Multi-State Alternate Assessment

2021 Technical Report

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Chapter 1. Overview of MSAA and 2021 Updates

1.1 Purposes and Uses of the MSAA

The Multi-State Alternate Assessment (the MSAA) is a comprehensive, two-stage adaptive, summative assessment system designed to promote increasingly higher academic outcomes for students with the most significant disabilities to prepare them for a broader array of post-secondary outcomes. The MSAA is designed to measure grade-level academic content that is aligned with, and derived from, MSAA Partner States' content standards. This test contains many built-in supports that allow students to use materials they are most familiar with and communicate what they know and can do as independently as they are able. The MSAA is administered in the areas of English language arts (ELA) and mathematics in grades 3–8 and 11.

The MSAA Partner States' long-term goal is to ensure that students with the most significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school with the potential to pursue productive post-secondary options. A well-designed summative assessment alone is insufficient to achieve this goal. The MSAA is a component of a system of curriculum, instruction, and professional development that enables students with the most significant cognitive disabilities to access grade-level content aligned with grade-level state content standards.

The MSAA is an alternate assessment aligned with alternate academic achievement standards (AA-AAAS) as described in the Elementary and Secondary Education Act (ESEA). This law mandates that all students participate in assessments that measure student achievement of grade-level content standards. The MSAA was developed to ensure that all students with the most significant cognitive disabilities are able to participate in a summative assessment that provides a measure of what they know and can do in relation to grade-level state content standards. In order to ensure that MSAA measures student achievement of alternate academic achievement standards aligned to grade-level content standards, this technical report provides the standard psychometric analyses and descriptions of technical procedures found in all state assessment technical reports. In addition, this report identifies four primary intended interpretations and uses of MSAA scores and cites the assumptions, elements, and evidence that are relevant to those interpretations and uses.

1.2 Intended MSAA Score Interpretations and Uses

MSAA is designed, developed, and implemented to support four primary intended score interpretations and uses, described in the following sections.

Primary Intended MSAA Score Interpretation

MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.

Primary Intended MSAA Score Uses

- Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers.
- Teachers use the MSAA and its results to integrate assessment with their instructional planning.

- Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year.

The intended score interpretation and uses stated here align with the original statements of intended score interpretations and uses in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see the "claim" and "uses" statements on page 8).

Assumptions, elements, and evidence that support the intended interpretations and uses of MSAA scores are provided in Chapter 11.

1.3 Validity Arguments for the MSAA

The 2021 technical report describes several procedural and psychometric processes of the MSAA program. These processes contribute to the accumulation of validity evidence to support MSAA score interpretations and uses. This report presents documentation to substantiate the intended interpretations and uses of MSAA test scores (AERA et al., 2014). Each section in this report contributes important information about the MSAA tests: test design and development, test alignment, test administration, scoring, reliability, performance levels, and reporting. The evidence available to support validity arguments for intended MSAA test score interpretations and uses is summarized in Chapter 11.

The phrase "intended score interpretations for uses" appears several times in the *Standards for Educational Psychological Testing* (AERA et al., 2014) and is the core of the field's views on validity and validation. For the MSAA and other assessment programs, the phrase refers broadly to **test scores** (e.g., total test scale scores, aggregations of test scores, the percentage of students at or above Level 3), and other test performance information elements (e.g., the definition of Level 3 in the performance level descriptors). The *Standards for Educational and Psychological Testing* provides a framework for describing sources of evidence that should be considered when constructing a validity argument. These sources include evidence based on the following five areas: test content, response processes, internal structure, relationship to other variables, and consequences of testing. These sources address different aspects of supporting evidence for validity arguments; they are not distinct types of validity. Instead, each contributes to a body of evidence about the comprehensive validity of score interpretations and uses and the four intended interpretations and uses. Moreover, these sources represent only a partial list of sources of evidence from the MSAA design, development, test administration, analysis, and reporting processes that are relevant to the overall validity arguments for intended interpretations and uses of MSAA scores and other information.

1.4 Updates for the 2021 Program

The MSAA Partner States for 2021 comprise American Samoa, Arizona, Bureau of Indian Education, Maine, Montana, The Marianas (Guam and the Commonwealth of the Northern Mariana Islands), South Dakota, Tennessee, the U.S. Virgin Islands, and Washington, D.C. The impact of COVID-19 worldwide resulted in cancellation of the 2020 administration and continued to influence many MSAA Partner States' participation levels in 2021. Washington, D.C. did not administer the assessment in the 2021.

New for 2021, MSAA expanded the number and type of sample items available to teachers through the online assessment platform. In mathematics, selected-response or constructed-response sample items were added at each grade. In ELA, new passage sets (including a passage and related items), writing stand-alone items, and two open-response writing prompts (Level 2 and Level 3) at grade 6 were added. Each grade has its own Directions for Test Administration (DTA) that corresponds with the items in the online system to emulate the student testing experience.

A new resource was developed for use prior to the 2021 administration. Sample Item Teacher Guides were created to help teachers use the sample items as an additional assessment tool. This allowed teachers to understand what students may know and be able to do based on their performance on these sample items. They were able to respond to this information by applying instructional strategies and scaffolding suggestions outlined in the Teacher Guides. An example from the Sample Item Teacher Guides is included in Appendix A.

The Teacher Guides have a blueprint table at each grade that outlines the items in each sample test. The ELA blueprint table/overview can be used to help select the sample item(s) that will provide the best evidence of student learning. The learning targets differentiate between the types of evidence each item will provide. The item type describes how the student will engage with the item; through multiple choice, constructed response, or open response. For ELA, items that address reading standards are grouped by passage set; each passage set primarily addresses standards in genre-specific content categories. The passages for items that assess reading standards are accessed in the Directions for Test Administration (DTA) and computer-based testing platform.

To obtain evidence of understanding for each grade-level standard, teachers can use the Teacher Guides to do the following:

- Access the sample items for the students' grade level.
- Use items individually as the learning targets are covered in class.
- Use the items in small groups to address a series of learning targets that focus on one standard.
- Use the entire sample item set to measure students' understanding of learning targets before, during, or after instruction.
- Review sample item sets from lower grades to build understanding of prerequisite skills for a given standard.
- Review sample item sets from higher grades to know how standard and item information build from the target grade.
- Use the sample items as models to create additional items to assess the standards.

Additionally, for the 2021 administration, test documentation was updated to reflect changes in the Test Administration Manual (TAM), MSAA Online Assessment System User Guide for Test Administrators, MSAA Online Assessment System User Guide for Test Coordinators, Directions for Test Administration (DTA), and the MSAA 2021 Guide for Score Report Interpretation Guide. The TAM, MSAA Online Assessment System User Guide for Test Administrators, MSAA Online Assessment System User Guide for Test Coordinators, DTA, and online training modules were revised in order to streamline information and provide more clarity to Test Administrators (TAs) and Test Coordinators (TCs). Additional detailed information is available in Chapter 5.

Chapter 2. Overview of the MSAA

The MSAA assesses ELA and mathematics at grades 3–8 and 11 and is aligned with the state content standards and the MSAA Core Content Connectors (CCCs). The MSAA is a computer-based, on-demand, two-stage adaptive assessment, consisting primarily of selected-response items, along with some constructed-response items and open-response writing prompts. These item types are written at distinct levels of complexity, representing different levels of skill and knowledge acquisition by students.

Students with the most significant cognitive disabilities often need materials and instructional strategies that are substantially adapted and scaffolded, providing built-in supports to meet their individual needs. When students begin to learn a new skill or acquire new knowledge, they need more support and scaffolding. As students learn and develop mastery of that skill or knowledge, they need less support.

The MSAA levels of complexity are designed to follow instructional practices. The test items are developed with many scaffolds and supports embedded within the items. Students are provided additional support based on their individual requirements, including other allowable ways for Test Administrators (TAs) to present each item.

The MSAA is designed to be administered one-on-one, delivered in an online format or via a paper-pencil/hybrid format as an accommodation if appropriate. The needs of the student are also addressed through other supports, such as assessment features built into the platform and accommodations such as using assistive technology, a scribe, and/or sign language. Appendix B contains the 2021 summary of accommodation usage frequencies for the MSAA. TAs have substantial leeway in developing a testing schedule, including the ability to start and stop a test depending on the engagement of the student.

Mathematics consists of 35 operational items, primarily selected-response with some constructed-response items. ELA consists of 39–42 operational items, consisting of selected-response items, along with a multiple-part selected-response writing prompt and an open-response writing prompt at each grade level. Each content area assessment is accomplished in two test sessions. There are also embedded field-test items in Session 1 for each grade and content area.

2.1 History of the MSAA

Work leading up to the MSAA began in late 2010, when the National Center and State Collaborative (NCSC) began development of the NCSC Alternate Assessment, which was designed to meet the requirements of the Elementary and Secondary Education Act and the Individuals with Disabilities Education Act and is based on alternate academic achievement standards for students with the most significant cognitive disabilities. This work culminated in the operationalized NCSC assessment in spring 2015. The work of NCSC ended following the spring 2015 administration. For additional information about the NCSC assessment, please refer to the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see “References” for URL) or contact the MSAA Partner States at MSAA@azed.gov. The MSAA Partner States continued the work of NCSC following many of the same principles, purposes, and core beliefs. The first administration of the MSAA was in the spring of 2016. Notably, the MSAA was not administered in 2020 due to school closings in response to the vast impact of COVID-19 on individuals worldwide.

2.1.1 Core Beliefs

The core beliefs that underlie the MSAA began with NCSC and were laid out in the prior planning and development of the AA-AAAS. As recorded in the *National Center and State Collaborative 2015*

Operational Assessment Technical Manual, states and organizational partners implementing the NCSC development plan found they needed to come to a consensus on topics that were a mix of practice and theory in the comprehensive context of teaching and learning. A blend of policy, educational, and technical solutions was required. Through policy discussions and in iterative research and design steps, the partners arrived at a shared philosophy and guiding principles that were reflected in the overall project resources. These project resources included a comprehensive system of curriculum, instruction, classroom assessment, and professional development as well as the operational assessment design.

The MSAA Partner States believe, as their NCSC counterparts did before them, that accessibility is central to the validity argument of the assessment, and that access to content based on college- and career-ready academic standards begins with rigorous curriculum, instruction resources, and training for teachers. The original design of NCSC curriculum and instruction resources was informed by extant research and iterative small studies to ensure inclusive accessibility and appropriately high expectations for learning. Then, the NCSC assessments were based on the same model of learning as reflected in classroom resources. Finally, the NCSC project provided resources for intervention in communicative competence to ensure that all students have a way first to learn the concepts, and then to show what they know and can do on the assessment. The NCSC Theory of Action and Validity Approach, available at ncscpartners.org/Media/Default/PDFs/Resources/NCSCBrief9.pdf, was developed to explain the basis for these resources, how they were intended to relate to one another and to college- and career-ready academic standards, and, ultimately, how they relate to the goal of having all students with the most significant cognitive disabilities leave high school ready to participate in college, careers, and their community.

Practice-focused summaries of the foundational components reflected in the design of the NCSC assessment, known as the NCSC Brief series, are available to orient readers to the larger context of the comprehensive NCSC system of curriculum, instruction, assessment, and professional development. The NCSC Brief series can be found in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see "References" for URL) or by contacting the MSAA Partner States at MSAA@azed.gov.

2.1.2 Stakeholders

Many stakeholders are involved in the development of the MSAA. MSAA State Representatives are key representatives from each Partner State who together compose the decision-making body for MSAA. Members of this body participate in various subcommittees that focus on specific aspects of the assessment and have decision-making authority on behalf of the MSAA Partner States for each subcommittee's focal area. Table 2-1 illustrates 2021 state representation for each subcommittee and is followed by a description of each subcommittee's area of responsibility.

Table 2.1 Subcommittee Representation

Subcommittee	State Representation
Item Development	American Samoa, Arizona, the Commonwealth of Northern Mariana Islands (CNMI), Maine, South Dakota, Tennessee, U.S. Virgin Islands, and Washington, D.C.
Manuals, User Guides, and Training	Arizona, Guam, Montana, South Dakota, and Washington, D.C.
Psychometric and Test Construction	American Samoa, Arizona, CNMI, Maine, Montana, and South Dakota
Platform (currently inactive)	Arizona, CNMI, Maine, Montana, and South Dakota
Scoring	Arizona, CNMI, Guam, and South Dakota
Reports	Arizona, Guam, and South Dakota

The MSAA Item Development Subcommittee provides overall input and direction related to development of field-test items; reviews all item development tasks; participates in development planning, item and passage reviews, and post-IRC edits; reviews alternative text; participates in Accessible Portable Item Protocol (APIP) reviews, plus the computer-based and paper-based materials review; and provides direction on updates to the graphics and editorial style guides, teacher directions, and front matter for the Directions for Test Administration (DTA). In addition to the Item Development Subcommittee, stakeholders from schools and districts across the MSAA states participate in the field-test item development process during the passage content and bias meeting and the item content and bias meeting. Additional detailed information is available in Chapter 4.

The Manuals, User Guides, and Training Subcommittee oversees development of the Test Administration Manual (TAM), MSAA Online Assessment System User Guide for Test Administrators, MSAA Online Assessment System User Guide for Test Coordinators, Parent Guides in English and Spanish, online training modules, and final quiz for TAs.

The Psychometric and Test Construction Subcommittee oversees planning Technical Advisory Committee (TAC) meetings, contributes to psychometric decisions, reviews item performance statistics for each field-tested item during Data Review, approves the test design, approves the test construction test blueprint, provides decisions and approvals related to the MSAA constructed sets (operational and field-test items), provides the content of the End-of-Test Survey, determines relevant policies, receives the survey results after administration, and advises on the structure of the technical report.

The Platform Subcommittee has determined development priorities for the online assessment platform used in the 2021 MSAA on an as-needed basis. This group has also reviewed recommendations and development pertaining to the security of the online platform and ultimately approved all changes made to the platform.

Members of the Scoring Subcommittee review and approve the scoring specifications and scorer training materials, observe scoring processes, review daily scorer quality control and production management reports, and participate in daily debriefs during operational scoring.

Finally, the Reports Subcommittee is responsible for decisions pertaining to report revisions and design. This group also approves all changes made to the overall layout of the student results files and the final processing and reporting business requirements implemented for MSAA reporting.

2.2 MSAA Participation

The criteria for student participation in the 2021 MSAA reflect the pervasive nature of a significant cognitive disability. All content areas are considered when determining who should participate in this assessment. Table 2-2 below shows the participation criteria and the descriptors used to determine eligibility for each student.

Table 2.2 Participation Criteria

Participation Criteria	Participation Criteria Descriptors
1. **The student has a significant cognitive disability.**	Review of student records indicates a disability or multiple disabilities that significantly impact intellectual functioning and adaptive behavior.*
2. **The student is learning content linked to grade-level content standards.**	Goals and instruction listed in the IEP for this student are linked to the enrolled grade-level content standards and address knowledge and skills that are appropriate and challenging for this student.
3. **The student requires extensive, direct, individualized instruction and substantial supports to achieve measurable gains in the grade- and age-appropriate curriculum.**	The student (a) requires extensive, repeated, individualized instruction and support that is not of a temporary or transient nature, and (b) uses substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills across multiple settings.

**Adaptive behavior is defined as essential for someone to live independently and to function safely in daily life.*

Appendix C shows the 2021 summary of participation rates for the MSAA for both mathematics and ELA by demographic category.

Assessments for students with the most significant cognitive disabilities rely on a foundation of communicative competence. Students who do not have receptive and expressive communication are unlikely to be able to demonstrate what they know and can do on an assessment. Students who do not have an appropriate mode of communication are identified during the assessment process. Post-assessment, teachers have the opportunity to use the Communication Tool Kit developed by NCSC to help these students develop an appropriate mode of communication. The Tool Kit can be found here: https://wiki.ncscpartners.org/index.php/Communication_Tool_Kit.

Chapter 3. Test Development-Content and Administration

3.1 History of Alternate Academic Achievement Standards and Core Content Connectors

As noted in Chapter 2, MSAA has evolved from the work of NCSC. As such, MSAA's history is firmly planted in the foundation of the NCSC AA-AAAS and follows the original Theory of Action. Designed specifically for students with the most significant cognitive disabilities, the NCSC AA-AAAS was a performance-based test that was aligned with grade-level state content standards for ELA and mathematics and tested student performance based on alternate academic achievement standards.

The NCSC state and center partners, comprised of content and special education experts, focused on defining the constructs of reading, writing, and mathematics to reflect an appropriate expectation of instruction and learning throughout a student's educational experience. Furthermore, the experts sought to make those constructs adaptable to the way in which students with the most significant cognitive disabilities demonstrate acquired knowledge and skills. NCSC established overarching content definitions by examining: (a) existing content definitions in general education; (b) the content, concepts, terminology, and tools of each domain; (c) a body of extant research; and (d) the Common Core State Standards (CCSS). These content definitions became central to the development of assessment items.

NCSC developers revised and refined the NCSC AA-AAAS design using cycles of continuous feedback from state and center partners. Developers evaluated proposed designs through iterative item and test development steps, special studies, and pilot testing, all of which were central to the final NCSC assessment model implemented through the first administration of the operational test in spring 2015.

Prior to the start of item development, the Core Content Connectors (CCCs) connecting the Learning Progression Frameworks (LPFs) to the CCSS were developed.

3.1.1 The Learning Progression Frameworks

The LPFs present a broad description of the essential content and general sequencing for student learning and skill development (Hess, 2010). The LPFs provide the educational logic to help move students with the most significant cognitive disabilities along with their peers, based on researched teaching and learning, toward mastering skills for college and career readiness. Experts at NCSC looked at these learning targets together with grade-level content expectations from the CCSS to identify and clarify the most salient grade-level core academic content to guide instruction and assessment from kindergarten through high school for students with the most significant cognitive disabilities. This core academic content is referred to as the CCCs.

3.1.2 Core Content Connectors

The CCCs were defined by NCSC as the academic content designed to frame the instruction and assessment of students with the most significant cognitive disabilities. This identified core content serves as a connection or stage between the LPFs (designed for typically developing students) and the CCSS (which define grade-level content and achievement). The CCCs are intentionally dually aligned with both. The CCCs are designed to contribute to a fully aligned system of content, instruction, and assessment

that focuses on the core content, knowledge, and skills needed at each grade to ensure success at the next grade level.
Each CCC represents a teachable and assessable part of the content. Related CCCs are addressed during instruction to create deeper understanding of grade-specific academic content. The CCCs are specifically intended to promote success as students advance alongside peers without disabilities from grade level to grade level. They are the starting point for instruction, not necessarily everything an individual student can and should learn.

The CCCs preserve the sequence of learning outlined in the LPFs, to the extent possible, while deconstructing the progress indicators (which describe concepts and skills along the learning continuum for each grade span in the learning progression) into smaller segments of content. The CCCs and corresponding *Curriculum Resource Guides* were developed to help explain and promote how students can engage in the CCSS while following the LPFs. To demonstrate the content sequence maintained by the CCCs, Table 3-1 shows a series of CCCs developed for multiple grades by NCSC for one big idea within the mathematics strand of geometry.

Table 3-1. CCCs Developed for Geometry Big Idea: Shapes and Figures—Their Attributes, Properties, and Corresponding Parts

Grades	Geometry Core Content Connectors			
K–2	K.G.M1a1 Recognize two-dimensional shapes (e.g., circle, square, triangle, rectangle) regardless of orientation or size	K.GM.1a2 Recognize two-dimensional shapes in environment regardless of orientation or size	K.GM.1a3 Use spatial language (e.g., above, below) to describe two-dimensional shapes	2.GM.1a4 Identify two-dimensional shapes such as rhombus, pentagons, hexagons, ovals, equilateral, isosceles, and scalene triangles
3–4	3.GM.1h1 Identify shared attributes of shapes	4.GM.1h2 Classify two-dimensional shapes based on attributes (number of angles)		
5–6	5.GM.1a1 Recognize properties of simple plane figures	5.GM.1b1 Distinguish plane figures by their properties		
7–8	7.GM.1e Construct or draw plane figures using properties	8.GM.1g1 Recognize congruent and similar figures		
HS	H.GM.1e Make formal geometric constructions with a variety of tools and methods	H.GM.1b Use definitions to determine congruency and similarity of figures		

The CCCs reference the *Learning Progressions Frameworks Designed for Use with the Common Core State Standards in Mathematics K–12* (Hess, 2010). The letter/number in each box provides a cross-reference to the letter/number in the original learning progressions. For example, for *3.GM.1h1*, the *3* means third grade, the *GM* means geometry, the *1h* relates to the specific progress indicator in the original learning progression, and the *1* means that it is the first in a series of connectors.

Table 3-1 shows how learner understanding builds across years. For example, in the second column, the student recognizes shapes, then compares shapes based on attributes, then distinguishes plane figures by properties, then recognizes congruent/similar figures, and finally by high school can use definitions to determine congruency/similarity of figures. These skills all promote the big idea about shapes—their attributes, properties, and corresponding parts (Wakeman, Lee, & Browder, 2012).

The MSAA State Partners adopted the CCCs as the standards that the students are instructed and assessed against as a participating consortia member. These CCCs are the measured academic content on the MSAA and are aligned to and derived from each participating state's content standards,

3.2 Alignment and Linkages

Evidence that test content reflects the concepts that were meant to be measured is one of the critical sources of information necessary to support valid interpretations of test scores (AERA et al., 2014). *Alignment* refers to coherent connections within and across a system (Forte, 2013a, 2013b). Traditional alignment procedures describe the degree of intersection, overlap, or relationship among academic content embedded in state content standards, assessment, and instruction (Webb, 2005).

As part of the assessment development process, NCSC conducted a series of studies to answer several key questions related to the alignment of the assessment. These efforts were meant to ensure that students' scores can be interpreted as reflecting the knowledge and skills defined in the standards and claims (developed by NCSC, see *National Center and State Collaborative 2015 Operational Assessment Technical Manual*). The alignment questions were:

1. What is the degree of alignment between the CCCs and the grade-level CCSS?
2. What is the degree of alignment between instructional student learning expectations and measurement targets (expectations for assessed knowledge and skills)?
3. To what degree dossssss the assessment tasks and items align to the grade-level CCSS?
4. To what degree do the assessment tasks and items align to the performance level descriptors (PLDs)?
5. How well do the claims align with grade-level content and provide useful information for tracking student progress toward achieving the knowledge and skills in the grade-level standards?

To address the five alignment questions, various studies were conducted between 2012 and 2015 at different points in the development process to ensure system coherence. Table 3-2 lists the studies, when each was conducted, and the alignment question being addressed.

Table 3-2. Studies Related to Evidence of System Coherence

Study	Conducted	Claim for Which Evidence Is Provided
Relationship Studies	Mathematics: Summer 2012; Reading: Winter 2013; Writing: Summer	Evidence for Alignment Question #1. The content and skills in the CCCs represent an adequate and appropriate sample of the grade-level CCSS.
UMASS Study of Coherence	Fall 2013	Evidence for Alignment Question #2. The targets for measurement provide information useful for tracking student progress in the CCSS and to teachers for providing instruction focused on academic expectations.
Task/Item Alignment Study	Summer 2015	Evidence for Alignment Question #3. The content and skills assessed by the NCSC AA-AAAS represent an adequate and appropriate sample of the grade-level CCSS.
Item Mapping Study	Summer 2015	Evidence for Alignment Question #4. The score reports are accurate and support appropriate inferences about student knowledge and skills.
Vertical Coherence Study	Summer 2015	Evidence for Alignment Question #5. The targets for measurement provide information useful for tracking student progress in the CCSS and for providing instruction focused on academic expectations.

MSAA has carefully and gradually evolved from NCSC, ensuring the alignment has been maintained while still allowing for adjustments. For example, the prioritized CCCs and reporting categories have remained the same for mathematics and for ELA (with the exception of one adjustment to the Reading Foundational CCC at grades 3 and 4) from those originally identified by NCSC. Section 3.4 provides detail on the contents and blueprints. The various alignment studies noted in Table 3-2 are applicable for the MSAA as the NCSC Theory of Action serves as the foundation for the MSAA program. MSAA has implemented test design adjustments that were outlined by NCSC during the original test design planning phase. One example of this is the implementation of the stage-adaptive test design. Section 3.3 below provides detailed information about the assessment design.

3.3 2021 MSAA Assessment Design

3.3.1 Operational Design

The operational MSAA is designed to produce valid and reliable mathematics and ELA scores. The mathematics and reading portions of the test are composed primarily of selected-response items. In mathematics, all grade levels also include constructed-response items that require students to work through a process to solve a problem, but that result in either correct or incorrect answers. Writing is composed of selected-response stand-alone items, a multiple-part selected-response writing prompt, and an open-response writing prompt.

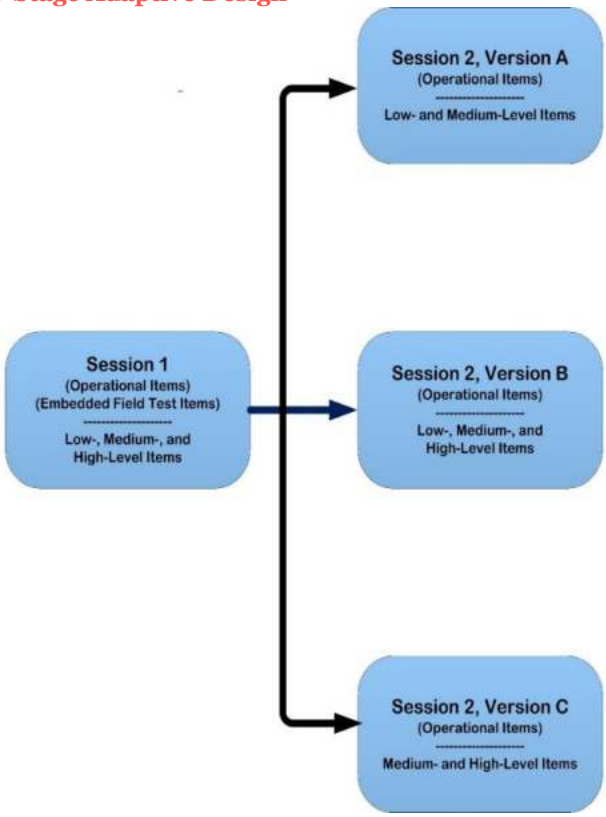
The operational items vary in complexity following the *Mathematics Tier Guidelines*, *ELA Tier Guidelines,* and *Passage and Item Sloping Guidelines,* where each tier at a given standard addresses both the content complexity and the degree of scaffolding and support provided with the items. The tiers provide four decreasingly complex versions (items) of the task referred to as Tier 4 (most complex), Tier 3 (less complex), Tier 2 (less complex than Tier 3), and Tier 1 (least complex). The writing prompts use three levels of items. Tier 1 is a multiple-part selected-response item series, where all items build on each other toward the creation of a final product. Tier 2 and Tier 3 are open-response writing prompts that vary in complexity based on the amount of support provided at each tier. The MSAA TAC and state partners monitored item performance and watched for substantive delineation among tiers. Ultimately, they decided the 4 tiers did not differentiate to the degree intended and shifted from 4 tiers to 3 levels in item development. In this model, Level 3 is the most complex, Level 2 is less complex than Level 3, and Level

1 is the least complex. There was no adjustment to the writing prompt levels. Guidelines providing sloping structure for the item design were updated to reflect the new model. Additional detailed information about item design, mapping of tiers to levels, and administration is provided in Section 3.3.3.

For the 2021 assessment, three two-stage adaptive forms were developed for both ELA and mathematics to accommodate the inclusion of field-test items within Session 1. The forms follow guidelines informed by the respective content-area test blueprints (test blueprints are discussed in Section 3.4). The operational items are presented in two sessions. The Session 1 operational items are the same across all forms. Session 1 is considered Stage 1. Session 1 is taken by all students, while Session 2, which is considered Stage 2, is assigned to students based on how they perform on Session 1. There are three versions of Session 2, of varying difficulty, that may be assigned. Version C is intended to be slightly more complex and difficult than Version B, and Version B is intended to be slightly more complex and difficult than Version A. A Level 1 writing prompt is included for Sessions 2A, 2B, and 2C. A Level 2 writing prompt is included in Session 2A, and a Level 3 writing prompt is included in Sessions 2B and 2C.
There are, thus, three possible paths for a student to take through the multistage test. All students take Stage 1, and, depending on how they perform on Stage 1, are assigned 2A, 2B, or 2C. In 2021 there is a moderate overlap of items in each version, but enough variation to ensure varying degrees of the desired separation of test information functions (TIFs) across the paths. For more information on TIF, see Chapter 9, and for more information on the measurement reliability stemming from these TIF values, see Chapter 10.

Figure 3-1 illustrates the two-stage adaptive design with field-test items indicated in Session 1, along with the levels of items that were used in each session. The three paths (Session 1 plus Session 2A, Session 1 plus Session 2B, and Session 1 plus Session 2C) for the operational assessment exist for each of the three field-test forms.

Figure 3.1 Two-Stage Adaptive Design



3.3.2 Operational Items and Embedded Field-Test Items

As discussed earlier, there are three versions of Session 2. A number of items are the same across Sessions 2A, 2B, and 2C.

As shown in Table 3-3, the ELA tests administer 39–42 operational items including two writing prompts, consisting of 18–21 Session 1 items and 21 Session 2 items. Each field-test form has 11–13 field-test items for a total of 33–39 items across the three field-test forms. As discussed earlier, there are three versions of Session 2, which consist of 3 passage sets and 5–7 writing items. In Session 2 a total of 7–21 items overlap across Sessions 2A, 2B, and 2C depending on the grade. The items that overlap are not always the same ones across all 3 versions (e.g., one passage set may overlap across 2A and 2B, and a different passage set may overlap across 2B and 2C).

Table 3-3. ELA Operational and Embedded Field-Test Items

Grade	Total Operational Items Administered to Each Student	Writing Prompt Operational Items	Selected-Response Field-Test Items Total Across Three Field-Test Forms
3	42	2	36
4	42	2	33
5	42	2	36
6	40	2	33
7	39	2	39
8	40	2	36
11	40	2	36

As shown in Table 3-4, the mathematics tests consist of 35 operational items across the testing sessions per grade, consisting of 15 Session 1 items and 20 Session 2 items. Each field-test form has 10 different field-test items for a total of 30 field-test items across the three field-test forms. As discussed earlier, Sessions 2A, 2B, and 2C each have 20 items. A subset of the items in Session 2A are common with items in Session 2B. There can be up to 10 items that are common between Sessions 2A and 2B. A subset of the items in Session 2C is common with items in Session 2B. There can be up to 10 items that are common between Sessions 2C and 2B. There are no common items between Session 2A and Session 2C.

Table 3-4. Mathematics Operational and Embedded Field-Test Items

Grade	Total Operational Items Administered to Each Student	Field-Test Items Total Across Three Field-Test Forms
3	35	30
4	35	30
5	35	30
6	35	30
7	35	30
8	35	30
11	35	30

The 2021 field-test items are selected based on the following criteria:

- mathematics and ELA items represent a variety of item complexity levels (including the writing stand-alone component and a Level 1 writing prompt);
- ELA passage or writing topics are unique to the form and provide a variety of genres; and
- the passage and items are engaging, accurate, and free of regional bias.

The items on each of the forms are reviewed by psychometrics for any validity and reliability concerns. The *MSAA Test Construction Process for 2021* provides the procedures to follow in constructing the test including the psychometric parameters that form the criteria each constructed test should meet. This document is used as the guiding resource to replicate MSAA test construction processes across administration years. The test construction process occurs following data review of the field test items from the previous administration. The content specialists create the test pulls based on the test blueprints and criteria provided by the psychometricians. The forms are then evaluated by psychometrics and revision loops occur as needed. Once the psychometricians provide approval of a constructed test it is then also reviewed by the Psychometric and Test Construction Subcommittee. All constructed tests, as well as the field-test items, are posted on a secure FTP site for the Psychometric and Test Construction Subcommittee review and approval. A webinar is held with the MSAA subcommittee to explain the test construction process and to review the Test Construction Design document, which provides information specific to each content area about the items selected. The MSAA subcommittee then has an opportunity to provide input and final approval.

The 2021 assessment includes field-test items in both mathematics and ELA (reading and writing) with differing levels of complexity. In order to address some of the overlap in item difficulty across Tiers 2, 3, and 4, the MSAA Partner States adjusted the item design to consist of three levels. Items that were field-tested in 2021 were written to three target levels, whereas some of the operational items in the 2021 test forms were written to four target tiers. The writing prompts were already developed at only three tiers, and as such, were renamed to designate them as levels instead of tiers. The tiers-to-levels mapping is shown in Table 3-5.

Table 3-5. Mapping of Tiers and Complexity Levels

Tier 4	Item complexity level 3
Tier 3 **Tier 2**	Item complexity level 2
Tier 1	Item complexity level 1

The *ELA Level Guidelines, Mathematics Level Guidelines,* and item specifications for each grade and content were updated to reflect the three item complexity levels. A primary distinction among items written at item complexity levels 1–3 is (a) their connection to content standards, and (b) the scaffolded supports provided at each level.

- Complexity level 3 items target the Core Content Connectors, with minimal supports provided during item administration.
- Complexity level 2 items target Core Content Connectors, with content supports (e.g., graphics, examples, definitions) provided during item administration.
- Complexity level 1 items target Essential Understandings, with content supports (e.g., graphics, simplified language) and item supports (e.g., two response options provided during item administration.

3.3.3 Item Design and Administration

The MSAA item design and administration is intended to capture student performance at different levels of skill and knowledge acquisition. The assessment items incorporate important aspects of item design related to both varying levels of content complexity and the degree and type of scaffolds and supports. The MSAA Partner States follow NCSC's intentional assessment development process to address the targeted grade-level academic content linked to evidence-based curricular and instructional materials.

The MSAA content development processes address levels of cognitive and language complexity, specifically addressing the state content standards, and the heterogeneous characteristics of the target student population. The assessment items vary systematically in complexity yet remain aligned with the focal knowledge, skill, and ability (FKSA) behind the CCCs. The items are designed to capture student performance by varying two characteristics: (1) levels of content complexity, and (2) degrees and types of scaffolds and supports. The scaffolds and supports (e.g., reminders, examples, and models) are provided to focus the student on the task and elicit a response without guiding the student's response.

Overall Item Structure

A range of item levels is developed for each CCC, as described in Section 3.3.1. Each level provides variable features and supports that offer multiple entry points for a variety of students to demonstrate their knowledge and skill. All items assess grade-level academic concepts defined by either the FKSAs or the Essential Understandings (EUs). Items follow the level guidelines and item specifications. As outlined in the level guidelines, items of graduated complexity address the same FKSA but provide increased levels of support and/or decreased levels of complexity, and at the lowest tier address the EU that has the most decreased level of complexity, and also as part of the item, provide the greatest level of support. Additionally, the MSAA item specifications are consistent with design patterns and task template guidelines that were originally developed by NCSC. The item types, as outlined in the MSAA item specifications, are selected-response, multiple-part selected-response, constructed-response, and open-response. Regardless of tier or item type, all items include teacher directives.

Mathematics and ELA (reading, language, and stand-alone writing) selected-response items are multiple-choice items where a student selects a response from three options (two options at Level 1); the answer is worth 0 or 1 point. ELA multiple-part selected-response items are multiple-choice items that are clustered together and connected to a single CCC. For each item, the student selects a response from three options (two options at Level 1); the answer is worth 0 or 1 point. The overall cluster could, then, be worth more than 1 point. There are two- and three-part items. A typical example of a multiple-part selected-response item would be an initial item in the cluster that asks the student to identify the main idea and then a second item that asks for a supporting detail. In contrast, the mathematics MSAA item specifications and tier guidelines require CCCs with multiple components to be addressed with unique items. For example, a CCC asking a student to identify and solve an equation might be evaluated using one item that requires the student to identify the correct equation for a word problem and a separate item that requires solving an equation.

Mathematics constructed-response items require the student to interact in some way with a set of materials to provide a response. These items are scored as correct or incorrect by the TA following the directions provided in the Directions for Test Administration (DTA). For example, students might construct a graph, solve a problem, or complete a table. These items are worth 0 or 1 point because the items ask the student to show whether a single concept is understood.

ELA reading foundational items focus on comprehension skills and are administered as selected-response items worth 0 or 1 point. Students are asked to read five words and select the most appropriate word to complete the sentence provided.

ELA writing prompt items require students to compose a permanent product about a specific topic, following the writing process. The Level 1 writing prompt is a multiple-part selected-response item where the items build on each other toward the creation of a final product. For each item in the series, the student selects a response from two options, with the answer worth 0 or 1 point. Items may have four to six parts, depending on the grade.

Unlike Level 1, the Level 2 and Level 3 writing prompts are open-response writing prompts that vary in complexity with the amount of support provided at each tier. The Level 2 writing prompt provides a graphic organizer and a template with sentence starters that a student utilizes to create a product based on information he or she included in the graphic organizer. The Level 3 writing prompt provides a graphic organizer and a template that does not have sentence starters; the student completes his or her product within the template based on information he or she included in the graphic organizer. For Levels 2 and 3, the student response is evaluated against a grade- and tier-specific rubric. Open-response writing prompt items were developed for Levels 2 and 3 only. As outlined in Chapter 1, the writing prompt items are operational in each grade for the 2021 MSAA. For reference, the specific writing rubrics are included as an appendix in the *MSAA 2021 Guide for Score Report Interpretation*.

Administration

For every grade level, the ELA and mathematics tests require two test sessions. TAs begin with Session 1 of either the ELA test or the mathematics test. Descriptions of the test sessions are shown in Tables 3-6 and 3-7.

Table 3-6. ELA Test Sessions

Session 1: ELA	Session 2: ELA, Includes Writing Prompts
Literary and informational reading passages and associated selected-response reading items	Literary and informational reading passages and associated selected-response reading items
Selected-response writing stand-alone items	One multiple-part selected-response writing prompt
Reading Foundational items field-test (grades 3 and 4 only)	One open-response writing prompt

Table 3-7. Mathematics Test Sessions

Session 1: Mathematics	Session 2: Mathematics
Selected-response mathematics items	Selected-response mathematics items
Constructed-response mathematics items*	Constructed-response mathematics items*

**Constructed-response mathematics items are dichotomously scored.*

3.3.4 Item Components

3.3.4.1 Selected-Response: Reading, Writing (Stand-Alone Items and Multiple-Part Selected-Response Writing Prompt), Mathematics

All directions and materials needed for administering selected-response items are provided in the secure grade-, content- and form-specific DTA. Selected-response items are presented to students in a standardized and consistent format. Every item is presented in the following order:

- item stimulus (which may include a passage, passage part, picture, graphic, or other illustration);
- item question; and
- response options presented in vertical or horizontal formation depending on the size of the response options.

Students select a response from the options in a variety of ways (e.g., using the computer mouse, verbalizing, gesturing, using eye gaze or communication devices, using assistive technology). Students' responses are entered into the MSAA System. If a student has the scribe accommodation, the scribe enters the student-selected response on behalf of the student.

3.3.4.2 Constructed-Response: Mathematics

The secure grade-, content-, and form-specific DTA contains the directions as well as the materials and manipulatives needed by the TA to assess the student on the constructed-response items. The TA prints out the materials and manipulatives with which the student will interact. Each item is presented to the student in a standardized, scripted sequence of steps, culminating in the TA scoring the student performance using the required Mathematics Scoring Rubrics. The Mathematics Scoring Rubrics provide scoring standards that must be used in evaluating student responses. The constructed-response item is scored as correct or incorrect based on the Mathematics Scoring Rubric for that item. The TA enters the student constructed-response score into the MSAA System.

3.3.4.3 Open-Response: Writing Prompt

All open-response writing prompt directions and stimulus materials, including the response template, are included in the secure grade-, content-, and form-specific DTA. TAs print or prepare any writing stimulus materials that they would need to use for the test. The open-response writing prompt is presented to the student by the TA in a standardized, scripted sequence of steps.

The student, or a scribe, records the response to the writing prompt either on the response template in the online MSAA System or on the paper response template included in the DTA. If the student uses a paper version of the response template, the TA

- uploads the response template, including any annotations, into the MSAA System, or
- transcribes or types (exactly) the student's writing response, including any annotations, into the MSAA System.

If the student's writing response includes inventive spelling, hard-to-read penmanship, or use of symbols, TAs are directed to annotate the response so that it can be understood by an external scorer. For more information about scoring, see Chapter 6.

3.4 Content and Blueprints

The test blueprints followed by MSAA are consistent with the original NCSC Theory of Action, the evidence-centered design undertaken to develop the summative assessment, and with best practices in educational measurement. Tables 3-8 and 3-9 show the broad targets developed to guide the item

development process and to inform test construction. The tables provide general guidance for identifying areas of emphasis in the development of the mathematics and ELA tests. The test blueprints in Appendix D incorporate the overall content distributions used for the development of the operational tests. Each grade level/content area is represented by a table that first describes the domain (e.g., operations and algebraic thinking) or text type (e.g., reading informational text), weights by domain and ELA strands and text types, CCC, item types, and number of items. To continuously improve the assessment following each administration, the items' statistics for each test in each grade and content area are revisited to balance both the content requirements of the blueprints and the psychometric characteristics of the items for the subsequent administration. The core set of operational items on each two-stage adaptive test is established from this balanced approach.

3.4.1 English Language Arts

For the 2021 MSAA, the ELA items in reading and writing are aligned with prioritized CCCs, which are in turn connected to the CCSS and state content standards, as well as to the LPFs. The distribution of ELA items related to various text types (e.g., literary, informational, and argument) aligns to the text type emphasis in reading and writing outlined in the CCSS and state content standards.

For the 2021 MSAA, reading comprehension assessment items are presented as a single selected-response or multiple-part selected-response item as described in Section 3.3.3.

In grades 5–8 and 11, some prioritized content standards require evaluation of content across more than one passage. These skills are measured using paired passage sets. All paired passages are written in the informational text type. Tables in the test blueprints identify which CCCs require paired passages.

In grades 3 and 4, the reading foundational content category addresses the anchor standard of fluency. In 2021 reading foundational items are being used operationally.

The three CCCs prioritized for writing at each grade level consist of one CCC operationally assessed by a multiple-part selected-response writing prompt and an open-response writing prompt, and two CCCs operationally assessed by selected-response writing stand-alone items. The selected-response writing stand-alone items are designed to assess discrete basic writing skills. The multiple-part selected-response writing prompt and the open-response writing prompt are designed to measure a student's ability to generate a permanent product to represent organized ideas specific to a writing mode, supported with details or facts to develop those ideas or clarify meaning, and the use of standard English conventions (for the open-response writing prompt only).

Table 3-8. Guidelines for Distribution of ELA Content by Grade Level

ELA Content Category	Gr 3	Gr 4	Gr 5	Gr 6	Gr 7	Gr 8	Gr 11
Reading Literary	24–32%	24–32%	25–33%	21–30%	17–26%	17–26%	17–26%
Reading Informational	18–26%	18–26%	25–33%	26–34%	32–36%	32–36%	32–36%
Reading Vocabulary and Foundational (G3 and G4)	12–16%	12–16%	6–10%	9–11%	6–9%	6–9%	6–9%
Writing	36–38%	32–38%	31–40%	36–40%	36–40%	36–40%	36–40%

3.4.2 Mathematics

Mathematics items are aligned with prioritized CCCs, which are in turn connected to the CCSS and state content standards, as well as to the LPFs. Mathematical knowledge across the CCCs is assessed

through selected-response items and constructed-response items. The need for constructed-response items is determined by the FKSA associated with a given CCC.

Table 3-9. Guidelines for Distribution of Mathematics Content by Grade Level

Mathematics Content Category	Gr 3	Gr 4	Gr 5	Gr 6	Gr 7	Gr 8	Gr 11
Operations and Algebraic Thinking	28–32%	28–32%	9–11%				
Number and Operations Base Ten	17–23%	9–11%	34–40%				
Number and Operations Fractions	17–23%	28–32%	17–23%				
Measurement and Data	17–23%	17–23%	17–23%				
Geometry	9–11%	9–11%	9–11%	9–11%	17–23%	28–32%	9–11%
Ratio and Proportions				28–32%	34–40%		
Expressions and Equations				17–23%	9–11%	17–23%	
The Number System				28–32%	17–23%	9–11%	
Statistics and Probability				9–11%	9–11%	17–23%	17–23%
Functions						17–23%	
Algebra and Functions							47–52%
Number and Quantity							17–23%

In some cases, the selected FKSAs are best addressed by separating the skill into two parts, creating two unique items to fully address a single content standard. Tables in Appendix D identify which CCCs require two items.

In addition, there are items identified as not allowing the use of calculators. These items tend to be related to computation, where the construct being assessed would be masked using a calculator.

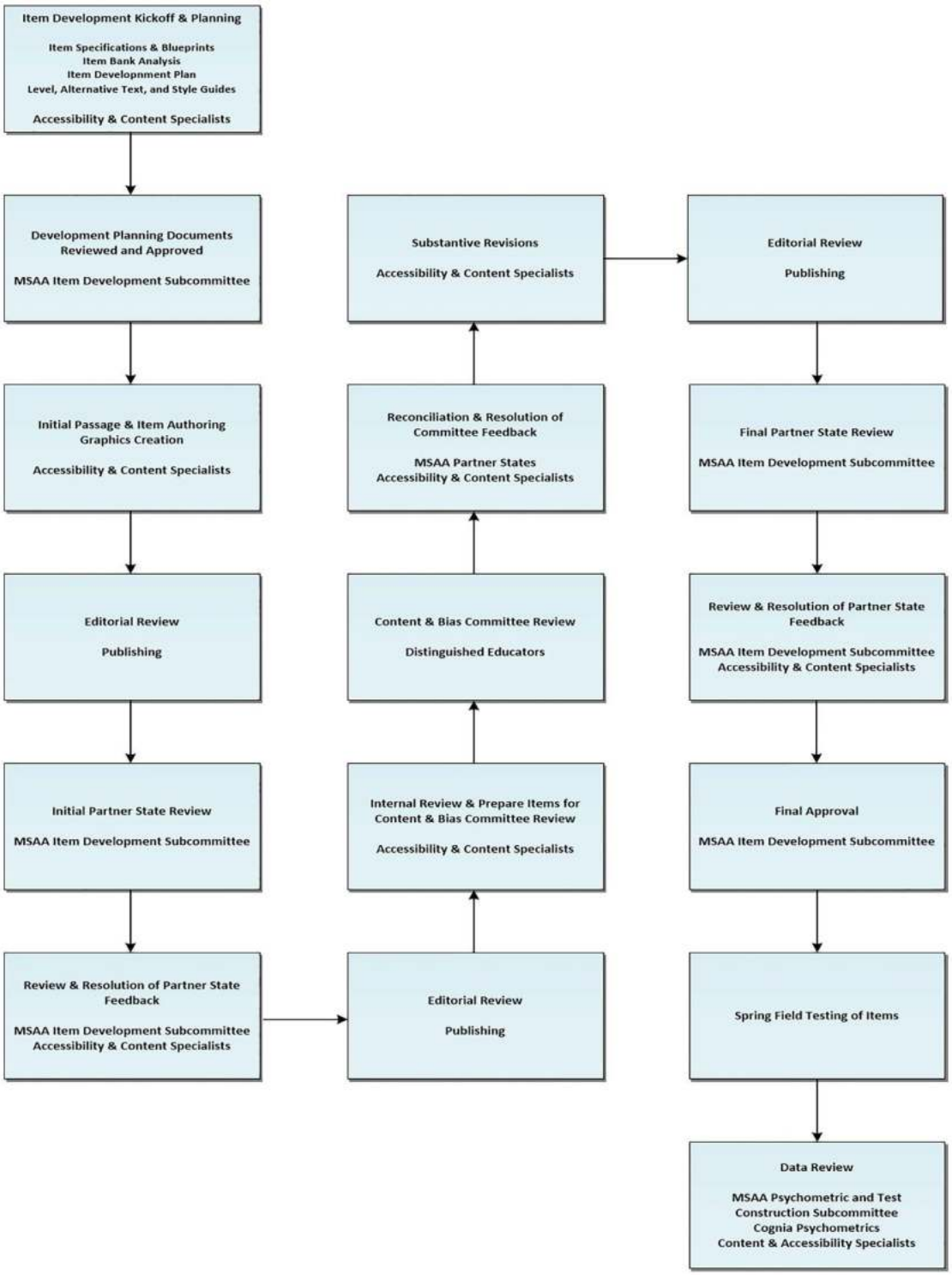
Chapter 4. Test Development-Stakeholder Involvement

4.1 General Philosophy and Role of the Item Development and Psychometric Subcommittees and Other Stakeholders in Test Development

As discussed previously, the MSAA is a comprehensive assessment system designed to promote increasingly higher academic outcomes for students with the most significant cognitive disabilities in preparation for a broader array of post-secondary outcomes. The MSAA is designed to assess the academic content of the CCCs through an assessment design that consists of items written at various levels of complexity and provides built-in supports to meet the individual needs of the students. The two-stage adaptive assessment allows students to demonstrate what they know and can do. Given the wide diversity of the student population, great emphasis is placed on ensuring that the MSAA is appropriate and accessible to all eligible students.

The MSAA items on the 2021 administration are from the previous NCSC 2015 administration, as well as the 2016, 2017, 2018, and 2019 MSAA administrations. As described in Chapter 3, the items selected as field-test items are developed by MSAA. The item development process is an iterative one, which allows for multiple opportunities for review of the items by various stakeholders including MSAA State Representatives, content experts and Partner State representative reviewers that are selected by MSAA State Representatives, and external passage and item content and bias review participants. Items that are newly developed are field-tested during the spring administration. Once they are field-tested, the items undergo data analysis and then go through a data review process with MSAA State Representatives. Figure 4-1 provides a flowchart outlining the item-development process.

Figure 4.1 Item Development Process



General and special education teachers, administrators, and other education specialists are selected to review passages for content or bias and sensitivity before item development begins for the ELA assessment. The review committee convenes in the summer to review newly developed items for content or bias and sensitivity in ELA and mathematics. Each ELA and mathematics content group reviews items for content-related considerations, such as alignment to the FKSA or EU, ratings of depth of knowledge, clarity of the item content, and consistency of teacher directions. Separate bias and sensitivity groups review the ELA and mathematics items for bias and sensitivity considerations, as well as accessibility considerations. The list of participants in the item content and bias review is included in Appendix E. The Item Development Subcommittee, which is made up of the MSAA State Representatives, provides overall direction and guidance regarding field-test item development. This multistage development and review process provides ample opportunity to evaluate items for their accessibility, appropriateness, and adherence to the principles of Universal Design. In this way, accessibility serves as a primary area of consideration throughout the item development process. This focus on accessibility is critical in developing an assessment that allows for the widest range of student participation, as educators seek to provide access to the general education curriculum and foster higher expectations for students with the most significant cognitive disabilities.

The Psychometric Subcommittee participates in the data review meeting(s) and is responsible for making determinations about the future usage of the items based on the field-test statistics. During the data review meeting(s) with the Psychometric Subcommittee, Cognia content specialists, accessibility specialists, and psychometricians review the Field Test Calibration Report, which includes item statistics for each field-test item that has been flagged by Psychometrics. The statistical parameters that trigger an item being flagged are shared with the subcommittee. Referenced during data review are the IRT analyses summarized in the Field Test Calibration Report (see Section 9.2 for field test calibration details). Data review attendees are also supplied with Asset Detail Reports, which provide the actual passage and item for each of the flagged items. This step allows for the content of the flagged items to be considered when determining future usage.

Flagged items are placed into categories. The items might be flagged only for form 2A (Use only in forms 2B and 2C), flagged for 2A and 2B (Use only in form 2C), flagged for all three Do Not Use (DNU), or flagged as Use with Caution (UWC). The content of the item is reviewed along with the statistics. After each item is reviewed, the subcommittee members determine whether an item is accepted with the corresponding usage recommendation, rejected, or designated as revise and re-field-test.

The items deemed eligible for usage are considered part of the operational item pool and may be selected during the test construction process. The items that are designated as rejected and designated as revise and re-field-test do not become part of the operational pool.

The Psychometric and Test Construction Subcommittee is also responsible for the review and approval of the constructed tests. As noted previously this activity occurs following data review. All constructed tests, as well as the field-test items, are posted on a secure FTP site for the Psychometric and Test Construction Subcommittee review and approval. A webinar is held with the MSAA subcommittee to explain the test construction process and to review the *MSAA Test Construction Process for 2021* document, which provides information specific to each content area about the items selected. The MSAA subcommittee then has an opportunity to provide input and final approval.

Chapter 5. Training and Administration

5.1 Test Administrator and Test Coordinator Training

The MSAA Partner States adhere to the premise from the testing standards (AERA et al., 2014) that a key consideration in developing test administration procedures and manuals is that test administration should be fair to all examinees. When all Test Administrators (TAs) are utilizing the same well-defined administration procedures and the provided training, manuals, and supporting documents, administration is optimally standardized and poised to be fair to all examinees. Test Coordinators (TCs) are directly responsible for supporting TAs in understanding and following the administration procedures. Comprehensive TC training and materials targeted to their role and responsibility ensure that they are appropriately prepared to support the TAs.

As the MSAA is a computer-administered test, the administration procedures are consistent with the hardware and software requirements of the test specifications. MSAA requires completion of training by all TCs and TAs to support standardized test processes and procedures. MSAA provides ancillary testing materials each year outlining specific practices and policies including (a) the Test Administration Manual (TAM); (b) MSAA Online Test Administration Training; (c) MSAA Online Assessment System User Guide for Test Administrators; (d) MSAA Online Assessment System User Guide for Test Coordinators; and (e) grade-, content-, and form-specific Directions for Test Administration (DTA). The online training and the supporting documents are comprehensive and prescriptive, but also provide clear information on where and how much flexibility a TA has while administering the MSAA. TCs and TAs receive both the online training and the supporting documents to ensure fidelity of implementation and the validity of the assessment results as well as to help MSAA prevent, detect, and respond to irregularities in academic testing and maintain testing integrity practices for technology-based assessments.

5.2 Test Administrator Training Modules

The online training modules for TAs are available prior to the beginning of the testing window and throughout the testing window. The training modules are customized to address the specific responsibilities of the TA and to provide important information from the three documents TAs are required to use: the (1) TAM, (2) DTA, and (3) *MSAA Online Assessment System User Guide for Test Administrators*. These training modules are updated for the 2021 administration in correspondence with the updates to the required documents. There are six modules (see Table 5-1). Each module requires approximately 15–30 minutes to complete.

Table 5-1. Training Modules for Test Administrators

Module 1: MSAA Overview
Module 2: Navigating the MSAA Online Assessment System
Module 3: Test Administrator and Test Coordinator Responsibilities
Module 4: The Writing Prompt
Module 5: Accessibility Features and Accommodations
Module 6: Student Response Check and Early Stopping Rule

TAs are required to view the training modules (accessed through the MSAA System) in sequence and to successfully complete a final quiz after viewing all modules. Each module must be viewed before the link for the subsequent module becomes accessible.
Questions pertaining to information in the module follow each online training module for TAs. These questions are included as a review of the content to prepare TAs for the final quiz. TAs must obtain a score of 80% or higher on the final quiz to be certified to access the secure test administration materials. If TAs do not fulfill this certification requirement, they are not allowed access to the secure test materials. The TAs are notified within the MSAA System whether they pass the final quiz. TAs are allowed multiple attempts to obtain a score of 80% or higher on the final quiz.

In addition to the module training, TAs are instructed to become familiar with the online system by accessing sample items. In addition to the sample items, which were developed by content and measurement experts for teachers, administrators, and policymakers for the NCSC assessment, MSAA added sample items for the 2021 administration that are representative of current MSAA item development. The sample items do not address all assessed content at each grade level and are not representative of every item type. Rather, the sample items provide a preview of the array of items and illustrate multiple item features that allow students with a wide range of learner characteristics to interact with the assessment process.

5.3 Test Coordinator Training Modules

Online modules specific to the role of TCs are made available both before and during the testing window. These training modules are customized to address the specific responsibilities of the TCs and to provide important information from the documents TCs are required to use: the (1) TAM and (2) *MSAA Online Assessment System User Guide for Test Coordinators*. Like the TA training modules, the TC training modules are updated based on the revisions made to the required documents. There are six modules; each of which runs 20–25 minutes (see Table 5-2).

Table 5-2. Training Modules for Test Coordinators

Module 1: MSAA Overview
Module 2: Navigating the MSAA Online Assessment System
Module 3: Test Administrator and Test Coordinator Responsibilities
Module 4: The Writing Prompt
Module 5: Creating and Managing Users and Classrooms
Module 6: Student Response Check and Early Stopping Rule

TCs are required to view the online training modules (accessed through the MSAA System) in sequence. Each module must be viewed before the link to the subsequent module becomes accessible. There are quiz questions at the end of each module as a review of the content of that module. TCs are required to complete the online training but not required to take a final quiz.

5.4 Best Practice Videos

The best practice videos are accessed through the MSAA System and provide TAs with targeted information about the MSAA. Video 1 focuses on (1) reviewing assessment features that are available within the MSAA online system, (2) how to go to full screen mode and zoom within the browser, and (3) procedures to follow when using the hybrid approach to administration (i.e., both online and paper-pencil formats). Video 2 focuses on the purpose and steps of conducting the student response check (SRC) and on how to implement the early stopping rule (ESR). Videos 3 and 4 focus on administration of the open-

response writing prompts. In each of these videos a mock student-TA interaction is used to provide TAs with a true picture of these administration processes (see Table 5-3).

Table 5-3. Best Practice Videos

Video 1: How to Administer an Item
Video 2: How to Administer the SRC and Implement the ESR
Video 3: How to Administer a Level 2 Writing Prompt
Video 4: How to Administer a Level 3 Writing Prompt

5.5 Test Administration Manual

The Test Administration Manual (TAM) provides an overview of, and the guidelines for, planning and managing the MSAA administration for district and school personnel. Additionally, the TAM defines the roles and responsibilities of the TA, TC, and State MSAA Coordinator, who are involved in and oversee the administration of the MSAA. It is organized according to the following tasks:

- providing an overview of the MSAA and the required documents (i.e., TAM, DTA, MSAA Online Assessment System User Guide for Test Administrators, MSAA Online Assessment System User Guide for Test Coordinators);
- defining the roles and responsibilities of the TA and TC, as well as training requirements;
- describing the accessibility features for both online and paper administration as well as the allowable accommodations (i.e., assistive technology, paper version, scribe, sign language); and
- providing detailed information about how to maintain test security and what constitutes a test irregularity.

The TAM also contains appendices for scribe accommodation and sign language accommodation protocols, the procedures for annotations, and guidelines regarding the use of augmentative and alternative communication by students taking the MSAA. The TAM is accessible to TAs and TCs through the MSAA System and is made available prior to the beginning of the testing window, as well as throughout the testing window.

5.6 Directions for Test Administration (DTA)

The secure grade-, content-, and form-specific DTAs are required to be used by TAs when administering the MSAA. Each DTA is accessible through the MSAA System once a TA has been certified. The DTAs are required to be used by the TA for MSAA administration. The following elements are provided as part of each DTA (as applicable for a content area):

- standardized directions and scripts that must be followed exactly as written for each item, including alternative text as appropriate;
- details about manipulatives required in order to administer a test item, such as calculators and counters;
- reference sheets that contain important graphics;
- scoring rubrics for mathematics constructed-response items;
- writing prompt scripts, graphic organizers, student response templates, and stimulus materials for all writing prompts in each grade-level ELA DTA; and
- specific directions to administer the braille versions of ELA foundational reading items in grades 3 and 4.

While the TA has some flexibility in presentation and response mode to ensure the MSAA is accessible to a student, the DTAs are designed to provide standardization to ensure a TA is not changing what is being measured.

5.7 Test Coordinator and Test Administrator User Guides

The *MSAA Online Assessment System User Guide for Test Coordinators* and *MSAA Online Assessment System User Guide for Test Administrators* provide technical information and troubleshooting tips, plus step-by-step instructions to navigate the MSAA System. Each user guide contains specific information relevant to the role of the TA and the TC. The user guides provide many efficient screenshots that demonstrate the functionality of the MSAA System. The user guides also contain appendices that describe accessibility features, assistive technology compatibility, and the MSAA System technology requirements.

As with the TAM, the user guides are accessible to TAs and TCs through the MSAA System and are available prior to the beginning of the testing window, as well as throughout the testing window.

5.8 Operational Administration

The administration window for the MSAA is March 15 – May 14, 2021. Both the ELA and mathematics assessments are completed within the same administration window. Regardless of administration format (i.e., online or paper), the student assessments are submitted electronically by the TA on or before May 14, 2021. The MSAA is not a timed test. Testing time varies for each student, with testing paused and resumed based on a student's needs. If a student becomes sick or exhibits frustration, lack of engagement, or refusal to participate during the administration of the MSAA, TAs are directed to pause the testing and take a break, which can last for a few minutes or a few days, depending on the student's needs. The MSAA protocols allow the TA to pause and resume the administration of the test as often as necessary during the testing window, based on a student's needs.

Throughout the administration window, monitoring and quality control processes are ongoing, as part of the MSAA. Support is provided to TCs and TAs through the MSAA Service Center, additional supports built into the MSAA System functionality, and the MSAA Partner States. TA feedback is gathered through an end of administration test survey. Review of the service center logs and analysis of the test survey results informs MSAA Partner States about areas where clarification and further support is needed.

5.8.1 MSAA Service Center

To provide support to schools before, during, and after testing, Cognia operates and provides tiered technical support through the MSAA Service Center. The MSAA Service Center is available year-round from 6:00 a.m. to 8:00 p.m. EST, Monday through Friday, to accommodate the multiple time zones in which the test is administered.

The TAM directs TAs and TCs to contact the MSAA Service Center with questions pertaining to the MSAA System and test administration procedures. The MSAA Service Center's toll-free support number, e-mail address, and chat link are disseminated to the field through the MSAA System and related communications.

Functionally, support is provided in a tiered manner where Tier 1 support involves direct support to the caller by MSAA Service Center representatives; Tier 2 support includes support by the program management team for items such as policy questions, and Tier 3 support applies to technical requests, which are escalated to the technology vendor for attention.
All activity is tracked in the new MSAA Service Center ticketing system, ServiceNow, and is included in weekly status reports that are provided to MSAA State Representatives. These reports summarize ticket activity, call analysis data (e.g., call duration, hold time), and per-grade/-content and per-state test status summaries throughout the administration window.

5.8.2 Additional Supports

In addition to the MSAA Service Center, the Cognia program management team periodically provides direct phone and e-mail support where logistical or procedural support is needed by MSAA State Representatives. In cases with policy or consortium-wide implications, program management refers the State Representative to the MSAA Partner States and related policy documentation.

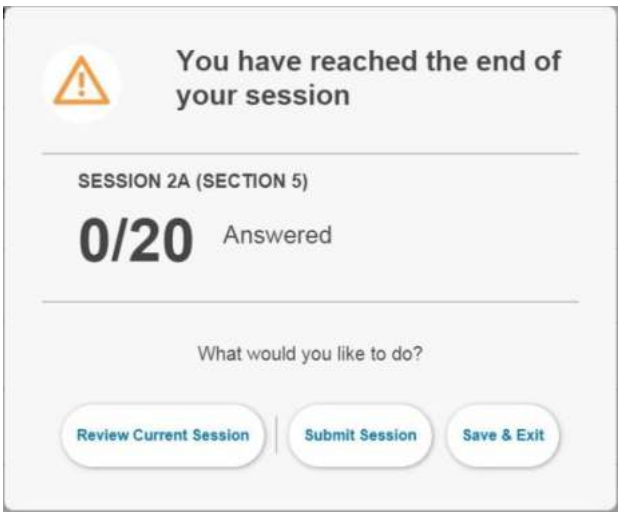
Furthermore, a banner messaging system in the MSAA System is implemented, as needed, to notify users of important information during the administration window. When the messaging system is activated, a banner message appears at the top of the screen upon login to notify users of system information and upcoming system activities, such as known issues and scheduled system maintenance, as well as upcoming test administration deadlines.

5.8.3 Monitoring and Quality Control

To ensure that proper testing procedures and appropriate test practices are maintained throughout administration, numerous measures are taken both to communicate participants' responsibilities and to monitor the appropriateness, accuracy, and completion of key procedures and tasks. The TAM outlines the procedure for reporting any violation or suspected violation of test security or confidentiality by notifying the school or district TC. TCs are then instructed to follow state procedures regarding reporting the issue or suspected issue; however, district TCs are informed that they must report to the State MSAA Coordinator any incidents involving alleged or suspected violations that are considered serious irregularities. The TAM further explains that the consequences for inappropriate test practices are determined by the individual state's professional codes of ethics and state law.

The online MSAA System contains built-in measures to ensure proper testing procedures, as seen in the session-based test design. When the TA clicks the *Next* button on the last question of a session, a prompt appears notifying the TA that he or she has reached the end of the session, displaying the number of answered items, and presenting options for the TA to proceed to the next phase of the test (either Session 2 or final submission of the completed test, as appropriate), return to the current session, or save and exit the test.

Figure 5.1 End of Session Prompt



If the TA clicks the *Save & Exit* button, the test will resume the next time on the last item answered. If the TA clicks the *Submit Session* button, the session is submitted and cannot be re-opened, and the TA is permitted to continue to the next phase of the test. This prompt reduces the risk of users accidentally submitting a session without properly understanding the implications.

Throughout the administration window, Cognia monitors activity and provides weekly updates to State Representatives on the test statuses across MSAA Partner States and on trends identified in support calls. These updates provide a mechanism for concerns to be identified early and the appropriate measures to be taken, such as creation of assessment-wide or state-level materials and communications. This high level of communication and collaboration throughout the assessment process contributes to a proper and valid administration of the MSAA.

5.8.4 Operational Test Survey Results

An End-of-Test Survey (EOTS) allows MSAA to gain knowledge from the experience of each TA administering the test. TAs are instructed to complete at least one EOTS after completing test administration for all of their students. The survey questions focus on several themes:

- technology use in the classroom,
- student behaviors and engagement,
- instructional time spent on academic content, and
- learning model.

The results of the EOTS highlight several areas of concern that the MSAA Partner States had identified prior to reviewing the survey data. The data support continued work in the following areas:

- increasing student engagement,
- monitoring the available technology in classrooms to ensure the platform is up to date for compatibility,
- providing professional development to support effective instructional strategies.

The survey data also identify the effectiveness of several improvements implemented in the 2021 MSAA to correct issues identified in the 2019 administration. These include

- improving the online messages for submission of tests, and
- referring to best practice videos that address common administration questions.

One issue raised by the teachers in the EOTS data is a lack of continuity between instruction and assessment. The MSAA Partner States focus on providing professional development to improve instructional practices and to clarify administration policies that increase student engagement by utilizing strategies that align with instruction and still allow for a standard administration.

Several questions on the survey address teachers' viewpoints and philosophies regarding teaching students with the most significant cognitive disabilities. The results again indicate the need for professional development that builds awareness and use of the available instructional and curricular materials, which illustrate various ways that students in this population have access to rigorous academic content.

The perception persists that the test is too difficult for some of the targeted population. To address this issue, the 2017 administration introduced a stage adaptive design. The MSAA Partner States continue work to ensure that future administrations' multistage tests increase differentiation while still maintaining the required match to the blueprint.

Furthermore, responses from TAs regarding the high level of difficulty of the test reveal that many students are not fully engaging with the assessment. Individual comments regarding engagement suggest the need for professional development in preparing students for testing. Professional development efforts should make use of the best-practice videos to highlight administration strategies.

The EOTS data also show that many students are using a variety of Augmentative and Alternative Communication (AAC) devices to access the test. In addition, most of the responses indicate that students use desktop computers, laptops, and tablets in the classroom with and without AAC devices and that devices and browsers are compatible with the test. However, some responses indicate that the students in these classrooms either do not utilize or have no access to electronic devices outside of testing. This valuable information can be used to gauge the impact of limited prior exposure to computers on student engagement with the online test.

Chapter 6. Scoring

6.1 Selected-response and Constructed-Response Item Scoring Processes

6.1.1 Overview of Scoring Process Within the System and Test Administrator/Scorer Training

Overview of Scoring Process Within the Assessment System

The MSAA System provides automated machine scoring for all item types, aside from the open-response writing prompt and mathematics constructed-response items, which require human scoring. The selected-response and constructed-response item types are described in detail in Chapter 3. The student may provide their responses to the items within the MSAA System. The system also allows for teacher entry of student responses for paper-based test delivery. The selected-response items are scored according to the answer keys provided in each test package. The mathematics constructed-response items are scored as a correct or incorrect student response, which is then entered by the Test Administrator (TA). At the completion of the operational test, all test data is extracted from the system and is then compiled to generate full result sets for each student's tests.

All item responses are exported from the system and are provided to the Cognia Information Technology Reporting (IT-Reporting) Department. The exported items go through a key verification check to confirm that the selected-response and constructed-response item keys were entered correctly. A key verification check is conducted by the data analyst. Any items that may be flagged are provided to the content specialists to conduct a blind key check. The content specialists review the actual item and mark the key in the flagged file. Any mismatches are researched by the content specialist, and updates are made following a problem item notice process to update and correct the key. In cases where no mismatches are found, the content specialist notifies the data analyst, and the file is released for final processing.

Items are scored in the MSAA testing system as correct or incorrect, with each of them contributing a score of 1 or 0 to the content-area raw score. Non-responses (blank responses) to any item are scored as 0 points. Detailed score assignments and the comprehensive data analysis requirements are provided in the MSAA Assessments Reporting Services Deliverables Decision Rules document, which can be reviewed in Appendix F.

Test Administrator/Scorer Training and Support

All TAs must participate in training modules and pass a final quiz in order to be certified to administer the MSAA, as described in detail in Chapter 5. During the test administration, TAs use the grade, content, and form-specific DTAs to administer each item. When TA scoring is required, such as in the case of the mathematics constructed-response items, the DTA includes the teacher scripting and directions related to any item setup and administration specifics, any templates required by the items, and the rubrics used to score the items.

The *MSAA Online Assessment System User Guide for Test Administrators* provides further direction to TAs on entering item responses in the MSAA. The guide outlines the use of the system, including how to enter student responses and submit each content-area test.

For support related to the administration, scoring, entry of student responses, and submission of student responses during the administration window, TAs can call or e-mail the MSAA Service Center with any questions.

6.2 Open-Response Writing Prompts Scoring Processes

6.2.1 Overview of Open-Response Writing Entry Process Within the Assessment System and Test Administrator Training

Open-Response Writing Entry Process

As described in Chapter 1, the open-response writing prompts in grades 3–8 and 11 are being operationally administered in the 2021 MSAA. The open-response writing prompts are described in detail in Chapter 3. The student, or a qualified scribe, records the response on either the response template in the MSAA System or the paper response template included in the writing DTA. TAs can upload the student's final writing response template directly in the system, retype the student response within the item response field of the item, or upload the template and retype it within the item response field. The item responses (no matter how they are entered) are then extracted from the online system and provided to Cognia for human scoring.

Test Administrator Training and Support

All TAs are required to participate in administration training modules and pass a final quiz to be certified to administer the MSAA assessment, as described in Chapter 5. The TA training includes review of the parameters for the administration of the open-response writing prompt, as well as entry of the student responses into the MSAA System. In addition, the best practice videos provide a student-TA representation that gives TAs a true picture of the processes involved in conducting the open-response writing prompt. During the test administration, TAs use the grade-, content-, and form-specific DTAs to administer each open-response writing prompt. The DTAs include the teacher scripting and directions related to any item setup, administration specifics, and the materials for the open-response writing prompt.

The *MSAA System User Guide for Test Administrators* provides further direction on entry of student responses to the open-response writing prompt. Additionally, the MSAA Service Center provides support for TAs.

6.2.2 Benchmarking and Identification of Scoring Materials

The open-response writing prompts were benchmarked during the 2015, 2016, and 2017 field tests. Cognia scoring experts (Scoring Supervisors and Scoring Team Leaders [STLs], defined below) worked collaboratively with NCSC representatives in 2015 and with MSAA representatives from the Scoring Subcommittee in 2016 and 2017 to review student responses, assign a score based on the MSAA grade- and tier-specific rubrics for each trait (i.e., organization, idea development, conventions), and identify item-specific writing anchors and practice sets.

The final scores for the anchor and practice sets were recorded, and representatives from NCSC (2015) and the MSAA Scoring Subcommittee (2016 and 2017) acknowledged their consensus on the sign-off document for each prompt. Also, development of a scoring decisions document began in 2017. It was reviewed by the MSAA Scoring Subcommittee, which provided rationale and decision points to be used during scoring by the Scoring Supervisors and STLs.

Following the identification of the anchor sets, two qualification sets were identified for each prompt. Each qualification set consisted of 10 responses; scores were based on anchor responses and scoring decisions made during the benchmarking meetings. The MSAA Scoring Subcommittee reviewed and approved the scores and responses used for qualification sets.

6.2.3 Scorer Recruitment and Qualifications

The MSAA scorers are a diverse group of individuals with a broad range of backgrounds, including teachers, business professionals, graduate students, and retired educators. They are primarily obtained through Kelly Services, a temporary employment agency. All selected scorers hold the minimum of a four-year college degree that included ELA or writing coursework. 11% of the scoring team hold a Master's Degree and 9% hold a Ph.D. 100% of the leadership and 71% of the scorer group assigned to the MSAA have previous experience in scoring alternate assessments. All scorers sign a nondisclosure/confidentiality agreement.

6.2.4 Cognia Staff and Scoring Leadership

The MSAA operational open-response writing prompts were scored between May 17 and June 8, 2021. The scoring activity occurred using a virtual scoring center and all participants scored from home instead of at a regional scoring center. The following staff members participated:

- Director, Scoring Operations: Primarily responsible for coordinating scheduling, budgeting, and logistics of all Scoring Centers. In addition, the Director for Scoring Operations coordinates the scoring of special education contracts, has overall responsibility for MSAA scoring-related activities, and serves as the Scoring Services Project Manager for MSAA.
- ELA Group Manager for Scoring: Responsible for managing scoring-related activities and monitoring reports, as well as leadership and training of scorers to ensure overall consistency of scoring.
- Scoring Content Specialist: Responsible for overseeing scoring activities across grades and monitoring accuracy and productivity across groups.
- Accessibility Assessment Specialist: Responsible for overseeing scoring activities and acting as the accessibility lead in coordination with the Cognia scoring staff.
- *iScore* Operations Manager: Responsible for setup and maintenance of *iScore* scoring system and for coordinating technical communication.
- Scoring Supervisor: Responsible for selecting calibration responses, training STLs and scorers, resolving arbitrations, and monitoring the consistency of scoring for items in assigned grades. Scoring Supervisors may also participate in benchmarking and identifying qualification sets prior to the onset of scoring.
- Scoring Team Leader (STL): Responsible for performing quality-control measures, resolving arbitrations, and monitoring the accuracy of a small group of scorers, usually consisting of not more than six. STLs may also participate in benchmarking and identifying qualification sets prior to the onset of scoring.

6.2.5 Training

Scoring Content Specialists and Scoring Supervisors assigned to train the STLs and scorers thoroughly review the decisions and materials that result from the benchmarking meetings in preparation for training. One Scoring Supervisor is assigned to each tier's writing prompts across grades. The Scoring Content Specialists and Scoring Supervisors are responsible for creating prerecorded training modules for use in training. Leadership training for 2021 took place on May 10th through May 14th. STLs are required to meet or exceed the accuracy standard of 80% exact agreement on all items and at least 90% exact/adjacent[1] agreement on each trait. This requirement is applied to each of the three writing traits[2]

[1] "Adjacent agreement" means that the two scores differed by only one score point.
[2] The three writing traits are organization, idea development, and conventions. See rubrics embedded in Appendix G.

individually across qualification sets 1 and 2. The STLs are also present during scorer training, which further reinforces their understanding of the rubrics and training materials.

Scoring Content Specialists and Scoring Supervisors conduct training on each open-response writing prompt before scorers are allowed access to student responses. Scorers are divided into two groups. One group focuses on Level 2 items and the other on Level 3 items. Training sessions for scorers are facilitated by the Scoring Content Specialists and a Scoring Supervisor and are conducted in the following manner:

- Training commences with an introduction to scoring and an overview to explain the purpose and goal of the testing program and any unique features of the test and/or testing population.
- A general discussion addresses the security, confidentiality, and proprietary nature of testing, scoring materials, and procedures.
- Initial item training consists of a pre-recorded module that focuses on the following:
    - The three traits of the MSAA analytic rubrics for writing and how the scoring for each trait is applied to student work. (See "Writing Scoring Rubrics," an appendix to the MSAA 2021 Guide for Score Report Interpretation, provided in Appendix G of this report.)
    - Pertinent information on the testing instructions and item stimuli.
    - Actual responses with an item-specific anchor set, averaging 10 responses representing a range of scores across traits.
    - Anchor exemplars (presented in a predetermined order) that consist of responses that are typical, rather than unusual or uncommon; solid, rather than controversial or borderline; and true.
    - The anchor response score and the scoring rationale, allowing scorers to internalize typical characteristics of each score point.
- Scorers are instructed to refer to the anchor set frequently during scoring.
- After completing the module, training continues with the Scoring Content Specialist and/or the Scoring Supervisor presenting the supplementary training materials practice responses representing all score points across traits, when possible, and often containing responses that are more unusual and/or less solid (e.g., are shorter than normal, employ atypical approaches, or contain both very low and very high attributes). None of the practice papers contain responses that would require identification as nonscorable responses.
- During the review of practice responses, the trainer(s) often focus on the distinction between adjacent score points or clarification of other scoring issues that are traditionally difficult for scorers to internalize.
- After scorers independently read and score each practice response, the trainer(s) discusses the actual score and explains the rationale.
- A question and answer segment address any remaining questions from scorers and provides clarification prior to the qualification process.

6.2.6 Qualification

Following the training for each prompt, scorers are required to complete a qualification set to determine eligibility to score student work. There are two qualification sets in each grade and tier consisting of 10 responses each. The responses, which represent a range of score points, are randomly distributed to scorers through *iScore*.

Scorers have two opportunities to qualify. If scorers attain a score match of at least 80% exact and 90% exact/adjacent agreement on all traits for the first qualification set, they are considered a "qualified scorer" and permitted to score live student responses. If they do not attain the required percentages, the Scoring Supervisor conducts a retraining. Following this retraining, scorers are assigned qualification set 2. Since scorers qualify at the trait level, a scorer who qualifies on the first and third trait in qualification set 1, for

example, receives the retraining referenced above. However, this scorer would only be required to qualify on trait 2 in qualification set 2. When the data indicate that a qualified scorer has demonstrated a weakness in a particular trait, that qualified scorer receives additional training prior to the start of scoring.

Scorers who fail to achieve the minimum levels of agreement are not allowed to score. When scorers demonstrate a level of understanding and the ability to apply feedback during the training and qualification process on a certain writing prompt, Scoring Leadership may choose to include the scorer in future trainings on a different writing prompt.

Typically, once the first open-response writing prompt for a grade and tier is completely scored, the training process is repeated for the next prompt. This process continues until all 14 open-response writing prompts are scored. (See Section 6.2.1) The qualification results listed in Appendix H accurately reflect our previous experience for the MSAA contract.

6.2.7 Methodology for Scoring Operational Open-Response Writing Prompts

Student responses to the open-response writing prompts and any uploaded material are exported from the platform and imported to the Cognia *iScore* scoring system. Through *iScore*, qualified scorers read and evaluate student responses, submitting scores electronically. The processes by which images are logged in, scanned, and uploaded into *iScore* provides anonymity to individual students and ensures random distribution of all responses during scoring.

All student responses are scored from uploaded evidence and/or computer-generated text, defined as student work directly entered into the MSAA System. For Tier 2 prompts, when both uploaded and computer-generated text is available, the uploaded evidence is scored first, and the computer-generated text is used for clarification and confirmation of the uploaded student writing evidence. When there is only uploaded writing evidence but no computer-generated text to provide clarification and confirmation, the uploaded writing evidence is scored. When there is only computer-generated text but no uploaded writing evidence, the computer-generated text is scored. For Tier 3 prompts, the computer-generated text and the uploaded evidence serve to provide a holistic demonstration of student ability and are considered together when both are available. When only one portion is available, the prompt is scored like a Tier 2 prompt.

The following processes are in place during the scoring of the MSAA operational open-response writing prompts:

- The *iScore* system forces scorers to review all available pages before allowing a score to be submitted.
- All scoring is “blind.” Only booklet numbers within *iScore* are linked to student responses; no student names are visible to scorers unless a name appears on material uploaded by the TA.
- Cognia maintains security during scoring by using a highly secure server-to-server interface to ensure that access to all student response images is limited to those who are scoring or working for Cognia in a scoring management capacity.
- During scoring, *iScore* enables a constant measuring and monitoring of scorers for scoring accuracy and consistency. Each scorer’s reading rate and total number of scored responses are also monitored.
- Scorers are required to maintain an acceptable scoring accuracy rate (80% exact and 90% exact/adjacent agreement) on a daily basis as measured through read-behinds, double-blinds, and daily calibration sets. (These measures are described below.)
- Scorers who repeatedly fall below standard are retrained or dismissed from scoring that item.

- Scoring rules are in place to determine the final score of record, or when a final score is to be provided by Scoring Leadership. (For examples of scoring resolutions, see Section 6.2.8.4.)

Table 6-1 represents the total number of student responses scored by writing prompt in each grade.

Table 6-1. Student Responses per Grade

Grade	Number of Student Responses		
	WRCC002	WRCC003	Total
3	737	948	1685
4	924	867	1791
5	879	1038	1917
6	732	1255	1987
7	928	1128	2056
8	654	1477	2131
11	476	1444	1920

Note: For identification purposes in iScore, Tier 2 prompts were designated as WRCC002 across all grades, and Tier 3 prompts were designated WRCC003.

Scoring Rules

All open-response writing prompts are scored against a three-trait rubric (see rubrics in Appendix G). The scoring scale options of 0, 1, 2, and 3 are applied to each trait. (Note: for determining a student's total raw score to be transformed to a scaled score, the score categories of 1 and 2 were combined to be converted to a 1, and score category 3 was converted to a 2. These converted trait scores were the scores used in the psychometric analyses.) When a response does not conform to score point parameters, scorers can designate the response as one of the following:

- **Blank:** There is no attempt to respond to the item; no uploaded material is provided, and no response has been typed.
- **Unreadable:** The text on the scorer's computer screen is indecipherable or too faint to read accurately.
- **Non-English:** The response is written in a language other than English.
- **Repeats the Prompt:** The response is a direct copy of the prompt without any original text.
- **No Score:** The response requires clarification or adjudication by Scoring Leadership; scorers can assign this designation only with approval from Scoring Leadership.

Table 6-2 displays the resolution process for each of the responses described above.

Table 6-2. Scoring Resolution Process

Designation	Resolution Process
Blank	Responses scored Blank are sent to another scorer for a second read. Responses scored Blank twice are converted to zeros ("0") for reporting purposes. Any discrepancies are resolved by the Scoring Leadership.
Unreadable	Responses judged unreadable are forwarded to a special queue within *iScore* to be reviewed by a Scoring Supervisor, who resolves the student score. (If the response remains unreadable after review, the Scoring Supervisor assigns a score of "0.")
Non-English	Responses written in a language other than English are marked Non-English and are converted to zeros ("0") for reporting purposes.
No Score	Responses that require additional clarification or adjudication are escalated to Scoring Leadership for response appraisal and scoring. This designation includes responses where more than one student's work appears to have been uploaded to the response. Responses where the uploaded evidence is a mismatch to the typed response are escalated to Scoring Leadership for response appraisal and scoring. Responses that legitimately respond to another item are escalated for review by Scoring Leadership. Any student response indicating administrative inconsistencies, potential cheating, and/or security lapses before, during, or after the test administration is scored based on its merits and then forwarded for review. If further attention is warranted, the State Services team notifies the appropriate MSAA Partner State. Responses that are determined to be nonscorable are resolved by the Cognia leadership team in consultation with the MSAA Scoring Subcommittee, if necessary.

Scorers also have the option of flagging a response as an "Alert," requiring immediate review and possible immediate action by Scoring Leadership and an MSAA Partner State. "Alert" responses can include, but are not limited to, those that suggest one or more of the following problems:

- thoughts of suicide;
- criminal activity;
- alcohol or drug use;
- extreme depression;
- violence;
- rape, sexual or physical abuse;
- self-harm or intent to harm others; and/or
- neglect.

Scoring flagged a total of seven responses as "Alert" during the scoring process and were forwarded to the appropriate Partner State representatives. See Table 6-3.

Table 6-3. Responses Flagged With "Alert"

MSAA Partner State	Number of "Alert" Responses Flagged
Arizona	1
Tennessee	5
South Dakota	1

Note: No responses were flagged "Alert" from any other Partner States.

6.2.8 Monitoring of Scoring Quality Control

Scorers are continuously monitored to ensure that scoring is accurate and consistent. Throughout the scoring process, read-behind scoring, double-blind scoring, and calibration sets are used as quality-control measures. MSAA Scoring Subcommittee representatives, along with the Cognia Accessibility and Scoring teams, monitor reports daily. Read-behind and double-blind statistics are reviewed daily. Calibration sets are administered and reviewed repeatedly during the course of the project. Scoring Leadership and Content Specialists from the Scoring Services and Content Development—Accessibility departments at Cognia pay close attention to the disaggregated read-behind, double-blind, and calibration statistics.

Scorers in need of additional clarification on applying scores to specific traits are coached by Scoring Leadership. This continuous training allows Scoring Leadership an opportunity to resolve issues, reiterate scoring guidelines, and establish parameters for atypical student responses. Scorers who demonstrate inaccurate or inconsistent scoring are retrained and allowed to resume scoring under increased supervision. Scoring Leadership removes scorers who continue to fall below accuracy standards. On any day that a scorer falls below accuracy standards, the work is voided and rescored by other qualified scorers. During MSAA scoring, the work of 14 scorers was voided.

6.2.8.1 Calibration Sets

To determine whether scorers are still calibrating to the scoring standard, they are required to complete a trio of online calibration sets at the start of each day, beginning with the second day of scoring. Scoring Leadership selects the responses for the sets, with each calibration set consisting of five responses representing a range of scores. Scorers who assign at least 12 out of 15 scores exactly can then begin scoring for the day. Scorers who fail to meet that standard are retrained by discussing the calibration responses in terms of the rubric and the anchor set. Scoring Leadership determines if these retrained scorers should be allowed to begin scoring; though if they are, these scorers continue to be closely monitored. Over the course of scoring, all scorers (across all seven grades and 14 items), required retraining at least once. In most cases, scorers who received retraining successfully returned to scoring or as mentioned previously, and had their work voided for that day.

6.2.8.2 Read-Behind Scoring

Read-behinds provide a crucial tool in verifying scorer accuracy. The STLs complete read-behinds on individual scorers on a daily basis. An STL's evaluation of each response is performed with no knowledge of the scores assigned across traits. The scores are only available to the STLs after they have also scored the response. If there is a difference in scores, either adjacent (one score point difference) or discrepant (more than one score point difference), the STL score is the score of record. If the scores are discrepant, or if there are a significant number of adjacent scores between the scorer and the STL, the STL discusses the rationale with the scorer.

The average number of read-behinds for each scorer is 5–10 reads a day, but this number varies depending on the accuracy of each scorer. Read-behinds provide an immediate means of identifying scorers in need of further clarification on how to effectively apply the scoring rubrics to student responses. If scorers fall consistently below the 80% exact and 90% exact/adjacent (combined) threshold, Scoring Leadership has the prerogative to void their scores for the day and/or stop them from scoring that item. Scoring Leadership monitors scoring accuracy and consistency by reviewing the read-behinds performed by the STLs as well as completing read-behinds on the STLs whenever possible.

6.2.8.3 Double-Blind Scoring

While read-behinds measure scorer accuracy in relationship to STL scores, double-blind scoring provides statistics on scorer-to-scorer agreement. Double-blind scoring is the practice of having two scorers independently score a response, without knowing either the identity of the other scorer or the score the other scorer assigned. In double-blind scoring, neither scorer knows which response will be (or already has been) scored by another randomly selected scorer. All responses for MSAA are 100% double-blind scored.

In addition to monitoring interrater agreement rates, double-blind scoring allows Scoring Leadership to resolve arbitrations when two scorers' double-blind scores do not agree across any of the three traits. If there is not exact agreement, *iScore* automatically places the response into an arbitration queue. Scoring Leadership, with no prior knowledge of the scores assigned, evaluates the response, with the leadership score becoming the score of record. The double-blind statistics provide an overview of agreement rate among the entire pool of scorers and assists in identifying any need of retraining.

6.2.8.4 Final Score Resolution

If scorers are adjacent in their scoring of a response, the two scores are averaged and rounded up for the score of record. If the scorers are discrepant in their scoring, the response will be sent to an STL for arbitration. The STL will review the response, provide the final score of record, and counsel scorers as needed. During the arbitration by scoring leadership, all three traits are evaluated and the final score of record for each trait is supplied by scoring leadership.

In read-behind cases, the Scoring Supervisor/STL score is the final score of record. For adjacent and discrepant scorer scores, the read-behind score is the final score of record. If a response gets more than one read-behind and the two scores supplied by the STLs do not agree, a resolution score is needed. In the unlikely event that a resolution is required, the Scoring Supervisor provides a final score for all three traits during the post-scoring edit process.

6.2.9 Quality and Production Management Reports

Reports generated through *iScore* are essential during the scoring of the MSAA. Reports provide real-time statistics for review by the Cognia Scoring team and the MSAA Scoring Subcommittee to closely monitor scoring, thereby ensuring that

- scorer data (individual level) is monitored in real time to allow early scorer intervention when necessary;
- overall accuracy, consistency, and reliability of scoring (group level) is maintained;
- individual traits in need of further clarification are identified; and
- scoring schedules are upheld.

The reports listed in Table 6-4 provide the comprehensive tools and statistical information needed to execute quality control and manage production.

Table 6-4. Scoring Quality Control and Production Management

Report	Description
Read-Behind Disaggregated Summary	The Read-Behind Disaggregated Summary report shows the total number of read-behind responses read by both the scorer and the STL, and notes the number and percentage of exact, adjacent, and discrepant scores across each trait.
Double-Blind Disaggregated Summary	The Double-Blind Disaggregated Summary report shows the total number of double-blind responses read by a scorer and notes the number and percentage of exact, adjacent, and discrepant scores across each trait.
Compilation Report	The Compilation Report shows, for each scorer, the total number of responses scored, the number of calibration responses scored, and the percentage of exact, adjacent, and discrepant scores across each trait.
Summary Report	The Summary Report lists the total number of student responses loaded into *iScore*. This report includes the number of reads completed to date and the number of reads that remain.

6.2.10 Interrater Agreement

Kappa statistics (kappa coefficients) measure the agreement among two or more raters. The calculation is based on the difference between the level of agreement actually present compared to the level of agreement that would be expected by chance alone. Kappa is a measure of this difference standardized to lie on a -1 to 1 scale, where 1 is perfect agreement, 0 is exactly what would be expected by chance, and negative values indicate disagreement. The kappa information in Table 6-5 shows agreement between raters at Substantial Agreement or Almost Perfect Agreement ranges for most of the open-response writing prompts across grades. In three cases, the kappa agreement rate is at the Moderate Agreement range (see grades 7 Organization and Idea Development traits for one level 3 prompt, grade 11 Organization trait for one level 3 prompt).

Table 6-5. Kappa Agreement—Operational Open-Response Writing

Grade	Item	Organization Trait 1	Idea Development Trait 2	Conventions Trait 3
3	WRCC002	0.79	0.81	0.88
	WRCC003	0.74	0.75	0.83
4	WRCC002	0.71	0.67	0.83
	WRCC003	0.75	0.69	0.83
5	WRCC002	070	0.64	0.86
	WRCC003	0.73	0.73	0.78
6	WRCC002	0.77	0.70	0.76
	WRCC003	0.57	0.57	0.78
7	WRCC002	0.70	0.79	0.66
	WRCC003	0.58	0.59	0.83
8	WRCC002	0.70	0.65	0.80
	WRCC003	0.68	0.61	0.83
11	WRCC002	0.77	0.71	0.76
	WRCC003	0.59	0.62	0.79

Note: For identification purposes in iScore, Tier 2 prompts are designated as WRCC002 across all grades and Tier 3 prompts are designated as WRCC003.

Agreement Ranges:
< 0 Disagreement
0 = Chance Agreement
0.01–0.20 Slight Agreement
0.21–0.40 Fair Agreement
0.41–0.60 Moderate Agreement
0.61–0.80 Substantial Agreement
0.81–0.99 Almost Perfect Agreement

Chapter 7. Reporting

7.1 Development and Approval of Report Specific Documents

Processing and Reporting Business Requirements Document

To ensure that reported results for MSAA are accurate relative to collected data, the *Processing and Reporting Business Requirements* document delineating processing rules is prepared, edited in collaboration with the MSAA Reports Subcommittee, and then approved by all participating MSAA Partner States prior to processing of the results. The processing and reporting business requirements and participation status structure provide the framework for the reporting requirements, which are defined for each unique report and similarly edited in collaboration with the MSAA Reports Subcommittee. The *Processing and Reporting Business Requirements* are then approved by the MSAA Reports Subcommittee prior to reporting.

The *Processing and Reporting Business Requirements* document contains the hierarchy by which the participation statuses are assigned for each individual test, incorporating data elements collected by the test platform and directly from the MSAA Partner States. The reporting requirements and corresponding report design templates were developed by Cognia with the guidance of the MSAA Reports Subcommittee. Both documents underwent iterative review processes that included draft reviews by the appropriate subcommittee, incorporation of edits, draft reviews by all participating MSAA Partner States, and subcommittee review and integration of feedback, until final revisions were approved by all participating MSAA Partner States.

Creating the Report Design Templates

To develop the report design templates, Cognia worked with the MSAA Reports Subcommittee to identify modifications to the templates used last year that would ensure that the data elements, layout, and report text were meaningful for reporting the spring 2021 MSAA results. Once finalized, the results of this collaborative process were presented to participating MSAA State Representatives for final approval.

MSAA 2021 Guide for Score Report Interpretation

Cognia uses an iterative process to annually update the *Guide for Score Report Interpretation* with the MSAA Reports Subcommittee. Updates are made to ensure that the guide provides the most helpful information to district and school staff as they review reports for their own knowledge and as they discuss the reports with parents or guardians. The guide includes an overview of the MSAA, student participation criteria, score reporting overview, and samples of the various types of reports available to schools and districts. Guidelines inform the interpretation and utilization of MSAA scores. The guide also includes explanations for all special reporting codes and messages, as well as performance-level scale score ranges. States are permitted to remove codes not used in their state. Appendices included in this guide contain the Performance Level Descriptors (PLDs) for ELA and mathematics, a sample individual student report, and the writing prompt scoring rubrics. The final, approved *2021 MSAA Guide for Score Report Interpretation* is delivered electronically to the MSAA Partner States for state-specific revisions and distribution.

7.2 Specific Primary Reports Generated for Schools, Districts, and States

Cognia, in collaboration with the MSAA Reports Subcommittee, annually reviews and updates the following primary reports:

- Student reports
- School and district roster reports
- School, district, and state summary reports

Reports are generated for each school, district, or state that has results, as defined by the MSAA processing and reporting business requirements and reporting requirements. These reports, along with student results data files, are posted online via the MSAA Online Assessment System's secure data and reporting portal. As determined by the MSAA State Representatives, only Test Coordinators (TCs) are granted access to the online reports. Access is controlled by user-permissioned accounts, as illustrated in Table 7-1.

Table 7-1. Report Availability by Role

Reports	Test Coordinator		
	State	District	School
Student	Yes	Yes	Yes
School Roster	Yes	Yes	Yes
District Roster	Yes	Yes	No
School Summary	Yes	Yes	Yes
District Summary	Yes	Yes	No
State Summary	Yes	No	No

For the purposes of the assessment system, MSAA State Representatives are regarded as State TCs. As such, they can add new district and school TCs to the online system and block from the system any users no longer in the TC role. For 2021, these reports were provided in August to schools, districts, and parents as soon as possible at the beginning of the school year.

The primary results reported are the student's scale score and performance-level classification for mathematics and ELA. The performance-level classifications, with cut scores determined through the original standard setting and subsequent standards validation processes (see Chapter 9 for more information), are reported under the generic labels, Level 1, Level 2, Level 3, and Level 4. Level 4 is the highest attainable performance level.

The average scale score and the percentage of students in each performance level are summarized by school, district, and state on both the roster and summary reports. These summaries allow for the comparison of individual student performance to overall state performance, as well as comparison of school and district results with the overall state results.

7.2.1 Student Report

The student report is a two-sided, single-page document generated for each student eligible to receive a performance level in at least one content area, as defined by the student report requirements. The report contains results for both ELA and mathematics content areas and was developed for parents and guardians of students who participated in MSAA. Reports are organized by school and posted via the secure-access portal for authorized users to download, print, and disseminate to parents and guardians. Each report contains the student name, test grade, and school on the front of the report. The back page contains the student name, state student ID, school, and test grade. Sample student reports are included in the *MSAA 2021 Guide for Score Report Interpretation* and appear in this document in Appendix I.

Page 1 of the report contains the scale score, performance level, and associated performance-level descriptor for the level obtained by the student for each content area. A sentence below the graphical display explains the standard error of measurement (SEM) in an easy-to-understand manner by providing the expected range of scores the student would likely earn if tested again.

Page 2 contains a brief overview of MSAA, including examples of some of the built-in supports available during testing, and highlights the compatibility of the assessment with various modes of communication. Parents and guardians are encouraged to discuss with their child's teacher the supports their child used on the MSAA.

Tests for students unable to show an observable mode of communication are closed using the Early Stopping Rule, and the lowest scale score is assigned and displayed along with the Level 1 performance level. This is annotated, and in place of the Level 1 performance-level descriptor, the following text is displayed: *Your child did not show a consistent observable mode of communication during the test, and the test was closed by the teacher. Since your child did not complete the test, the results may not be an accurate representation of your child's skills. If you have additional questions, please contact your child's teacher.*

If a student receives a student report but does not receive results for one of the two content areas, results for the missing content area are replaced with text encouraging parents or guardians to contact the child's teacher or school for more information.

7.2.2 School Roster Report

The school roster report is organized at the school level and provides a by-grade list of all students enrolled in MSAA, with a snapshot of their participation/test status and results for both content areas. The number of tested students, the average scale score, and the percent of students by performance level are summarized for the school, district, and state at the top of the roster. The processing and reporting business requirements and roster report requirements identify which of the participation status codes are included on the roster and which of the participation test status codes are included in each calculation.

The summary information at the top of the school roster report supports interpretation of results by users, typically those at the school and district levels. Given that many schools have a relatively small number of students in this population, MSAA Partner States do not suppress information when the number of students participating is small. This practice places an added responsibility on users to understand the data in the context of small numbers and to use all of the provided information to understand the results, as explained in the *MSAA 2021 Guide for Score Report Interpretation*.

Student results are listed below the summary section and are identified by name and by state student identification number. It is intended that these data points be used in conjunction with the *MSAA 2021 Guide for Score Report Interpretation*. For each content area, the following student-level elements are reported:

- Participation/Test Status
- State Compare (Comparison to state average)
- Scale Score
- Performance Level

7.2.3 Summary Reports

Summary reports are organized at the school, district, and state levels for each entity with at least one student included in summary report calculations. Inclusion in these calculations is defined by the processing and reporting business requirements and summary report requirements. The following information is summarized by grade and content area and displayed for the school, district, and state based on the level of the report:

- Enrolled (number of students enrolled)
- Tested (number of valid student tests)
- Did Not Test (number of enrolled students who did not test)
- Average Scale Score
- Performance Level (number and percentage at each performance level by grade in the state, district, school)

This summary provides a comparative snapshot of results and participation information at a high level and includes both participation and performance summary information, allowing users to evaluate both aspects of their assessment results as guided by the *MSAA 2021 Guide for Score Report Interpretation*.

7.2.4 Quality Assurance

Proprietary quality-assurance measures at Cognia are embedded throughout the entire process of data capture, analysis, and reporting. The data processors and data analysts who work on the project implement quality-control checks of their respective computer programs. Moreover, when data are handed off to different teams within the IT-Reporting Department, the sending team verifies that the data are accurate prior to handoff. Additionally, when a team receives a data set, the first step is to verify the data for accuracy.

A second level of quality-assurance measurement is parallel processing. One data analyst is responsible for writing all programs required to populate the student and aggregate reporting tables for the administration. Each reporting table is assigned to another data analyst on staff who uses the processing and reporting business requirements to independently program the reporting table. The production and quality-assurance tables are compared, and only after 100% agreement is attained are the tables released for report generation.

The third aspect of quality control at Cognia involves the Software Quality Assurance (SQA) team, which works together with the data processing and data analysis teams to ensure quality data is captured and delivered accurately. Quality control checks are being performed by the data processors and data analysts as the data are handed off via multiple internal software tools. These quality checks initialize the accuracy of the data being ingested into the database and subsequent tables/columns. SQA develops a test plan that includes previously agreed upon report designs and decision rule documents. Test cases

housed in an internal test cases repository are then executed in a process including but not limited to the following steps:

1. Testing data counts of data imported.
2. Testing data quality of individual fields for valid values, such as Gender, Ethnicity, etc.
3. Validating scripts developed by the software developers to ensure that they match business requirements and technical specifications.

In this testing effort to ensure the quality of the data, the SQA team uses a sample of schools and districts selected based on multiple criteria, such as:

- Unique student testing records
- Students complete testing
- Students partially completed testing
- Invalidated students

Working with the data processing and data analysis teams allows for timely and precise turnaround if any data anomalies are found. To allow full transparency and cohesive teamwork in data validation, test cases are tied to tickets outlining required work.

Finally, the SQA team executes test cases validating student printed reports in comparison to the previously agreed-to report design specifications.

Once all the test cases have passed, the SQA team notifies the Cognia State Services team for final sign-off and communication.

Chapter 8. Classical Item Analysis

As noted in Brown (1983), “A test is only as good as the items it contains.” A complete evaluation of a test’s quality must include an evaluation of each item. Both *Standards for Educational and Psychological Testing* (AERA et al., 2014) and *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) include standards for identifying quality items. Items should assess only knowledge or skills that are identified as part of the domain being tested and should avoid assessing irrelevant factors. Items should also be unambiguous and free of grammatical errors, potentially insensitive content or language, and other confounding characteristics. In addition, items must not unfairly disadvantage students, particularly racial, ethnic, or gender groups.

Both qualitative and quantitative analyses have been conducted to ensure that the 2021 MSAA ELA (reading and writing) and mathematics items met these standards. Qualitative analyses are described in earlier chapters of this report; this chapter focuses on quantitative evaluations. Statistical evaluations are presented in two parts: (1) differential item functioning (DIF) statistics and (2) dimensionality analysis of inter-item correlations. The item analyses presented here are based on the administration of the MSAA in spring 2021.

Note that classical difficulty (*p*-value) and discrimination (point-biserial) indices are often used in testing programs to compare the quality of items. However, such indices are not appropriate for a multistage adaptive test. The inappropriateness of these statistics stems from the fact that when two items are on two different stages or on different levels of a stage, the students taking one of the items will tend to have a higher overall ability distribution (as measured by scaled score) compared to the students taking the other item. As an example of the inappropriateness, consider a case where the two items have similar *p*-values, but one item is from Stage 2A and the other is from 2C. This similarity would lead to the misleading inference that the two items are comparable in difficulty when, in fact, the 2C item is much harder than the 2A item. Thus, the classical difficulty and discrimination statistics are not included in the evaluation of item quality presented in this chapter.

8.1 Differential Item Functioning

The *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) explicitly states that subgroup differences in performance should be examined when sample sizes permit and that actions should be taken to ensure that differences in performance are due to construct-relevant, rather than irrelevant, factors. Chapter 3 of *Standards for Educational and Psychological Testing* (AERA et al., 2014) includes similar guidelines. As part of the effort to identify such problems, MSAA items were evaluated in terms of DIF statistics.

For the 2020–21 MSAA, the standardization DIF procedure (Dorans & Kulick, 1986) was employed to evaluate subgroup differences. The standardization DIF procedure is designed to identify items for which subgroups of interest perform differently, beyond the impact of differences in overall achievement. The DIF procedure calculates the difference in item performance for two groups of students (at a time) matched for achievement on the total test. Specifically, average item performance is calculated for students conditional on scale score. Then an overall average is calculated, weighting by the pooled scale score distribution so that it is the same for the two groups.

When differential performance between two groups occurs on an item (i.e., a DIF index in the “low” or “high” categories, explained below), it may or may not indicate item bias. Course-taking patterns or differences in school curricula can lead to DIF but for construct-relevant reasons. On the other hand, if

subgroup differences in performance can be traced to differential experience (such as geographical living conditions or access to technology), the inclusion of such items should be reconsidered.

For the 2020–21 MSAA, six subgroup comparisons were evaluated for DIF:

- Male compared with female
- White compared with Black
- White compared with Hispanic
- White compared with American Indian
- Not economically disadvantaged status compared with low economically disadvantaged
- Not Limited English Proficiency (LEP) compared with LEP (including current, exited one year, and exited two years)

The DIF statistics were calculated based only on the members of the subgroup in question in the computations; values were calculated only for subgroups with 100 or more students. The tables in Appendix J present the number of items classified as either "low" or "high" DIF, overall and by group favored. Computed DIF indices have a theoretical range from -1.0 to 1.0 for selected-response items. Dorans and Holland (1993) suggested that index values between -0.05 and 0.05 should be considered negligible. The preponderance of MSAA items fell within this range (see Appendix J). Dorans and Holland further state that items with values between -0.10 and -0.05 and those with values between 0.05 and 0.10 (i.e., "low" DIF) should be inspected to ensure that no possible effect is overlooked, and that items with values outside the -0.10 to 0.10 range (i.e., "high" DIF) are more unusual and should be examined very carefully; thus, content experts conducted a review of items flagged for DIF.

The number of items with a "high" DIF index for each level is shown in Tables 8-1 and 8-2. Since an item can exhibit DIF for multiple comparisons, an item was counted once if any of the comparisons showed "high" DIF. Tables 8-1 and 8-2 show that only a few items were classified as "high" DIF for each grade and each level.

Table 8-1. Number of Items with "High" DIF by Level—ELA

Grade	Level 1	Level 2	Level 3
3	1	0	0
4	1	0	0
5	1	0	0
6	0	0	0
7	0	0	0
8	0	0	0
11	0	0	0

Table 8-2. Number of Items with "High" DIF by Level—Mathematics

Grade	Level 1	Level 2	Level 3
3	0	0	1
4	0	0	0
5	0	0	0
6	0	0	1
7	0	0	0
8	1	1	0
11	0	0	0

8.2 Dimensionality Analysis

Because tests are constructed with multiple content-area subcategories, and their associated knowledge and skills, the potential exists for a large number of dimensions being invoked beyond the common primary dimension. Generally, the subcategories are highly correlated with each other; therefore, the primary dimension they share typically explains an overwhelming majority of variance in test scores. In fact, the presence of just such a dominant primary dimension is the psychometric assumption that provides the foundation for the unidimensional item response theory (IRT) models that are used for calibrating, linking, scaling, and equating the 2020–21 MSAA operational tests.

The purpose of dimensionality analysis is to investigate whether violation of the assumption of test unidimensionality is statistically detectable and, if so, (a) the degree to which unidimensionality is violated and (b) the nature of the multidimensionality. Findings from dimensionality analyses performed on the 2020–21 MSAA operational items for ELA and mathematics are reported below. (Note: Only operational items were analyzed since they are used for score reporting.)

The dimensionality analyses were conducted using the nonparametric IRT-based methods DIMTEST (Stout, 1987; Stout et al., 2001) and DETECT (Zhang & Stout, 1999). Both of these methods use as their basic statistical building block the estimated average conditional covariances for item pairs. A conditional covariance is the covariance between two items conditioned on expected total score for the rest of the test, and the average conditional covariance is obtained by averaging across every possible conditioning score. When a test is strictly unidimensional, all conditional covariances are expected to take on values of zero, indicating statistically independent item responses for examinees with equal expected total test scores. Nonzero conditional covariances are essentially violations of the principle of local independence, and local dependence implies multidimensionality. Thus, nonrandom patterns of positive and negative conditional covariances are indicative of multidimensionality.

DIMTEST is a hypothesis-testing procedure for detecting violations of local independence. The data are first divided into a training sample and a cross-validation sample. Then an exploratory analysis of the conditional covariances is conducted on the training sample data to find the cluster of items that displays the greatest evidence of local dependence. The cross-validation sample is then used to test whether the conditional covariances of the selected cluster of items displays local dependence, conditioned on total score on the nonclustered items. The DIMTEST statistic follows a standard normal distribution under the null hypothesis of unidimensionality.

The DETECT statistic is an effect-size measure of multidimensionality. As with DIMTEST, the data are first divided into a training sample and a cross-validation sample. The training sample is used to find a set of mutually exclusive and collectively exhaustive clusters of items that best fit a systematic pattern of positive conditional covariances for pairs of items from the same cluster and negative conditional covariances from different clusters. Next, the clusters from the training sample are used with the cross-validation sample data to average the conditional covariances: Within-cluster conditional covariances are summed, from this sum the between-cluster conditional covariances are subtracted, this difference is divided by the total number of item pairs, and this average is multiplied by 100 to yield an index of the average violation of local independence for an item pair. DETECT values less than 0.2 indicate very weak multidimensionality (or near unidimensionality); values of 0.2 to 0.4, weak to moderate multidimensionality; values of 0.4 to 1.0, moderate to strong multidimensionality; and values greater than 1.0, very strong multidimensionality (Roussos & Ozbek, 2006).

Note that the goal of the dimensionality analysis is to evaluate the assumption of unidimensionality in the IRT model used for the calibration. In 2018 an additional culling procedure was introduced to determine which data would be used to calibrate the operational items. The new procedure was introduced in response to the repeated finding in dimensionality analyses from previous years that a small (but nontrivial) percentage of the students, referred to as "R9-stringers," were exhibiting response behavior incompatible with the assumptions of the psychometric model. R9-stringers are students who respond to nine (or more) consecutive multiple-choice items with the exact same option. Because the calibration data had the R9-stringers removed, the data used in the dimensionality analysis also had the R9-stringers removed. For 2021, the data from R9-stringers were first identified and removed prior to conducting the dimensionality analyses. Table 8-3 summarizes the dimensionality analysis sample sizes both prior to and after removing the data from the R9-stringers.

Table 8-3. Summary of Testing Population

Subject	Grade	Total before removing stringers	Total after removing stringers	Number of Stringers	Percent Stringers
ELA	3	1,684	1,395	289	17
	4	1,787	1,526	261	15
	5	1,915	1,657	258	13
	6	1,985	1,711	274	14
	7	2,054	1,788	266	13
	8	2,130	1,813	317	15
	11	1,918	1,684	234	12
Mathematics	3	1,672	1,445	227	14
	4	1,780	1,580	200	11
	5	1,910	1,641	269	14
	6	1,977	1,742	235	12
	7	2,047	1,769	278	14
	8	2,132	1,865	267	13
	11	1,921	1,705	216	11

DIMTEST and DETECT were separately applied to the three operational paths of each grade on the 2020–21 MSAA ELA and mathematics tests. The three paths resulted in three datasets to be analyzed for each ELA and mathematics grade-level test. Thus, a total of 42 analyses were conducted. First, each dataset was split into a training sample and a cross-validation sample. The sample sizes across the 42 analyses varied from a low of 338 (grade 7 ELA, Path B) to a high of 746 (grade 6 mathematics, Path B; grade 7 ELA, Path C). A rough tabulation of the sample size distribution is given in Table 8-4 below, including a comparison to the most recent past administration, which occurred in 2019. Note that the sample sizes were generally much smaller for 2021. The smaller sample sizes in 2021 were caused by the coronavirus pandemic's continuing interruption of learning and instruction, which led to a substantial number of students not being tested as compared to a typical year, such as 2019. The overall average sample size for 2021 was about 550, whereas the overall average for 2019 was about 890.

Table 8-4. Dataset Sample Sizes Used for Dimensionality Analyses

Sample Size	Number of Datasets					
	Path A		Path B		Path C	
	2019	2021	2019	2021	2019	2021
< 600	0	11	1	7	0	9
600 to 800	6	3	5	7	3	5
800 to 1000	6	0	5	0	4	0
> 1000	2	0	3	0	7	0

DIMTEST was then applied to every dataset. Even though the sample sizes were not large for the MSAA test paths, the DIMTEST null hypothesis was rejected at a significance level of 0.05 for every dataset. Next, DETECT was used to estimate the effect size for the violations of local independence for all the tests. Table 8-5 displays the multidimensional effect size estimates from DETECT.

Table 8-5. 2018–19 MSAA: Average Multidimensional Effect Sizes by Content Area and Grade

Path	Content Area	Grade	Multidimensionality Effect Size	
			2018–19	2020–21
A	ELA	3	0.60	0.42
		4	0.65	0.52
		5	0.49	0.54
		6	0.80	0.36
		7	0.74	0.86
		8	0.64	0.52
		11	0.41	0.40
		Average	**0.62**	**0.52**
	Mathematics	3	0.82	0.38
		4	0.69	0.47
		5	0.78	0.72
		6	1.17	0.94
		7	0.73	0.61
		8	0.56	0.50
		11	0.64	0.46
		Average	**0.77**	**0.58**
B	ELA	3	0.50	0.53
		4	0.48	0.38
		5	0.50	0.38
		6	0.51	0.21
		7	0.46	0.36
		8	0.26	0.42
		11	0.31	0.40
		Average	**0.43**	**0.38**
	Mathematics	3	0.60	0.76
		4	1.12	0.65
		5	0.72	0.61
		6	0.48	0.73
		7	0.98	0.85
		8	0.97	0.47
		11	0.79	0.90
		Average	**0.81**	**0.71**
C	ELA	3	0.19	0.17
		4	0.23	0.24
		5	0.32	0.23
		6	0.21	0.21
		7	0.18	0.19
		8	0.14	0.20
		11	0.17	0.10
		Average	**0.21**	**0.19**
	Mathematics	3	0.29	0.40
		4	0.46	0.57
		5	0.49	0.34
		6	0.38	0.20
		7	0.56	0.53
		8	0.56	0.30
		11	0.37	0.37
		Average	**0.44**	**0.39**

The results for 2020–21 displayed in Table 8-5 show that the ELA tests tend to have lower DETECT indices than the mathematics tests. Also, Path C indices tend to be lower than Paths A and B, for both

ELA and mathematics. The ELA Path C tests had the lowest indices and were the only set of tests for a fixed combination of content area and path that consistently displayed low DETECT indices (weak or very weak multidimensionality). For mathematics, although the Path C tests tended to be lower than for Paths A or B, the DETECT indices were still generally moderate. Summarizing the remaining results in Table 8-5, the DETECT indices for the ELA Paths A and B tests were mostly at a moderate level; whereas for mathematics, the DETECT indices for Paths A and B were a mixture of moderate and strong values.

For comparison purposes, Table 8-5 also provides the results from last year, 2018–19. The two sets of results are mostly consistent with each other. The two strong trends for 2020–21 (ELA having lower indices than mathematics; Path C having lower indices than Paths A and B) were also present in 2018–19. Moreover, the detailed 2020–21 tendencies described above also occurred in 2018–19. The most notable trend differences between 2018–19 and 2020–21 were that the DETECT indices for 2020–21 tended to be slightly lower than for 2018–19.

Next, an investigation was conducted to identify the possible source(s) of the violations of local independence that could help explain the DIMTEST and DETECT results. Hence, how DETECT divided the tests into clusters was investigated to see if there were any discernable patterns with respect to known substantive item characteristics. Prior to 2017–18, R9-stringers were included in the data, and a strong and consistent pattern was found related to the answer keys of the items—for tests administered on Paths A and B, the placement of the correct-response key option was a strong indicator of the cluster membership of nearly every multiple-choice item. In other words, nearly all the multiple-choice items fell into three clusters, where one cluster was dominated by items with a key of “A” (the first option), another was dominated by items with a key of “B” (the middle option, when it was available), and the third was dominated by items with a key of “C” (the last option). Note that the vast majority of multiple-choice items had three answer-choice options, and the few items that did not have three options were items that had only two options, which were labeled “A” and “C” for cluster-membership labeling purposes.

The removal of the R9-stringers from the data in 2017–18 and 2018–19 did not totally eliminate the key-option clustering, but it did greatly weaken its effect. This same pattern again occurred to a noticeable degree in 2020–21, though not as strongly as in 2017–18 or 2018–19. Specifically, for both ELA and mathematics nearly every grade-level test for Paths A and B had at least one cluster related to one of the three keys. In the previous two years, the effect was stronger in that nearly every test had at least two clusters related to one of the keys. For Path C, there were far fewer key-related clusters. For ELA, none of the tests had any cluster related to the keys, as compared to the past two years where every ELA test had either an “A” or a “C” cluster for Path C. For mathematics, only three out of seven Path C tests showed strong evidence of a key-related cluster, whereas for the previous two years, the majority of the mathematics tests had a “C” cluster. Overall, these results were very similar to those of 2017–18 and 2018–19. The weaker results for 2020–21 may well have been due to the reduced sample size for this year.

For the ELA tests, the operational items also included a writing prompt, which had three trait scores. For Path A, for four out of seven tests, the writing prompt traits clustered together into a single cluster. By comparison, in 2018–19, the writing prompt traits clustered together into a single cluster for every Path A ELA test. For Paths B and C, half the tests displayed this clustering pattern for the writing prompt traits (four out of seven for Path B, and three out of seven for Path C), which was the same as occurred for 2018–19. These results indicate that the writing prompt traits tend to display evidence of dimensionality distinctiveness relative to the rest of the test. These results are similar to what was found in 2017–18, the first year that writing prompts were operationally administered, and led to proactive measures that were taken at that time to deal with the dimensionality distinctiveness of the writing prompt traits. Specifically,

the non-writing prompt items were calibrated first and then the writing prompt traits were calibrated while holding the psychometric model for the rest of test fixed. This process resulted in maintaining the same scale as was set prior to the introduction of the writing prompts while also allowing the writing prompt traits to contribute in an appropriate manner to that scale.

As in the past years, the dimensionality analysis results for Paths A and B continue to indicate a violation of local independence having to do with how some student scores are related to the placement of the correct response options; however, the violations of local independence are greatly reduced because of the removal of the R9-stringers from the datasets. In general, it is important that violations of local independence be understood, monitored, and controlled on tests. The violations of local independence that are related to the ordering of the correct-response option in selected-response items are a phenomenon that will continue to require close study.

Chapter 9. Item Response Theory Scaling and Equating

This chapter describes the procedures used to calibrate, equate, and scale the 2021 MSAA. Throughout these psychometric analyses, a number of quality-control procedures and checks on the processes were implemented. These procedures included evaluation of item parameters and their standard errors for reasonableness, examination of test characteristic curves (TCCs) and test information functions (TIFs) for reasonableness, evaluation of model fit, and evaluation of the scaling results (e.g., parallel processing by the Data and Reporting Services and the Psychometrics and Research Departments, and comparison of lookup tables to the previous year's lookup tables).

9.1 Item Response Theory

All MSAA items were calibrated using item response theory (IRT). IRT uses a mathematical model to define a relationship between an unobserved measure of student performance, usually referred to as theta (θ), and the probability ($P(\theta)$) of obtaining a particular score on an item. This mathematical relationship is referred to as the item characteristic curve (ICC). In IRT, all items are assumed to be unique measures of the same construct (i.e., of the same θ). Another way to think of θ is as a mathematical representation of the latent trait of interest. Several common IRT models are used to specify the relationship between θ and $P(\theta)$ (Hambleton & Swaminathan, 1985; Hambleton & van der Linden, 1997). The process of estimating the specific mathematical relationship between θ and $P(\theta)$ is called *item calibration*. After items are calibrated, they are defined by a set of parameters that specify a nonlinear relationship between θ and $P(\theta)$. Once the item parameters are known, an estimate of θ for each student can be calculated based on the student's observed responses to the items. This estimate, $\hat{\theta}$, is considered to be an estimate of the student's true score or a general representation of student performance. It has characteristics that may be preferable to those of raw scores for equating purposes because it specifically models examinee responses at the item level, and also facilitates equating to an IRT-based item pool (Kolen & Brennan, 2014).

For the 2021 MSAA tests, the two-parameter logistic (2PL) model was used to estimate the ICC for dichotomous items, and the graded-response model (GRM) was used for polytomous items (Nering & Ostini, 2010). The 2PL model for dichotomous items can be defined as:

$$P_i(\theta_j) = P(U_i = 1|\theta_j) = \frac{exp[Da_i(\theta_j - b_i)]}{1 + exp[Da_i(\theta_j - b_i)]},$$

where
U indexes the scored response on an item,
i indexes the items,
j indexes students,
a represents item discrimination,
b represents item difficulty,
θ is the student proficiency, and
D is a normalizing constant equal to 1.701.

In the GRM for polytomous items, an item is scored in $k + 1$ graded categories that can be viewed as a set of k dichotomies. At each point of dichotomization (i.e., at each threshold), a two-parameter model can be used to model the probability that a student's response falls at or above a particular ordered

category, given θ. This implies that a polytomous item with k + 1 categories can be characterized by k item category threshold curves (ICTCs) of the two-parameter logistic form:

$$P_{ik}^{*}(\theta_j) = P(U_i \geq k|\theta_j) = \frac{exp[Da_i(\theta_j - b_i + d_{ik})]}{1 + exp[Da_i(\theta_j - b_i + d_{ik})]},$$

where
U indexes the scored response on an item,
i indexes the items,
j indexes students,
k indexes threshold,
θ is the student ability,
α represents item discrimination,
b represents item difficulty,
d represents an item-category threshold, and
D is a normalizing constant equal to 1.701.

After computing k ICTCs in the GRM, k + 1 item category characteristic curves (ICCCs), which indicate the probability of responding to a particular category given θ, are derived by subtracting adjacent ICTCs:

$$P_{ik}(\theta_j) = P(U_i = k|\theta_j) = P_{ik}^{*}(\theta_j) - P_{i(k+1)}^{*}(\theta_j),$$

where
i indexes the items,
j indexes students,
k indexes threshold,
θ is the student ability,
P_{ik} represents the probability that the score on item i falls in category k, and
P_{ik}^{*} represents the probability that the score on item i falls at or above the threshold k
($P_{i0}^{*} = 1$ and $P_{i(m+1)}^{*} = 0$).

The GRM is also commonly expressed as:

$$P_{ik}(\theta_j) = \frac{exp[Da_i(\theta_j - b_i + d_k)]}{1 + exp[Da_i(\theta_j - b_i + d_k)]} - \frac{exp[Da_i(\theta_j - b_i + d_{k+1})]}{1 + exp[Da_i(\theta_j - b_i + d_{k+1})]}.$$

Finally, the item characteristic curve (ICC) for a polytomous item is computed as a weighted sum of ICCCs, where each ICCC is weighted by a score assigned to a corresponding category. The expected score for a student with a given theta is expressed as:

$$E(U_i|\theta_j) = \sum_{k}^{m+1} w_{ik} P_{ik}(\theta_j),$$

where
w_{ik} is the weighting constant and is equal to the number of score points for score category k on item i.

Note that for a dichotomously scored item, $E(U_i|\theta_j) = P_i(\theta_j)$. For more information about item calibration and estimation, refer to Lord and Novick (1968), Hambleton and Swaminathan (1985), or Baker and Kim (2004).

9.2 Calibration Procedure

Because the 2021 MSAA was a pre-equated assessment program, the item parameters for the 2021 operational administration came from calibrations conducted in previous years. Items previously used

operationally were calibrated in the post-equating procedures that were implemented after their corresponding operational administrations. Items previously used only as field-test items were calibrated in the corresponding field-test calibration that occurred after the calibration of the operational items. No new calibrations were run for the 2021 MSAA prior to the reporting of scores. The procedures used to conduct the calibrations discussed above are described in this section.

As described in Section 8-2, in preparation for the operational and field-test calibrations, the R9 stringers were removed from the data. In calibrating the operational items, first, an off-scale calibration was conducted on all the operational items using PARSCALE (Muraki & Bock, 2003). At this point, each item was carefully examined for model fit. In particular, a visual inspection of the item fit plots was conducted. The empirical proportions of correct responses at a given level of ability must follow the shape of the model-based curve. In addition, the item parameter estimates were inspected. The discrimination parameters should not be extreme in either direction (neither greater than 3 nor less than 0.35); the difficulty parameters should also not be extreme (generally between -3 and 3, and definitely between -4 and 4); and the standard error of the difficulty parameters should generally be less than 0.2.

The equating set (a subset of the operational items) was then carefully chosen to represent the test as a whole, in terms of content coverage and difficulty levels, and the equating items were evaluated to ensure only psychometrically stable items were used. For any equating design, it is critical that rigorous procedures are implemented to monitor the quality of the equating and to check that the assumptions underlying the equating are not violated. Cognia psychometricians have conducted research studies (Hagge & Keller, 2009; Keller et al., 2008; Keller et al., 2007; Parker et al., 2009) in this regard and have developed tools to estimate equating error across years under realistic violations of the equating assumptions. The Psychometrics Department monitors well-known violations of IRT equating assumptions and uses the research to estimate their effects on the reliability and validity of the equating. Specifically, the equating data were analyzed in detail for scale drift through traditional *b*-*b* analyses.

The *b*-*b* analysis compared the old *b* parameters to the new *b* parameters using linear regression analysis. A standardized perpendicular difference from the regression line was calculated for each item; any item with a difference of a magnitude of 3 or greater was flagged for drift. Furthermore, special procedures were enacted during the calibration phase to check that the quality of the equating items was maintained consistently across years. Equating items that displayed lack of stability (e.g., standard error of the *b* parameters being large, inadequate model-data fit, etc.) were flagged and removed. Using this equating set, the Stocking-Lord transformation constants were calculated to determine the relationship between the off-scale calibration and the base-year scale established in the first year of the program. The Stocking-Lord transformation was then applied to all the off-scale operational item parameters to bring them onto the base-year scale.

Next, the field-test items were calibrated. Then the field-test items were evaluated, based on model-fit and item parameter estimates, in the same way as described above for the operational items. Based on the evaluation of model-fit and item parameter estimates, the field-test items were classified as Do-Not-Use (DNU) if any model-fit issues were identified or any item parameter estimates fell outside of the criteria. Items that were not classified as DNU were considered eligible and were then uploaded to the item bank.

9.3 Item Response Theory Results

The tables in Appendix K give the IRT item parameters for all the operational items on the 2021 MSAA tests by grade and content area based on their pre-equated models. The statistics for the operational items are summarized in Tables 9-1 through 9-4. The mean item parameter estimates shown in the tables

below are within generally acceptable and expected ranges. For easy reference, Table 9-1 displays the means and standard deviations averaged across all dichotomously scored operational items for each grade and content area.

Table 9-1. IRT Summary Statistics for Dichotomously Scored Items

Content Area	Grade	Number of Items	*a*		*b*	
			mean	SD	mean	SD
ELA	3	69	0.79	0.30	-0.44	0.65
	4	60	0.64	0.27	-0.27	0.69
	5	62	0.72	0.33	-0.31	0.80
	6	63	0.83	0.35	-0.20	0.68
	7	59	0.77	0.32	-0.37	0.80
	8	63	0.79	0.33	-0.31	0.64
	11	51	0.87	0.37	-0.24	0.74
Mathematics	3	65	0.74	0.25	0.06	0.68
	4	63	0.81	0.33	0.30	0.59
	5	64	0.69	0.22	0.16	0.74
	6	62	0.89	0.25	-0.10	0.47
	7	66	0.71	0.24	0.00	0.74
	8	69	0.77	0.29	0.01	0.52
	11	66	0.91	0.30	-0.01	0.52

Because the items were developed to correspond to different levels, the item statistics have also been summarized by level for ELA (Table 9-2 for the dichotomous items and Table 9-3 for the writing prompt traits) and for mathematics (Table 9-4).

Table 9-2. IRT Summary Statistics by Grade and Level—ELA Dichotomous Items

Grade	Level	Number of Items	*a*		*b*	
			Mean	SD	Mean	SD
03	1	22	0.97	0.24	-1.12	0.24
	2	30	0.76	0.31	-0.29	0.40
	3	16	0.63	0.23	0.15	0.52
04	1	15	0.80	0.23	-1.08	0.31
	2	40	0.57	0.25	-0.06	0.55
	3	5	0.66	0.38	0.49	0.45
05	1	16	1.00	0.31	-1.16	0.23
	2	41	0.60	0.25	-0.05	0.73
	3	5	0.76	0.46	0.32	0.56
06	1	17	1.02	0.43	-0.69	0.52
	2	40	0.76	0.31	-0.08	0.65
	3	6	0.74	0.15	0.39	0.54
07	1	19	0.83	0.31	-0.98	0.31
	2	35	0.76	0.33	-0.18	0.75
	3	5	0.59	0.11	0.62	0.83
08	1	17	0.97	0.40	-0.99	0.17
	2	26	0.75	0.32	-0.26	0.54
	3	20	0.69	0.20	0.18	0.49
11	1	10	1.26	0.40	-1.07	0.16
	2	23	0.81	0.35	-0.12	0.77
	3	18	0.73	0.22	0.08	0.53

Table 9-3. IRT Summary Statistics by Trait and Level—ELA Writing Prompt Items

Trait	Level	Number of Items	a		b		d0		d1		b-d0		b-d1	
			Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
C	2	7	0.80	0.08	-0.15	0.19	0.68	0.11	-0.68	0.11	-0.83	0.16	0.53	0.27
	3	7	0.80	0.08	0.30	0.22	0.92	0.11	-0.92	0.11	-0.62	0.21	1.22	0.27
I	2	7	0.81	0.10	0.23	0.25	0.69	0.19	-0.69	0.19	-0.46	0.17	0.92	0.41
	3	7	0.84	0.18	1.41	0.46	0.96	0.24	-0.96	0.24	0.45	0.59	2.36	0.43
O	2	7	0.76	0.08	0.35	0.31	1.19	0.14	-1.19	0.14	-0.84	0.24	1.54	0.41
	3	7	0.91	0.19	1.36	0.45	1.38	0.31	-1.38	0.31	-0.02	0.54	2.74	0.56

Note. C = Conventions, I = Idea Development, O = Organization.

Table 9-4. IRT Summary Statistics by Grade and Level—Mathematics

Grade	Level	Number of Items	*a*		*b*	
			Mean	SD	Mean	SD
3	1	11	0.63	0.11	-0.90	0.37
	2	44	0.77	0.27	0.20	0.55
	3	6	0.75	0.26	0.47	0.63
4	1	12	0.82	0.35	-0.54	0.25
	2	43	0.82	0.33	0.44	0.46
	3	6	0.73	0.38	0.64	0.31
5	1	19	0.76	0.21	-0.75	0.29
	2	39	0.66	0.21	0.54	0.51
	3	5	0.54	0.16	0.52	0.30
6	1	11	1.00	0.11	-0.79	0.18
	2	41	0.85	0.27	-0.01	0.34
	3	11	0.86	0.28	0.43	0.61
7	1	12	0.89	0.24	-1.20	0.26
	2	42	0.66	0.24	0.21	0.49
	3	9	0.76	0.18	0.58	0.60
8	1	13	0.83	0.31	-0.76	0.33
	2	51	0.76	0.28	0.17	0.37
	3	5	0.72	0.38	0.35	0.33
11	1	15	0.96	0.25	-0.78	0.26
	2	46	0.91	0.30	0.14	0.28
	3	6	0.74	0.31	0.71	0.34

Results for the dichotomously scored items are as follows. As seen in Tables 9-2 and 9-4, item difficulty tends to have a positive relationship with level: as the level increases, the items tend to be more difficult (as intended). In nearly all cases, the average difficulty increased from Level 1 to Level 2 and from Level 2 to Level 3. The largest differences were clearly the Level 1 to Level 2 differences for all grade levels for both ELA and mathematics. To investigate these tendencies more rigorously, a one-way analysis of variance (ANOVA) was conducted on item difficulty with level as the factor. Separate ANOVAs were run for ELA and mathematics. Item difficulty differed significantly by grade level for either ELA or mathematics.

The ANOVAs indicated that level was statistically significant for both ELA and mathematics with R-squared values of 39.9% for ELA and 51.3% for mathematics. Further Tukey paired-comparison tests were also conducted. These results showed that for both ELA and mathematics, the Tukey tests indicated statistically significant differences between Level 1 and each of the other levels. For both ELA and mathematics, the Tukey comparison for Level 2 versus Level 3 was also significant.

Next are the results for the polytomously scored writing prompt traits. As shown in table 9-3, for all three traits, the Level 3 traits tend to be more difficult than the Level 2 traits, but the difference is much greater for the Idea Development trait and the Organization trait than for the Conventions trait.

The IRT statistics were also summarized by different paths (Tables 9-5 and 9-6).

Table 9-5. IRT Summary Statistics by Grade by Path—ELA Dichotomous Items

Grade	Path	Number of Items	*a*		*b*	
			Mean	SD	Mean	SD
3	A	41	0.85	0.29	-0.70	0.62
	B	41	0.69	0.24	-0.29	0.60
	C	41	0.76	0.28	-0.31	0.56
4	A	41	0.64	0.26	-0.53	0.64
	B	41	0.63	0.25	-0.14	0.60
	C	41	0.60	0.24	-0.13	0.62
5	A	39	0.81	0.31	-0.67	0.57
	B	39	0.67	0.30	-0.28	0.78
	C	39	0.68	0.31	-0.17	0.84
6	A	38	0.82	0.37	-0.39	0.66
	B	38	0.87	0.34	-0.34	0.61
	C	38	0.82	0.30	-0.19	0.53
7	A	38	0.86	0.33	-0.60	0.45
	B	38	0.77	0.32	-0.33	0.78
	C	38	0.66	0.25	-0.14	0.87
8	A	38	0.82	0.35	-0.43	0.61
	B	38	0.80	0.32	-0.25	0.64
	C	38	0.78	0.32	-0.19	0.61
11	A	38	0.91	0.40	-0.36	0.74
	B	38	0.89	0.39	-0.29	0.69
	C	38	0.84	0.40	-0.11	0.78

Table 9-6. IRT Summary Statistics by Grade by Path—Mathematics

Grade	Path	Number of Items	*a*		*b*	
			Mean	SD	Mean	SD
3	A	35	0.72	0.24	-0.11	0.70
	B	35	0.70	0.23	-0.02	0.69
	C	35	0.79	0.27	0.17	0.64
4	A	35	0.76	0.31	0.11	0.62
	B	35	0.81	0.31	0.20	0.55
	C	35	0.84	0.35	0.33	0.54
5	A	35	0.71	0.21	-0.15	0.73
	B	35	0.66	0.22	0.21	0.63
	C	35	0.68	0.22	0.44	0.68
6	A	35	0.86	0.24	-0.27	0.45
	B	35	0.83	0.23	-0.13	0.38
	C	35	0.89	0.22	0.05	0.45
7	A	35	0.69	0.25	-0.26	0.76
	B	35	0.64	0.22	-0.01	0.63
	C	35	0.73	0.25	0.28	0.61
8	A	35	0.76	0.28	-0.19	0.52
	B	35	0.76	0.28	0.00	0.51
	C	35	0.74	0.21	0.15	0.44
11	A	35	0.89	0.22	-0.20	0.47
	B	35	0.84	0.23	-0.03	0.50
	C	35	0.95	0.32	0.15	0.46

The average item difficulty substantially increased from Path A to Path B for nearly all ELA tests and for most of the mathematics tests, as intended. Difficulty also usually increased from Path B to Path C for both ELA and mathematics, although in most cases the difference was small.
The TCCs provide a more complete picture of the various paths. TCCs display the expected (average) raw score associated with each θ_j value between -2.0 and 2.0. Mathematically, the TCC is computed by summing the expected score on all the ICCs of all items that contribute to the raw score. Using the notation introduced in the previous section, the expected raw score at a given value of θ_j is

$$E(X|\theta_j) = \sum_{i=1}^{n} E(U_i|\theta_j),$$

where
X indexes total raw test score,
U_i indexes the scored response on an item,
i indexes the items (and n is the number of items contributing to the raw score),
j indexes students (here, θ_j runs from -2 to 2), and
$E(X|\theta_j)$ is the expected raw score on the test for a student of ability θ_j.

The expected raw score monotonically increases with θ_j, consistent with the notion that students of high ability tend to earn higher raw scores than do students of low ability. Most TCCs are "S-shaped"—flatter at the ends of the distribution and steeper in the middle.

The TIF, $I(\theta)$ (see Lord, 1980, for theoretical definitions and examples of equations), displays the amount of statistical information the test provides at each value of θ_j. Information functions depict test precision across the entire latent trait continuum. There is an inverse relationship between the information of a test and its standard error of measurement (SEM). The SEM at a given θ_j is approximately equal to the inverse of the square root of the statistical information at θ_j (Hambleton, Swaminathan, & Rogers, 1991), as follows:

$$SEM(\theta_j) = \frac{1}{\sqrt{I(\theta_j)}}.$$

Appendix L shows graphs of the TCCs and TIFs for each grade and content area.

9.4 Equating

The purpose of equating is to ensure that scores obtained from different forms of a test are equivalent to each other. Equating may be used if multiple test forms are administered in the same year, as well as to equate one year's forms to those given in the previous year. Equating ensures that students are not advantaged or disadvantaged because the test form they took is easier or harder than those taken by other students.

All 2020–21 MSAA tests used item pre-equating methodology as described in Kolen and Brennan (2014). Item pre-equating allows the raw-to-scaled score conversion to be produced before a form is administered, which in turn allows for faster reporting and turnaround times. In item pre-equating, new forms are built from a pool of pre-existing IRT-calibrated items. In addition to these operational items, new non-operational items (field-test items) were also included on the forms. The operational items were used as a set of common items for transforming the item parameters of the non-operational items so that they

would be on the same theta scale as the IRT-calibrated item pool. This allows for the item pool to be expanded continually.

However, with pre-equating, a number of cautions need to be taken into consideration. Kolen and Brennan (2014) state that, to ensure that items behave the same on each administration, the items should appear in the same contexts and positions operationally as they did non-operationally. Thus, care must be taken to avoid significant shifts in position and context. Any drift must be carefully monitored and controlled to ensure comparability between forms of the test.

The item parameters for scoring the 2020–21 operational tests were based on post-equated calibrations conducted on past operational administrations. The raw score to scaled score lookups based on the pre-equated model for the items used in the 2020-21 administration are displayed in Appendix M.

Post-equating procedures are conducted after every operational administration. For any equating design, it is critical that rigorous procedures are implemented to monitor the quality of the equating and to check that the assumptions underlying the equating are not violated. The equating data are analyzed in detail for scale drift through traditional *b-b* analyses.

During the post-equating, item parameter estimates are placed on the base-year scale (i.e., the item bank scale) by using the method of Stocking and Lord (1983), which is based on the IRT principle of item parameter invariance. According to this principle, the equating items for both the base year and current year tests should have the same item parameters. After the item parameters for each current year's test are estimated using PARSCALE (Muraki & Bock, 2003), the Stocking and Lord method is employed to find the linear transformation (slope and intercept) that adjusts the equating items' parameter estimates such that the current year's test characteristic curve (TCC) for the equating items is as close as possible to that of the base year's tests.

In addition, the calibrated and equated parameters are evaluated to further investigate drift at both the item and test levels. At the item level, the individual item parameters are compared and investigated, and at the test level, the TCC, test information function (TIF), and raw score cuts are compared. Finally, the item parameters resulting from this process are updated in the item bank, and these updated parameters are used in field-test calibrations and in future test form development.

9.5 Reported Scale Scores

Because the θ scale used in IRT calibrations is not readily understood by most stakeholders, reporting scales were developed for MSAA. The reporting scales are simple linear transformations of the underlying θ scale. The reporting scales range from 1200 through 1290 for all grade/content-area combinations. The second cut was originally fixed at the August 2015 standard setting to be 1240 for each grade level, but some of the scale score cuts, including some of the second cuts, were adjusted during the July 2018 standards validation, as evidenced in Table 9-8.

By providing more specific information about the position of a student's results, scale scores supplement performance-level scores. Students' raw scores (i.e., total number of points) on the 2021 MSAA tests were translated to scale scores using a data analysis process called scaling, which simply converts from one scale to another. In the same way that a given temperature can be expressed on either Fahrenheit or Celsius scales, or the same distance can be expressed in either miles or kilometers, student scores on

the 2021 MSAA tests can be expressed in raw scores (where in this case a “raw score” is a score in the theta metric of logits) or scale scores (and linear transformation of the theta metric).

It is important to note that converting from raw scores to scale scores does not change students’ performance-level classifications. Scale scores make for more consistent reporting of results. Raw scores are not comparable from year to year (nor across Paths A, B, and C) because they are affected by differences in group ability and/or difficulty of the items that appear on each test form. Equating is a statistical procedure that is used to adjust for differences in form difficulty so that scores on alternate forms can be used interchangeably (Kolen & Brennan, 2014). Since the θ scale is used for equating, scale scores are comparable from one year to the next.

The scale scores are obtained by a simple translation of ability estimates ($\hat{\theta}$) using the linear relationship between threshold values on the θ metric and their equivalent values on the scale score metric. Students’ ability estimates are based on their raw scores and are found by mapping through the TCC. Scale scores are calculated using the following linear equation:

$$SS = m\hat{\theta} + b,$$

where
m is the slope, and
b is the intercept.

For MSAA, the base-form operational scale was set so that the theta corresponding to the proficient cut from the August 2015 standard setting was transformed to a scale score of 1240, and so that the standard deviation of the scale scores in the base-year was 15. The lowest obtainable scale score (LOSS) was set at 1200, and the highest obtainable scale score (HOSS) was set at 1290. A separate linear transformation is used for each grade and content-area combination. Because only one point within the θ scale score space and the standard deviation of the scale was fixed, the scale score cutpoints between Level 1 and Level 2 and between Level 3 and Level 4 were free to vary across the grade and content-area combinations. When the standards validation was conducted in July 2018, the transformation constants established in the base year were not modified, but some of the theta cuts were modified, including some of the Level 2/Level 3 cuts (i.e., the proficient cuts). Thus, scale score value for the proficient cut is no longer equal to 1240 for some tests (as seen in Table 9-8).

Table 9-7 shows the slope and intercept values used to calculate the scale scores for each content area and grade. Note that the values in Table 9-7 will not change unless the standards are reset.

Table 9-7. Scale Score Slope and Intercept by Content Area and Grade

Content Area	Grade	Slope	Intercept
ELA	3	11.7202	1242.0537
	4	12.0593	1240.0910
	5	12.4236	1241.6149
	6	12.3522	1237.8126
	7	12.2964	1242.4332
	8	12.6082	1239.4570
	11	11.4922	1244.2240
Mathematics	3	13.0552	1243.6651
	4	13.1002	1239.8674
	5	13.0769	1241.4102
	6	12.8203	1241.2532
	7	12.9093	1243.2438
	8	13.0213	1242.3583
	11	12.9897	1242.4799

Appendix M contains raw score to scale score lookup tables for the 2021 MSAA tests. These are the actual tables used to determine student scale scores, error bands, and performance levels. Graphs of the scale score cumulative frequency distributions for the 2021 MSAA tests and for the most recent past test are presented in Appendix N. Although the population of students tested was significantly smaller than pre-COVID-19, the cumulative frequency distributions showed that the 2021 MSAA overall student performance was similar to pre-COVID-19 results.

9.6 MSAA Performance Levels, Cut Scores, and Standards Validation

Cut scores for MSAA in ELA and mathematics were originally set in a standard setting process that took place in August 2015. Details of the standard setting procedures can be found in the standard setting report (Measured Progress, 2015). In July 2018, Cognia and the MSAA Psychometric Subcommittee conducted a standards validation. Standards validation does not change the scale; its purpose is only to determine whether adjustments to the cut scores are needed.

The standards validation process for the 2018 MSAA was necessary to ensure that cut scores, set in 2015 for the assessments, continue to provide valid interpretation of ELA and mathematics performance using the Performance Level Descriptors (PLDs). The standards for both ELA and mathematics were vertically articulated, using 2017 performance data, to update the performance standards and provide a coherent basis for interpreting 2018 scores and performance, and in preparation for validating the ELA standards further. No additional steps were necessary to validate the mathematics performance standards. The validation process for the ELA performance standards was necessitated by the addition of the open-response writing prompt scores to the existing ELA score scale in 2018.

A complete description of the standards articulation and validation processes appears in the 2018 *MSAA Standards Validation Report* (see Appendix M of the 2018 *MSAA Technical Report* located online here: https://cms.azed.gov/home/GetDocumentFile?id=5cb0b3b61dcb2511e88cfef7).

Final cut scores, after mathematics and ELA vertical articulation and ELA standards validation for the 2017-18 MSAA, appear in Table 9-8.

Table 9-8. Cut Scores on the Theta Metric and Reporting Scale

Content Area	Grade	Theta				Scale Score			
		Cut1	Cut2	Cut3	Minimum	Cut1	Cut2	Cut3	Maximum
ELA	3	-0.70318	-0.21788	0.97664	1200	1234	1240	1254	1290
	4	-0.53007	-0.00755	1.52654	1200	1234	1240	1259	1290
	5	-0.83676	-0.12999	1.15500	1200	1232	1240	1256	1290
	6	-0.63000	-0.10626	1.02714	1200	1231	1237	1251	1290
	7	-0.59215	-0.19788	0.94792	1200	1236	1240	1255	1290
	8	-0.75241	-0.15521	0.78177	1200	1230	1238	1250	1290
	11	-0.76610	-0.41106	0.89860	1200	1236	1240	1255	1290
Mathematics	3	-0.70202	-0.16584	0.76660	1200	1235	1242	1254	1290
	4	-0.63872	-0.10438	0.81776	1200	1232	1239	1251	1290
	5	-0.75784	-0.10784	0.84805	1200	1232	1240	1253	1290
	6	-0.68276	-0.21475	0.72127	1200	1233	1239	1251	1290
	7	-0.75478	-0.25128	0.76727	1200	1234	1240	1254	1290
	8	-0.65755	-0.21950	0.62527	1200	1234	1240	1251	1290
	11	-0.61432	-0.22940	0.54044	1200	1235	1240	1250	1290

Table 9-9 shows the percentage of students by performance-level categories along with the average and standard deviation of the scale scores for each grade/content-area combination. Also, the percentages of Levels 3 and 4 (levels corresponding to proficient or above, which are the levels of critical interest for federal accountability purposes) within each grade and content area are provided in the table.

Table 9-9. Percentage of Students by Performance-Level Categories

Content Area	Grade	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	Level 2	Level 3	Level 4	Levels 3 & 4		
ELA	3	1,764	42	19	27	12	39	1237.39	14.77
	4	1,873	48	14	31	8	38	1236.33	15.92
	5	1,994	33	31	26	9	35	1236.80	14.13
	6	2,053	37	19	33	11	44	1235.01	13.45
	7	2,108	42	13	27	18	45	1240.05	14.28
	8	2,203	30	27	30	14	43	1236.30	12.84
	11	1,967	28	19	40	12	53	1241.34	12.91
Mathematics	3	1,752	32	27	27	14	41	1239.10	15.07
	4	1,866	22	28	41	9	50	1237.38	13.71
	5	1,987	24	36	30	10	40	1238.05	13.51
	6	2,045	24	28	34	14	48	1239.02	13.53
	7	2,101	30	26	31	13	45	1239.40	14.25
	8	2,205	28	22	33	17	50	1239.57	14.00
	11	1,969	21	25	41	13	54	1239.78	11.91

Tables 9-10 (ELA) and 9-11 (mathematics) show the percentage of students in each performance-level category by path, along with the average and standard deviation of the scale scores for each

grade/content-area combination. Note that the percentage of examinees being classified as Level 3 and Level 4 (levels of proficient or above) increased as we move from Path A to Path C. This trend was expected due to the stage adaptive nature of the 2021 MSAA.

Table 9-10. Performance-Level Distributions by Path—ELA

Grade	Path	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	Level 2	Level 3	Level 4	Levels 3 & 4		
3	A	817	85	14	1	0	1	1226.20	10.13
	B	511	9	42	49	0	49	1239.62	4.83
	C	436	1	1	48	50	98	1255.73	9.29
4	A	1,009	85	12	3	0	3	1225.36	10.26
	B	446	7	30	63	0	63	1242.08	5.77
	C	418	0	1	65	34	98	1256.69	10.24
5	A	957	67	31	2	0	2	1226.66	9.79
	B	598	4	54	42	0	42	1239.68	5.53
	C	439	0	3	56	41	97	1254.97	9.52
6	A	806	84	15	1	0	1	1222.99	9.48
	B	588	14	43	43	0	44	1235.81	4.82
	C	659	0	3	62	35	97	1249.00	7.73
7	A	982	85	12	3	0	3	1228.83	9.03
	B	375	13	39	48	0	48	1240.38	4.51
	C	751	0	1	48	50	98	1254.55	8.97
8	A	726	79	21	1	0	1	1224.08	9.42
	B	781	11	54	35	0	35	1235.76	4.51
	C	696	0	3	54	43	97	1249.65	8.51
11	A	527	82	14	4	0	4	1228.28	11.92
	B	847	14	35	51	0	51	1240.16	4.66
	C	593	1	1	58	41	99	1254.64	8.06

Table 9-11. Performance-Level Distributions by Path—Mathematics

Grade	Path	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	Level 2	Level 3	Level 4	Levels 3 & 4		
3	A	707	74	24	2	0	2	1226.92	11.76
	B	523	9	55	36	0	36	1239.84	4.64
	C	522	0	3	52	45	97	1254.86	10.18
4	A	589	66	32	2	0	2	1223.77	12.38
	B	625	2	52	46	0	46	1238.52	3.76
	C	652	0	2	71	27	98	1248.59	9.57
5	A	725	62	37	2	0	2	1226.50	11.30
	B	765	4	56	40	1	41	1239.50	4.64
	C	497	0	5	55	40	95	1252.65	9.96
6	A	593	75	24	1	0	1	1225.71	11.50
	B	838	6	50	43	0	43	1238.50	4.45
	C	614	0	0	54	45	100	1252.58	9.98
7	A	752	74	23	4	0	4	1227.86	10.49
	B	783	9	45	45	1	45	1,239.02	5.16
	C	566	0	2	49	49	98	1255.25	11.93
8	A	750	75	22	3	0	3	1226.67	11.01
	B	719	8	42	50	1	50	1239.62	4.05
	C	736	0	3	47	49	97	1252.67	10.31
11	A	559	64	34	2	0	2	1228.28	12.18
	B	702	8	38	54	0	54	1239.28	3.78
	C	708	0	4	59	37	96	1249.34	8.18

Chapter 10. Reliability

Although the psychometric characteristics of individual items performance are an important focus for evaluation, a complete evaluation of an assessment must also address the way items function together. Tests that function well provide a dependable assessment of the student's level of ability. Unfortunately, no test can do this perfectly. A variety of factors can contribute to a given student's score being either higher or lower than his or her true ability. For example, a student may misread an item or mistakenly fill in the wrong bubble when he or she knew the right answer. Collectively, extraneous factors that affect a student's score are referred to as "measurement error." Any assessment includes some amount of measurement error; that is, no measurement is perfect. This is true of all academic assessments—some students will receive scores that underestimate their true ability and other students will receive scores that overestimate their true ability. When tests have a high amount of measurement error, student scores are very unstable. Students with high ability may get low scores or vice versa. Consequently, one cannot reliably estimate a student's true level of ability with such a test. Assessments that have less measurement error (i.e., errors made are small on average and student scores on such a test will consistently represent their ability) are described as "reliable."

There are a number of ways to estimate an assessment's reliability. The most common method is Cronbach's alpha, which is premised on a design in which all students for a given assessment were administered the same fixed set of items. For the 2020–21 MSAA, there were three different paths (A, B, and C), each of which essentially corresponded to a different test form. Even though Cronbach's alpha could be applied to each form separately, this would not be ideal for two reasons. First, the ability distributions for the three forms are very different from each other by design—essentially the standard deviation for any one form is much smaller than the standard deviation for the whole population, and the mean increases from Paths A to B to C. The resulting restriction of ability range causes severe underestimation of reliability for each path. Second, a single measure of reliability for each grade-level assessment is preferable to three values. Thus, an IRT-based estimate of reliability that results in a single value for each grade-level assessment was used.

10.1 IRT Marginal Reliability

IRT marginal reliability estimation is based on applying the standard classical test theory (CTT) formula, relating variances of true score, observed score, and measurement error, in the IRT setting. In CTT, the relationship between these variances is given by:

$$\sigma_X^2 = \sigma_T^2 + \sigma_E^2$$

where σ_X^2 is the observed-score variance, σ_T^2 is the true-score variance, and σ_E^2 is the error variance.

Starting from this basic equation, it can be shown that the formula for CTT reliability can be expressed by:

$$CTT\ Reliability = 1 - \frac{\sigma_E^2}{\sigma_X^2}.$$

IRT marginal reliability is based on extending the CTT model to an IRT framework (Samejima, 1994) and provides an IRT-based estimate of the overall test reliability. Error variance is estimated as the mean

squared conditional standard error of measurement (CSEM) of the theta estimates across students within a grade. Observed score variance is estimated as the variance of the theta estimates across students within a grade. Equivalently, the mean squared CSEM of the scale scores and the variance of the scale scores can be used in place of the CSEM of the theta estimates and the variance of the theta estimates, respectively. IRT marginal reliability is then given by the following formula:

$$IRT\ Marginal\ Reliability = 1 - \frac{\overline{CSEM(\theta)^2}}{Var(\hat{\theta})} = 1 - \frac{\overline{CSEM(SS)^2}}{Var(SS)}$$

where

$\overline{CSEM(\theta)^2}$ is the mean squared CSEM,

$\overline{CSEM(SS)^2}$ is the mean squared scale CSEM,

$Var\ (\hat{\theta})$ is the variance of theta estimates, and

$Var(SS)$ is the scale score variance.

Using this formula, IRT marginal reliability estimates were calculated for each multistage test in ELA and mathematics, using the scale scores (and their standard errors) for all the students across all three paths. The reliability of a test can also be evaluated by simply examining directly the CSEMs themselves. CSEMs facilitate the interpretation of individual scale scores. With any given scale score estimate for a student, the reasonable limits of the true scale score for the student can be calculated by using the CSEM for the scale score.

Tables 10-1 and 10-2 present descriptive scale score statistics, IRT-based reliability, and mean scale score CSEMs for ELA and mathematics by grade. (Statistics are based on operational items, which counted toward students' reported scores only.) As shown in the tables, most of the values reached levels associated with adequate reliability (0.80 or higher).

Table 10-1. IRT Marginal Reliability by Grade—ELA

Grade	Min	Max	Mean	SD	IRT Marginal Reliability	Mean Scaled CSEM
3	1200	1289	1240.57	12.94	0.92	3.44
4	1200	1290	1239.89	14.33	0.91	4.02
5	1200	1290	1239.65	12.49	0.90	3.66
6	1200	1290	1237.80	11.95	0.88	3.56
7	1200	1290	1242.60	12.97	0.91	3.67
8	1200	1286	1238.91	11.29	0.89	3.44
11	1200	1285	1243.59	11.28	0.88	3.28

Table 10-2. IRT Marginal Reliability by Grade—Mathematics

Grade	Min	Max	Mean	SD	IRT Marginal Reliability	Mean Scaled CSEM
3	1200	1290	1242.30	12.83	0.87	4.30
4	1200	1290	1239.82	11.12	0.80	3.93
5	1200	1290	1240.60	11.56	0.84	4.42
6	1200	1290	1241.47	11.55	0.84	3.75
7	1200	1290	1241.50	13.23	0.87	4.44
8	1200	1290	1242.13	11.86	0.86	3.99
11	1200	1290	1241.52	10.27	0.77	3.64

10.2 Subgroup Reliability

The reliability coefficients discussed in the previous section were based on all students who took a particular 2020–21 MSAA test. As an alternate assessment program, it is likely that there are reliability differences across subgroups. For this reason, reliability coefficients for different subgroups were calculated, including gender, ethnicity, LEP status, socioeconomic status, migrant status, and various disability groups. Appendix O presents reliabilities for various subgroups of interest. Subgroup reliabilities were calculated using the IRT-based formula (defined above) based only on the members of the subgroup in question in the computations; values were calculated only for subgroups with 100 or more students and where more than 25% of the students scored above the LOSS (lowest obtainable scale score, which was 1200).

For several reasons, the results relating to subgroup reliability should be interpreted with caution. First, reliabilities are dependent not only on the measurement properties of a test but on the statistical distribution of the studied subgroup. For example, it can readily be seen in Appendix O that subgroup sample sizes varied considerably, which results in a natural variation in reliability coefficients. Alternatively, reliability, which is a type of correlation coefficient, may be artificially depressed for subgroups with little variability (Draper & Smith, 1998). Second, there is no industry standard to interpret the strength of a reliability coefficient, especially when the population of interest is a single subgroup. Again, the reliability statistics provided in the tables in Appendix O should be cautiously interpreted because of the restriction of range mentioned earlier (Section 8.1).

10.3 Reliability of Performance-Level Categorization

While related to reliability, the accuracy and consistency of student classification into performance categories are even more important statistics in a standards-based reporting framework (Livingston & Lewis, 1995). After the performance levels were specified and students' performances were classified into those levels, empirical analyses were conducted to determine the statistical accuracy and consistency of the classifications. For the MSAA, students are classified into one of four performance levels: Level 1, Level 2, Level 3, or Level 4. This section of the report explains the methodologies used to assess the reliability of classification decisions, and results are provided.

Accuracy refers to the extent to which decisions based on test scores match decisions that would have been made if the scores did not contain any measurement error. Consistency measures the extent to which classification decisions based on test scores match the decisions based on scores from a second, parallel form of the same test. Consistency can be evaluated directly from actual responses to test items if two complete and parallel forms of the test are given to the same group of students. In operational test programs, however, such a design is usually impractical.

However, techniques have been developed to estimate both the accuracy and the consistency of classification decisions based on a single administration of a test. The Rudner (2001, 2005) technique was used for the 2021 MSAA because it can be easily applied to data that is scored in the IRT theta metric or any linear transformation of this metric, such as the MSAA scale scores. The applicability of the Rudner technique to IRT-based metrics distinguishes this method from methods based on observed scores, such as the Lewis and Livingston (1995) method. Thus, the Rudner method can be used to provide a single index for a multistage test, whereas an observed score method would need to be separately applied to each path of a multistage test.

For details of the Rudner method, refer to Rudner (2001, 2005); given here is a brief review of the basic idea behind the method. Using an examinee's estimated scale score and standard error, assuming a

normal probability distribution, the method first calculates for all examinees at a fixed value of true scale score, the expected proportion whose observed scale score is in an interval [a,b]. Then, by summing over all examinees whose true scale scores are in an interval [c,d], the method yields the expected proportion of all examinees whose true scale score is in [c,d] and whose observed scale score is in [a,b]. By setting [a,b] and [c,d] to correspond to the true score intervals defined by the cut scores yields the elements of a classification table that shows the expected proportion of all examinees with observed and true scale scores in each cell. These proportions can then be used to calculate both classification accuracy and classification consistency estimates.

For the classification accuracy tables, cell [*i*, *j*] represents the estimated proportion of students whose true scale score fell into classification *i* (where *i* = 1 to 4, for the four achievement levels) and whose observed scale score fell into classification *j* (where *j* = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students whose true and observed classifications matched) signified overall accuracy.

For the classification consistency tables, cell [*i*, *j*] of this table represents the estimated proportion of students whose observed scale score on the first of the two hypothetical parallel multistage tests would fall into classification *i* (where *i* = 1 to 4) and whose observed scale score on the second hypothetical parallel multistage test would fall into classification *j* (where *j* = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students categorized by the two forms into exactly the same classification) signified overall consistency.

Another way to measure consistency is to use Cohen's (1960) coefficient κ (kappa), which assesses the proportion of consistent classifications after removing the proportion of consistent classifications that would be expected by chance. It is calculated using the following formula:

$$\kappa = \frac{(\text{Observed agreement}) - (\text{Chance agreement})}{1 - (\text{Chance agreement})} = \frac{\sum_i C_{ii} - \sum_i C_{i.} C_{.i}}{1 - \sum_i C_{i.} C_{.i}},$$

where
$C_{i.}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the first hypothetical parallel form of the test;
$C_{.i}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the second hypothetical parallel form of the test; and
C_{ii} is the proportion of students whose observed performance level would be Level i (where i = 1–4) on both hypothetical parallel forms of the test.

Because κ is corrected for chance, its values are lower than other consistency estimates.

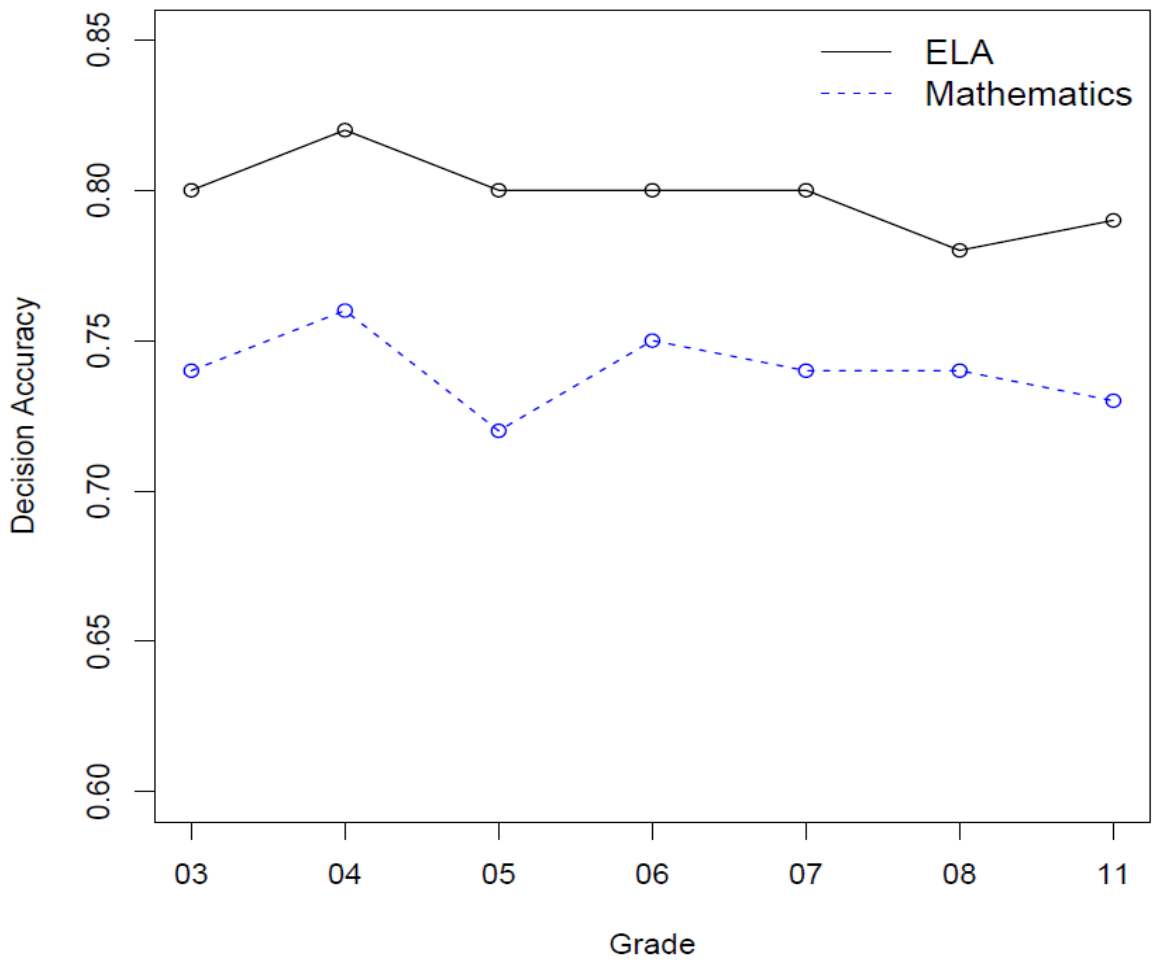
10.4 Accuracy and Consistency

Figure 10-1 shows the overall decision accuracy for ELA and mathematics by grade level. More details on decision accuracy and consistency (DAC) are provided in Appendix P. Table P-1 in Appendix P includes overall accuracy and consistency indices, along with kappa. Accuracy and consistency values conditional on performance level are also provided in Table P-1. For these calculations, the denominator is the proportion of students associated with a given performance level. Following is an example from Table P-1, looking at Level 1 for grade 3 ELA.

- The conditional *accuracy* value was 0.91. This indicates that among the students whose *true scale scores* placed them in Level 1, 91% would be expected to be in this same level again when categorized according to their observed scale scores.
- The *consistency* value was 0.84. This indicates that among the students whose *observed scale scores* placed them in Level 1, 84% would be expected to be in this same level again if a second parallel test form were used.

For some testing situations, the greatest concern may be decisions regarding level thresholds. For example, in testing done for No Child Left Behind accountability purposes, the primary concern is distinguishing between students who are proficient and those who are not yet proficient. For the 2021 MSAA, Table P-2 in Appendix P provides accuracy and consistency estimates at each cutpoint, as well as false positive and false negative decision rates. A false positive rate is the proportion of students whose observed scores were above the cut and whose true scores were below the cut. A false negative rate is the proportion of students whose observed scores were below the cut and whose true scores were above the cut.

Figure 10-1. Overall Decision Accuracy by Content Area by Grade



Chapter 11. Validity Arguments to Support Intended Score Interpretations and Uses

Chapter 11 presents the primary intended score interpretation and three primary intended score uses. This chapter also presents the assumptions that underlie these four score interpretations and uses (SIUs) and the evidence that supports the assumptions. The MSAA validity argument model is introduced and applied to develop validity arguments to support the four SIUs.

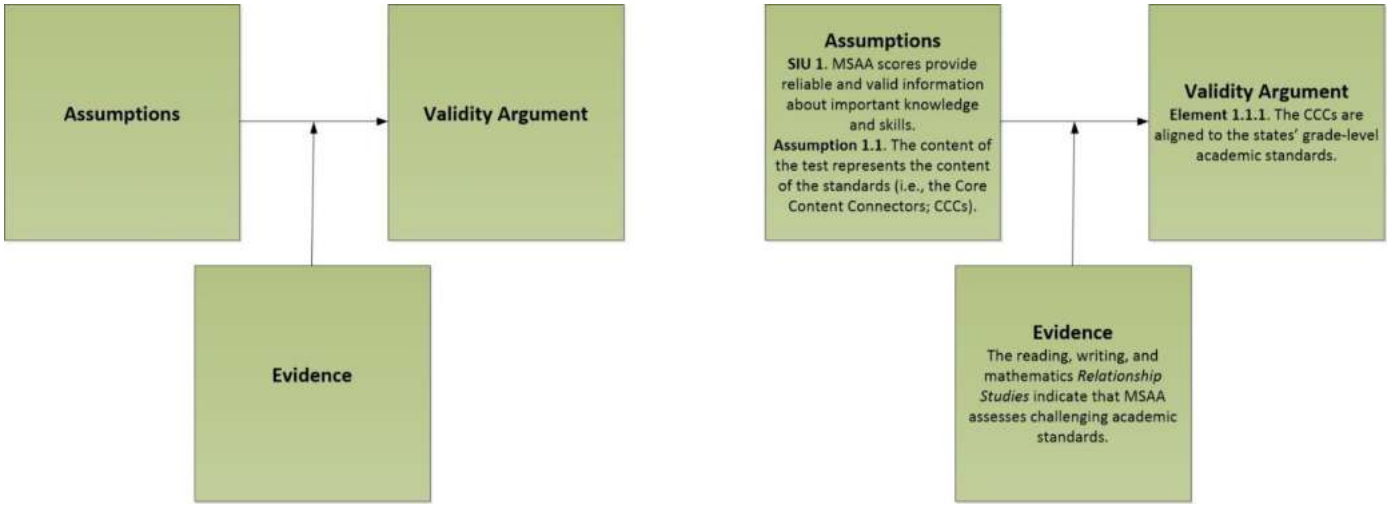
It is important to note that the 2021 MSAA tests were administered at the end of a school year in which COVID-19 still had a strong impact on instruction and learning. The fact that the 2021 MSAA is pre-equated shields the item parameters, equating results, and psychometric characteristics of the 2021 assessment from deleterious COVID-19 effects. That shielding enables valid interpretations of student performance in 2021, which is likely to reflect whatever deleterious COVID-19 effects there may be, specifically loss of high-quality opportunity learning and impacts on test performance. The combination of these two facts (pre-equated model and the similarity of student results from past years) indicates that the scores can be interpreted similarly in 2021 and 2019.

The *Standards for Educational and Psychological Testing* (2014) define validity as “the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests” (p. 11). Elaborating on that definition, the *Standards* assert that “it is the interpretations of test scores for proposed uses that are evaluated, not the test itself” (p. 11) and that “validation logically begins with an explicit statement of the proposed interpretation of test scores, along with a rationale for the relevance of the interpretation to the proposed use” (p. 11). This definition applies specifically to intended interpretations and uses of test scores, rather than to the broader program of curriculum and instruction in which a testing program is embedded or to the surrounding education and school improvement policies and aspirations for student learning.

Further, the *Standards* state that “a sound validity argument integrates various strands of evidence into a coherent account of the degree to which existing evidence and theory support the intended interpretations of test scores for specific uses” (p. 21; emphasis added).

Emerging practice in state assessment programs is to construct validity arguments based on Toulmin’s model of argumentation (Toulmin, 1958), Chapelle (2021) proposed practice-oriented adaptation, and Kane’s formulation of validity arguments (2013). A model for MSAA validity arguments, derived from these three conceptualizations, is shown in Figure 11-1. The first panel shows the MSAA model; the second panel is an illustration for an MSAA validity argument.

Figure 11-1. MSAA Validity Argument Model



Adapted from Chapelle (2021) Figures 2.1-2.3, Kane (2013) Figure 1, and Toulmin (1958).

In the first panel in Figure 11-1, MSAA assumptions (and elements of assumptions, subsumed) appear at the left and connect directly to a corresponding validity argument, portrayed at the right. The evidence that supports the MSAA assumptions and elements (and required inferences, subsumed) connect directly to the assumption-validity argument pairings.

In the MSAA validity argument model, the overall validity argument is that the existing design, procedural, and psychometric evidence supports the four intended score interpretations and uses. Each of the interpretations and uses represents a set of assumptions and elements that require supporting evidence to connect the evidence to the assumption. This line of reasoning and argumentation creates supported MSAA validity arguments. Sections 11.1 through 11.2 below describe the:

1. four intended SIUs;
2. assumptions and their elements, which connect the MSAA design, procedural, psychometric, and other program information to the SIUs; and
3. evidence that supports each assumption and element (and which is provided in detail in Chapters 2–10).

The relationships among the score interpretations and uses, assumptions, and elements appear in Table 11-1 (below). Each entry in the table is presented following the table, with descriptions and summaries of the supporting evidence.

Table 11.1 Relationships Among Score Interpretations and Uses, Necessary Assumptions, and Elements That Support the Assumptions

Necessary Assumptions	Elements That Support Assumptions
Primary Intended Score Interpretation	
MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.	
1.1	The content of the test represents the content of the standards (i.e., the Core Content Connectors).
	1.1.1 MSAA content is aligned to the CCCs and grade-level standards.
	1.1.2 MSAA items are aligned to the CCCs.
	1.1.3 States have confirmed alignment of the MSAA to state content standards.
	1.1.4 MSAA items are aligned to the PLDs.
1.2	MSAA test items are construct relevant. The elements corresponding to this assumption are concerned with the skills and cognitive processes required to understand and respond to an item in particular, whether they correspond to the skills and processes required in the PLDs.
	1.2.1. Items require application of the KSAs of the targeted construct.
	1.2.2. Items are accessible to all students.
	1.2.3. Appropriate accommodations are provided to meet student needs.
	1.2.4. Scoring rubrics focus on construct-relevant aspects of student responses.
	1.2.5. Scaffolding is not a source of construct-irrelevant variance.
	1.2.6. Item rendering does not interfere with student access to test content.
	1.2.7. Platform does not interfere with student interaction with test content.
	1.2.8. Items are free of bias and sensitive issues.
1.3	Test administrations in MSAA states in 2021 followed prescribed, standardized procedural requirements.
	1.3.1. Test Administrators and School and District Coordinators understood and performed their roles properly.
	1.3.2. Test security concerns were limited.
1.4	Test scores on the 2021 MSAA provide reliable information about student performance and accurate classifications into performance levels.
	1.4.1. MSAA scores and categorizations into performance levels are adequately reliable for their intended purpose.
	1.4.2. Item characteristics support intended interpretations about all students who take the MSAA.
	1.4.3. Test characteristics, for Paths A, B, and C support intended interpretations about all students who take the MSAA.
	1.4.4. Scaling of the MSAA supports intended interpretations about all students who take the MSAA.
	1.4.5. Equating of MSAA test forms supports intended interpretations about MSAA students.
	1.4.6. Stage 1 covers a broad enough range of item difficulty and item cognitive complexity to route students into appropriate stage 2 tests.
	1.4.7. Routing into the stage 2 test level is appropriate for students.
	1.4.8. Stage 2 test levels are sufficiently separable and targeted toward different ranges of achievement for the MSAA students who are routed to those levels.

continued

Necessary Assumptions	Elements That Support Assumptions
1.5	Item and test scoring in 2021 were implemented accurately.
	1.5.1. Machine scored items were scored accurately.
	1.5.2. Constructed response item scoring training and monitoring procedures met industry standards.
1.6	MSAA scores correlate as expected with external indicators of student proficiency (1.e., concurrent evidence).
	1.6.1. MSAA scores correlate as expected with other measures of student proficiency.
Primary Intended Score Use 1	
Schools and districts use the MSAA and its results to (a) monitor trends in school performance, and (b) design professional development for teachers.	
2.1	MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups
	2.1.1. MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups.
	2.1.2. MSAA scores and proficiency level categorizations of groups of students are adequately reliable and valid to enable monitoring of grade-level performance and student cohort performance.
	2.1.3. The relationship between MSAA scores and external measures of student achievement and growth is as expected, compared to grade-level assessments and other alternate assessments.
2.2	MSAA results are used to design professional development for teachers.
Primary Intended Score Use 2	
The MSAA and its results are used to help teachers integrate MSAA scores and other information with their instructional planning.	
3.1	Teachers use the MSAA and its results to better integrate assessment with their instructional planning
	3.1.1. Teachers find the performance level descriptors and their students' performance levels useful for planning instruction, especially students in performance levels 1 and 2.
	3.1.2. Teachers find their students' scale score information useful for planning instruction, especially students in levels 1 and 2.
3.2	Teachers use MSAA scores and other information for instructional planning.
	3.2.1. Teachers use MSAA scores and other information for planning instruction.
Primary Intended Score Use 3	
Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.	
4.1	Parents find MSAA scores and other information useful for understanding what their child knows and can do.
	4.1.1. Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.
	4.1.2. Parents use MSAA scores and other information appropriately to understand what their child knows and can do and make decisions about their child's education and learning needs.
4.2	Parents find MSAA scores and other information useful for understanding their child's progress from year to year.
	4.2.1. Parents understand and interpret correctly MSAA scores and other information to understand their child's progress from year to year.
	4.2.2. `Parents use MSAA scores and other information appropriately to understand their child's progress from year to year and make decisions about their child's education and learning needs.

Evidence that supports elements of the assumptions in MSAA validity arguments is summarized below, using a relevance rating scale, with rating levels defined in Table 11-2.

Table 11.2 Relevance of Evidence in Support of Elements and Assumptions Underlying Validity Arguments for MSAA Score Interpretations and Uses

Complete Evidence	When all required pieces of relevant evidence are provided to support a validity argument
Moderate to Substantial Evidence	When several pieces of relevant evidence are provided, but not all required pieces of evidence are provided
Limited Evidence	When only one or two pieces of evidence are provided, where the evidence may be only marginally relevant or where more than 1–2 pieces of evidence are required
No Evidence	When no relevant evidence exists

Relevance ratings summarize the **applicability** of the evidence, in terms of "the quality or state of being closely connected or appropriate" (Lexico.com, 2019), and the **completeness** of the evidence. Relevance ratings do not imply the persuasiveness of the evidence, which is defined as "the power to induce the taking of a course of action or the embracing of a point of view by means of argument or entreaty" (Vocabulary.com, 2019). Cognia's MSAA Psychometric Team developed these definitions in response to recommendations from the MSAA Technical Advisory Committee and applied the ratings to the assumptions and elements below.

The primary score interpretation and use statements (SIUs) for which supporting evidence is needed are as follows.

Primary Intended MSAA Score Interpretation

MSAA scores provide reliable and valid information about important grade-level numeracy and literacy knowledge and skills attained by students with the most significant cognitive disabilities.

Primary Intended MSAA Score Uses

- Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers.
- Teachers use the MSAA and its results to better integrate assessment with their instructional planning.
- Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year.

11.1 Primary Intended Score Interpretation

MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.

Assumption 1.1. The content of the test represents the content of the standards (i.e., the Core Content Connectors).

The evidence to support this test alignment assumption and its elements was generated in a series of alignment studies that were conducted between 2012 and 2015 by the National Center and State Collaborative (NCSC). Details regarding the alignment reports and evidence of findings is available in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see http://ncscpartners.org/Media/Default/PDFs/Resources/NCSC15_NCSC_TechnicalManualNarrative.pdf).

Element 1.1.1. The Core Content Connectors are aligned to the states' grade-level academic content standards. (See alignment question 1 in the technical manual.)

Evidence: The technical manual summarizes evidence from the Reading, Writing, and Mathematics Relationship Studies and states that "all the evidence suggested the mathematics, reading, and writing CCCs had a strong relationship to the CCSS standards" (p. 75). The evidence in all three content areas includes content centrality and performance centrality, that the overall cognitive complexity of the assessment is appropriately lower than that of the grade-level content standards, and that some Core Content Connectors were rated at high depth of knowledge levels, suggesting that MSAA accesses challenging academic standards.

Summary of evidence: Complete evidence

Element 1.1.2. The 2021 MSAA items are aligned to the Core Content Connectors. (See alignment question 3 in the technical manual.)

Evidence: The NCSC technical manual indicates that "NCSC designed the operational items to assess the knowledge and skills of a wide variety of students with the most significant cognitive disabilities [and]…The study provided evidence that the assessment's operational items allowed students using various communication modes and with specific characteristics to access the items. Panelists indicated that the items were suitable for students who used various communication modes, and panelists indicated that no modifications were necessary to enable student access to the test items" (p. 80). Item specifications and development and review processes every year since 2015 are designed and implemented to ensure that items are closely aligned to the Core Content Connectors.

Summary of evidence: Complete Evidence

Element 1.1.3. The states have confirmed that the MSAA Core Content Connectors, which are assessed on the MSAA, are aligned with each state's academic content standards for each grade level.

Evidence: Membership in MSAA requires each member state to adopt the academic content standards that are assessed on the MSAA.

Summary of evidence: Complete Evidence

Element 1.1.4. The 2021 operational MSAA items are aligned to the MSAA performance level descriptors. (See alignment question 4 in the technical manual.)

Evidence: As reported in the technical manual, "Panelists rated item groups based on their judgment of whether the KSAs in the item groups represent the KSAs in the PLDs… For all content areas and grade levels, the majority of the item groups were rated as having the same KSAs as the PLDs, ranging from 57% to 78%. Some panelists indicated that some KSAs were missing in the item groups or the PLDs, but overall, the overlap of KSAs found in the item groups and PLDs was acceptable" (p. 81). The items are developed following item specifications for each CCC. The item specifications accomplish two purposes: (1) they provide both general and specific guidelines for developing all test items at the grade levels assessed and (2) they describe the test items and prompt types needed. Within the specifications documents are sections dedicated to information about item contexts, variable features, cognitive task levels, use of graphics, item style and format, and general content limits by academic grade-level content

target. As such, in addition of the items to the performance level descriptors, there is alignment from the item specifications to the performance level descriptors.

Summary of evidence: Moderate to Substantial; a follow-up study of alignment between more recent items and the MSAA performance level descriptors may be warranted.

Assumption 1.2. MSAA test items are construct relevant. The elements corresponding to this assumption are concerned with the skills and cognitive processes required to understand and respond to an item in particular, and whether they correspond to the skills and processes required in the PLDs.

Element 1.2.1. Items require application of the KSAs of the targeted construct.
Element 1.2.2. Items are accessible for all students.
Element 1.2.3. Appropriate accommodations are provided to meet student needs.
Element 1.2.4. Item scoring rubrics and criteria focus on construct-relevant aspects of student response.
Element 1.2.5. Scaffolding is not a source of construct-irrelevant variance.
Element 1.2.6. Item rendering does not interfere with students' access to test content.
Element 1.2.7. Platform does not interfere with students' ability to interact with test content.
Element 1.2.8. Items are free of bias and sensitive issues.

The evidence for Elements 1.2.1 through 1.2.8 is interrelated. Some evidence is relevant to a single element. Other evidence is relevant to multiple elements. For that reason, the elements are listed as a group, rather than for each individual element. After listing the evidence for these elements, the relevance of the evidence for each individual element is summarized.

Evidence for 1.2.1: The 2021 operational MSAA items are aligned to the Core Content Connectors, through the targeted focal knowledge, skills, and abilities (FKSAs) and/or essential understandings (EUs), which supports this element. The evidence for Element 1.2.1 is directly linked to the Element 1.1.2. As noted above in Element 1.1.2 (Assumption 1.1: The content of the test represents the content of the standards [i.e., the Core Content Connectors]), the evidence for 1.1.2 is Complete Evidence.
Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, and 1.2.8: During the item development process, the items followed a rigorous development cycle, including reviews by MSAA State Representatives and by Item Content and Bias and Sensitivity panelists. See Chapter 3 for a detailed description of item review process.
Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, and 1.2.7: Cognitive labs (also referred to by NCSC as Student Interaction Studies) were conducted by NCSC in the early stages of development of the assessment program to acquire detailed information about the cognitive processes used by students in responding to assessment tasks. The studies resulted in adjustments in the assessment program to ensure the construct validity of student response data. This information is outlined in *the National Center and State Collaborative 2015 Operational Assessment Technical Manual*.
Evidence for 1.2.5, 1.2.6, and 1.2.7: Three usability studies were conducted by NCSC in the early stages of development of the assessment program to evaluate how students and teachers interacted with items and gathered evidence related to item complexity and usability. The studies resulted in adjustments to ensure the assessment met all usability standards required to support the validity of the assessment program. This information is outlined in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual*.
Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.2.6 and 1.2.8: During the item development process, the items followed a rigorous development cycle, including reviews by MSAA State Representatives and by

Item Content and Bias and Sensitivity panelists. See Chapter 3 for a detailed description of item review process.

Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, and 1.2.7: Cognitive labs (also referred to by NCSC as Student Interaction Studies) were conducted by NCSC in the early stages of development of the assessment program to acquire detailed information about the cognitive processes used by students in responding to assessment tasks. The studies resulted in adjustments in the assessment program to ensure the construct validity of student response data. This information is outlined in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual*.

Evidence for 1.2.8: In differential item functioning (DIF) analyses, we examine subgroup differences in performance when sample sizes permit. Actions are taken to ensure that differences in performance are due to construct-relevant, rather than irrelevant, factors. A detailed description of the DIF analysis procedures is given in Chapter 8 along with a summary of the results. Detailed results are presented in Appendix J.

Summary of evidence for 1.2.1: Moderate to Substantial Evidence; if the standard setting included a process where subject matter experts evaluated the KSA demands of the items relative to the KSAs in the PLDs would provide additional evidence

Summary of evidence for 1.2.2: Moderate to Substantial Evidence; results of a teacher survey on their experience in regard to accessibility during test administration

Summary of evidence for 1.2.3: Moderate to Substantial Evidence; results of a teacher survey of their experience in regard to accommodations during test administration would provide additional evidence

Summary of evidence for 1.2.4: Moderate to Substantial Evidence; a description of the standard setting process where subject matter experts evaluated the KSA demands of the scoring rubrics and criteria relative to the KSAs in the PLDs would provide additional evidence

Summary of evidence for 1.2.5: Moderate to Substantial Evidence; a follow-up study evaluating whether construct-irrelevant variance of more recent items may be warranted

Summary of evidence for 1.2.6: Moderate to Substantial Evidence; results of a teacher survey of their experience in regard to any issues having to do with item rendering during test administration would provide additional evidence

Summary of evidence for 1.2.7: Moderate to Substantial Evidence; results of a teacher survey of their experience in regard to any issues having to do with the platform during test administration would provide additional evidence

Summary of evidence for 1.2.8: Moderate to Substantial Evidence; results from the NCSC Student Interaction studies may contain evidence of bias or sensitivity issues reported during that study

Assumption 1.3. Test administrations in MSAA states in 2021 followed prescribed, standardized procedural requirements.

Element 1.3.1. Test Administrators and School and District Coordinators understood and performed their roles appropriately.

Evidence: Test Administrators participated in mandatory test administration training. Chapter 5, Training and Administration, provides detailed evidence in regard to ensuring the Test Administrators and Test Coordinators properly understood and performed their roles.
Six online training modules address the specific responsibilities of the Test Administrators and provide information from the three documents they were required to use: Test Administrator Manual (TAM), the Directions for Test Administration (DTA), and the MSAA Online Assessment System User Guide for Test Administrators. After completing the training modules, Test Administrators were required to successfully complete a final quiz with a score of 80% or better.
Required training for Test Coordinators. Six online training modules address the responsibilities of the Test Coordinators. Test Coordinators are also provided the following supporting documents: TAM, DTAs, the MSAA Online Assessment System User Guide for Test Administrators, and the MSAA Online Assessment System User Guide for Test Coordinators. In addition, each Test Administrator:

- Receives four best-practice videos.
- Receives a technical support chart that provides examples of when and who to contact to obtain answers in regard to MSAA assessment or administration.
- Completes a survey. Results are evidence that address this element.

All the above evidence is described in detail in Chapter 5.

Observers were sent into the field to observe test administration and complete an observation checklist. The checklists and any accompanying notes provide evidence as to whether the training was effectively followed by the Test Administrators and Test Coordinators.

The Arizona Department of Education summarized results from its spring 2021 MSAA administration observations. Their observations included the following:

- Of 61 observations, 93.4% administered the MSAA following the instructions in the Directions for Test Administration (DTA).
- Of 45 observations, 75.6% reported high implementation of DTA requirements, 20% reported medium implementation, and 4.4% reported low implementation fidelity.
- Of 54 responses, 96.3% observed secure storage of secure test materials.

Summary of evidence: Moderate to Substantial. Complete Evidence would require positive reports on observations of test administrations in all states. Observations and reports should be conducted annually in order to ensure implementation fidelity and maintain Complete Evidence status.

Element 1.3.2. Test security concerns were limited.

Chapter 5, Section 5.6.11, *Test Security and Test Irregularities*, provides detailed evidence indicating that test security policies and practices resulted in limited test security concerns.

Evidence: Evidence for 1.3.2 includes the following:

- Irregularity reports, which Test Administrators and District Test Coordinators file if disruptions to orderly test administrations occur or if they observe suspicious activity related to test content security or student test data integrity, indicate no significant problems. Specifically:
  - **ELA**: 316 reports were filed from all administrations in the state of incidents which could represent disruptions to orderly administrations of MSAA in 2021. This number represents 1.88% of the 16,792 students who took the ELA test and received a score report. This total is calculated across all tested students in the state in grades 3-8 and high school.
  - **Mathematics**: 293 reports were filed from all administrations in the state of incidents which could represent disruptions to orderly administrations of MSAA in 2021.. This number

represents 1.42% of the 16,792 students who took the mathematics test and received a score report. This total is calculated across all tested students in the state in grades 3-8 and high school.

- No patterns of responses which may indicate the need to include State investigation for test irregularities exist. For instance, if reference to information unrelated to the task appeared consistently within several student responses, scoring would escalate the responses for further investigation – particularly if the responses all originated from the same state, district, or school. There were no occurrences noted for this administration.

Summary of evidence: Limited Evidence. Cognia and the MSAA Psychometrics Subcommittee are requesting state test administration observation reports that are relevant to this element.

Assumption 1.4. Test scores on the 2021 MSAA provide reliable information about student performance and accurate classifications into performance levels.

Element 1.4.1. MSAA scores and categorizations into performance levels are adequately reliable for their intended purpose.

Evidence: Evidence for 1.4.1 includes the following:

- Internal consistency: Chapter 10 provides a description of reliability theory and interpretation, a review of the relevant equations, and a summary of the results. In particular, the reliability estimates can be interpreted as the correlation that would be obtained between scaled scores on two parallel forms.
- Scaled score standard errors: Chapter 9 provides a description of calculation and interpretation of the scaled scores, as well as a description of the calculation of the standard error for a scaled score. The average standard error for a reported scaled score is reported in Chapter 10. The scaled score standard error can be compared to the scaled score range and the scaled score standard deviation to provide some context for interpretation.
- Performance level classification consistency and accuracy estimates: Accuracy is an estimate of the probability that the observed classification is the true classification. Consistency is an estimate of the probability that students would receive the same classification if they tested twice on parallel forms. Chapter 11 describes the theory and equations underlying the estimation of classification accuracy and consistency, while also reporting summary statistics. Detailed results are provided in Appendix P.

Summary of evidence: Complete Evidence

Element 1.4.2. Item characteristics support intended interpretations about all students who take the MSAA.

Evidence: The psychometric characteristics most pertinent to evaluating the adequacy of individual items are the estimated item parameters. The item parameter estimates are summarized in tables in Chapter 9. For dichotomously scored items, the item parameters include the discrimination parameter and the difficulty level parameter. For polytomously scored items, namely the writing traits, the item parameter estimates include the discrimination parameter, the overall difficulty level parameter, and the step difficulty parameters for each of the possible non-zero scores. All items undergo statistical analyses at the time of field-testing, including classical, DIF, and IRT analyses. The results of these analyses are reviewed in Data Review meetings with the MSAA psychometric subcommittee. After field-testing and prior to operational administration, items from the previous operational administration are reviewed for their item information function (IIF) contributions at the performance level cuts to evaluate and rate the quality of each item. After each operational administration, dimensionality analyses are also conducted to determine how the items correlate with each other in terms of the underlying constructs of the test.

Summary of evidence: Complete Evidence

Element 1.4.3. Test characteristics for paths A, B, and C support intended interpretations about all students who take the MSAA.

Evidence: Evidence for 1.4.3 includes the following:

- Dimensionality: Dimensionality analysis was conducted on each path for each grade-level test. Section 8.2 gives a detailed description of the hypothesis testing and effect size estimation methods. Results are summarized in a table accompanied by a description of the results. Small to moderate violations of local independence were noted, and interpretations of these results were presented.
- Test Information Functions: Chapter 9 provides a detailed description of the psychometric model that was fitted to the data. In particular, it describes the test information function (TIF), the most pertinent product of the psychometric model in regard to evaluating the adequacy of the test. Appendix L shows the TIF graphs for all three paths for all the MSAA tests. By examining the value of TIF at the performance level cuts (given in the graphs), the psychometric appropriateness of each test can be evaluated.

Summary of evidence: Moderate to Substantial. The TIFs indicate that path-specific information functions are maximized at three different locations on the theta scale. Another piece of evidence that enhances this argument is the overlap of path-specific TIFs displayed in Appendix L. Still another piece of evidence is the small amount of overlap in the path-specific student proficiency distributions displayed in Tables 9-10 and 9-11. Finally, the path-specific TCC locations are ordered logically and are reasonably separated, as shown in Appendix L. Taken together, all of this evidence provides a nearly complete argument supporting this element.

Element 1.4.4. Scaling of the MSAA supports intended interpretations about all students who take the MSAA.

Evidence: Evidence for 1.4.4 includes the following:

- Differential item functioning (DIF) analyses: The scale used for reporting scores is assumed to be measuring only those constructs that are intended to be measured by each test. DIF analyses were conducted to detect items that may be measuring construct-irrelevant variance. Subgroup differences in item-level performance are examined when sample sizes permit. If an item is flagged, appropriate actions are taken to investigate whether the differences in performance are due to construct-irrelevant factors. A detailed description of the DIF analysis procedures is given in Chapter 8 along with a summary of the results. Detailed results are presented in Appendix J.
- Dimensionality: The scale used for reporting scores is a unidimensional scale. Dimensionality analysis was conducted on each Path for each grade-level test to examine the degree to which unidimensionality is evident. When the null hypothesis of unidimensionality is rejected, the dimensionality analysis quantifies the violation of unidimensionality and attempts to describe what may be causing the violation. Section 8.2 gives a detailed description of the hypothesis testing and effect size estimation methods. Results are summarized in a table accompanied by a description of the results. Small to moderate violations of local independence were noted, and interpretations of these results were presented.
- Calibration: The unidimensional scale used for reporting scores is based on an underlying unidimensional IRT model. The initial form of the IRT model is established by an initial calibration of the item response data. The calibration must be conducted accurately in order for the scaling to be appropriately implemented. Section 9.2 provides evidence that can be used to evaluate the effectiveness of the calibration. The evidence provided for the calibration procedure includes discussion of the removal of stringers and a description of how the convergence of the statistical calibration was evaluated.

- Model fit: After the initial calibration converged to a solution, the fit of the model was evaluated. Section 9.2 described how model fit was evaluated and the criteria that were used.

Summary of evidence: Complete Evidence

Element 1.4.5. Equating of MSAA test forms supports intended interpretations about MSAA students.

Evidence: Evidence to support 1.4.5 includes the following:

- Evaluation of equating items: The appropriateness of the equating is contingent upon the substantive and statistical quality of the equating items. Section 9.2 gives a detailed description of the procedures used to ensure the quality of the equating items, in terms of both content representativeness, as well as statistical stability.
- Third-party analysis: As a check on the equating procedures, a third-party vendor is contracted with to also conduct the equating analysis. The third-party results are not included in the technical report. A separate report is written up by the third party and is available upon request. The third-party results for the 2021 were essentially identical to the results reported in the technical report.

Summary of evidence: Moderate to Substantial Evidence.

Element 1.4.6. Stage 1 covers a broad enough range of item difficulty and item cognitive complexity to route students into appropriate stage 2 test levels.
Element 1.4.7. Routing into the stage 2 test level is appropriate for students.
Element 1.4.8. Stage 2 test levels are sufficiently separable and targeted toward different ranges of achievement for the MSAA students who are routed to those levels.

Evidence: Evidence for 1.4.6, 1.4.7, and 1.4.8 includes the following.

- Test construction process: The evidence most pertinent to the stages is the report *MSAA Test Construction Process for 2021* (which also reflects the process and criteria for the 2018 MSAA). This detailed report describes how item and test information is targeted for the various stages, including the determination of the routing rules. A brief description is given in Chapter 4. Refer to the full report for a more detailed description.
- Performance level distributions by test path: The test-level statistical results in the technical report are focused on the test as a whole. Thus, the statistical results are focused on Paths A, B, and C, rather than on the stages. Still, some of the path results are especially pertinent to evaluating the psychometric characteristics of the stages. In particular, Section 9.6 reports the Performance Level Distributions across the different paths. If the stages are properly constructed and the routing is properly implemented, the performance level distributions should differ across paths in reasonable ways. The results presented in Section 9.6 can be evaluated in this regard.

Summary of evidence: Complete Evidence

Assumption 1.5. Item and test scoring in 2021 were implemented accurately.

Element 1.5.1. Machine-scored items were scored accurately.

Evidence: Machine-scorable MSAA items are submitted to a key verification process. As mentioned in Chapter 6, all the operational multiple-choice items are examined prior to score reporting to ensure that the option that was designated as the key was indeed the correct response.

Summary of evidence: Complete Evidence

Element 1.5.2. Constructed-response item scoring training and monitoring procedures met industry standards.

Evidence: Scorer recruitment, training, and qualification and scoring monitoring procedures follow industry standards. Section 6.2, Open-Response Writing Prompts Scoring Processes, is predominantly devoted to describing all the procedures that are used to ensure the accuracy of the scoring for the constructed-response items, including administrator training and monitoring (6.2.1), benchmarking and identification of scoring materials (6.2.2), scorer recruitment and qualifications (6.2.3), scoring leadership (6.2.4), qualification (6.2.6), specific scoring rules to ensure accuracy (6.2.5), monitoring of quality control (6.2.8), quality reports (6.2.9), and interrater reliability (6.2.10).

Summary of evidence: Complete Evidence

Assumption 1.6. MSAA scores correlate as expected with external indicators of student proficiency (i.e., concurrent evidence).

Element 1.6.1. MSAA scores correlate as expected with other measures of student proficiency.

Evidence: Peer reviewers acknowledge the challenge of acquiring additional evidence of student achievement that can be correlated with state alternate assessment scores, which they require for state grade-level assessments. As an alternative, peer reviewers do accept correlations that are internal to an alternate assessment as evidence in support of this assumption. (D. Peasley, personal communication to S. Ferrara, October 21, 2019.) The disattenuated correlations between 2021 MSAA ELA and mathematics scale scores in grades 3-8 and 11 are, in order, .83, .85, .76., .87, .79, .77, and .81. The strong positive values of the MSAA ELA and mathematics correlations provide convergent validity evidence in the sense that they suggest that students' general academic and communicative capabilities are reflected strongly in both their ELA and mathematics performances and scores.

Summary of evidence: Limited Evidence.

11.2 Primary Intended Score Uses

11.2.1 Primary Intended Score Use 1

Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers.

Assumption 2.1. MSAA scores enable teachers and school, district, and state leaders to monitor trends in student proficiency.

Element 2.1.1. MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups.

Evidence: Evidence for the reliability and validity of the scores and the corresponding scoring processes is presented above under Assumptions 1.4 and 1.5 and in Chapters 6, Scoring, and 10, Reliability. Specifically:

- Evidence of individual score reliability in Section 10.1, IRT Marginal Reliability, is comparable to industry standards for grade-level educational achievement tests. The reliability of aggregated scores (e.g., means) usually is as high as or higher than individual score reliabilities (Brennan, 1995).
- Evidence presented in Appendix O and discussed in Section 10.2, Subgroup Reliability, indicates that reliability for some subgroups is strong. However, Section 10.2 discusses caveats in interpreting subgroup score reliability with caution because of the potential deleterious effects of small subgroup sizes on estimator standard error as well as possible severe restriction of range.
- No other aggregate score reliabilities (e.g., at the school level) exist.

Summary of evidence: Limited Evidence; possible additional evidence is discussed under Assumptions 1.4, 1.5, and 1.6

Element 2.1.2. MSAA scores and proficiency level categorizations of groups of students are adequately reliable and valid to enable monitoring of grade-level performance and student cohort performance.

Evidence: Evidence for the reliability and validity of proficiency level categorizations is presented above under Assumption 1.4. The most pertinent evidence follows.

- Performance level classification consistency and accuracy estimates: Accuracy is an estimate of the probability that the observed classification is the true classification. Consistency is an estimate of the probability that students would receive the same classification if they tested twice on parallel forms. Section 10.4 describes the theory and equations underlying the estimation of classification accuracy and consistency, while also reporting summary statistics. Detailed results are provided in Appendix P.
- Performance level distributions by testing path: Section 9.6 reports the Performance Level Distributions across the different paths. If the stages are properly constructed and the routing is properly implemented, the performance level distributions should differ across paths in reasonable ways. The results presented in Section 9.6 can be evaluated in this regard.

Summary of evidence: Complete Evidence

Element 2.1.3. The relationship between MSAA scores and external measures of student achievement and growth is as expected, compared to grade-level assessments and other measures of student achievement.

Evidence: In 2015, NCSC submitted the following evidence in support of peer review critical element 3.4, Evidence of Relations to Other Variables.

(a) <u>Alignment between knowledge, skills, and abilities in assessment to student learning expectations for instruction.</u> Chapter 2 Test Development; pp. 75-76 and Appendix 3-B, Study 2. Notes: This investigation affirmed that the targets for measurements provide information useful for tracking student progress in the CCSS and to teachers for providing instruction focused on academic expectations.

(b) Vertical coherence study. Chapter 2 Test Development; pp. 82-84 and Appendix 3-B, Study 5. Notes: This investigation addresses the extent to which assessment claims align with grade-level content and are useful for tracking progress. Results indicate measurement targets are appropriate and useful for these purposes.

In addition, the internal correlations between 2021 MSAA ELA and mathematics scores for grades 3–8 and 11 are, in order, .83, .85, .76, .87, .79, .77, and .81. These correlations indicate a moderate to strong relationship between ELA and mathematics MSAA scores, reasonably consistent with correlations observed between grade-level state assessments and external measures (e.g., local interim assessments). They suggest that MSAA scores enable teachers and school, district, and state leaders to

monitor trends in student achievement as when, for example, student achievement in both content areas progress similarly or do not progress similarly.

Internal correlations are accepted as evidence for critical element 3.4, specifically for alternate assessments, because of the difficulties in collecting additional, external assessment evidence on students with significant cognitive disabilities (D. Peasley, personal communication to S. Ferrara, October 17, 2019).

Summary of evidence: Substantial to Moderate

Assumption 2.2. MSAA results are used to design professional development for teachers.

Evidence: States provide guidance to local districts to promote and guide development of teacher professional development. For example, the Arizona Department of Education provides a document called How to Teach the State Standards to Students Who Take Alternate Assessments https://cms.azed.gov/home/GetDocumentFile?id=5866dbe1aadebe085c4de5b4

Summary of evidence: Limited Evidence; an example of additional evidence would be a survey of LEAs to begin to understand the degree to which MSAA-based professional development is implemented.

11.2.2 Primary Intended Score Use 2

The MSAA and its results are used to help teachers integrate MSAA scores and other information with their instructional planning.

Assumption 3.1. Teachers use the MSAA and its results to better integrate assessment with their instructional planning.

Element 3.1.1. Teachers find the performance level descriptors and their students' performance levels useful for planning instruction, especially students in performance levels 1 and 2.

Evidence: Annual compliance monitoring of IEPs in all states indicates that special education teachers refer to PLDs to establish present levels of performance and to inform goals. For example, the Arizona Department of Education guidance on IEP-required components requires that "The IEP includes measurable annual goals, including academic and functional goals that reflect the needs identified in the PLAAFP and current assessment data" (p. D40; see https://cms.azed.gov/home/GetDocumentFile?id=5b2a897d1dcb250f1c55e5b3).

Summary of evidence: Limited Evidence; an example of additional evidence would be a survey of teachers to begin to understand the degree to which teachers find MSAA scores and other MSAA-based information useful for planning instruction.

Element 3.1.2. Teachers find their students' scale score information useful for planning instruction, especially students in levels 1 and 2.

Evidence: Annual compliance monitoring of IEPs in all states suggests that special education teachers refer to PLDs to establish present levels of performance and to inform goals. For example, the Arizona

Department of Education guidance on IEP required components requires that "The IEP includes measurable annual goals, including academic and functional goals that reflect the needs identified in the PLAAFP and current assessment data" (p. D40; see https://cms.azed.gov/home/GetDocumentFile?id=5b2a897d1dcb250f1c55e5b3).

Summary of evidence: Limited Evidence; an example of additional evidence could be a survey of teachers to begin to understand the degree to which teachers find MSAA scores useful for planning instruction.

Assumption 3.2. Teachers use MSAA scores and other information for instructional planning.

Element 3.2.1. Teachers use MSAA scores and other information for planning instruction.

Evidence: Annual compliance monitoring of IEPs in all states indicates that special education teachers refer to PLDs to establish present levels of performance and to inform goals. For example, the Arizona Department of Education guidance on IEP required components requires that "The IEP includes measurable annual goals, including academic and functional goals that reflect the needs identified in the PLAAFP and current assessment data" (p. D40; see https://cms.azed.gov/home/GetDocumentFile?id=5b2a897d1dcb250f1c55e5b3).

Summary of evidence: Limited Evidence. An example of additional evidence could be a survey of teachers to begin to understand the degree to which teachers use MSAA scores and other MSAA-based information for planning instruction.

11.2.3 Primary Intended Score Use 3

Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year.

Assumption 4.1. Parents find MSAA scores and other information useful for understanding what their child knows and can do.

Element 4.1.1. Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.

Evidence: MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a Parent Overview to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly, the Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf).

Summary of evidence: Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents correctly understand and interpret MSAA scores and other MSAA-based information to understand what their child knows and can do.

Element 4.1.2. Parents use MSAA scores and other information appropriately to understand what their child knows and can do and make decisions about their child's education and learning needs.

> ***Evidence:*** MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a Parent Overview to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly, the Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf).
>
> ***Summary of evidence:*** Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents use MSAA scores and other MSAA-based information to understand what their child knows and can do.

Assumption 4.2. Parents find MSAA scores and other information useful for understanding their child's progress from year to year.

Element 4.2.1. Parents understand and interpret correctly MSAA scores and other information to understand their child's progress from year to year.

> ***Evidence:*** MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a Parent Overview to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly, the Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf).
>
> ***Summary of evidence:*** Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents correctly understand and interpret MSAA scores and other MSAA-based information to understand their child's progress from year to year.

Element 4.2.2. Parents use MSAA scores and other information appropriately to understand their child's progress from year to year and make decisions about their child's education and learning needs.

> ***Evidence:*** MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a Parent Overview to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly, the Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf).

Summary of evidence: Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents use MSAA scores and other MSAA-based information to understand their child's progress from year to year.

11.3 Conclusions

The majority of the assumptions and underlying elements that support the four claims—that is, the primary intended score interpretations and three intended score uses—are supported by solid evidence. These assumptions and elements comprise the validity arguments for MSAA scores. Table 11-3 summarizes the relevance ratings for each assumption and element. The table indicates the following.

Primary Score Intended Score Interpretation

MSAA scores provide reliable and valid information about important grade-level numeracy and literacy knowledge and skills attained by students with the most significant cognitive disabilities. Of the 25 assumptions and elements that support the intended score interpretation, 11 sets of evidence are Complete and 14 sets of evidence are Moderate to Substantial.

Intended Score Use 1

Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers. Of the four assumptions and elements that support intended score use 1, one set of evidence is Missing, two sets are Limited, none are Moderate to Substantial, and one is Complete.

Intended Score Use 2

Teachers use the MSAA and its results to better integrate assessment with their instructional planning. The evidence for all three assumptions and elements that the support of intended score use 2 is Limited.

Intended Score Use 3

Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year. The evidence for all four assumptions and elements that support the intended score use 3 is Limited.

Table 11.3 Status of Evidence for All Four SIUs, Assumptions, and Elements

Element	Relevance of the Evidence to the Element			
	No Evidence Exists Currently	Limited	Moderate to Substantial	Complete
Primary Intended Score Interpretation				
MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.				
1.1.1 MSAA content is aligned to the CCCs and grade-level standards.				X
1.1.2 MSAA items are aligned to the CCCs.				X
1.1.3 States have confirmed alignment of the MSAA to state content standards.				X
1.1.4 MSAA items are aligned to the PLDs.			X	
1.2.1. Items require application of the KSAs of the targeted construct.			X	
1.2.2. Items are accessible to all students.			X	
1.2.3. Appropriate accommodations are provided to meet student needs.			X	
1.2.4. Scoring rubrics focus on construct-relevant aspects of student responses.			X	
1.2.5. Scaffolding is not a source of construct-irrelevant variance.			X	
1.2.6. Item rendering does not interfere with student access to test content.			X	
1.2.7. Platform does not interfere with student interaction with test content.			X	
1.2.8. Items are free of bias and sensitive issues.			X	
1.3.1. Test Administrators and School and District Coordinators understood and performed their roles properly.			X	
1.3.2. Test security concerns were limited.			X	
1.4.1. MSAA scores and categorizations into performance levels are adequately reliable for their intended purpose.				X
1.4.2. Item characteristics support intended interpretations about all students who take the MSAA.				X
1.4.3. Test characteristics, for Paths A, B, and C support intended interpretations about all students who take the MSAA.			X	
1.4.4. Scaling of the MSAA supports intended interpretations about all students who take the MSAA.				X
1.4.5. Equating of MSAA test forms supports intended interpretations about MSAA students.			X	
1.4.6. State 1 covers a broad enough range of item difficulty and item cognitive complexity to route students into appropriate stage 2 tests.				X
1.4.7. Routing into the stage 2 test level is appropriate for students.				X
1.4.8. Stage 2 test levels are sufficiently separable and targeted toward different ranges of achievement for the MSAA students who are routed to those levels.				X

continued

Element	Relevance of the Evidence to the Element			
	No Evidence Exists Currently	Limited	Moderate to Substantial	Complete
1.5.1. Machine-scored items were scored accurately.				X
1.5.2. Constructed-response item scoring training and monitoring procedures met industry standards.				X
1.6.1. MSAA scores correlate as expected with other measures of student proficiency.		X		
Primary Intended Score Use 1 Schools and districts use the MSAA and its results to (a) monitor trends in school performance, and (b) design professional development for teachers.				
2.1.1. MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups.		X		
2.1.2. MSAA scores and proficiency level categorizations of groups of students are adequately reliable and valid to enable monitoring of grade-level performance and student cohort performance.				X
2.1.3. The relationship between MSAA scores and external measures of student achievement and growth is as expected, compared to grade-level assessments and other alternate assessments.			X	
2.2 (Assumption) MSAA results are used to design professional development for teachers.		X		
Primary Intended Score Use 2 The MSAA and its results are used to help teachers integrate MSAA scores and other information with their instructional planning.				
3.1.1. Teachers find the performance level descriptors and their students' performance levels useful for planning instruction, especially students in performance levels 1 and 2.		X		
3.1.2. Teachers find their students' scale score information useful for planning instruction, especially students in levels 1 and 2.		X		
3.2.1. Teachers use MSAA scores and other information for planning instruction.		X		
Primary Intended Score Use 3 Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.				
4.1.1. Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.		X		
4.1.2. Parents use MSAA scores and other information appropriately to understand what their child knows and can do and make decisions about their child's education and learning needs.		X		
4.2.1. Parents understand and interpret correctly MSAA scores and other information to understand their child's progress from year to year.		X		
4.2.2. Parents use MSAA scores and other information appropriately to understand their child's progress from year to year and make decisions about their child's education and learning needs.		X		

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[3] See chapter 7: http://ncscpartners.org/Media/Default/PDFs/Resources/NCSC15_NCSC_TechnicalManualNarrative.pdf

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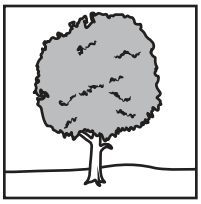
Appendices

APPENDIX A
TEACHER GUIDE—SAMPLE ITEMS

Sample Items 1 & 2		
Alignment	**Core Content Connector (CCC): 3 RI k5** Determine the main idea of a text; recount the key details and explain how they support the main idea.	
Learning Targets	**Instructional Strategies**	**Scaffolds and Supports**
I can determine the topic of an informational text presented in diverse media. I can identify a supporting detail of the topic in a text. I can identify a supporting detail in diverse media that supports the topic in the medium.	**Graphic organizer** • List the topic of a text or multi-media and note events and/or details that support the topic. • Use a System of Least Prompts when selecting a supporting detail. **Topic board/display** • Identify pictures that represent the topic(s) of a given text. • Include illustrations or sentences from the text; include events and details that support the topic in a topic board/display or graphic organizer. **Interactive story reading** • Choose and pre-read a text prior to instruction. • Read the text aloud to students, stopping at predetermined points. • At each stopping point, ask student to share their thoughts and respond to text. **Group think** Tell the students what the topic is prior to reading a text or watching multimedia. After reading the text, ask the students to identify sentences that tell you the topic and supporting details about the topic. **Think aloud** Model the thought processes that occur while reading the text. This may include asking questions while reading the text, identifying important details, identifying the topic, and identifying the main idea.	• Pictures, objects, or tactile representations to illustrate the topic, events, or details • Sentence strips that reflect supporting details about the topic • Videos or story boards/ cards of the story for visual supports. • Technology (e.g., interactive whiteboard, informational texts read by the computer that highlights text)

Item 1*

What is the main idea in this passage?



A. The Sun helps trees to grow big and tall.

B. People can guess a riddle and win a prize.

C. The Lantern Festival is important to families.

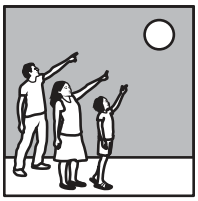
Would you like to read this question again, yes or no?

*Please note: passage may be accessed in the DTA or computer-based testing platform.

Item 2*

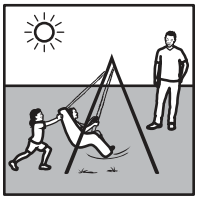
The main idea in this passage is the Lantern Festival is important to families.

Which sentence helps the reader understand the main idea?



A. Families go outside to look at the full moon.

B. Many places have their own holidays.



C. Families spend time together outside on sunny days.

Would you like to read this question again, yes or no?

*Please note: passage may be accessed in the DTA or computer-based testing platform.

APPENDIX B
ACCOMMODATION FREQUENCIES

Table B-1. Accommodation Frequencies—ELA

Accommodations	Grades						
	3	4	5	6	7	8	11
LCI_Vision[1]	69	84	94	102	88	98	95
SAR_Assistive_Response_After[2]	147	170	180	209	217	246	144
SAR_No_Accomm_Needed_After[3]	386	455	419	526	599	597	600
SAR_Paper_Version_After[4]	131	111	112	114	93	106	43
SAR_Scribe_After[5]	427	418	458	433	403	426	269
SAR_Sign_Interpretation_After[6]	27	26	22	23	12	17	10

1: LCI_Vision - Input could occur through alternate keyboards, eye-gaze, switch devices, speech-to-text, and other similar input devices. Students are also expected to access text using AT devices (e.g., screen readers), but refreshable Braille display is not supported for presentation of text-based content for the first operational year.
2: SAR_Assistive_Response_After - Assistive Technology (AT) for viewing, responding, or interacting with test items.
3: SAR_No_Accomm_Needed_After - No accommodations needed.
4: SAR_Paper_Version_After - Paper version of item/s.
5: SAR_Scribe_After - A scribe will enter in the MSAA Online Assessment System the student-indicated answer to a selected-response item. For the constructed-response writing item, the scribe will record the student's response to the writing prompt on the response templates in the MSAA Online Assessment System.
6: SAR_Sign_Interpretation_After - TA may communicate passages, items and response options using sign language to student.

Table B-2. Accommodation Frequencies—Mathematics

Accommodations	Grades						
	3	4	5	6	7	8	11
LCI_Vision[1]	69	85	93	100	88	96	96
SAR_Assistive_Response_After[2]	147	170	178	212	217	246	146
SAR_No_Accomm_Needed_After[3]	385	454	418	523	599	594	602
SAR_Paper_Version_After[4]	132	113	112	115	91	106	43
SAR_Scribe_After[5]	426	419	457	434	403	427	269
SAR_Sign_Interpretation_After[6]	27	26	23	23	12	17	10

1: LCI_Vision - Input could occur through alternate keyboards, eye-gaze, switch devices, speech-to-text, and other similar input devices. Students are also expected to access text using AT devices (e.g., screen readers), but refreshable Braille display is not supported for presentation of text-based content for the first operational year.
2: SAR_Assistive_Response_After - Assistive Technology (AT) for viewing, responding, or interacting with test items.
3: SAR_No_Accomm_Needed_After - No accommodations needed.
4: SAR_Paper_Version_After - Paper version of item/s.
5: SAR_Scribe_After - A scribe will enter in the MSAA Online Assessment System the student-indicated answer to a selected-response item. For the constructed-response writing item, the scribe will record the student's response to the writing prompt on the response templates in the MSAA Online Assessment System.
6: SAR_Sign_Interpretation_After - TA may communicate passages, items and response options using sign language to student.

Table B-3. Accommodation Summary

Content Area	Grade	Number of Students Tested	
		With Accommodations	Without Accommodations
ELA	3	933	831
	4	1,024	849
	5	1,048	946
	6	1,168	885
	7	1,173	935
	8	1,237	966
	11	1,033	934
Mathematics	3	932	820
	4	1,024	842
	5	1,045	942
	6	1,166	879
	7	1,171	930
	8	1,233	972
	11	1,038	931

APPENDIX C
PARTICIPATION RATES

Table C.1 Summary of Participation by Demographic Category—ELA

Description	# Complete	Tested # No Observable Mode of Communication[1]	Total Tested	Total Percent
All Students	13,461	501	13,962	100.00
Female	4,478	154	4,632	33.18
Male	8,195	314	8,509	60.94
Gender Undefined	788	33	821	5.88
Hispanic or Latino	3,134	115	3,249	23.27
American Indian or Alaska Native	331	13	344	2.46
Asian	281	7	288	2.06
Black or African American	2,251	76	2,327	16.67
Native Hawaiian or Pacific Islander	111	0	111	0.80
White (non-Hispanic)	5,822	229	6,051	43.34
Two or More Races (non-Hispanic)	481	15	496	3.55
No Primary race/Ethnicity Undefined	1,050	46	1,096	7.85
Currently receiving LEP services	342	8	350	2.51
Not receiving LEP services	7,064	295	7,359	52.71
LEP: All Other Students	6,055	198	6,253	44.79
Economically Disadvantaged Students	2,590	94	2,684	19.22
Non-economically Disadvantaged Students	4,793	209	5,002	35.83
SES: All Other Students	6,078	198	6,276	44.95
Migrant	4	1	5	0.04
Non- migrant	7,354	302	7,656	54.83
Undefined Migrant Status	6,103	198	6,301	45.13
Augmentative Communication	2,041	134	2,175	15.58
No Augmentative Communication	11,331	355	11,686	83.70
Undefined Augmentative Communications	89	12	101	0.72
Hearing Loss	311	63	374	2.68
Within Normal Limits	13,107	433	13,540	96.98
Undefined Hearing Loss	43	5	48	0.34
Visual Impairment	481	149	630	4.51
Within Normal Limits	12,895	346	13,241	94.84
Undefined Visual Impairment	85	6	91	0.65
Sensory Stimuli Response	854	384	1,238	8.87
Follow Directions	12,600	113	12,713	91.05
Undefined Receptive Language	7	4	11	0.08
Special School	762	92	854	6.12
Regular School Self-contained	9,128	388	9,516	68.16
Regular School Resource Room	2,222	13	2,235	16.01
Regular School Primarily Self-contained	958	1	959	6.87
Regular School General Education	384	3	387	2.77
Undefined Classroom Setting	7	4	11	0.08
Student Communicates Primarily Through Cries	716	363	1,079	7.73
Uses Intentional Communication	2,687	98	2,785	19.95
Uses Symbolic Language	10,051	35	10,086	72.24
Undefined Expressive Communication	7	5	12	0.09

[1] *No Observable Mode of Communication indicates that the students' test was closed because they had no visible means of communication.*

Table C-2. Summary of Participation by Demographic Category—Mathematics

Description	Tested # Complete	Tested # No Observable Mode of Communication[1]	Total Tested	Total Percent
All Students	13,424	501	13,925	100.00
Female	4,459	154	4,613	33.13
Male	8,182	314	8,496	61.01
Gender Undefined	783	33	816	5.86
Hispanic or Latino	3,128	115	3,243	23.29
American Indian or Alaska Native	334	13	347	2.49
Asian	282	7	289	2.08
Black or African American	2,240	76	2,316	16.63
Native Hawaiian or Pacific Islander	110	0	110	0.79
White (non-Hispanic)	5,810	229	6,039	43.37
Two or More Races (non-Hispanic)	477	15	492	3.53
No Primary race/Ethnicity Undefined	1,043	46	1,089	7.82
Currently receiving LEP services	342	8	350	2.51
Not receiving LEP services	7,036	295	7,331	52.65
LEP: All Other Students	6,046	198	6,244	44.84
Economically Disadvantaged Students	2,585	94	2,679	19.24
Non-economically Disadvantaged Students	4,770	209	4,979	35.76
SES: All Other Students	6,069	198	6,267	45.01
Migrant	4	1	5	0.04
Non- migrant	7,326	302	7,628	54.78
Undefined Migrant Status	6,094	198	6,292	45.18
Augmentative Communication	2,032	134	2,166	15.55
No Augmentative Communication	11,303	355	11,658	83.72
Undefined Augmentative Communications	89	12	101	0.73
Hearing Loss	309	63	372	2.67
Within Normal Limits	13,072	433	13,505	96.98
Undefined Hearing Loss	43	5	48	0.34
Visual Impairment	478	149	627	4.50
Within Normal Limits	12,864	346	13,210	94.87
Undefined Visual Impairment	82	6	88	0.63
Sensory Stimuli Response	858	384	1,242	8.92
Follow Directions	12,559	113	12,672	91.00
Undefined Receptive Language	7	4	11	0.08
Special School	762	92	854	6.13
Regular School Self-contained	9,103	388	9,491	68.16
Regular School Resource Room	2,215	13	2,228	16.00
Regular School Primarily Self-contained	954	1	955	6.86
Regular School General Education	383	3	386	2.77
Undefined Classroom Setting	7	4	11	0.08
Student Communicates Primarily Through Cries	719	363	1,082	7.77
Uses Intentional Communication	2,669	98	2,767	19.87
Uses Symbolic Language	10,029	35	10,064	72.27
Undefined Expressive Communication	7	5	12	0.09

[1] *No Observable Mode of Communication indicates that the students' test was closed because they had no visible means of communication.*

Table C-3. Participation Rates by Subgroup

Description	Total Tested	Invalidated	Did Not Test
ELA	13,962	268	2,562
Mathematics	13,925	272	2,595

APPENDIX D
TEST DESIGN BLUEPRINTS

20-21 MSAA ELA Operational Blueprint

Notes:

- Measured Progress psychometricians have analyzed passage sets as a whole to show how well they differentiate between stages 2A, 2B, and 2C using IRT stats. For additional details about this process, please reference the Test Construction Process documentation here: T:\Contracts\MSAA\6027 - 2018\Program Management\Test Construction\TC process document
    - Goal is to move toward:
        - 2A: difficulty range-low
        - 2B: difficulty range-medium
        - 2C: difficulty range-high
- Linking passage sets may occur in Session 2A, B & C, but they will vary based on how well they differentiate based on IRT stats.
- Writing standalones are included in Session One.
- Writing Prompt-SRs (Level 1) are administered in all Session 2 versions.
- Writing Prompt-OR WP Level 2 is administered in Session 2A. Writing Prompt -OR WP Level 3 is administered in Sessions 2B and 2C.
- Reading Foundational items are added to Session 1, Form 1 for grades 3 and 4 in Field Test. Grades 3-8 & 11 will have FT writing items, L1 Writing Prompts or a shortened passage set.

Item Types:

SR- Selected Response: an independent item that is not connected to any other items.

- Two-Part SR: a two-part Selected Response item in which answering one item is not dependent on answering the previous item. Students can reference the previous item without impacting their score.
- MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.
- The CR writing prompts are scored based on 9 possible points, but score point 1 and 2 are collapsed for reporting purposes for a total of 6 possible points.

Blueprint Guidelines ELA

When the item pool allows, these are the blueprint guidelines that will inform test construction.

ELA Content Category	Gr 3	Gr 4	Gr 5	Gr 6	Gr 7	Gr 8	Gr 11
Reading Literary	24-32%	24-32%	25-33%	21-30%	17-26%	17-26%	17-26%
Reading Informational	18-26%	18-26%	25-33%	26-34%	32-36%	32-36%	32-36%
Reading Vocabulary and Foundational (G3 and G4)	12-16%	12-16%	6-10%	9-11%	6-9%	6-9%	6-9%
Writing	36-38%	32-38%	31-40%	36-40%	36-40%	36-40%	36-40%

Grade 3 Targets by Standard
MSAA ELA Operational Test Blueprint Grade 3

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range	2021 Point Range
Reading: Literary	24-32%	3.RL.h1** Answer questions related to the relationship between characters, setting, events, or conflicts (e.g., characters and events, characters and conflicts, setting and conflicts) NOT 2-PART	SR, MSR one or two-part item	12-16	12-16
		3.RL.i2 Answer literal questions and refer to text to support your answer	SR		
		3.RL.k2** Determine the central message, lesson, moral, and key details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally	MSR, MSR two-part		
Reading: Informational	18-26%	3.RI.h1** Identify the purpose of a variety of text features NOT 2-PART	SR	9-13	9-13
		3.RI.h4 Use illustrations (e.g., maps, photographs, diagrams, timelines) in informational texts to answer questions	SR		
		3.RI.i2 Determine the main idea of text read or read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally	SR		
		3.RI.k5** Determine the main idea of a text; recount the key details and explain how they support the main idea	SR,MSR two-part		
Reading:Vocabulary and Foundational	12-16%	3.RWL.i2 Use sentence context as a clue to the meaning of a new word, phrase, or multiple meaning word	SR	6-8	6-8
		3.RWL.i1 Use context to confirm or self-correct word recognition.	SR		
Writing	36-38%	3.WI.l4 Sort evidence (e.g., graphic organizer) collected from print and/or digital sources into provided categories	SR	3-4	3-4
		3.WI.p1 Include text features (e.g., numbers, labels, diagrams, charts, graphics) to enhance clarity and meaning	SR		
		3.WL.o1 With guidance and support from adults, produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g., to entertain), or audience	MSR, CR	7	15
Total	**100%**			**42 Total Items**	**50 Total Points**

** Percentages are approximate with the total equaling 100%*
*** CCCs require a multipart item to assess.*
****MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.*

Actual percentages by point value, not item count.

ELA Content Category	Gr 3
Reading Literary	24-32%
Reading Informational	18-26%
Reading Vocabulary and Foundational (G3 and G4)	12-16%
Writing	36-38%

Grade 4 Targets by Standard
MSAA ELA Operational Test Blueprint Grade 4

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range	2021 Point Range
Reading: Literary	24-32%	4.RL.i1 Refer to details and examples in a text when explaining what the text says explicitly	SR	12-16	12-16
		4.RL.k2** Determine the theme of a story, drama, or poem; refer to text to support answer	SR, MSR one or two-part item		
		4.RL.l1** Describe character traits (e.g., actions, deeds, dialogue, description, motivation, interactions); use details from text to support description	SR, MSR two-part		
Reading: Informational	18-26%	4.RI.h4 Use information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) to answer questions	SR	9-13	9-13
		4.RI.i3 Determine the main idea of an informational text	SR		
		4.RI.l1** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears	SR, two-part MSR		
Reading: Vocabulary Reading Foundational	12-16%	4.RWL.i2 Use context as a clue to determine the meaning of unknown words, multiple meaning words, or words showing shades of meaning	SR	6-8	6-8
		4.RWL.j1 Use general academic and domain specific words and phrases accurately	SR		
		4.RWL.i1 Use context to confirm or self-correct word recognition.	SR		
Writing	32-38%	4.WI.q1 Provide a concluding statement or section to support the information presented	SR	3-4	3-4
		4.WI.p1 Include formatting (e.g., headings, bulleted information), illustrations, and multimedia when useful to promote understanding	SR		
		4.WL.o1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g. to entertain), or audience	MSR, CR	5-7	13-15
Total	100%			42 Total Items	50 Total Points

** Percentages are approximate with the total equaling 100%*
*** CCCs require a multipart item to assess.*
****MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.*

ELA Content Category	Gr 4
Reading Literary	24-32%
Reading Informational	18-26%
Reading Vocabulary and Foundational (G3 and G4)	12-16%
Writing	32-38%

Grade 5 Targets by Standard
MSAA ELA Operational Test Blueprint Grade 5

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range	2021 Point Range
Reading: Literary	25-33%	5.RL.b1 Refer to details and examples in a text when explaining what the text says explicitly	SR	12-16	12-16
		5.RL.c2** Summarize a text from beginning to end in a few sentences	SR, MSR single or multi-part		
		5.RL.d1 Compare characters, settings, events within a story; provide or identify specific details in the text to support the comparison	SR		
Reading: Informational	25-33%	5.RI.d5** Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts 2 Part	SR	12-16	12-16
		5.RI.c4** Determine the main idea, and identify key details to support the main idea 2 PART	SR, MSR two-part		
		5.RI.e2 Explain how an author uses reasons and evidence to support particular points in a text	SR		
Reading: Vocabulary	6-10%	5.RWL.a2 Use context to determine the meaning of unknown or multiple meaning words or phrases	SR	3-5	3-5
Writing	31-40%	5.WI.b3 Organize ideas, concepts, and information (using definition, classification, comparison/contrast, and cause/effect)	SR	2-4	2-4
		5.WI.d1 Support a topic with relevant facts, definitions, concrete details, quotations, or other information and examples	SR		
		5.WL.h1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g. to entertain), or audience	MSR, CR	5-7	13-15
Total	**100%**			**40 Total Items**	**48 Total Points**

** Percentages are approximate with the total equaling 100%*
*** CCCs require a multipart item to assess.*
****MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.*

ELA Content Category	Gr 5
Reading Literary	25-33%
Reading Informational	25-33%
Reading Vocabulary	6-10%
Writing	31-40%

Grade 6 Targets by Standard
MSAA ELA Operational Test Blueprint Grade 6

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range	2021 Point Range
Reading: Literary	21-30%	6.RL.b2 Refer to details and examples in a text when explaining what the text says explicitly	SR	10-14	10-14
		6.RL.b3 Use specific details from the text (words, interactions, thoughts, motivations) to support inferences or conclusions about characters including how they change during the course of the story	SR		
		6.RL.c3** Summarize a text from beginning to end in a few sentences without including personal opinions 3-PART	SR, SR two-part, MSR		
Reading: Informational	26-34%	6.RI.b4 Summarize information gained from a variety of sources including media or texts	SR	12-16	12-16
		6.RI.c2** Provide a summary of the text distinct from personal opinions or judgments 2 PART	SR, MSR single or multi-part		
		6.RI.g4 Determine how key individuals, events, or ideas are elaborated or expanded on in a text	SR		
		6.RI.g6 Evaluate the claim or argument; determine if it is supported by evidence	SR		
Reading: Vocabulary	9-11%	6.RWL.a1 Use context to determine the meaning of unknown or multiple meaning words or phrases	SR	4-5	4-5
		6.RWL.c1 Use general academic and domain specific words and phrases accurately	SR		
Writing	36-40%	6.WL.c1 Organize ideas and event so that they unfold naturally	SR	3-4	3-4
		6.WL.c3 Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another	SR		
		6.WI.h2 Produce a clear, coherent, permanent product that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience (e.g., reader)	MSR, CR	6-7	14-15
Total	**100%**			**39 Total Items**	**47 Total Points**

** Percentages are approximate with the total equaling 100%*
*** CCCs require a multipart item to assess.*
****MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.*

ELA Content Category	GR 6
Reading Literary	21-30%
Reading Informational	26-34%
Reading Vocabulary	9-11%
Writing	36-40%

Grade 7 Targets by Standard
MSAA ELA Operational Test Blueprint Grade 7

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range	2021 Point Range
Reading: Literary	17-26%	7.RL.i2** Use two or more pieces of textual evidence to support inferences, conclusions, or summaries of text	SR, SR two-part	8-12	8-12
		7.RL.j1 Analyze the development of the theme or central idea over the course of the text	SR		
Reading: Informational	32-36%	7.RI.j1** Use two or more pieces of evidence to support inferences, conclusions, or summaries of text	SR, SR two-part	15-17	15-17
		7.RI.j5 Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events)	SR		
		7.RI.l1** Compare/contrast how two or more authors write about the same topic	SR, SR two-part		
		7.RI.k4 Evaluate the claim or argument to determine if they are supported by evidence	SR		
Reading: Vocabulary	6-9%	7.RWL.g1 Use context as a clue to determine the meaning of a grade appropriate word or phrase	SR	3-4	3-4
Writing	36-40%	7.WL.o1 Select or provide a concluding statement or paragraph that follows from the narrated experiences or events.	SR	2-4	2-4
		7.WL.l1 Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events	SR		
		7.WI.o1 Produce a clear, coherent, permanent product (e.g. select/generate responses to form paragraph/essay) that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience(reader)	MSR, CR	7	15
Total	**100%**			**39 Total Items**	**47 Total Points**

** Percentages are approximate with the total equaling 100%*
*** CCCs require a multipart item to assess.*
****MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.*

ELA Content Category	GR 7
Reading Literary	17-26%
Reading Informational	32-36%
Reading Vocabulary	6-9%
Writing	36-40%

Grade 8 Targets by Standard
MSAA ELA Operational Test Blueprint Grade 8

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range	2021 Point Range
Reading: Literary	17-26%	8.RL.i2** Use two or more pieces of evidence to support inferences, conclusions, or summaries of text	SR, SR two-part	8-12	8-12
		8.RL.j2 Analyze the development of the theme or central idea over the course of the text including its relationship to the characters, setting, and plot	SR		
Reading: Informational	32-36%	8.RI.j1** Use two or more pieces of evidence to support inferences, conclusions, or summaries of text 2 PART	SR, SR two-part	15-17	15-17
		8.RI.l1 Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation	SR		
		8.RI.k2 Determine how the information in each section contribute to the whole or to the development of ideas	SR		
		8.RI.k4 Identify an argument or claim that the author makes	SR		
Reading: Vocabulary	6-9%	8.RWL.g1 Use context as a clue to the meaning of a grade-appropriate word or phrase	SR	3-4	3-4
		8.RWL.i1 Use general academic and domain specific words and phrases accurately	SR		
Writing	36-40%	8.WP.k2 Create an organizational structure in which ideas are logically grouped to support the writer's claim	SR	2-4	2-4
		8.WP.j1 Gather relevant information (e.g., highlight in text, quote or paraphrase from text or discussion) from print and/or digital sources	SR		
		8.WI.o1 Produce a clear, coherent, permanent product (e.g. select/generate responses to form paragraph/essay) that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience (e.g., reader)	MSR, CR	7	15
Total	**100%**			**39 Total Items**	**47 Total Points**

** Percentages are approximate with the total equaling 100%*
*** CCCs require a multipart item to assess.*
****MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.*

ELA Content Category	Gr 8
Reading Literary	17-26%
Reading Informational	32-36%
Reading Vocabulary	6-9%
Writing	36-40%

Grade 11 Targets by Standard
MSAA ELA Operational Test Blueprint Grade 11

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range	2021 Point Range
Reading: Literary	17-26%	1112.RL.b1** Use two or more pieces of evidence to support inferences, conclusions, or summaries of the plot, purpose, or theme within a text	SR, SR two-part	8-12	8-12
		1112.RL.d1 Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning	SR		
Reading: Informational	32-36%	1112.RI.b1** Use two or more pieces of evidence to support inferences, conclusions, or summaries or text	SR, SR two-part	15-17	15-17
		1112.RI.b5** Determine how key details support the development of the central idea of a text	SR, SR two-part, MSR		
		1112.RI.d1 Determine the author's point of view or purpose in a text	SR		
		1112.RI.e1 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem	SR		
Reading: Vocabulary	6-9%	1112.RWL.b1 Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position in a sentence) as a clue to the meaning of a word or phrase	SR	3-4	3-4
		1112.RWL.c3 Develop and explain ideas for why authors made specific word choices within text	SR		
Writing	36-40%	1112.WI.b2 Create an organizational structure for writing that groups information logically (e.g., cause/effect, compare/contrast, descriptions and examples) to support paragraph focus	SR	2-4	2-4
		1112.WI.b4 Select the facts, extended definitions, concrete details, quotations, or other information and examples that are most relevant to the focus and appropriate for the audience	SR		
		1112.WP.f1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (to persuade), and audience	MSR, CR	7	15
Total	**100%**			**39 Total Items**	**47 Total Points**

** Percentages are approximate with the total equaling 100%*
*** CCCs require a multipart item to assess.*
****MSR- Multi-Select Response: for MSAA, this item type is a two-part Selected Response with a dependency between items, similar to an Evidence-Based Selected Response (EBSR). Students are not allowed to reference the previous item because the answer to the first item in the pair is included in the directions/stem of the second item.*

ELA Content Category	GR 11
Reading Literary	17-26%
Reading Informational	32-36%
Reading Vocabulary	6-9%
Writing	36-40%

20-21 MSAA Mathematics Operational Blueprint

- * Standards with operational CR items in 2019
- ** Standards with operational CR items beginning in 2020 and 2021

Grade 3 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range
Operations and Algebraic Thinking	28-32%	3.NO.2d3 Solve multiplication problems with neither number greater than 5	SR	10 -11
		3.NO.2e1 Solve or solve and check one- or two-step word problems requiring addition, subtraction, or multiplication with answers up to 100		
		3.PRF.2d1 Identify multiplication patterns in a real word setting		
Number and Operations Base Ten	17-23%	3.NO.1j3 Use place value to round to the nearest 10 or 100	SR CR	7
		3.NO.2c1** Solve multi-step addition and subtraction problems up to 100		
Number and Operations Fractions	17-23%	3.NO.1l3 Identify the fraction that matches the representation (rectangles and circles; halves, fourths, thirds, and eighths)	SR	7
		3.SE.1g1 Use =, <, or > to compare 2 fractions with the same numerator or denominator		
Measurement and Data	17-23%	3.DPS.1g1* Collect data; organize into picture or bar graph	SR CR	7
		3.ME.1d2 Measure area of rectilinear figures by counting squares		
Geometry	9-11%	3.GM.1i1 Partition rectangles into equal parts with equal area	SR	3 -4
Total	**100%**			**35**

Grade 4 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range
Operations and Algebraic Thinking	28-32%	4.NO.2d7 Determine how many objects go into each group when given the total number of objects and groups where the number in each group or number of groups is not > 10	SR	10-11
		4.PRF.1e3 Solve multiplicative comparisons with an unknown using up to 2-digit numbers with information presented in a graph or word problem (e.g., an orange hat cost $3. A purple hat cost 2 times as much. How much does the purple hat cost? [3 x 2 = p])		
		4.NO.2e2 Solve or solve and check one or two step word problems requiring addition, subtraction, or multiplication with answers up to 100		
Numberand Operations Base	9-11%	4.NO.1j5 Use place value to round to any place (i.e., ones, tens, hundreds, thousands)	SR	3-4
Number and Operations Fractions	28-32%	4.NO.1m1 Determine equivalent fractions	SR	10-11
		4.NO.1n2 Compare up to 2 given fractions that have different denominators		
		4.SE.1g2 Use =, <, or > to compare 2 fractions (fractions with a denominator or 10 or less)		
Measurem ent and Data	17-23%	4.ME.1g2 Solve word problems using perimeter and area where changes occur to the dimensions of a rectilinear figure	SR CR	7
		4.DPS.1g3* Collect data; organize in graph (e.g. picture graph, line plot, bar graph)		
Geometry	9-11%	4.GM.1h2* Classify two-dimensional shapes based on attributes (# of angles)	SR CR	3-4
Total	**100%**			**35**

Grade 5 Targets bt Standard

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range
Operations and Algebraic Thinking	9-11%	5.PRF.2b1 Generate or select a comparison between two graphs from a similar situation	SR	3-4
Number and Operations Base Ten	34-40%	5.NO.1b1 Read, write, or select a decimal to the hundredths place	SR CR	14
		5.NO.1b4 Round decimals to the next whole number		
		5.NO.2c1 Solve one-step problems using decimals		
		5.NO.2a5** Solve word problems that require multiplication or division		
Number and Operations Fractions	17-23%	5.NO.2c2 Solve word problems involving the addition, subtraction, multiplication, or division of fractions	SR	7
		5.PRF.1a1 Determine whether the product will increase or decrease based on the multiplier		
Measurement and Data	17-23%	5.ME.1b2 Convert standard measurements of length	SR	7
		5.ME.2a1 Use a calculator to solve one-step problems involving conversions of standard measurement units of area, volume, time, mass in the same system		
Geometry	9-11%	5.GM.1c3* Use order pairs to graph given points	SR CR	3-4
Total	100%			35

Grade 6 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range
Ratio and Proportions	28-32%	6.PRF.1c1 Describe the ratio relationship between two quantities for a given situation	SR	10-11
		6.ME.2a2 Solve one-step real world measurement problems involving unit rates with ratios of whole numbers when given the unit rate (3 inches of snow falls per hour, how much in 6 hours?)		
		6.NO.1f1 Find a percent of a quantity as rate per 100		
Expressions and Equations	17-23%	6.PRF.1d1 Solve real world single-step linear equations	SR	7
		6.NO.2a6 Solve problems or word problems using up to three-digit numbers and any of the four operations		
The Number System	28-32%	6.NO.2c3 Solve one-step, addition, subtraction, multiplication, or division problems with	SR CR	10-11
		6.NO.1d4** Select the appropriate meaning of a negative number in a real world situation		
		6.NO.1d2* Locate positive and negative numbers on a number line		
Statistics and Probability	9-11%	6.DPS.1d3 Select the statement that matches mean, mode, and spread of data for 1 measure of central tendency for a given data set	SR	3-4
Geometry	9-11%	6.GM.1d1 Find area of quadrilaterals	SR	3-4
Total	**100%**			**35**

Grade 7 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range
Ratio and Proportions	34-40%	7.NO.2f1** Identify the proportional relationship between two quantities (use rules or symbols to show quantitative relationships)	SR CR	14
		7.NO.2f2 Determine if two quantities are in a proportional relationship using a table of equivalent ratios or points graphed on a coordinate plane		
		7.NO.2f6 Solve word problems involving ratios		
		7.PRF.1f1 Use proportional relationships to solve multistep percent problems in real world situations		
Expressions and Equations	9-11%	7.PRF.1g2 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities	SR	3-4
The Number System	17-23%	7.NO.2i1 Solve multiplication problems with positive/negative numbers	SR	7
		7.NO.2i2 Solve division problems with positive/negative numbers		
Statistics and Probability	9-11%	7.DPS.1k1* Analyze graphs to determine or select appropriate comparative inferences about two samples or populations	SR CR	3-4
Geometry	17-23%	7.ME.2d1 Apply formula to measure area and circumference of circles	SR	7
		7.GM.1h2 Find the surface area of three-dimensional figures using nets of rectangles or triangles		
Total	100%			35

Grade 8 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range
Functions	17-23%	8.PRF.2e2** Identify the rate of change (slope) and initial value (*y*-intercept) from graphs	SR	7
		8.PRF.1f2 Describe or select the relationship between the two quantities given a line graph of a situation		
Expressions and Equations	17-23%	8.PRF.1e2 Represent proportional relationships on a line graph	SR	7
		8.PRF.1g3 Solve linear equations with 1 variable		
The Number System	9-11%	8.NO.1k3* Use approximations of irrational numbers to locate them on a number line	SR CR	3-4
Statistics and Probability	17-23%	8.DPS.1h1* Graph bivariate data using scatter plots and identify possible associations between the variables	SR CR	7
		8.DPS.1k2 Analyze displays of bivariate data to develop or select appropriate claims about those data		
Geometry	28-32%	8.ME.1e1 Describe the changes in surface area, area, and volume when the figure is changed in some way (e.g., scale drawings)	SR	10-11
		8.GM.1g1 Recognize congruent and similar figures		
		8.ME.2d2 Apply the formula to find the volume of 3-dimensional shapes (i.e., cubes, spheres, and cylinders)		
Total	100%			35

Grade 11 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2021 Item Range
Algebra And Functions	47-52%	H.PRF.2b1** Translate a real-world problem into a one-variable linear equation	SR CR	17-18
		H.PRF.2b2 Solve equations with one or two variables using equations or graphs		
		H.ME.1b2 Solve a linear equation to find a missing attribute given the area, surface area, or volume and the other attribute		
		H.PRF.1c1 Select the appropriate graphical representation of a linear model based on real world events		
		H.PRF.2c1 Make predictions based on a given model (for example, a weather model, data for athletes over years)		
Number and Quantity	17-23%	H.ME.1a2 Solve real world problems involving units of measurement	SR	7
		H.NO.1a1 Simplify expressions that include exponents		
Statistics and Probability	17-23%	H.DPS.1b1* Complete a graph given the data, using dot plots, histograms, or box plots	SR CR	7
		H.DPS.1c1 Use descriptive stats, range, median, mode, mean, outliers/gaps, to describe data set		
Geometry	9-11%	H.GM.1b1 Use definitions to demonstrate congruency and similarity in figures	SR	3-4
Total	**100%**			**35**

APPENDIX E

PANELISTS AND COMMITTEE MEMBERS

MSAA 2021 Item Content and Bias Review Meeting Final Panelists by Grade and Content Area

ELA Content Grades 3–6

Name	State
Jessica Nolan	AZ
Jodi Mercural	SD
Valerie Guerrero	GU
Kyu-Ryung Hwang	DC
Prudence Lybeck	MT
Kelsey Weismantel	SD
Cassandra Laapui	AS
Tracy Lynn Del Rosario	CNMI
Mary Ashes	SD
Elmie Manley	CNMI

Mathematics Content Grades 3–6

Name	State
Karen Anne Felise Ioka	AS
Jeff Larsen	SD
Lisa Oliver	AZ
Leora Byras	ME
Cassandra Buska	MT
Jestine Mayberry	DC
Wesley McFall	AS
Rebecca Coons	AZ
Lizelle Amirez	CNMI
Sue Nay	ME
Jay Berglund	SD

Mathematics Bias All Grades

Name	State
Roxane Dyk	SD
Allen Hogie	SD
Theresa Huelskamp	AZ
Mykayla Conerly	ME
Sharon Teague	MT
Helen Cruz	GU

ELA Content Grades 3–5 Reading/Writing

Name	State
Lizelle Amirez	CNMI
Susan Teel	ME
Sacha Richards	DC
Naomi Taala	AS
Pam Kelk	AZ
Yvonne Field	MT
Jennifer Cox	TN
Stacy Paulsen	SD
Timoteo Tali	AS
Elmie Manley	GU
Shalee Lastoria	TN
Kristen Taglia	AZ
Christy LoCicero	ME
Dawn Wirth	SD
Helene Cruz	GU
Prudence Lybeck	MT

Mathematics Content Grades 6–7

Tracy Del Rosario	CNMI
Vanessa Wilson	MT
Christina Flora	SD
Carrie Carstens	AZ
Jacqueline Bing	TN
Therese Flores	GU
Suzanne Brooks	DC
Jasmine Laulu	AS

MSAA 2021 Technical Advisory Committee Members		
Name	**Organization**	**Expertise**
Derek Briggs	University of Colorado	• Assessment • Growth • Psychometrics
Chris Domaleski	Center for Assessment	
Rachel Quenemoen	National Center on Educational Outcomes	• Students with Significant Cognitive Difficulties • NCSC Awareness
Mike Russell	Boston College	• Technology • Accessibility
Martha Thurlow	University of Minnesota/NCEO	• Special Education • Accessibility

APPENDIX F

PROCESSING AND REPORTING BUSINESS REQUIREMENTS

MSAA Assessments Reporting Services Deliverables Decision Rules

2020-2021

03/09/2020

Tara LaPierre

cognia

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Overview

This document describes the Reporting Services administration analysis and reporting requirements for the Multi-State Alternate Assessments (MSAA) administered during the 2020-2021 academic school year. For each Reporting Services responsibility, information needed to produce accurate and timely deliverables is included throughout this document.

Members

MSAA is a consortium of members. Each member may select various analysis and reporting deliverable options. The active member for the current school year is included in the table below. Member, Client, and State are synonymous throughout this document.

Member	Member Abbreviation
American Samoa	AS
Arizona	AZ
Bureau of Indian Education (BIE)	BI
District of Columbia	DC
Guam	GU
Maine	ME
Northern Mariana Islands (CNMI)	MP
Montana	MT
South Dakota	SD
Tennessee	TN
Virgin Islands	VI

Assessment and Administrations

The MSAA contract consists of ELA and Mathematics assessments administered during the school year to grades 03-08, and 11. As a member option, Science may also be administered during the school year to grades 05, 08, and 11 students. Breakthrough's system will be used for registration and administration of the assessments. Student test data will be collected online only; there will be no scannable documents.

Assessment Content Area	Assessment Grade	Brief Description	Start Date	End Date	Members
English Language Arts	03	Staged Adaptive test that includes operational and embedded field test items consisting of Single Select Choice Items and Writing Prompt item types	3/15/2021	05/14/2021	All
	04				
	05				
	06				
	07				
	08				
	11				

continued

Assessment Content Area	Assessment Grade	Brief Description	Start Date	End Date	Members
Mathematics	03	Staged Adaptive test that includes operational and embedded field test items consisting of Single Select Choice Items	03/15/2021	05/14/2021	All
	04				
	05				
	06				
	07				
	08				
	11				
Science	05	Field test consisting of Single Select Choice Items	03/15/2021	05/14/2021	AZ, ME
	08				
	11				

Reporting Services Deliverables List

Reporting Services will produce various data file and static report deliverables included in the table below. This document details the data preparation, processing, and formatting rules.

Post-Test Administration Deliverable		Members
Student Demographics Datafile (for Test Clean-Up)		All
Organization Datafile (for Test Clean-Up)		All
Test Materials Download Count		All
Writing Score Off-Topic		All
Billable Records Datafile		All
ELA/Math Scaled Score Lookup Datafile		AZ
ELA/Math Student Results School, District, and State Datafile	Preliminary (State Only)	All
	Final	All
ELA/Math Duplicate/Void State Student Test		All
Science Student Participation State Datafile		AZ, ME
ELA/Math Student Report	Online	All
	Print	TN
ELA/Math School and District Roster Report		All
ELA/Math School, District, and State Summary Report		All
Parental Rescore Request		SD

Change Log

Administration	Description
• 2020-2021	• Datafile deliverables will be in EXCEL format instead of CSV
• 2020-2021	• ELA/Math Student Roster will be created at the district level in addition to school
• 2020-2021	• Any member choosing the Student Report Print Option will receive two copies of the report
• 2020-2021	• When both/all tests for a student are not launched/started but are closed (due to TA/TC misadministration) will be reported as ESM. These tests were previously reported as DNT.
• 2020-2021	• Science will be administered to the members who select the science option • Science Participation file will be created after test clean-up
• 2020-2021	• Administration window extended from 04/30/2021 to 05/14/2021 • Note: SD admin ends 05/07/2021
• 2020-2021	• Student Demographic test clean-process modified by combining bull-pen and demographic process • Clients can provide information for Cognia to add, remove, merge student data to be included in analysis and reporting • Clients can provide information for Cognia to update demographics, test status, and reporting status (participation status) • The process is outlined in the requirements document MSAA 2021 Student Demographic Instructions.pdf • Final reporting status values will be calculated as part of the demographic clean-up process and detailed in the requirements document MSAA 2021 Student Demographic Instructions.pdf
• 2020-2021	• DC does not plan to administer MSAA in 2021
• 2020-2021	• Do not print the Scaled Score Low/High sentence on the student report for students with a reporting status of ESR
• 2021-2021	• WRP Reporting Status will stay in the student results file. However, the rules will be to submit a value if different from ELA reporting status and blank if the same. Change the valid values to remove those that would not apply (remove TES, ESR, ESM, INC, ELL, EXE, DNT, WDR, and NLE). • A few supports/accommodation fields were removed from the student results layout since they no longer exist

Pre-Test Administration Data Preparation

Organizational Data

Members provides Cognia Operational Services department district and school data following a standardized layout. Cognia will load the data into an internal database referred to as ICORE. The requirements for district and school organizational handoff, load into ICORE, and data maintenance is out of scope for this document. However, the data will be used to support reporting assessment results. Internal use only school and district organizations are added ICORE to support quality assurance. The fields and value descriptions used for MSAA reporting are detailed below.

MSAA Reporting Organizational Data Descriptions

Field	Field Description
ReportCode1	• Member Abbreviation • Member code DEMO are for internal use only
BT Org ID	• Unique code assigned by the Breakthrough Portal to identify the Members, Districts, and Schools
District Code	• Unique code (within member) to identify districts • District Code values of DEMOA and DEMOB are for internal use only • Length and Pattern of Values Varies
District Name	• District name used for reporting • ASCII Text field • Maximum allowable length 30
School Code	• Unique code (within member) when combined with District Code identifies a unique School • Schools associated with District Code values DEMOA and DEMOB are for internal use only • Length Varies and Pattern of Values
School Name	• School Name used for reporting • ASCII Text field • Maximum allowable length 30

MSAA ICORE Data Store

ICORE contract code is used to identify the set of organizational data used to support analysis and reporting.

Administration	ICORE Contract Code	Members
Spring 2021	• 603050, 603000	• All

Test Meta Data

The information in this section describes the test meta data needed to support data student test data validation as well as analysis and reporting activities. Test meta data includes information about tests, forms, and items being administered. Test meta data impacting analysis and reporting include Test Form ID, Test Form Session & Position, Item Number, Item Type, Item Points, Item Subject, Count Towards Student Score, Item Role on Test Form, Equating Eligible Status.

Source

NTS is the primary test meta data source support MSAA analysis and reporting. Test meta data will be extracted from NTS after Content Development and Publications Cognia department (CDP) completes test clean up.

Session Forms

MSAA is designed to be stage adaptive. The student's score on the first session determines what form will be administered in the second session. Therefore, Forms will be constructed at the session level. Each eligible student is expected to take one form for session 1 and one form for session 2 for an assessment content area (also referred to as test). All forms will be available in English only. Note: Science is Field Test in 2020-2021 and therefore will not be staged adaptive.

Test Session & Position

Within the NTS data, for staged adaptive tests, each form consists of one session where each session consists of a collection of items. The NTS form name includes the session. The position field indicates the order items are presented to students. Position should be unique on a test form.

Special Processing of Form Meta Data

Session Form data will be used to create Test Form data by combining all possible combinations of Session 1 Form and Session 2 Forms.

Item Number

Item number (NTS AssetID) is used to support various psychometric analyses as well linking student test data to NTS data.

Item Types

Each item is characterized by its type. The item type identifies student response and score data formats. The table below lists the item types administered by MSAA. MSAA tests consist of single select choice items and a writing prompt (ELA only). Writing prompts are scored on three trait dimensions: Organization, Idea Development, and Conventions.

Item Type Label	NTS Identification	Reporting Abbreviation	CDP Abbreviation
Single-Select Choice	Interaction Type: choiceInteraction, and Correct Response: Exactly one option is the correct response	MC	SR
Writing Prompt: Scored on Three Dimensions/Traits	PointValue = 9 (Note: Each Dimension scored on 3 points)	WP	WP

Item Role on Test Form

Each item on a form is characterized as operational or field test. An item's role on a test form impacts various analyses including calculating student test scores.

Role	Abbreviation	Rule
Operational	OP	• Included in calculating student test scores • CountsTowardStudentScore = Yes
Field Test	FT	• Excluded from calculating student test scores • CountsTowardStudentScore = No

Staged Adaptive Requirements

Reporting provides Psychometrics session 1 scaling items item lists. Psychometrics provides the routing lookups to Cognia CDP department to be incorporated in test production. Psychometrics determines the raw scores for each session 1 form required for session 2 form assignment. Since Science as a Field Test in 2020-2021, routing item lists will not be produced.

ELA Reading and Writing Items

Every ELA item is assigned a Subject value of Reading or Writing in NTS. The Subject code is used for calculating Reading Percent of Points Earned and Writing Percent of Points Earned.

Test Administration Validation

Reporting participates in validating Breakthrough MSAA Testing System prior to the system going live for an administration.

Student Registration Data

Student registration occurs with each member utilizing the Breaktrhough MSAA Systems Portal. Registration requirements are outside the scope of this document. Each student will be associated to a member, district within the member, and school within the member in the portal.

Post-Test Administration Data Clean-up

Report Services receives data from various sources, validates the data, and applies processing rules to prepare data for psychometrics, analysis, and report generation. This section provides a general overview of the various sources and a detailed description of student item responses and scores as well as test status. In-depth detail on the data processing rules and data sources are out of scope of this document.

Student Data Sources

Student Online Test Data – BT Systems Portal	
Description	• Breakthrough will provide Cognia data related to student online testing following and agreed upon schedule. • The data includes o student demographics at the time of testing, o student accommodation, o LCI data, o student response check data, o student test data including not tested reasons, student test session data, test date time stamp, student item responses item evidence, and scores, o test meta data o test proctor data, o organization data
General Rules	• Cognia Reporting will import and validate the files • Cognia Reporting will provide item evidence counts to Cognia Client Services for conformation that all evidence files have been received for scoring
File Layout	• BT provides Cognia standard CSV files following an agreed upon format

Demographic File – Client Updated	
Description	• States provide an updated student demographic data file • Cognia will incorporate updates as part of post-test administration student test cleanup
General Rules	• Refer to MSAA 2021 Student Demographic Instructions.pdf
File Layout	• Refer to MSAA 2021 Student Demographic Instructions.pdf

Student Human Item Scores	
Description	• Cognia Scoring Services will provide Reporting Services student level item scores and non-scorable scores
General Rules	• Refer to section “Student Item Response: Human Score Type “
File Layout	• Scoring Specifications

Student Item Data

The purpose of this section is to describe in detail the data associated with items on student tests necessary for analysis and reporting and student data clean-up activities.

Student Item Response: Format

Student item responses are captured and formatted and stored as described below. Item type is used to categorize the response formats.

Item Type	Student Response Description	Sample Value
Single-Select Choice	• Single alpha character	• A
Writing Prompt	• N/A	N/A

Student Item Response: Scoring Method

Each student response to an item is assigned a score value. An item score is assigned either by machine scored or human scored. Student responses collected online is either machine scored by the testing platform or human scored.

Item Type	CBT	PBT	Scoring
Single-Select Choice	Testing Platform	N/A	Exact Match: 1 = student response match correct response; 0 otherwise
Writing Prompt	Human	N/A	Refer to sections Student Item Response: Human Score Type, Writing Prompt: Valid Dimension Score Combinations and Writing Prompt: Score Adjustment sections below

Item Excluded: Identify Student Modified Test Form

Rarely an administration issue may lead to excluding an item from a student test form during test clean-up. To exclude the item from scoring a particular student’s test, the item response is set to X and score set to blank. Student test scores will be based on all core items administered the student where the response is not X.

Writing Prompt: Raw Trait Dimension Scores

Student responses requiring a human score will have a final score of record, scorer 1 score, scorer 2, and scorer 3 score as defined by scoring procedures. The final score of record value is used to calculate official student test scores and used to determine if a student attempted an item. Refer to the Writing Prompt: Score Adjustment section for more information on the wring prompt score. Scoring rubrics and procedures are out of scope for this

document. Each student response requiring a human score will be assigned a final score of record score value for each rubric dimension as outlined in the table below.

Human Score	Interpretation	Raw iScore Value	Valid*	Item Attempt**
Numeric	Valid numeric score (an integer greater than or equal to 0 and less than or equal maximum allowed item score as defined in the rubric)	0,1,2,3	OP, FT	Yes
Blank	No deliberate marks in the answer space; No evidence submitted	B	OP, FT	No
Unreadable	Faint handwriting or otherwise obstructed student response	U	FT	Yes
Non-English	Response is written in a language other than English, or is a mix of English and another language but lacks sufficient English to provide a score	F	OP, FT	Yes
Off Topic	A response that is not related to the task/prompt administered or is not a valid attempt at answering any task/prompt on the test	5	OP, FT	Yes
Repeats the Prompt	The response copies the prompt or portions of it and offers no attempt to respond to the task/prompt	P	OP, FT	Yes
No Score	Any other response that cannot receive a numeric score	N	OP, FT	Yes
Insufficient Amount to Score	The response contains an insufficient amount of writing to score	A	N/A	Yes
Refusal	The response clearly indicates a refusal on the part of the student to address the prompt or participate in the test	R	N/A	Yes
Illegible	Tiny or poor handwriting, spelling that cannot be deciphered, or other conditions that render the student work indecipherable	I	N/A	Yes
Wrong Location	Item response inconsistent with student form	W	N/A	Yes
Response Not Scored	Field test item where students' response was not selected for scoring	# or blank	FT	Unknown

(*) Valid: OP = Human score value is valid for operational items

FT = Human score value is valid for field test items

N/A = Not applicable for project. If value provided, resolution needed.

Note: In 2020-2021, all Writing Prompts are OP.

(**) Item Attempt: Yes = Human score value indicates student attempted the item

No = Human score value indicates student did not attempt the item

Unknown = Not enough information to determine if the student attempted the item

Writing Prompt: Valid Trait Dimension Score Combinations

Writing prompts are scored on three trait dimensions: Organization, Idea Development, and Conventions. Each trait is assigned a score listed in the "Raw Score Value" column in "Writing Prompt: Raw Trait Dimension Scores". Off Topic is not a valid score for the Conventions trait. If one dimension score is scored a B, then all dimension scores must be a B.

Writing Prompt: Dimension Score Adjustment

The raw iScore dimension score values are translated as indicated below to support analysis and reporting requirements. During test cleanup, the raw iScore value is translated to the Student Results value except Z will be set to B to be consistent with standard processes. “B” will be translated to “Z” when producing the student results and void/duplicate files

Human Score	Raw iScore Value	Psychometric Score Value	Student Results
Rubric Score	0	0	0
Rubric Score	1	1	1
Rubric Score	2	1	1
Rubric Score	3	2	2
Blank	B	0	Z
Unreadable	U		U
Non-English	F	0	F
Off Topic	5	0	O
Repeats the Prompt	P	0	P
No Score	N	0	N
Item Excluded: Identify Student Modified Test Form during Clean Up	0-3,5, B, U, F, P, N		X

Single-Select Choice Response: Response Adjustment

Student responses to single-select choice items are translated below to support analysis and reporting.

Raw Response	Raw Value	Psychometric Score Value	Student Results
Raw Response	A, B, C, or D	0 = response does not match item key	A, B, C or D
		1 = response matches item key	+
Raw Response	blank	0	Z
Item Excluded: Identify Student Modified Test Form during Clean Up	A,B,C, D, or blank		X

Student Item Attempt

Item Type	Item Attempt Rule
Single-Select Choice	If student raw response is not blank or X, the student attempted the item
Writing Prompt	If the student’s earned score value for one or more dimensions is listed as a “Yes” in “Item Attempt” column in “Writing Prompt: Raw Trait Dimension Scores” table, the student attempted the item.

Student Test Data

Test data applies at the ELA, Mathematics, and Science levels. Science test data will only exist for members who selected the option to administer the science test. The purpose of this section is to describe in detail the data associated with student tests necessary for analysis and reporting and student data Clean-Up activities

Student Test Status

Each student test is assigned a test status in the Breakthrough Portal and adjusted during student data Clean-Up when necessary. This field will be updated during demographic clean-up.

Final Test Status	Condition
InProgress	• BT Portal value Paused value is changed to InProgress during test Clean-Up • Provided by field using BT Portal
Cancelled	• Provided by field using BT Portal • Canceled test status is also referred to as Closed Tests
Completed	• Provided by field using BT Portal • Completed test status value is also referred to as Submitted
[Blank]	• Final Test Status will be blank for Science if a member does not participate in Science • Final Test Status will be blank for students who were added during demographic clean up

Student Reporting Status (Participation Status)

Each student is assigned an ELA Reporting Status, Mathematics Reporting Status, a Writing Reporting Status, and Science Reporting Status during test cleanup. The allowed values are detailed in the table below. If a state does not participate in Science, the Science Reporting Status will be blank. The rules for assigning the final reporting status are out of scope of this document. Refer to student demographic clean-up instructions for reporting status assignment rules.

Test Reporting Status	Code	Description
Administration Irregularity	IRR	Administration irregularity reported, but does not necessitate an invalidation
Invalidated	INV	Student-based or administration-based irregularity resulting in invalidation
Parental Refusal	PRF	Parental refusal
ELL Exempt (ELA Only)	ELL	Student meets the ELA ELL 1st Year in U.S. exemption requirements
Exempt	EXE	Student meets test exemption requirements
Withdrew	WDR	Student withdrew
No Longer Eligible	NLE	Student is no longer eligible for testing
Tested	TES	Submitted test, regardless of number of item responses
Tested-Incomplete	INC	In-Progress Test, with at least one item response
Early Stopping Rule	ESR	Closed Test – with no item response
Early Stopping Rule – Misadministration	ESM	Closed Test – with at least one item response Closed Test – both/all content area tests not launched or started
Did Not Test	DNT	No Test, or In-Progress Test with no item response

Post-Test Administration Student Data Clean-Up

Various data sources, including Test Meta Data, Organization Data, Online Student Test Data, Scores for Human scored items, and Demographic Clean-Up are used to conduct student data clean-up to produce student test data ready for analysis and reporting. The table below describes relevant detail related to the clean-up process and requirements.

Data	Guidelines
General Information	• Cognia will update student data using the updated demographic files returned by each member as outlined in the Demographic Clean-Up Instructions for additional details • Updates include modifying demographic, test status, preliminary reporting (participation status), item responses/scores data as well as adding and removing student tests • After the updates are incorporated, Cognia will perform additional clean up as outlined below
Organization Data	• All student test records associated with the same student ID must have the same School, District, and State • State, District, and School codes associated with student tests must exist in ICORE and Breakthrough Organization file. • New or revised Organization data will be updated in both ICORE and Breakthrough reporting platforms • Cognia will work with states to identify the complete set of schools and district organizations, along with the names for reporting, during the demographic file acceptance and organization Clean-Up process with each state
Student Test Grade	• Test grade is expected to match Student Enrolled Grade. • If a student's enrolled grade level is provided in the final demographic data does not match the student's tested grade, the test is considered off-grade and will be marked as "Void/Duplicate"

Duplicate Test	• After Off-Grade tests have been resolved, duplicate tests are tests in the same Assessed Content Area and State Student ID within a State member
	• The final test used for analysis and reporting is determined used the following hierarchy
	  o Submitted/Completed
	  o Closed
	  o In Progress
	  o If two or more tests have the same status, the test associated with the latest date will be used, determined by the datetime stamp of the test record. Additionally, the larger TestID is used if still duplicate.
	• The duplicate test(s) not selected for analysis and reporting will marked as "Void/Duplicate"

Student Test Status	• Final ELA, Math , and Science Test Status will be audited based on MSAA 2021 Student Demographic Instructions.pdf
Student Test Reporting Status	• Final ELA, Math , and Science Test Reporting Status (Participation Status) will be calculated based on MSAA 2021 Student Demographic Instructions.pdf
Student Writing Prompt Reporting Status	• Final Writing Prompt Reporting Status (Participation Status) will be calculated based on MSAA 2021 Student Demographic Instructions.pdf
Student Test Item Responses	• Item responses could be removed based on Student Test Reporting Status as detailed in the demographic clean up instructions

Post-Test Administration Psychometric Data

Reporting Services will provide Cognia Psychometric team test meta data and student test administration data consisting of demographics, student test status, student test form, and student item level responses and scores. Psychometrics will conduct statistical key checks, Stringer Analyses, CTT, and IRT. The specifications for such activities are out of scope for this document. Psychometric will provide Reporting Services pre-equated test scaling information and raw score to scaled score lookup tables as described in this section to support creation of data file and report deliverables.

Psychometrics Assigned Scores	
ELA Cut Scores by Test Grade	• Proficiency Level Scale Score Ranges
ELA Scaled Score Lookup by Test Grade	• Scale form • Raw Score • Scale Score • Proficiency Level • Scale Score Low/High
Math Cut Scores by Test Grade	• Proficiency Level Scale Score Ranges
Math Scaled Score Lookup by Test Grade	• Scale form • Raw Score • Scale Score • Proficiency Level • Scale Score Low/High
Science Cut Scores by Test Grade	• Proficiency Level Scale Score Ranges (Not Applicable in 2020-2021)
Science Scaled Score Lookup by Test Grade	• Scale form • Raw Score • Scale Score (Not Applicable in 2020-2021) • Proficiency Level (Not Applicable in 2020-2021)

Post-Test Administration Reporting Calculations

This section details calculations and formatting applied after test clean-up is complete.

Student Data

The data listed below details student level data used to support various analysis and reporting tasks. It does not include a complete list of student data fields available. Student data prepared for psychometrics is merged with student scores calculated by psychometrics. [Test] Refers to ELA, Math, and Science tests. Science test fields will be blank for members who did not participate in Science.

Field	Description
[Test] Form	• Two letter test form identification where the first letter identifies the session1 form and the second letter identifies the session 2 form • Students without a test form who need to be reported are defaulted to form AA or 01
[Test] Scale Form	• Identifies the unique set of scaling and equating items based on Test Form and “Item Excluded: Identify Student Modified Test Form during Clean Up”
[Test] Form Modified	• If during test clean up the student test was identified as “Item Excluded: Identify Student Modified Test Form during Clean Up” the field will be set to a “1” ; otherwise it will be “0”
[Test] Raw Score	• Sum of final non-flawed item scores classified as “counts toward student score” items for the student test
[Test] Scaled Score	• Using calculated Test Scale Form, Test Raw Score and Psychometric Raw Score to scale score lookup, assign a Test Scaled Score • Apply Reporting Status test score rules as appropriate for a specific deliverable • ELA/Math only in 2020-2021
[Test] Performance Level	• Using calculated Test Scale Form, Test Raw Score and Psychometric Raw Score to scale score lookup, assign a Test Performance Level • Apply Reporting Status test score rules as appropriate for a specific deliverable • ELA/Math only in 2020-2021
[Test] Scaled Score Low/High	• Using calculated Test Scale Form, Test Raw Score and Psychometric Raw Score to scale score lookup, assign a Test Scaled Score Low/High • Apply Reporting Status test score rules as appropriate for a specific deliverable • ELA/Math only in 2020-2021

[Test] State Compare	• Calculate by comparing the student’s [test] scaled score with the state average scaled score and the student’s scaled score SEM
	  o Below (-): state average scaled score – student’s scaled score SEM > student’s scaled Score
	  o At (=): state average scaled score – student’s scaled score SEM <= student’s scaled Score <= state average scaled score + student’s scaled score SEM
	  o Above (+): < student’s scaled Score > state average scaled score + student’s scaled score SEM
	• ELA/Math only in 2020-2021

continued

Field	Description
[Test] Item Score String	• Test Item Score/Response String • Apply Reporting Status test score rules formatting as appropriate for a specific deliverable • Each column in the string represents a core item (count's toward student score) • Selected Response: o + = Correct Response o A,B,C,D = Incorrect Response o Z = No Response o X = Item Excluded from Student's form • Writing Prompt: o 0,1,2 = Response Score o Z (blank) ,F (Foreign Language) ,P (Copy of Prompt) ,N (No Score) ,O (Off Topic) Non-Scorable Codes o X = Item Excluded from Student's form
[Test] Field Item	• If at least one field test item is attempted on the test then "1", otherwise "0"
ELA Reading Percent of Points Earned	• Percentage of possible points correct for reading items • Values: 0-100, N/A • Apply Reporting Status test score formatting rules as appropriate for a specific deliverable • Include all core items administered to the student
ELA Writing Percent of Points Earned	• Percentage of possible points correct for writing items • Values: 0-100, N/A • Apply Reporting Status test score rules as appropriate for a specific deliverable • Include all core items administered to the student
WR Trait Scores	• Student level writing trait scores are included part of overall ELA test • Apply Reporting Status test score formatting rules as appropriate for a specific deliverable • Refer to Writing Prompt: Dimension Score Adjustment table Student results column o 0,1,2 = Response Score o Z (blank) ,F (Foreign Language) ,P (Copy of Prompt) ,N (No Score) ,O (Off Topic) Non-Scorable Codes

Aggregate Data

Aggregation Level

Each student is assigned one State, District, and School code to use for aggregations as described in the table below

Aggregation Organizational Level	Aggregation Code
State	Member Abbreviation
District	Combined Member Abbreviation and District Code
School	Combined Member Abbreviation, District and School Code

Aggregation Formulas

The aggregations below are calculated to support various datafiles and reports. The calculations are aggregated by state, school and district. Student tests identified as Void/Duplicate or Remove are excluded from all aggregations.

Aggregation	Calculation
Number Enrolled	• Number of student tests that have at least one test assigned one of the final reporting status values other than WDE or NLE for the aggregation level
Number Tested	• Number of student tests assigned TES, ESR, or IRR final reporting status for the aggregation level
Number of Did Not Test	• Number of student tests assigned PRF, ELL, EXE, DNT, WDR, NLE final reporting status for the aggregation level
Average Scale Score	• Average test scale score for students included in the “Number Tested” aggregation rounded to the nearest whole number for the aggregation level
Number of Students at each Performance Level	• Number of student tests included in the “Number Tested” count with the specific Performance Level Value for the aggregation level
Percent of Students at each Performance Level	• Divide the “Number of Students at each Performance Level” by the Number Tested for the aggregation level. Multiply by 100 and round to the nearest whole number.

Aggregation Suppression Rule

Aggregations with less than 10 students included in the denominator will be suppressed from state level reports only

Post-Test Administration Data File Deliverables

Student Demographics Datafile (for Test Clean-up)

Description	• Cognia provides each participating member an excel file containing raw student data to support data cleanup
Generation Rules	• Refer to MSAA 2021 Student Demographic Instructions.pdf
File Layout	• Refer to MSAA 2021 Student Demographic Instructions.pdf
File Name	• Refer to MSAA 2021 Student Demographic Instructions.pdf

Organization Datafile (for Test Clean-up)

Description	• Cognia provides each participating member an excel file containing organization data to support data cleanup
Generation Rules	• ICORE organization data are used directly to create the file as detailed in the layout
File Layout	• MSAA2021OrgDataLayout.xlsx
File Name	• MSAA2021_ICORE_[state abbreviation].xlsx

Test Materials Download Count Datafile

Description	• Breakthrough provides test materials data table • Cognia uses the data table to create a data file for each state containing the relevant state data
File Name	• MSAA2021_tblFilddownloads_[state abbreviation].xlsx

Writing Score Off-Topic Datafile

Description	• The writing off-topic datafile lists students and their writing prompt trait scores.
Generation Rules	• Raw ISCORE scores are provided in the file except Off Topic is O and B, F, N are translated to 0
File Layout	• State, DistrictCode, SchoolCode, DistrictName, SchoolName, Lname, Fname,StateStudentID, Grade, ItemNumber, Trait1score, Trait2Score, Trait3Score
File Name	• WritingDelivareble-[state abbreviaton].xlsx

Billable Records Datafile

Description	• MSAA States shall be billed out based on record results. Billable results shall be delivered to Cognia's Finance Department for true up and final billing.
Generation Rules	• Each tested student is considered a billable record o Each student test shall be considered a valid billable record when a test is launched and In Progress, Closed or Submitted. o A billable record does not include where a student does not have a test record, is no longer enrolled or is withdrawn • Records with a blank nap_delivery_id will be highlighted • The datafile will include two tabs: one for Reporting records (included in results datafile) and Not Reported Records (included in Duplicate/Void datafile) • The records will be reported in the file with their SSID
File Name	• Billing_[state abbreviation].xlsx

ELA/Math Scaled Score Lookup Datafile

Description	• The rawscore to scaled score lookup will be created and provided as an option to members
Generation Rules	• One EXCEL file for each Test Subject will be created containing the psychometric raw score to scale score lookup data • Each EXCEL file will contain a worksheet for each test grade
File Layout	• Each worksheet will contain columns: Grade, Subject, ScaleForm, RawScore, ScaledScore, LowScaledScore, HighScaledScore, and PerfLevel
File Name	• MSAA2021ScaledScoreLookups_mat.xlsx • MSAA2021ScaledScoreLookups_ela.xlsx

ELA/Math Student Results School, District, State Datafile

Description	• The student results data file will contain all data for student tests not identified as Void/Duplicate during test Clean-Up as well as students tests added during test clean-up following the file layout • State files will be produced and provided on the sFTP • State, District, and School files will be provided to Breakthrough
Generation Rules	• The student results data file is sliced by state, district, and school. • Student ELA/Math tests are included in the specific version of the file based on the Aggregation Organization Level of State, District, and School assignment rules • Refer to table "Final Report Status Formatting of Student Scores table" • The file layout defines each field and valid values • The file will be exported to EXCEL.

continued

File Layout	• MSAA2021StudentResultsLayout.xlsx • District and School files will contain a subset of variables as indicated in the layout "District, School Files" column
Preliminary State File Name	• 2021_[member abbreviation]_PreliminaryStudentResults.xlsx
State File Name	• 2021_[member abbreviation]_StateStudentResults.xlsx
BT State File Name	• 2021_[BT Org ID]_StateStudentResults.xlsx
BT District File Name	• 2021_[BT Org ID]_DistrictStudentResults.xlsx
BT School File Name	• 2021_[BT Org ID]_SchoolStudentResults.xlsx

Student Results Datafile: Final Reporting Status Formatting of Student Scores

Final Test Reporting Status	Code	State File All Scores*	District & School File		
			Scaled Score	Perf Level	R/W Percent
Administration Irregularity	IRR	Yes	Yes	Yes	Yes: 0-100
Invalidated	INV	Yes	No	No	N/A
Parental Refusal	PRF	No	No	No	No
ELL Exempt (ELA Only)	ELL	No	No	No	N/A
Exempt	EXE	No	No	No	N/A
Withdrew	WDR	No	No	No	N/A
No Longer Eligible	NLE	No	No	No	N/A
Tested	TES	Yes	Yes	Yes	Yes: 0-100
Tested-Incomplete	INC	Yes	Yes	No	Yes: 0-100
Early Stopping Rule	ESR	Yes	Yes	Yes	N/A
Early Stopping Rule – Misadministration	ESM	Yes	Yes	No	Yes:0 -100
Did Not Test	DNT	No	No	No	N/A

(*) All Scores: State student results file includes item responses, WP trait scores, raw scores, scaled scores, and performance levels.

- Yes = Include score in data file; No = Leave column blank in data file; N/A = Put N/A in the data file

ELA/Math Duplicate/Void Student Datafile

Description	• The file contains the student tests identified as Void/Duplicate, including Off-Grade test records during test Clean-Up process • Data within the datafile shall be interpreted with caution since minimal Clean-Up has been applied
Generation Rules	• The file will follow the same layout and rules as the ELA/Math student results file, except only include student tests identified as Void/Dup • A file will be created for each member if there is at least one student test identified as Void/Dup • The file will be exported to EXCEL.
File Layout	• MSAA2021StudentResultsLayout.xlsx
State File Name	• 2021_[member abbreviation]_VoidDupResuls.xlsx

Science Student Participation Datafile

Description	• The science student participation datafile will contain science student test data after test clean-up process is complete • State files will be produced and provided on the sFTP
Generation Rules	• The file layout defines each field and valid values • The file will be exported to EXCEL.
File Layout	• MSAA2021StudentSCIParticipationLayout.xlsx
File Name	• 2021_[member abbreviation]_StateStudentParticipation_sci.xlsx

Post-Test Administration Report Deliverables

ELA/Math Student Report

Report Delivery

- Students who have an ELA or Math final reporting status of TES, ESR, or IRR will receive an ELA/Math Student Report.

Print

- Only members who selected the Print option will receive two printed copies of the student report
- A print report package will be created by school.
- Slip sheets will be created at the start of each new report pack. The slip sheet identifies the appropriate shipping information and provides a way to track the secure shipment.

Online

- A PDF will be generated for each member and school containing all ELA/Math student reports for the school regardless of test grade.
- Student reports will be sorted by Test Grade, Student Last Name, Student First Name, Student ID

Data Visualization

This section details the data visualizations for the ELA/Math Student Report. Each student report is a two-page report (front and back). The front page is noted as “Confidential”. The report is designed to display both ELA and Math results side by side.

- Print Student First name possessive, when appropriate. Throughout the student report, the student’s first name appears embedded in text, it will appear as is or modified to be possessive as follows
  - If student first name ends in ‘s’ append apostrophe to student first name
  - Otherwise, print [Student First Name]’s in section introduction sentence
- First Page Header
  - Name: [Student First Name] [Student Last Name]
  - ID: [State Student ID]
  - School: Print School Name
  - Test Date: Spring [Year] (example: Spring 2021)
  - Grade: [Two-Digit Test Grade]
- First Page Performance Summary

Format Performance Summary section based on the student's final test reporting status as detailed in the table below.

Test Final Reporting Status	Test Result Section	Visualization
TES or IRR	**Performance Level**	• Print formatted earned student performance level o Level 1 o Level 2 o Level 3 o Level 4
	Score	• Print the student earned scaled score
	Score Graphic	• Place arrow in the relative location of the graphic for the student's scaled score with score printed above the arrow • Print scaled score ranges in each performance level
	Score Low/High	• Print the student's lower and upper scaled score
	R/W Percent of Points Earned (ELA Only)	• Print the student's earned percent of points
ESR	Performance Level	• Print formatted student performance with an asterisk • Level 1*
	Score	• Print the student scaled score provided by psychometrics. It is expected to be 1200.
	Score Graphic	• Place arrow in the relative location of the graphic for the student's scaled score with score printed above the arrow • Print scaled score ranges in each performance level
	Score Low/High	• Leave blank. Do not print the Low/High Scaled Score sentence.
	R/W Percent of Points Earned (ELA Only)	• Print N/A
All Other Values	**Leave blank under the Test Subject header except print the note:**	• Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.

- First Page Performance Level Descriptors

Format Performance Level Descriptors section based on the student's final test reporting status detailed in the table below.

Test Final Reporting Status	Visualization
TES or IRR	• Print formatted performance level descriptors based on student test grade, test subject, and earned student performance level • The performance level descriptors were provided to Reporting during report design after standard setting. The text is carry forward from year to year. • Each statement starts with a checkmark
ESR	• Print the text under the Test Header: * Your child did not show an observable response mode during the test; therefore, the test was not administered by the teacher. If you have additional questions, please contact your child's teacher.
Other	• Leave section under Test header blank

- First Page Footer
  - Left Justified: Copyright information
  - Right justified: Page 1
- Second Page Header
  - 2021 Results for [Student First Name] [Student Last Name] ([State ID]) | Grade [2-digit test grade] | [School Name]
  - Example: 2021 for Jane Smith (12345678) | Grade 04 | Demonstration School A
- Second Page Letter to Parents and Guardians
  - Letter is provided by the client and one letter for all ELA/Math Student Reports
- Second Page: What skills can be worked on next?

Format "What skills can be worked on next?" section based on the student's final test reporting status as detailed in the table below.

Test Final Reporting Status	Visualization
TES or IRR	• Print the specific skills text provided during report design based on the students test grade and subject • Each statement starts with a plus symbol
ESR	• Print the text under the Test Header: • Revisit IEP communication goals in collaboration with the speech language pathologist, AT specialist, and others who assist the student in developing a consistent mode of communication.
Other	• Leave section under Test header blank

- Second Page What now?
  - Print the questions and suggestions developed during report design with student's first name embedded in the statements and questions
- Second Page Footer
  - Left Justified: Copyright information
  - Right justified: Page 1

ELA/Math School and District Roster Report

Report Delivery

- An ELA/Math School Roster Report will be produced when a school has at least one student assigned an ELA or Math reporting status value other than WDR or NLE.
- An ELA/Math District Roster Report will be produced when a district has at least one student assigned an ELA or Math reporting status value other than WDR or NLE.
- Static PDFs will be generated to be posted online. The report is not printed.

Data Visualization

This section details the data visualizations for the ELA/Math School and District Roster Report.

- **District Roster Report**
  - Header
    - Print: CONFIDENTIAL
    - Print: [Formatted State Name]
    - Print: [Formatted District Name]
    - Print: Grade [Two Digit Test Grade]
  - Summary Data Rows:
    - Each row will contain the state and district aggregated test results
    - Do not suppress aggregations
  - Student Roster
    - Header: Spring 2021
    - Student Name [Student Last Name],[Student First Name]
    - Student ID [State Student ID]
    - Test Status Impact on Report of Student Test Results

Final Test Reporting Status	Code	Print Test Status	Print State Compare	Print Scale Score	Print Performance Level
Administration Irregularity	IRR	Yes	Yes	Yes	Yes
Invalidated	INV	Yes	No	No	No
Parental Refusal	PRF	Yes	No	No	No
ELL Exempt (ELA Only)	ELL	Yes	No	No	No
Exempt	EXE	Yes	No	No	No
Withdrew	WDR	Yes	No	No	No
No Longer Eligible	NLE	Yes	No	No	No

continued

Final Test Reporting Status	Code	Print Test Status	Print State Compare	Print Scale Score	Print Performance Level
Tested	TES	No	Yes	Yes	Yes
Tested-Incomplete	INC	Yes	Yes	Yes	No
Early Stopping Rule	ESR	Yes	Yes	Yes	Yes
Early Stopping Rule – Misadministration	ESM	Yes	Yes	Yes	No
Did Not Test	DNT	Yes	No	No	No

Print Test Status: Yes – print the three letter code; No – Leave blank

Print State Compare: Yes – print - , +, or = based on student score; No – Leave blank

Print Scale Score: Yes – print student scale score; No – Leave blank

Print Performance Level: Yes: Print "Level 1", "Level 2" , "Level 3", or "Level 4" student performance level; No – Leave blank

- Footer
  - State Comparison Key
  - Copyright
  - Page X (Restart page count at 1 for each test grade)

ELA/Math School, District, and State Summary Report

Report Delivery

- Each participating member with at least one student included the "Number Enrolled" calculation will receive an ELA/Math State Summary Report.
- Each district with at least one student included the "Number Enrolled" calculation will receive a District Summary Report.
- Each school with at least one student included in the "Number Enrolled" will receive a School Summary Report.
- Static PDFs will be generated to be posted online. The report is not printed.
- Each static PDF will contain a page for ELA and a page for Math

Data Visualization

This section details the data visualizations for the ELA/Math State, District, and School Summary Report

- **State Summary Report**
  - Title: [Formatted Subject]
  - Right Justified Header: Print [Formatted State Name]
  - Summary Data Rows:

        - Each row will contain the state aggregated test results for each grade
        - If the “Number Tested” is less than 10, then suppress the Number and Percent at each Performance Level and Average Scale Score
    - Footnote: Copyright statement
- **District Summary Report**
    - Title:
        - Print CONFIDENTIAL
        - Print [Formatted Subject]
    - Right Justified Header:
        - Print [Formatted State Name]
        - Print [District Name]
    - Summary Data Rows:
        - Each grade row will contain the state and district aggregated test results
        - Only grades with at least one student enrolled in the district will be included on the district roster
        - Do not suppress aggregations
    - Footnote: Copyright statement
- **School Summary Report**
    - Title:
        - Print: CONFIDENTIAL
        - Print: [Formatted Subject]
    - Right Justified Header:
        - Print: [Formatted State Name]
        - Print: [District Name]
        - Print: [School Name]
    - Summary Data Rows:
        - Each grade row will contain the state, district, and school aggregated test results
        - Only grades with at least one student enrolled in the school will be included on the district roster
        - Do not suppress aggregations
    - Footnote: Copyright statement

Parental Rescore Request

For members selecting the Parental Rescore Request option, if one or more students require a score update as part of the parental rescore request the following deliverables will be updated with the corrected student scores and provided to Client Services Program Management to be delivered to each member. Aggregate data will not be re-calculated as part of the parental rescore request.

- ELA/Math Student Results Datafile
- ELA/Math Student Report
- ELA/Math School and District Roster Report

APPENDIX G
GUIDE FOR SCORE REPORT INTERPRETATION

Multi-State Alternate Assessment

(MSAA)

2021 Guide
for
Score Report Interpretation

State Specific Information

Listed below is the contact information for each state's MSAA State Representative(s):

American Samoa Thor Tinitali 684-633-1323 ext. 243 thort@doe.as Herbert Boat 684-633-1323 ext. 225 herbert.boat@doe.as Kimberly Pili 684-633-4789 K_pili@yahoo.com	**Arizona** Bethany Spangenberg 602-542-4061 Bethany.Spangenberg@azed.gov Sarah Han 602-364-0452 Sarah.Han@azed.gov	**Bureau of Indian Education** Maureen Lesky 505-563-5397 Maureen.Lesky@bie.edu
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Introduction to the MSAA

Purpose

The Multi-State Alternate Assessment (MSAA) is a comprehensive assessment system, designed to promote increasing higher academic outcomes for students with the most significant cognitive disabilities, in preparation for a broader array of post-secondary outcomes. The MSAA is designed to assess students with the most significant cognitive disabilities and measures academic content that is aligned to and derived from each participating state's content standards. This assessment contains many built-in supports that allow students to use materials they are most familiar with, and communicate what they know and can do as independently as possible. The MSAA is administered in the areas of English Language Arts (ELA) and Mathematics in grades 3–8 and 11.

This assessment was developed with Cognia through the research and development done by the National Center and State Collaborative (NCSC), and is now carried forward by the MSAA State Partners, including American Samoa, Arizona, Bureau of Indian Education, CNMI, District of Columbia, Guam, Maine, Montana, South Dakota, Tennessee, and United States Virgin Islands. Arizona and Maine also administered Science in grades 5, 8, and 11.

This guide provides information regarding the administration and results of the spring 2021 MSAA to district and school personnel.

Student Participation

The criteria for student participation in the MSAA reflect the pervasive nature of a significant cognitive disability. All content areas should be considered by the IEP team when determining who should participate in this assessment. The table below shows the participation criteria and the descriptors used to determine eligibility for participation for each student. Students must meet the following eligibility criteria:

Participation Criteria	Participation Criteria Descriptors
1. The student has a significant cognitive disability.	Review of student records indicates a disability or multiple disabilities that significantly impact intellectual functioning and adaptive behavior.* *Adaptive behavior is defined as essential for someone to live independently and to function safely in daily life.
2. The student is learning content linked to grade-level content standards.	Goals and instruction listed in the Individualized Education Program (IEP) for this student are linked to the enrolled grade-level content standards and address knowledge and skills that are appropriate and challenging for this student.
3. The student requires extensive direct individualized instruction and substantial supports to achieve measurable gains in the grade and age-appropriate curriculum.	The student (a) requires extensive, repeated, individualized instruction and support that is not of a temporary or transient nature, and (b) uses substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills across multiple settings.

Assessments for students with the most significant cognitive disabilities rely on a foundation of communicative competence. Students who do not have receptive and expressive communication are unlikely to be able to demonstrate what they know and can do on an assessment. Students who do not have a mode of communication are identified during the assessment process.

Post assessment, teachers may use the Communication Toolkit developed by NCSC to help these students develop a mode of communication. The Toolkit can be found here: https://wiki.ncscpartners.org/index.php/Communication_Tool_Kit.

Overview of the MSAA Format

The MSAA assesses ELA (reading and writing) and mathematics at grades 3–8 and 11 and is aligned to the state's content standards and the MSAA Core Content Connectors. The MSAA is a computer-based, on-demand, stage-adaptive assessment consisting mostly of selected-response and some constructed-response items written at three levels of complexity. These complexity levels represent different levels of skill acquisition by students.

Students with the most significant cognitive disabilities often need materials and instructional strategies that are substantially adapted, scaffolded, and have built-in supports to meet their individual needs.

The MSAA levels of complexity are designed to follow instructional practices. When students begin to learn a new skill, or acquire new knowledge, they need more support. As students learn and develop mastery of that skill or knowledge, they need less support. The test items on the MSAA are developed with many scaffolds and supports embedded within the items. Supports not embedded in the test items may be provided as accommodations, as well as other allowable ways to present the item to a student, based on their individual requirements.

The assessment is a computer-based test and is administered one-on-one. Based on the needs of the student, the assessment may also be delivered in a paper–pencil format. The needs of the student may also be addressed through other supports and accommodations, such as reading the test aloud, having a scribe, using manipulatives, using object replacement, translating the test into American Sign Language, among others. Test administrators (TA) have substantial leeway in developing a testing schedule, with the ability to start and stop a test depending on the engagement of the student.

Each content area consists of 45–55 items across two test sessions. These are primarily selected-response items with some constructed-response items in mathematics. The writing portion of the ELA test contains a scaffolded writing prompt at each grade level.

Scoring

Scoring of most items is accomplished within the online test platform. The selected-response items are scored as correct or incorrect by the test platform based on the answer keys programmed into the system. Constructed-response items are scored by the Test Administrator and then marked correct or incorrect in the test platform. Items without responses receive a score of zero. Student responses to writing prompts are hand scored by trained scorers utilizing the rubrics in Appendix A.

MSAA Score Reports

Overview

This guide describes the types of score reports provided for the 2020–21 MSAA administration. The data in the sample reports are for illustrative purposes only and are not intended to reflect performance of any student(s).

Information included on the score reports:

- *Performance Levels* describe how the student performed in relation to the knowledge and skills of that content area and grade level. Each performance level has two components: the scale scores that make up each level and the performance level descriptors (PLD). The PLDs are broad and general statements regarding skills and abilities of students who have attained each level. Performance levels for the MSAA were established by committees of educators after the first NCSC administration of the assessment in 2015 and were updated in 2018. PLDs for each content area and grade level can be found in Appendix B of this document. The scale score ranges that make up each performance level can be found in Appendix C.
- *Scale scores* report the performance level the student achieved. Scale scores are more precise than performance levels and may be used to make comparisons between groups of students, schools, and districts. In Appendix C, Table 1 shows the scale score ranges for each performance level, content area, and grade level.
- *Descriptive and informative reports*. In addition to including student demographic information, performance level, and scale scores, the Individual Student Report (ISR) contains supportive information about student performance and MSAA measures.
    - *Reading and Writing Scores*—the percent of items answered correctly for reading and writing separately. The writing items consisted of selected response and constructed response (or multiple choice and the writing prompt).
    - *What skills can be worked on next*—skills related to the standards in the following grade.
    - *What now?*—conversation starters for parents when talking with teachers about instruction for their child.

Interpreting and Using the MSAA Scores

The MSAA tests student performance in ELA and mathematics based on the state's content standards at the student's enrolled grade level. The student's performance level is based on alternate academic achievement standards. Results for the MSAA are reported by a scale score and performance level for each content area.

MSAA scores should be used in conjunction with the IEP progress reports, student work, diagnostic assessments, district-required assessments, and report cards in order to place the student's performance on academic content and skills in context and to provide a complete picture of the student's progress across a wide range of categories.

It is helpful to read the PLDs to understand the expectations for the performance level and grade level for each student. This information can provide a concrete link from the test to instructional planning.

Talking to Parents and Guardians

MSAA parent overviews are available for parents to introduce and describe the assessment. Contact your MSAA State Representative to locate these materials.

When talking to parents and guardians about their child's score, it may be helpful to keep the following in mind:

- MSAA assessment results should be used along with local assessment results and other information to determine what changes in curriculum and instruction may be needed to support students learning.
- MSAA scores alone should not be used to make placement or eligibility decisions.

Special Reporting Codes and Messages

In some cases, students were assigned a special reporting code. A complete list of special reporting codes and their associated descriptions is provided below. For additional information or interpretation of special reporting codes, contact your MSAA State Representative.

Code	Test Status	Description
ESR	Early Stopping Rule	If the TA did not observe a student response after the presentation of four items, the test was closed by the test coordinator (TC).
ESM	Early Stopping Rule Misadministration	Testing may have ended early on the basis that a consistent mode of communication was not observed. At least one response was recorded for the student, but the student may not have had the opportunity to complete the entire test.
INC	Tested - Incomplete	The student's test was not submitted by the close of testing. The student may not have had the opportunity to complete the entire test.
TES	Test	The student's test was submitted by the close of testing.
IRR	Administration Irregularity	An administration irregularity not necessitating an invalidation of scores was reported for the student's test.
INV	Invalidated	The results of the student's test have been invalidated.
PRF	Parental Refusal	The student did not test due to a parent/guardian refusal.
ELL	ELL Exempt (ELA Only)	The student was exempt from ELA testing due to being a first year English Language Learner.
EXE	Exempt (Emergency, Medical, Other)	The student was exempt from testing.
DNT	Did Not Test	The student did not test via the MSAA assessment.
WDR	Withdrew	The student withdrew.
NLE	No Longer Eligible	The student is not eligible to test via the MSAA assessment.

Types of Score Reports

Below are the types of MSAA score reports that will be available on the MSAA Reporting Portal. Only district TCs using their current MSAA username and password may access the MSAA reports here: https://www.msaaassessment.org under the Reporting tab. Reports are only available during the online reporting window. All MSAA score reports are confidential documents.

- Reports for the District
  - District Summary Report (DSR)
  - District Roster Report (DRR)
  - Student Results File
- Reports for the School
  - School Summary Report (SSR)
  - School Roster Report (SRR)
  - Student Results File
  - Individual Student Report

An Excel file of all student results at the district and school level will be available to district TCs through the MSAA Reporting Portal. For information regarding this file or questions about accessing the reports, contact your MSAA State Representative. Contact information can be found at the beginning of this document.

Testing Participation

All students in grades 3–8 and 11 are required to be assessed in ELA and mathematics. Participation status is assigned independently for ELA and mathematics.

All submitted tests receive a participation status, regardless of the number of item responses.

For additional information regarding the reported test status, contact your MSAA State Representative. Contact information can be found at the beginning of this document.

Reports for the District

District Summary Report

The DSR provides district staff with a summary of student participation and performance by district and school. State-level data is taken from the individual participating state. See Figure 1 below.

Figure 1 – Sample District Summary Report

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1 English Language Arts

2 SUMMARY REPORT
Demonstration State
Demonstration District A

		Enrolled	3 Tested	Did Not Test	Average Scale Score	4 Performance Level							
						Level 1		Level 2		Level 3		Level 4	
						N	%	N	%	N	%	N	%
Grade 03	State	25	17	8	1222	17	100	0	0	0	0	0	0
	District	19	15	4	1221	15	100	0	0	0	0	0	0
Grade 04	State	25	25	0	1221	25	100	0	0	0	0	0	0
	District	19	19	0	1221	19	100	0	0	0	0	0	0
Grade 05	State	25	21	4	1226	17	81	4	19	0	0	0	0
	District	19	16	3	1227	12	75	4	25	0	0	0	0
Grade 06	State	25	25	0	1223	20	80	5	20	0	0	0	0
	District	18	18	0	1225	14	78	4	22	0	0	0	0
Grade 07	State	25	18	7	1225	18	100	0	0	0	0	0	0
	District	19	15	4	1224	15	100	0	0	0	0	0	0
Grade 08	State	25	23	2	1223	23	100	0	0	0	0	0	0
	District	19	18	1	1223	18	100	0	0	0	0	0	0
Grade 11	State	25	24	1	1232	22	92	2	8	0	0	0	0
	District	19	18	1	1233	16	89	2	11	0	0	0	0

The DSR contains the following features, highlighted above:

1. Content area of the report.
2. State and district included in the report.
3. Number of students by grade that were enrolled, tested, did not test, and average scale score by state and district.
4. The number and percentage of students at each performance level by grade in the state and district.

District Roster Report

The DRR provides district staff with a summary of student scale scores and performance levels by district and state. State-level data is taken from the individual participating state. See Figure 2 below.

Figure 2 – Sample District Roster Report

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DISTRICT ROSTER REPORT

2 Demonstration State
Demonstration District A

Grade 03

	English Language Arts 1							Mathematics						
	Enrolled	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)
State	25	17	1233	59	6	24	12	17	1239	35	0	47	18
District	19	15	1232	60	7	20	13	15	1237	40	0	47	13

3

Spring 2021

Student Name Student ID	English Language Arts				Mathematics			
	Test Status*	State Compare	Scale Score	Performance Level	Test Status*	State Compare	Scale Score	Performance Level
LastName1, First1 10021		+	1251	Level 3		+	1258	Level 4
LastName11, First11 10104	ESR	-	1200	Level 1	ESR	-	1200	Level 1
LastName13, First13 10107		=	1231	Level 1		-	1234	Level 1
LastName17, First17 10127		+	1259	Level 4		+	1253	Level 3
LastName19, First19 10138	ESM	-	1223		ESM	-	1200	
LastName23, First23 10165		+	1245	Level 3		+	1250	Level 3
LastName25, First25 10182		+	1259	Level 4		+	1260	Level 4
LastName5, First5 10048	ESM	+	1251		ESM	+	1249	
LastName7, First7 10087	DNT				DNT			

4

State Comparison Key
- \- Performance is lower than state average
- = Performance is similar to state average
- \+ Performance is greater than state average

* For descriptions of the Test Statuses, see your State's Guide for Score Report Interpretation.

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The DRR contains the following features, highlighted above:

1. Content areas of the report.
2. State and district included in the report.
3. Number of students that were enrolled, tested, the average scale score, and the percentage of students at each performance level by state and district.
4. The test status, state comparison, scale score, and performance level by student and content area. Refer to the Special Reporting Codes and Messages for information regarding test status.

Reports for the School

School Summary Report

The SSR provides summarized performance information at the district, state and school level for each grade, including number of students enrolled, tested, did not test, as well as average scale score and performance level. See Figure 3, below.

Figure 3 – Sample School Summary Report

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1 English Language Arts

2 SUMMARY REPORT
Demonstration State
Demonstration District A
Demonstration School 1

		3				4 Performance Level							
		Enrolled	Tested	Did Not Test	Average Scale Score	Level 1		Level 2		Level 3		Level 4	
						N	%	N	%	N	%	N	%
Grade 03	State	25	17	8	1222	17	100	0	0	0	0	0	0
	District	19	15	4	1221	15	100	0	0	0	0	0	0
	School	9	6	3	1223	6	100	0	0	0	0	0	0
Grade 04	State	25	25	0	1221	25	100	0	0	0	0	0	0
	District	19	19	0	1221	19	100	0	0	0	0	0	0
	School	8	8	0	1222	8	100	0	0	0	0	0	0
Grade 05	State	25	21	4	1226	17	81	4	19	0	0	0	0
	District	19	16	3	1227	12	75	4	25	0	0	0	0
	School	8	6	2	1226	5	83	1	17	0	0	0	0
Grade 06	State	25	25	0	1223	20	80	5	20	0	0	0	0
	District	18	18	0	1225	14	78	4	22	0	0	0	0
	School	8	8	0	1225	6	75	2	25	0	0	0	0
Grade 07	State	25	18	7	1225	18	100	0	0	0	0	0	0
	District	19	15	4	1224	15	100	0	0	0	0	0	0
	School	9	7	2	1219	7	100	0	0	0	0	0	0
Grade 08	State	25	23	2	1223	23	100	0	0	0	0	0	0
	District	19	18	1	1223	18	100	0	0	0	0	0	0
	School	8	7	1	1223	7	100	0	0	0	0	0	0
Grade 11	State	25	24	1	1232	22	92	2	8	0	0	0	0
	District	19	18	1	1233	16	89	2	11	0	0	0	0
	School	9	9	0	1232	9	100	0	0	0	0	0	0

The SSR contains the following features, highlighted above:

1. Content area of the report.
2. State, district, and school included in the report.
3. Number of students by grade that were enrolled, tested, did not test, and average scale score by state, district, and school.
4. The number and percentage of students at each performance level by grade in the state, district, and school.

School Roster Report

The SRR provides student performance information at the school level for each grade, including each student's test status, scale score, and performance level. See Figure 4, below.

Figure 4 – Sample School Roster Report

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SCHOOL ROSTER REPORT

1 Demonstration State
Demonstration District A
Demonstration School 1
Grade 03

2

		English Language Arts						Mathematics					
	Enrolled	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)
State	25	17	1222	100	0	0	0	17	1230	41	53	6	0
District	19	15	1221	100	0	0	0	15	1229	47	47	7	0
School	9	6	1223	100	0	0	0	6	1230	33	67	0	0

Spring 2021

3

Student Name Student ID	English Language Arts				Mathematics			
	Test Status*	State Compare	Scale Score	Performance Level	Test Status*	State Compare	Scale Score	Performance Level
LastName1, First1 10021		+	1228	Level 1		+	1238	Level 2
LastName11, First11 10104	ESR	-	1200	Level 1	ESR	-	1200	Level 1
LastName13, First13 10107		+	1231	Level 1		+	1237	Level 2
LastName17, First17 10127		+	1228	Level 1		+	1235	Level 2
LastName19, First19 10138	ESM	=	1220		ESM	-	1200	
LastName23, First23 10165		=	1225	Level 1		=	1233	Level 1
LastName25, First25 10182		=	1225	Level 1		+	1236	Level 2
LastName5, First5 10048	ESM	+	1228		ESM	+	1235	
LastName7, First7 10087	DNT				DNT			

4

State Comparison Key 5

- \- Performance is lower than state average
- = Performance is similar to state average
- \+ Performance is greater than state average

* For descriptions of the Test Statuses, see your State's Guide for Score Report Interpretation.

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Page 1

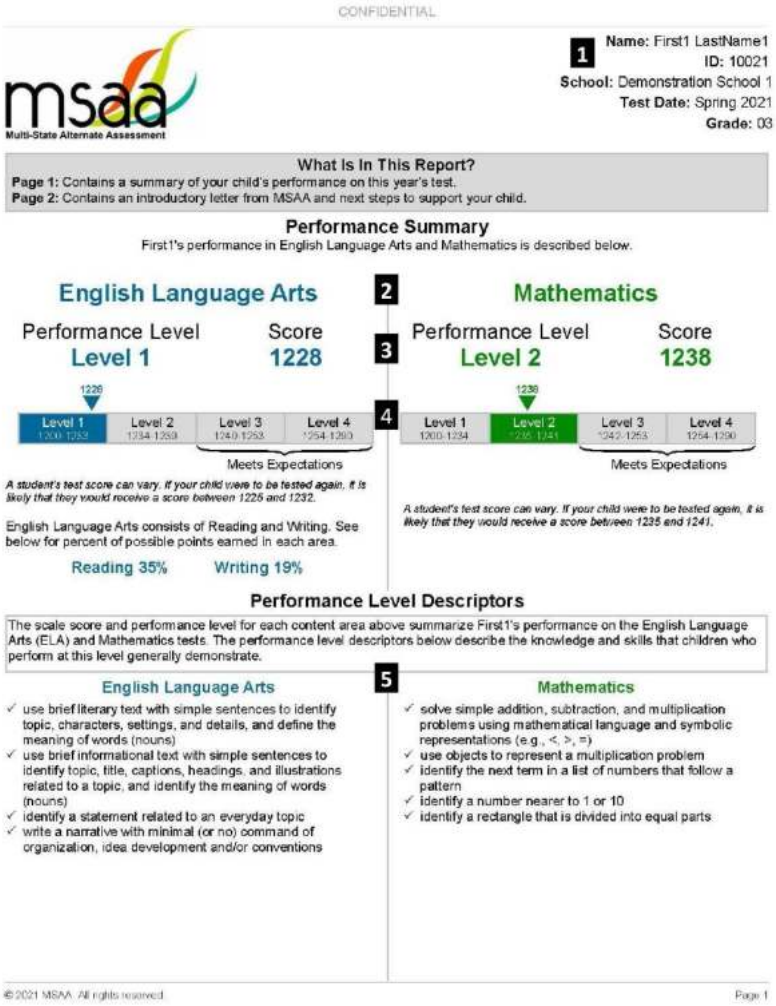
The SRR contains the following features, highlighted above:

1. The state, district, and school included in the report.
2. A summary of enrolled and tested students and the average scale score for the state, district, and reported school. The results are displayed by content area.
3. For each content area, the student's test status, comparison to other students in the same grade level in the state, scale score, and performance level are displayed.
4. This section of the report includes all students tested at the school for the specified grade.
5. This key shows symbols used in the "State Compare" column.

Individual Student Report

The ISR provides scale score and performance level information for a specific student. Figure 5 shows page 1 of the ISR. A full sample ISR is included in Appendix D.

Figure 5 – Sample Individual Student Report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1 Name: First1 LastName1
ID: 10021
School: Demonstration School 1
Test Date: Spring 2021
Grade: 03

What Is In This Report?
Page 1: Contains a summary of your child's performance on this year's test.
Page 2: Contains an introductory letter from MSAA and next steps to support your child.

Performance Summary
First1's performance in English Language Arts and Mathematics is described below.

English Language Arts 2 Mathematics

Performance Level Level 1 Score 1228 3 Performance Level Level 2 Score 1238

4 Level 1 (1200-1233) | Level 2 (1234-1239) | Level 3 (1240-1253) | Level 4 (1254-1290) — Meets Expectations

Level 1 (1200-1234) | Level 2 (1235-1241) | Level 3 (1242-1253) | Level 4 (1254-1290) — Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1225 and 1232.

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1235 and 1241.

English Language Arts consists of Reading and Writing. See below for percent of possible points earned in each area.

Reading 35% Writing 19%

Performance Level Descriptors

The scale score and performance level for each content area above summarize First1's performance on the English Language Arts (ELA) and Mathematics tests. The performance level descriptors below describe the knowledge and skills that children who perform at this level generally demonstrate.

5

English Language Arts
- ✓ use brief literary text with simple sentences to identify topic, characters, settings, and details, and define the meaning of words (nouns)
- ✓ use brief informational text with simple sentences to identify topic, title, captions, headings, and illustrations related to a topic, and identify the meaning of words (nouns)
- ✓ identify a statement related to an everyday topic
- ✓ write a narrative with minimal (or no) command of organization, idea development and/or conventions

Mathematics
- ✓ solve simple addition, subtraction, and multiplication problems using mathematical language and symbolic representations (e.g., <, >, =)
- ✓ use objects to represent a multiplication problem
- ✓ identify the next term in a list of numbers that follow a pattern
- ✓ identify a number nearer to 1 or 10
- ✓ identify a rectangle that is divided into equal parts

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The ISR contains the following features, highlighted above:

1. The report header includes the student's full name, student ID, grade and school.
2. The results for each content area are displayed separately on the report.
3. The student's scale score and performance level for each content area are shown.
4. This display shows the student's score compared to the performance level scale.
5. This text shows the performance level descriptor for the student's performance level.

Appendix A
Writing Scoring Rubrics

Grade 3 Writing Scoring Rubrics
Level 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) and includes a character with relevant descriptive statements. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **and** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The narrative includes a sequence of events that unfold naturally and develops a story using temporal words.	The narrative includes at a minimum: ☐ a sequence of **two** events related to the situation (activity **or** setting) ☐ **both** events include a detail	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The narrative includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** simple sentence that contains a complete thought **with** subject-verb agreement Ex: "Dog runs" or "dog runs"	The narrative includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** thought unit **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 3 Writing Scoring Rubrics
Level 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) and includes a character with relevant descriptive statements. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **and** setting) ☐ **two** descriptions related to a character ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ **one** description related to a character ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion **OR** ☐ descriptive words related to a character **or** situation (activity **or** setting)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes a sequence of events that unfold naturally and develops the story using temporal words (e.g., first, then, next).	The narrative includes at a minimum: ☐ **two** sequenced events related to the situation (activity **or** setting) ☐ **both** events include a detail ☐ appropriate use of temporal words that signal order of events	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail ☐ **one** temporal word that may **or** may not be used appropriately	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The narrative includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **more than one** thought unit ☐ **one** simple sentence that contains a complete thought **with** subject-verb agreement Ex: "Dog runs" or "dog runs"	The narrative includes at a minimum **two** of the following: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** simple sentence **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

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Grade 4 Writing Scoring Rubrics
Level 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity or setting) and includes a character. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The narrative includes a description of events using concrete words or sensory details (e.g., how things look, sound, taste, smell, or feel) related to the events.	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **both** of the events include a detail related to character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail related to a character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complex thought unit that expresses a complete idea **with** subject-verb agreement Ex: "The dog runs" or "the dog runs"	The narrative includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complex thought unit **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no** evidence of standard English conventions	

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Grade 4 Writing Scoring Rubrics
Level 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) and includes a character. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **and** setting) ☐ description of character **and** situation (activity **or** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ description of the character **or** the situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion **OR** ☐ descriptive words related to a character **or** situation (activity **or** setting)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes a description of events using concrete words or sensory details (e.g., how things look, sound, taste, smell or feel) related to the events.	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **both** events include a detail related to a character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail related to a character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The narrative includes at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **more than one** thought unit ☐ **one** complex thought unit that expresses a complete idea **with** subject-verb agreement Ex: "The dog runs" or "the dog runs"	The narrative includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complex thought unit **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no evidence** of standard English conventions	

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Grade 5 Writing Scoring Rubrics
Level 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) for the story and includes characters. The response provides a conclusion.	The narrative includes at a minimum: ☐ **two** characters **unchanged** through the narrative ☐ establish a situation (activity **and** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **two** characters ☐ a situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The narrative includes dialogue, and events supported with relevant details and descriptive statements.	The narrative includes at a minimum: ☐ **two** events that connect to the narrative ☐ **both** of the events include a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** dialogue statement from one character to the other character **relevant to the narrative** Ex.: I said "No, I want to play."	The narrative includes at a minimum: ☐ **two** events related to a characters' action **or** response to a situation (activity **or** setting) ☐ **one** of the events includes a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** dialogue statement from one character to the other character which **may not** be relevant to the narrative	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The narrative includes **more than one** sentence and at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The narrative includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no** evidence of standard English conventions	

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Grade 5 Writing Scoring Rubrics
Level 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) for the story and includes characters. The response provides a conclusion.	The narrative includes at a minimum: ☐ **two** characters unchanged through narrative ☐ identification of the situation (activity **and** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **two** characters ☐ identification of the setting **or** the activity ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character **or** conclusion	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The narrative includes dialogue, and events supported with relevant details and descriptive statements.	The narrative includes at a minimum: ☐ **two** sequenced events related to the situation (activity **or** setting) ☐ **both** events include a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** relevant conversation between two characters Ex.: I said "No! I don't want to go to bed." Mom said "OK."	The narrative includes at a minimum: ☐ **two** events related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** event that includes a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** relevant piece of dialogue showing what one character said to the other	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The narrative includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The narrative includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no evidence** of standard English conventions	

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Grade 6 Writing Scoring Rubrics
Level 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized to describe two opposing conditions (e.g., compare/contrast).	The essay includes at a minimum: ☐ an introduction that states the essay is about **two opposing conditions** ☐ a body that includes: ○ **one** activity for **each** of the two opposing conditions; **and** ○ **one** activity common to **both** conditions ☐ a conclusion that states **two opposing conditions or** summarizes the content	The essay includes at a minimum: ☐ an introduction that states **one** activity **or** topic ☐ a body that relates two conditions with activities ☐ a conclusion that states **one** activity **or** the topic	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, compare/contrast relationship, **or** conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes relevant facts and details to promote meaning and create clarity.	The essay includes at a minimum: ☐ **three** activities, each with relevant details (the same detail may be used for all activities **if relevant to each**)	The essay includes at a minimum: ☐ **one** activity with a relevant detail	The essay includes at a minimum: ☐ **one** detail that describes an activity	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

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Grade 6 Writing Scoring Rubrics
Level 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized to describe two opposing conditions (e.g., compare/contrast). The response provides a conclusion.	The essay includes at a minimum: ☐ an introduction that presents the **two** opposing conditions ☐ a body that includes: ○ **one** activity **common to both** conditions ○ **one** activity related to **each** of the two opposing conditions ☐ a conclusion that states the **two** opposing conditions	The essay includes at a minimum: ☐ an introduction that presents the topic ☐ a body that includes: ○ **one** activity **common to both** conditions ○ **one** activity related to **one of the two** opposing conditions ☐ a conclusion that states the topic	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, compare/contrast relationship, **or** conclusion)	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development –. The essay develops a topic, includes relevant facts and details, to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** activity related to **both** conditions **with** a relevant detail ☐ **one** activity related to **each** of the two opposing conditions, **each with** relevant details	The essay includes at a minimum: ☐ **two** activities **each with** a relevant detail	The essay includes at a minimum: ☐ **one** activity **OR** ☐ **one** detail that describes an activity	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "**T**he dog runs**.**"	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no evidence** of standard English conventions	

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Grade 7 Writing Scoring Rubrics
Level 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized with an effect related directly to a cause (e.g., cause/effect).	The essay includes at a minimum: ☐ an introduction that states the topic/cause ☐ a body that relates the effect to the provided cause ☐ a conclusion that states the essay is about a cause **and** its effect	The essay includes at a minimum: ☐ an introduction that states the topic/cause ☐ a body that includes an effect that **may not** relate to the provided cause ☐ a conclusion that states a cause **or** the effect	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, cause/effect relationship, **or** conclusion)	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes details to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** relevant detail to describe the effect	The essay includes at a minimum: ☐ **one** effect with **no** relevant detail	The essay includes at a minimum: ☐ **one** idea related to the topic	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence** and at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no** evidence of standard English conventions	

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Grade 7 Writing Scoring Rubrics
Level 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized with an effect related directly to a cause (cause/effect).	The essay includes at a minimum: ☐ an introduction that presents the cause **and** its effects ☐ a body that includes **two** effects **and** refers them to the cause ☐ a conclusion that states the essay is about a cause **and** its effects	The essay includes at a minimum: ☐ an introduction that presents a topic ☐ a body that includes **one** effect **and** refers it to the cause ☐ a conclusion that states the topic	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, on-topic cause/effect relationship, or conclusion)	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development– The essay develops a topic, includes details and transitional words to promote meaning and create clarity.	The essay includes at a minimum: ☐ **two** effects, **each** with a relevant detail ☐ transitional words to connect the cause to **each** of the **two** effects	The essay includes at a minimum: ☐ **one** effect **with** a relevant detail ☐ transitional word to **connect one** cause/effect relationship	The essay includes at a minimum: ☐ **one** detail that describes the cause **or** effect **OR** ☐ **one** transition word	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no evidence** of standard English conventions	

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Grade 8 Writing Scoring Rubrics
Level 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses the specified topic and is organized with a solution related directly to the problem (e.g., problem/solution).	The essay includes at a minimum: ☐ an introduction that states **both** parts of the problem ☐ a body that relates **how** the solution can be applied to the problem ☐ a conclusion that states the problem **and** the solution	The essay includes at a minimum: ☐ an introduction that states the problem ☐ **one** solution that **may not** relate to the problem ☐ a conclusion that states the problem **or** the solution	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, on-topic problem/solution relationship, **or** conclusion)	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes details to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** relevant detail to describe the problem ☐ **one** relevant detail to describe the solution	The essay includes at a minimum: ☐ **one** relevant detail to describe the problem **or** the solution	The essay includes at a minimum: ☐ **one** detail **or** word that describes the problem **or** the solution	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no** evidence of standard English conventions	

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Grade 8 Writing Scoring Rubrics
Level 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses the specified topic and is organized with a solution related directly to the problem (problem/solution).	The essay includes at a minimum: ☐ an introduction that states **both** parts of the problem ☐ body that includes a solution **and** refers to the problem ☐ a conclusion that states the problem **and** its solution	The essay includes at a minimum: ☐ an introduction that states **one** part of the problem ☐ a body that includes a **related** solution ☐ a conclusion that states the problem **or** the solution	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, on-topic problem/solution relationship, **or** conclusion)	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes details and transitional words to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** problem **with** a relevant detail ☐ **one** solution **with** a relevant detail ☐ **one** transitional word(s) that connects the problem to the solution	The essay includes at a minimum: ☐ **one** problem **or** solution **with** a relevant detail ☐ **one** transitional word(s) that is in relation to the problem **or** the solution	The essay includes at a minimum: ☐ **one** detail **or** word that describes the problem **or** the solution	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "**T**he dog runs**.**"	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no evidence** of standard English conventions	

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Grade 11 Writing Scoring Rubrics
Level 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified claim supported with organized complex ideas.	The essay includes at a minimum: ☐ an introduction that states the claim **and** a rational reason ☐ a conclusion that states the claim **and** the rational reason	The essay includes at a minimum: ☐ an introduction that states the claim **or** a reason ☐ a conclusion that states the claim **or** the reason	The essay includes at a minimum: ☐ **some** evidence related to the specified claim/topic (i.e., introduction, claim/topic, **or** conclusion)	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The defended claim includes relevant evidence, and uses words, phrases, and clauses to clarify the relationship among claim, reasons and evidence	The essay includes at a minimum: ☐ a body with **two** relevant facts **or** examples ☐ words **or** phrases to connect the reason with **one** relevant fact **or** example	The essay includes at a minimum: ☐ a body with **one** relevant fact **or** example ☐ **one** word **or** phrase to connect the reason with **one** fact or example	The essay includes at a minimum: ☐ **one** word related to the reason	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence** and at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no** evidence of standard English conventions	

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Grade 11 Writing Scoring Rubrics
Level 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified claim supported with organized complex ideas.	The essay includes at a minimum: ☐ an introduction that states the claim **and** is supported by **two** rational reasons ☐ a body that includes **two** reasons related to the claim ☐ a conclusion that states the claim **and** is supported by **two** rational reasons	The essay includes at a minimum: ☐ an introduction that states the claim ☐ a body that includes **one** reason related to the claim ☐ a conclusion that states the claim **with one** rational reason **or** relevant evidence	The essay includes at a minimum: ☐ **some** evidence related to the specified claim/topic (i.e., introduction, claim/topic, or conclusion)	0 ☐ **no** evidence of organization	5 ☐ evidence is **off topic**
Idea Development – The defended claim includes relevant evidence, and uses words, phrases, and clauses to clarify the relationship among claim, reasons and evidence.	The essay includes at a minimum: ☐ **one** piece of **relevant** evidence follows **each of the two** provided reasons ☐ words **or** phrases that **connect each of the two** reasons **with relevant** evidence	The essay includes at a minimum: ☐ a body with **one** reason **and one** piece of relevant evidence ☐ word **or** phrase that connects **one** reason **with one** piece of **relevant** evidence	The essay includes at a minimum: ☐ **one** word related to the reason **or** a connecting word or phrase	0 ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no evidence** of standard English conventions	

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Appendix B
Performance Level Descriptors

Performance Level Descriptors for ELA and Mathematics

MSAA developed PLDs for ELA and mathematics at grades 3–8 and 11 through an iterative process involving multiple stakeholder groups. The MSAA partnership developed grade-level PLDs to summarize the knowledge, skills, and abilities (KSAs) prioritized for the MSAA that students need to attain at each level of achievement (Level 1–Level 4). Each performance level is understood to include the knowledge, skills and abilities of the preceding performance levels.

The performance descriptors included in this appendix provide a detailed description for teachers, parents, and the public to see not only what grade-level content a student should know and be able to do in order to meet high expectations, but also the depth, breadth, and complexity of that content.

By using the PLDs, test results become multi-dimensional. Test results in the form of scale scores are one way educators, parents, and guardians find out where a student's performance is in relation to other students. The PLDs provide another dimension that completes the description of how a student interacts with the standards the test measures. Both of the scale score and the PLDs provide information that helps teachers, schools, parents and guardians build a path to student learning.

Grade 3 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify the topic of a literary text • identify a detail from a literary text • identify a character or setting in a literary text • identify the topic of an informational text • identify a title, caption, or heading in an informational text • identify an illustration related to a given topic • identify a topic presented by an illustration • identify the meaning of words (i.e., nouns)	**In reading, the student is able to:** • determine the central idea and supporting details in literary text • determine the main idea and identify supporting details in informational text • determine the main idea of visually presented information • identify the purpose of text features in informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use context to identify the meaning of multiple meaning words	**In reading, the student is able to:** • determine the central idea and supporting details in literary text • determine the main idea and identify supporting details in informational text • determine the main idea of visually presented information • identify the purpose of text features in informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use context to identify the meaning of multiple meaning words	**In reading, the student is able to:** • determine the central idea and supporting details in literary text • determine the main idea and identify supporting details in informational text • determine the main idea of visually presented information • identify the purpose of text features in informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use context to identify the meaning of multiple meaning words
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• use details from a literary text to answer specific questions • describe the relationship between characters, and character and setting in literary text	• use details from a literary text to answer specific questions • describe the relationship between characters, and character and setting in literary text	
	AND with accuracy, the student is able to: • identify simple words (i.e., words with a consonant at the beginning, a consonant at the end, and a short vowel in the middle)	**AND with accuracy, the student is able to:** • identify grade level words	
AND in writing, the student is able to: • identify a statement related to an everyday topic • use the writing process to create a narrative product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of a narrative text to include beginning, middle, and end • identify the category related to a set of facts • use the writing process to create a narrative product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify a text feature (e.g., captions, graphs or diagrams) to present information in explanatory text • use the writing process to create a narrative product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create a narrative product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

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Grade 4 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a topic of a literary text • identify a detail from a literary text • identify a character in a literary text • identify charts, graphs, diagrams, or timelines in an informational text • identify a topic of an informational text • use context to identify the meaning of multiple meaning words • identify general academic words	**In reading, the student is able to:** • determine the theme of literary text and identify supportive details • describe character traits using text-based details in literary text • determine the main idea of informational text • locate information in charts, graphs, diagrams, or timelines • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words	**In reading, the student is able to:** • determine the theme of literary text and identify supportive details • determine the main idea of informational text • explain how the information provided in charts, graphs, diagrams, or timelines contributes to an understanding of informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words	**In reading, the student is able to:** • determine the theme of literary text and identify supportive details • determine the main idea of informational text • explain how the information provided in charts, graphs, diagrams, or timelines contributes to an understanding of informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• use details from a literary text to answer specific questions • use context to identify the meaning of multiple meaning words	• use details from a literary text to answer specific questions • describe character traits using text-based details in literary text • use context to identify the meaning of multiple meaning words	
	AND with accuracy, the student is able to: • identify simple words (i.e., words with a consonant at the beginning, a consonant at the end, and a short vowel in the middle)	**AND with accuracy, the student is able to:** • identify grade level words	
AND in writing, the student is able to: • identify the concluding sentence in a short explanatory text • use the writing process to create a narrative product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of a narrative text to include beginning, middle, and end • identify a concluding sentence related to information in explanatory text • use the writing process to create a narrative product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify a text feature (e.g., headings, charts, or diagrams) to present information in explanatory text • use the writing process to create a narrative product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create a narrative product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 5 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify an event from the beginning of a literary text • identify a detail from a literary text • identify a character, setting and event in a literary text • identify the topic of an informational text • identify the main idea of an informational text • identify the difference in how information is presented in two sentences	**In reading, the student is able to:** • compare characters, settings, and events in literary text • determine the main idea and identify supporting details in informational text • use details from the text to support an author's point in informational text • compare and contrast how information and events are presented in two informational texts • use context to identify the meaning of multiple meaning words	**In reading, the student is able to:** • compare characters, settings, and events in literary text • determine the main idea and identify supporting details in informational text • use details from the text to support an author's point in informational text • compare and contrast how information and events are presented in two informational texts • use context to identify the meaning of multiple meaning words	**In reading, the student is able to:** • compare characters, settings, and events in literary text • determine the main idea and identify supporting details in informational text • use details from the text to support an author's point in informational text • compare and contrast how information and events are presented in two informational texts • use context to identify the meaning of multiple meaning words
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• summarize a literary text from beginning to end • use details from a literary text to answer specific questions	• summarize a literary text from beginning to end • use details from a literary text to answer specific questions	
AND in writing, the student is able to: • identify the category related to a set of common nouns • use the writing process to create a narrative product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of a narrative text to include beginning, middle, and end • identify a sentence that is organized for a text structure such as comparison/contrast • use the writing process to create a narrative product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • support an explanatory text topic with relevant information • use the writing process to create a narrative product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create a narrative product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 6 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify an event from the beginning or end of a literary text • identify a detail from a literary text • identify a character in a literary text • identify the topic of an informational text • identify the main idea of an informational text • identify a fact from an informational text • identify a description of an individual or event in an informational text • use context to identify the meaning of multiple meaning words • identify the meaning of general academic words	**In reading, the student is able to:** • summarize a literary text from beginning to end without including personal opinions • support inferences about characters using details in literary text • use details from the text to elaborate a key idea in informational text	**In reading, the student is able to:** • summarize a literary text from beginning to end without including personal opinions • support inferences about characters using details in literary text • summarize an informational text without including personal opinions • use details from the text to elaborate a key idea in informational text • use evidence from the text to support an author's claim in informational text • summarize information presented in two informational texts • use domain specific words accurately	**In reading, the student is able to:** • summarize a literary text from beginning to end without including personal opinions • use details from a literary text to answer specific questions • support inferences about characters using details in literary text • use details from the text to elaborate a key idea in an informational text • use evidence from the text to support an author's claim in informational text • use domain specific words accurately
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• use details from a literary text to answer specific questions • use context to identify the meaning of multiple meaning words	• use details from a literary text to answer specific questions • use context to identify the meaning of multiple meaning words	
AND in writing, the student is able to: • identify an everyday order of events • use the writing process to create an explanatory product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of an explanatory text to include introduction, body, and conclusion • identify the next event in a brief narrative • use the writing process to create an explanatory product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify transition words and phrases to convey a sequence of events in narrative text • use the writing process to create an explanatory product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create an explanatory product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 7 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a theme from a literary text • identify an inference from a literary text • identify a conclusion from an informational text • identify a claim the author makes in an informational text • compare and contrast two statements related to the same topic • use context to identify the meaning of words	**In reading, the student is able to:** • identify the relationship between individuals or events in an informational text • use evidence from the text to support an author's claim in informational text	**In reading, the student is able to:** • use details to support a conclusion from informational text • use details to explain how the interactions between individuals, events or ideas in informational texts are influenced by each other • use evidence from the text to support an author's claim in informational text • compare and contrast how two authors write about the same topic in informational texts • use context to identify the meaning of grade-level phrases	**In reading, the student is able to:** • use details to support a conclusion from informational text • use details to explain how the interactions between individuals, events or ideas in informational texts are influenced by each other • use evidence from the text to support an author's claim in informational text • compare and contrast how two authors write about the same topic in informational texts • use context to identify the meaning of grade-level phrases
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• use details to support themes from literary text • use details to support inferences from literary text	• use details to support themes from literary text • use details to support inferences from literary text	
AND in writing, the student is able to: • identify a graphic that includes an event as described in a text • use the writing process to create an explanatory product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of an explanatory text to include introduction, body, and conclusion • identify the next event in a brief narrative • use the writing process to create an explanatory product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify a sentence that provides a conclusion in narrative text • use the writing process to create an explanatory product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create an explanatory product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 8 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a theme from a literary text • identify an inference from a literary text • identify a fact related to a presented argument in informational text • identify a similar topic in two informational texts • use context to identify the meaning of multiple meaning words • identify the meaning of general academic words	**In reading, the student is able to:** • use details to support a conclusion from literary text • identify an inference drawn from an informational text • identify the portion of text which contains specific information • identify an argument the author makes in informational text • examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation • use domain specific words or phrases accurately	**In reading, the student is able to:** • use details to support a conclusion from literary text • use details to support an inference from informational text • identify the information (e.g., facts or quotes) in a section of text that contributes to the development of an idea • identify an argument the author makes in informational text • examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation • use domain specific words and phrases accurately	**In reading, the student is able to:** • use details to support a conclusion from literary text • use details to support an inference from informational text • identify the information (e.g., facts or quotes) in a section of text that contributes to the development of an idea • identify an argument the author makes in informational text • examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation • use domain specific words and phrases accurately
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• analyze the development of a theme including the relationship between a character and an event in literary text • use context to identify the meaning of grade-level words and phrases	• analyze the development of a theme including the relationship between a character and an event in literary text • use context to identify the meaning of grade-level words and phrases	
AND in writing, the student is able to: • identify a writer's opinion • use the writing process to create an explanatory product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of an explanatory text to include introduction, body, and conclusion • identify an idea relevant to a claim • use the writing process to create an explanatory product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify relevant information to support a claim • use the writing process to create an explanatory product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create an explanatory product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 11 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a summary of a literary text • identify an event from a literary text • identify the central idea of an informational text • identify facts from an informational text • identify what an author tells about a topic in informational text • use context to identify the meaning of multiple meaning words • identify a word used to describe a person, place, thing, action or event	**In reading, the student is able to:** • use details to support a summary of literary text • identify a conclusion from an informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts	**In reading, the student is able to:** • use details to support a summary of literary text • use details to support a conclusion presented in informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts	**In reading, the student is able to:** • use details to support a summary of literary text • use details to support a conclusion presented in informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• evaluate how the author's use of specific details in literary text contributes to the text • determine an author's point of view about a topic in informational text • use context to identify the meaning of grade-level phrases	• evaluate how the author's use of specific details in literary text contributes to the text • determine an author's point of view about a topic in informational text • use context to identify the meaning of grade-level phrases	
AND in writing, the student is able to: • identify information which is unrelated to a given topic • use the writing process to create an argumentative product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of an argument to include introduction, claim, evidence, and conclusion • identify how to group information for a specific text structure • use the writing process to create an argumentative product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify relevant information to address a given topic and support the purpose of a text • use the writing process to create an argumentative product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create an argumentative product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 3 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • solve addition problems • identify growing number patterns • identify an object showing a specified number of parts shaded • identify which object has the greater number of parts shaded • identify an object equally divided in two parts • identify the number of objects to be represented in a pictograph	**The student is able to:** • solve addition and subtraction word problems • identify an arrangement of objects which represents factors in a problem • solve multiplication equations in which both numbers are equal to or less than five • identify multiplication patterns • identify a set of objects as nearer to 1 or 10 • identify a representation of the area of a rectangle	**The student is able to:** • solve addition and subtraction word problems • check the correctness of an answer in the context of a scenario • solve multiplication equations in which both numbers are equal to or less than five • identify multiplication patterns • match fraction models to unitary fractions • compare fractions with different numerators and the same denominator • transfer data from an organized list to a bar graph	**The student is able to:** • solve addition and subtraction word problems • check the correctness of an answer in the context of a scenario • solve multiplication equations in which both numbers are equal to or less than five • identify multiplication patterns • match fraction models to unitary fractions • compare fractions with different numerators and the same denominator • transfer data from an organized list to a bar graph
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify geometric figures which are divided into equal parts	• round numbers to nearest 10 • identify geometric figures which are divided into equal parts • count unit squares to compute the area of a rectangle	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

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Grade 4 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • identify an array with the same number of objects in each row • identify values rounded to nearest tens place • identify equivalent representations of a fraction (e.g., shaded diagram) • compare representations of a fraction (e.g., shaded diagram) • identify a rectangle with the larger or smaller perimeter • identify a given attribute of a shape • identify the data drawn in a bar graph that represents the greatest value	**The student is able to:** • match a model to an multiplication expression using two single digit numbers • identify a model of a multiplicative comparison • show division of objects into equal groups • round numbers to nearest 10, 100 or 1000 • differentiate parts and wholes • compute the perimeter of a rectangle	**The student is able to:** • solve multiplication word problems • show division of objects into equal groups • round numbers to nearest 10, 100, or 1000 • compare two fractions with different denominators • sort a set of 2-dimensional shapes • compute the perimeter of a rectangle • transfer data to a graph	**The student is able to:** • solve multiplication word problems • show division of objects into equal groups • round numbers to nearest 10, 100 or 1000 • compare two fractions with different denominators • sort a set of 2-dimensional shapes • compute the perimeter of a rectangle • transfer data to a graph
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify equivalent fractions • select a 2-dimensional shape with a given attribute	• solve a multiplicative comparison word problem using up to two-digit numbers • check the correctness of an answer in the context of a scenario • identify equivalent fractions	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 081618

Grade 5 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • solve one-step subtraction word problems • divide sets (no greater than 6) into two equal parts • identify values in the tenths place • identify a number in the ones, tens or hundreds place • identify a given axis of a coordinate plan • match the conversion of 3 feet to 1 yard to a model • calculate elapsed time (i.e., hours) • identify whether the values increase or decrease in a line graph	**The student is able to:** • identify if the total will increase or decrease when combining sets • perform operations with decimals • identify a symbolic representation of the addition of two fractions • identify place values to the hundredths place • convert standard measurements	**The student is able to:** • solve multiplication and division word problems • perform operations with decimals • solve word problems involving fractions • identify place values to the hundredths place • locate a given point on a coordinate plane when given an ordered pair • convert standard measurements • convert between minutes and hours • make quantitative comparisons between data sets shown as line graphs	**The student is able to:** • solve multiplication and division word problems • perform operations with decimals • solve word problems involving fractions • identify place values to the hundredths place • locate a given point on a coordinate plane when given an ordered pair • convert standard measurements • convert between minutes and hours • make quantitative comparisons between data sets shown as line graphs
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• compare the values of two products based upon multipliers • round decimals to nearest whole number	• compare the values of two products based upon multipliers • round decimals to nearest whole number	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

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Grade 6 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • identify a model of a given percent • match a given unit rate to a model • identify a representation of two equal sets • identify a number less than zero on a number line • identify the meaning of an unknown in a modeled equation • count the number of grids or tiles inside a rectangle to find the area of a rectangle • identify the object that appears most frequently in a set of data (mode) • identify a representation of a set of data arranged into even groups (mean)	**The student is able to:** • match a given ratio to a model • recognize a representation of the sum of two halves • solve real world measurement problems involving unit rates • identify a representation of a value less than zero • identify the median or the equation needed to determine the mean of a set of data	**The student is able to:** • perform operations using up to three-digit numbers • solve real world measurement problems involving unit rates • identify positive and negative values on a number line • determine the meaning of a value from a set of positive and negative integers • solve word problems with expressions including variables • compute the area of a parallelogram • identify the median or the equation needed to determine the mean of a set of data	**The student is able to:** • solve real world measurement problems involving unit rates • identify positive and negative values on a number line • solve word problems with expressions including variables • compute the area of a parallelogram • identify the median or the equation needed to determine the mean of a set of data
	AND with Moderate task complexity *- Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• perform one-step operations with two decimal numbers • solve word problems using a percent	• perform one-step operations with two decimal numbers • solve word problems using a percent • solve word problems using ratios and rates	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

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Grade 7 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • identify a representation which represents a negative number and its multiplication or division by a positive number • identify representations of area and circumference of a circle • identify representations of surface area • make qualitative comparisons when interpreting a data set presented on a bar graph or in a table	**The student is able to:** • match a given ratio to a model • identify the meaning of an unknown in a modeled equation • describe a directly proportional relationship (i.e., increases or decreases) • find the surface area of three-dimensional right prism	**The student is able to:** • solve division problems with positive/negative whole numbers • solve word problems involving ratios • use a proportional relationship to solve a percentage problem • identify proportional relationships between quantities represented in a table • identify unit rate (constant of proportionality) in tables and graphs of proportional relationships • compute the area of a circle • find the surface area of a three-dimensional right prism	**The student is able to:** • solve division problems with positive/negative whole numbers • solve word problems involving ratios • identify proportional relationships between quantities represented in a table • compute the area of a circle • find the surface area of a three-dimensional right prism
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• solve multiplication problems with positive/negative whole numbers • interpret graphs to qualitatively contrast data sets	• solve multiplication problems with positive/negative whole numbers • evaluate variable expressions that represent word problems • interpret graphs to qualitatively contrast data sets	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 081618

Grade 8 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • locate a given decimal number on a number line • identify the relatively larger data set when given two data sets presented in a graph • identify congruent rectangles • identify similar rectangles • identify an attribute of a cylinder • identify a rectangle with the larger or smaller area as compared to another rectangle • identify an ordered pair and its point on a graph	**The student is able to:** • identify the solution to an equation which contains a variable • identify the y-intercept of a linear graph • match a given relationship between two variables to a model • identify a data display that represents a given situation • interpret data presented in graphs to identify associations between variables	**The student is able to:** • locate approximate placement of an irrational number on a number line • solve a linear equation which contains a variable • identify the relationship shown on a linear graph • calculate slope of a positive linear graph • compute the change in area of a figure when its dimensions are changed • solve for the volume of a cylinder • plot provided data on a graph	**The student is able to:** • locate approximate placement of an irrational number on a number line • solve a linear equation which contains a variable • identify the relationship shown on a linear graph • compute the change in area of a figure when its dimensions are changed • plot provided data on a graph
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify congruent figures • use properties of similarity to identify similar figures • interpret data tables to identify the relationship between variables	• interpret data presented in graphs to identify associations between variables • interpret data tables to identify the relationship between variables • use properties of similarity to identify similar figures • identify congruent figures	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 081618

Grade 11 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • arrange a given number of objects into two sets in multiple combinations • match an equation with a variable to a provided real world situation • determine whether a given point is or is not part of a data set shown on a graph • identify an extension of a linear graph • use a table to match a unit conversion • complete the formula for area of a figure	**The student is able to:** • identify the model that represents a square number • identify variable expressions which represent word problems • identify the hypotenuse of a right triangle • identify the greatest or least value in a set of data shown on a number line • identify the missing label on a histogram • calculate the mean and median of a set of data	**The student is able to:** • compute the value of an expression that includes an exponent • identify variable expressions which represent word problems • solve real world measurement problems that require unit conversions • find the missing attribute of a three-dimensional figure • determine two similar right triangles when a scale factor is given • make predictions from data tables and graphs to solve problems • plot data on a histogram • calculate the mean and median of a set of data	**The student is able to:** • identify variable expressions which represent word problems • solve real world measurement problems that require unit conversions • determine two similar right triangles when a scale factor is given • make predictions from data tables and graphs to solve problems • plot data on a histogram • calculate the mean and median of a set of data
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify the linear representation of a provided real world situation • use an equation or a linear graphical representation to solve a word problem	• identify the linear representation of a provided real world situation • use an equation or a linear graphical representation to solve a word problem • identify a histogram which represents a provided data set	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 081618

Appendix C
Scale Score Ranges

Table 1 –
2021 Performance-Level Scale Score Ranges by Content Area and Grade

Performance Level	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11
English Language Arts							
Level 4	1254-1290	1259-1290	1256-1290	1251-1290	1255-1290	1250-1290	1255-1290
Level 3	1240-1253	1240-1258	1240-1255	1237-1250	1240-1254	1238-1249	1240-1254
Level 2	1234-1239	1234-1239	1232-1239	1231-1236	1236-1239	1230-1237	1236-1239
Level 1	1200-1233	1200-1233	1200-1231	1200-1230	1200-1235	1200-1229	1200-1235
Mathematics							
Level 4	1254-1290	1251-1290	1253-1290	1251-1290	1254-1290	1251-1290	1250-1290
Level 3	1242-1253	1239-1250	1240-1252	1239-1250	1240-1253	1240-1250	1240-1249
Level 2	1235-1241	1232-1238	1232-1239	1233-1238	1234-1239	1234-1239	1235-1239
Level 1	1200-1234	1200-1231	1200-1231	1200-1232	1200-1233	1200-1233	1200-1234

Appendix D
Individual Student Report Sample

CONFIDENTIAL

Name: First1 LastName1
ID: 10021
School: Demonstration School 1
Test Date: Spring 2021
Grade: 03

What Is In This Report?

Page 1: Contains a summary of your child's performance on this year's test.
Page 2: Contains an introductory letter from MSAA and next steps to support your child.

Performance Summary

First1's performance in English Language Arts and Mathematics is described below.

English Language Arts

Performance Level **Level 1** Score **1228**

Level 1	Level 2	Level 3	Level 4
1200-1233	1234-1239	1240-1253	1254-1290

1228 ▼

Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1225 and 1232.

English Language Arts consists of Reading and Writing. See below for percent of possible points earned in each area.

Reading 35% **Writing 19%**

Mathematics

Performance Level **Level 2** Score **1238**

Level 1	Level 2	Level 3	Level 4
1200-1234	1235-1241	1242-1253	1254-1290

1238 ▼

Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1235 and 1241.

Performance Level Descriptors

The scale score and performance level for each content area above summarize First1's performance on the English Language Arts (ELA) and Mathematics tests. The performance level descriptors below describe the knowledge and skills that children who perform at this level generally demonstrate.

English Language Arts

- ✓ use brief literary text with simple sentences to identify topic, characters, settings, and details, and define the meaning of words (nouns)
- ✓ use brief informational text with simple sentences to identify topic, title, captions, headings, and illustrations related to a topic, and identify the meaning of words (nouns)
- ✓ identify a statement related to an everyday topic
- ✓ write a narrative with minimal (or no) command of organization, idea development and/or conventions

Mathematics

- ✓ solve simple addition, subtraction, and multiplication problems using mathematical language and symbolic representations (e.g., <, >, =)
- ✓ use objects to represent a multiplication problem
- ✓ identify the next term in a list of numbers that follow a pattern
- ✓ identify a number nearer to 1 or 10
- ✓ identify a rectangle that is divided into equal parts

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Dear Parents and Guardians,

This report summarizes your child's performance on the online 2021 Multi-State Alternate Assessment (MSAA). This report shows the scaled score and performance levels in English Language Arts (ELA) and Mathematics. Also shown is the percent of possible points earned in Reading and Writing. The performance level descriptors describe the knowledge and skills that children who perform at this level generally demonstrate.

The MSAA is designed to assess students in grades 3-8 and 11 with significant cognitive disabilities and measures academic content that is aligned to and derived from your state's content standards. The test contains many built-in supports that allow students to take the test using materials they are most familiar with and to communicate what they know and can do. These are some of the built-in supports found in the MSAA:

- shortened ELA reading passages
- pictures, charts, tables, and maps to help students understand the reading passages
- models and examples that explain important ideas and concepts
- smaller numbers on the mathematics tests

To support communication independence to the greatest extent possible, the MSAA is designed to work with different communication modes and systems. Please discuss the supports your child used on the MSAA with your child's teacher.

More information and resources for helping your child are available at your state's alternate assessment web page or by talking with your child's teacher. If you require this letter or your child's report in a different format, please contact your state's department of education.

What skills can be worked on next?

English Language Arts

+ Determine the main idea and supporting details of text
+ Use information from charts, graphs, diagrams to answer questions
+ Use general academic words in reading and writing
+ Produce writing that expresses real or imaginary experiences and ideas

Mathematics

+ Use mathematical terms and symbols (<, >, =)
+ Round numbers to the nearest ten, hundred, or thousand
+ Solve single digit multiplication problems including arrays, models, and word problems
+ Compare fractions with different denominators; identify equivalent fractions
+ Identify perimeter of a rectangle
+ Analyze data in bar graphs
+ Sort two-dimensional shapes

What now?

Bring this report to your next conference with First1's teachers.
You can ask First1's teachers:

- What is First1 learning in ELA and Mathematics this year?
- How is First1 doing?
- How can I use this information to work with First1 this year?
- What resources should I use to support First1?

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Multi-State Alternate Assessment

APPENDIX H

MSAA QUALIFICATION RATES

Table H-1. Qualification Summary

Grade 3	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	4	0	4	3	6	9
Total Failed	4	4		18	12	
Grade 4	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	3	2	5	7	8	15
Total Failed	4	2		12	4	
Grade 5	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	6	1	7	15	0	15
Total Failed	10	3		2	2	
Grade 6	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	4	1	5	15	0	15
Total Failed	2	1		2	2	
Grade 7	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified
Total Passed	3	2	5	7	1	8
Total Failed	3	1		10	9	
Grade 8	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	2	4	6	5	2	7
Total Failed	5	1		13	9	
Grade 11	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	5	0	5	5	4	9
Total Failed	1	1		13	9	

Note: For identification purposes in iScore, Level 2 items were designated as WRCC002 across all grades and Level 3 items were designated WRCC003.

APPENDIX I

SAMPLE STUDENT REPORT

Multi-State Alternate Assessment

Name: First1 LastName1
ID: 10021
School: Demonstration School 1
Test Date: Spring 2021
Grade: 03

What Is In This Report?

Page 1: Contains a summary of your child's performance on this year's test.
Page 2: Contains an introductory letter from MSAA and next steps to support your child.

Performance Summary

First1's performance in English Language Arts and Mathematics is described below.

English Language Arts

Performance Level
Level 1

Score
1228

1228

Level 1	Level 2	Level 3	Level 4
1200-1233	1234-1239	1240-1253	1254-1290

Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1225 and 1232.

English Language Arts consists of Reading and Writing. See below for percent of possible points earned in each area.

Reading 35% **Writing 19%**

Mathematics

Performance Level
Level 2

Score
1238

1238

Level 1	Level 2	Level 3	Level 4
1200-1234	1235-1241	1242-1253	1254-1290

Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1235 and 1241.

Performance Level Descriptors

The scale score and performance level for each content area above summarize First1's performance on the English Language Arts (ELA) and Mathematics tests. The performance level descriptors below describe the knowledge and skills that children who perform at this level generally demonstrate.

English Language Arts

- ✓ use brief literary text with simple sentences to identify topic, characters, settings, and details, and define the meaning of words (nouns)
- ✓ use brief informational text with simple sentences to identify topic, title, captions, headings, and illustrations related to a topic, and identify the meaning of words (nouns)
- ✓ identify a statement related to an everyday topic
- ✓ write a narrative with minimal (or no) command of organization, idea development and/or conventions

Mathematics

- ✓ solve simple addition, subtraction, and multiplication problems using mathematical language and symbolic representations (e.g., <, >, =)
- ✓ use objects to represent a multiplication problem
- ✓ identify the next term in a list of numbers that follow a pattern
- ✓ identify a number nearer to 1 or 10
- ✓ identify a rectangle that is divided into equal parts

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Dear Parents and Guardians,

This report summarizes your child's performance on the online 2021 Multi-State Alternate Assessment (MSAA). This report shows the scaled score and performance levels in English Language Arts (ELA) and Mathematics. Also shown is the percent of possible points earned in Reading and Writing. The performance level descriptors describe the knowledge and skills that children who perform at this level generally demonstrate.

The MSAA is designed to assess students in grades 3-8 and 11 with significant cognitive disabilities and measures academic content that is aligned to and derived from your state's content standards. The test contains many built-in supports that allow students to take the test using materials they are most familiar with and to communicate what they know and can do. These are some of the built-in supports found in the MSAA:

- shortened ELA reading passages
- pictures, charts, tables, and maps to help students understand the reading passages
- models and examples that explain important ideas and concepts
- smaller numbers on the mathematics tests

To support communication independence to the greatest extent possible, the MSAA is designed to work with different communication modes and systems. Please discuss the supports your child used on the MSAA with your child's teacher.

More information and resources for helping your child are available at your state's alternate assessment web page or by talking with your child's teacher. If you require this letter or your child's report in a different format, please contact your state's department of education.

What skills can be worked on next?

English Language Arts

+ Determine the main idea and supporting details of text
+ Use information from charts, graphs, diagrams to answer questions
+ Use general academic words in reading and writing
+ Produce writing that expresses real or imaginary experiences and ideas

Mathematics

+ Use mathematical terms and symbols (<, >, =)
+ Round numbers to the nearest ten, hundred, or thousand
+ Solve single digit multiplication problems including arrays, models, and word problems
+ Compare fractions with different denominators; identify equivalent fractions
+ Identify perimeter of a rectangle
+ Analyze data in bar graphs
+ Sort two-dimensional shapes

What now?

Bring this report to your next conference with First1's teachers.
You can ask First1's teachers:

- What is First1 learning in ELA and Mathematics this year?
- How is First1 doing?
- How can I use this information to work with First1 this year?
- What resources should I use to support First1?

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Multi-State Alternate Assessment

Name: First11 LastName11
ID: 10104
School: Demonstration School 1
Test Date: Spring 2021
Grade: 03

What Is In This Report?

Page 1: Contains a summary of your child's performance on this year's test.
Page 2: Contains an introductory letter from MSAA and next steps to support your child.

Performance Summary

First11's performance in English Language Arts and Mathematics is described below.

English Language Arts

Performance Level **Level 1***

Score **1200**

1200

Level 1	Level 2	Level 3	Level 4
1200-1233	1234-1239	1240-1253	1254-1290

Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1200 and 1215.

English Language Arts consists of Reading and Writing. See below for percent of possible points earned in each area.

Reading N/A **Writing N/A**

Mathematics

Performance Level **Level 1***

Score **1200**

1200

Level 1	Level 2	Level 3	Level 4
1200-1234	1235-1241	1242-1253	1254-1290

Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1200 and 1230.

Performance Level Descriptors

The scale score and performance level for each content area above summarize First11's performance on the English Language Arts (ELA) and Mathematics tests. The performance level descriptors below describe the knowledge and skills that children who perform at this level generally demonstrate.

English Language Arts

* Your child did not show an observable response mode during the test; therefore, the test was not administered by the teacher. If you have additional questions, please contact your child's teacher.

Mathematics

* Your child did not show an observable response mode during the test; therefore, the test was not administered by the teacher. If you have additional questions, please contact your child's teacher.

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Dear Parents and Guardians,

This report summarizes your child's performance on the online 2021 Multi-State Alternate Assessment (MSAA). This report shows the scaled score and performance levels in English Language Arts (ELA) and Mathematics. Also shown is the percent of possible points earned in Reading and Writing. The performance level descriptors describe the knowledge and skills that children who perform at this level generally demonstrate.

The MSAA is designed to assess students in grades 3-8 and 11 with significant cognitive disabilities and measures academic content that is aligned to and derived from your state's content standards. The test contains many built-in supports that allow students to take the test using materials they are most familiar with and to communicate what they know and can do. These are some of the built-in supports found in the MSAA:

- shortened ELA reading passages
- pictures, charts, tables, and maps to help students understand the reading passages
- models and examples that explain important ideas and concepts
- smaller numbers on the mathematics tests

To support communication independence to the greatest extent possible, the MSAA is designed to work with different communication modes and systems. Please discuss the supports your child used on the MSAA with your child's teacher.

More information and resources for helping your child are available at your state's alternate assessment web page or by talking with your child's teacher. If you require this letter or your child's report in a different format, please contact your state's department of education.

What skills can be worked on next?

English Language Arts

- Revisit IEP communication goals in collaboration with the speech language pathologist, AT specialist, and others who assist the student in developing a consistent mode of communication.

Mathematics

- Revisit IEP communication goals in collaboration with the speech language pathologist, AT specialist, and others who assist the student in developing a consistent mode of communication.

What now?

Bring this report to your next conference with First11's teachers.
You can ask First11's teachers:
• What is First11 learning in ELA and Mathematics this year?
• How is First11 doing?
• How can I use this information to work with First11 this year?
• What resources should I use to support First11?

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Multi-State Alternate Assessment

Name: First2 LastName2
ID: 10203045
School: Demonstration School 2
Test Date: Spring 2021
Grade: 11

What Is In This Report?

Page 1: Contains a summary of your child's performance on this year's test.
Page 2: Contains an introductory letter from MSAA and next steps to support your child.

Performance Summary

First2's performance in English Language Arts and Mathematics is described below.

English Language Arts

Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.

Mathematics

Performance Level	Score
Level 2	**1237**

1237

Level 1	Level 2	Level 3	Level 4
1200-1234	1235-1239	1240-1249	1250-1290

Meets Expectations

A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1234 and 1240.

Performance Level Descriptors

The scale score and performance level for each content area above summarize First2's performance on the English Language Arts (ELA) and Mathematics tests. The performance level descriptors below describe the knowledge and skills that children who perform at this level generally demonstrate.

English Language Arts

Mathematics

- ✓ solve simple word problems using mathematical language and symbolic representations (e.g., <, >, =, x, y)
- ✓ write equations that contain a variable
- ✓ solve a real-world problem using a line graph
- ✓ calculate the mean and median of a set of data
- ✓ identify the hypotenuse of a right triangle
- ✓ identify the greatest or least value of data shown on a number line
- ✓ identify the missing label on a histogram
- ✓ identify a model that represents a square number

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Dear Parents and Guardians,

This report summarizes your child's performance on the online 2021 Multi-State Alternate Assessment (MSAA). This report shows the scaled score and performance levels in English Language Arts (ELA) and Mathematics. Also shown is the percent of possible points earned in Reading and Writing. The performance level descriptors describe the knowledge and skills that children who perform at this level generally demonstrate.

The MSAA is designed to assess students in grades 3-8 and 11 with significant cognitive disabilities and measures academic content that is aligned to and derived from your state's content standards. The test contains many built-in supports that allow students to take the test using materials they are most familiar with and to communicate what they know and can do. These are some of the built-in supports found in the MSAA:

- shortened ELA reading passages
- pictures, charts, tables, and maps to help students understand the reading passages
- models and examples that explain important ideas and concepts
- smaller numbers on the mathematics tests

To support communication independence to the greatest extent possible, the MSAA is designed to work with different communication modes and systems. Please discuss the supports your child used on the MSAA with your child's teacher.

More information and resources for helping your child are available at your state's alternate assessment web page or by talking with your child's teacher. If you require this letter or your child's report in a different format, please contact your state's department of education.

What skills can be worked on next?

English Language Arts

Mathematics

+ Simplify expressions that contain exponents
+ Use an equation to find the volume of a figure
+ Select the graphical representation of a linear model
+ Complete a histogram
+ Make predictions based on a given model
+ Solve problems using equations or graphs
+ Use descriptive stats such as range, median, mode, and mean to describe the data set
+ Solve real world measurement problems that require interpretation
+ Translate a real-world problem into a one-variable equation
+ Identify similarities in figures

What now?

Bring this report to your next conference with First2's teachers. You can ask First2's teachers:

- What is First2 learning in ELA and Mathematics this year?
- How is First2 doing?
- How can I use this information to work with First2 this year?
- What resources should I use to support First2?

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APPENDIX J

DIFFERENTIAL ITEM FUNCTIONING RESULTS

Table J-1. DIF— ELA—Dichotomous

Grade	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
3	Male	Female	69	7	2	5	1	1	0
	Non-EconDis	EconDis	41	3	1	2	0	0	0
	White	Black or African American	27	2	0	2	0	0	0
		Hispanic or Latino	55	0	0	0	0	0	0
4	Male	Female	60	1	0	1	0	0	0
	Non-EconDis	EconDis	55	0	0	0	0	0	0
	White	Black or African American	50	3	1	2	1	0	1
		Hispanic or Latino	55	5	3	2	0	0	0
5	Male	Female	62	4	3	1	1	1	0
	Non-EconDis	EconDis	62	0	0	0	0	0	0
	White	Black or African American	30	1	1	0	0	0	0
		Hispanic or Latino	53	2	1	1	0	0	0
6	Male	Female	63	4	3	1	0	0	0
	Non-EconDis	EconDis	53	4	4	0	0	0	0
	White	Black or African American	48	3	1	2	0	0	0
		Hispanic or Latino	63	5	2	3	0	0	0
7	Male	Female	59	7	5	2	0	0	0
	Non-EconDis	EconDis	52	2	1	1	0	0	0
	White	Black or African American	52	5	2	3	0	0	0
		Hispanic or Latino	52	2	1	1	0	0	0
8	Male	Female	63	5	3	2	0	0	0
	Non-EconDis	EconDis	48	4	1	3	0	0	0
	White	Black or African American	48	4	1	3	0	0	0
		Hispanic or Latino	63	4	2	2	0	0	0
11	Male	Female	51	1	0	1	0	0	0
	Non-EconDis	EconDis	43	1	0	1	0	0	0
	White	Black or African American	38	2	1	1	0	0	0
		Hispanic or Latino	38	2	0	2	0	0	0

Table J-2. DIF—ELA / Writing Prompt—Polytomous

Grade	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
3	Male	Female	6	0	0	0	0	0	0
	Non-EconDis	EconDis	3	0	0	0	0	0	0
	White	Black or African American	3	1	1	0	0	0	0
		Hispanic or Latino	6	1	1	0	0	0	0
4	Male	Female	6	1	0	1	0	0	0
	Non-EconDis	EconDis	6	0	0	0	0	0	0
	White	Black or African American	6	0	0	0	0	0	0
		Hispanic or Latino	6	0	0	0	0	0	0
5	Male	Female	6	0	0	0	0	0	0
	Non-EconDis	EconDis	6	0	0	0	0	0	0
	White	Black or African American	3	0	0	0	0	0	0
		Hispanic or Latino	6	0	0	0	0	0	0
6	Male	Female	6	1	0	1	0	0	0
	Non-EconDis	EconDis	3	0	0	0	0	0	0
	White	Black or African American	3	0	0	0	0	0	0
		Hispanic or Latino	6	0	0	0	0	0	0
7	Male	Female	6	1	0	1	0	0	0
	Non-EconDis	EconDis	6	1	1	0	0	0	0
	White	Black or African American	6	1	1	0	0	0	0
		Hispanic or Latino	6	0	0	0	0	0	0
8	Male	Female	6	0	0	0	0	0	0
	Non-EconDis	EconDis	3	0	0	0	0	0	0
	White	Black or African American	3	0	0	0	0	0	0
		Hispanic or Latino	6	0	0	0	0	0	0
11	Male	Female	6	0	0	0	0	0	0
	Non-EconDis	EconDis	3	0	0	0	0	0	0
	White	Black or African American	3	0	0	0	0	0	0
		Hispanic or Latino	3	1	1	0	0	0	0

Table J-3. DIF— Mathematics—Dichotomous

Grade	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
3	Male	Female	65	2	1	1	0	0	0
	Non-EconDis	EconDis	40	2	0	2	1	0	1
	White	Black or African American	25	2	1	1	0	0	0
		Hispanic or Latino	65	1	0	1	0	0	0
4	Male	Female	63	4	3	1	0	0	0
	Non-EconDis	EconDis	51	2	2	0	0	0	0
	White	Black or African American	42	2	1	1	0	0	0
		Hispanic or Latino	63	3	1	2	0	0	0
5	Male	Female	64	5	2	3	0	0	0
	Non-EconDis	EconDis	48	1	0	1	0	0	0
	White	Black or African American	48	2	0	2	0	0	0
		Hispanic or Latino	51	4	4	0	0	0	0
6	Male	Female	62	1	0	1	0	0	0
	Non-EconDis	EconDis	48	2	1	1	0	0	0
	White	Black or African American	48	3	2	1	0	0	0
		Hispanic or Latino	62	5	3	2	1	0	1
7	Male	Female	66	4	2	2	0	0	0
	Non-EconDis	EconDis	66	4	3	1	0	0	0
	White	Black or African American	51	5	3	2	0	0	0
		Hispanic or Latino	66	0	0	0	0	0	0
8	Male	Female	69	5	3	2	0	0	0
	Non-EconDis	EconDis	51	5	1	4	0	0	0
	White	Black or African American	51	3	1	2	0	0	0
		Hispanic or Latino	69	3	3	0	2	1	1
11	Male	Female	66	0	0	0	0	0	0
	Non-EconDis	EconDis	39	2	1	1	0	0	0
	White	Black or African American	51	5	2	3	0	0	0
		Hispanic or Latino	51	2	0	2	0	0	0

APPENDIX K
ITEM RESPONSE THEORY PARAMETERS

Table K-1. IRT Parameters for ELA Grade 3

IREF	a	SE (a)	b	SE (b)
113681A	0.87	0.09	-0.24	0.10
113682A	0.76	0.08	-0.27	0.11
113683A	0.62	0.07	0.28	0.09
113685A	1.11	0.11	-0.29	0.09
113746A	0.65	0.10	-0.50	0.08
113747A	0.87	0.11	0.01	0.07
114008A	1.67	0.19	-0.45	0.08
114010A	1.07	0.10	-0.17	0.08
114735A	0.71	0.04	-0.86	0.05
114736A	1.16	0.05	-0.68	0.03
114737A	0.54	0.03	-0.19	0.05
116009A	0.85	0.09	-1.16	0.05
116011A	0.93	0.10	-1.13	0.05
116012A	0.92	0.10	-1.53	0.07
116202A	0.40	0.03	-0.29	0.07
116203A	0.78	0.04	-0.20	0.04
116204A	1.12	0.05	-0.58	0.03
116205A	0.76	0.04	-1.12	0.05
120902A	0.71	0.09	-1.33	0.07
120912A	1.05	0.10	-0.13	0.08
120914A	0.49	0.06	0.27	0.11
120922A	0.39	0.03	0.21	0.07
120926A	0.46	0.09	-0.19	0.11
120927A	0.47	0.09	-0.13	0.11
121545A	0.96	0.09	-0.10	0.08
121726A	0.73	0.08	-0.15	0.10
121799A	0.32	0.03	0.98	0.11
124170A	0.47	0.03	-0.16	0.06
448821	0.84	0.04	-1.13	0.05
449541	0.40	0.02	1.08	0.08
451136	0.78	0.08	-0.28	0.11
451148	0.88	0.08	-0.33	0.10
451160	1.14	0.10	-0.09	0.07
451172	1.20	0.09	0.14	0.05
451474	0.67	0.11	-0.92	0.12

IREF	a	SE (a)	b	SE (b)
451486	0.50	0.10	-0.73	0.13
451498	0.56	0.10	-0.17	0.09
451521	0.37	0.02	1.04	0.09
451534	1.05	0.12	-0.22	0.05
455391	1.15	0.10	-1.04	0.06
455403	0.88	0.07	-0.90	0.07
455415	1.07	0.09	-1.04	0.06
455427	1.16	0.12	-1.48	0.09
455439	1.53	0.15	-1.29	0.06
455461	0.58	0.06	0.52	0.08
455473	0.38	0.05	0.78	0.13
455485	0.79	0.07	0.31	0.06
455498	0.49	0.06	0.05	0.11
455511	0.49	0.04	-0.03	0.08
511558	0.50	0.03	-0.39	0.05
528721	0.75	0.04	-1.28	0.06
528734	0.72	0.04	-0.46	0.04
530045	0.61	0.04	-0.02	0.05
538024	0.91	0.10	-1.36	0.06
538036	1.16	0.11	-1.03	0.04
538048	1.21	0.11	-1.26	0.04
538060	1.16	0.11	-1.36	0.05
538072	1.35	0.12	-1.26	0.04
607569	0.60	0.06	-0.77	0.09
607598	0.87	0.08	-1.11	0.08
607601	0.96	0.08	-0.84	0.06
607604	0.73	0.07	-0.98	0.08
607607	0.82	0.07	-0.67	0.07
607609	0.91	0.08	-0.77	0.06
607611	0.42	0.05	-0.78	0.13
614868	0.53	0.08	-0.33	0.15
614899	0.56	0.05	-0.03	0.09
614915	0.58	0.06	-0.74	0.09
614930	0.38	0.08	1.13	0.19

Table K-2. IRT Parameters for ELA Grade 4

IREF	a	SE (a)	b	SE (b)
113055A	0.85	0.08	-0.27	0.06
113087A	0.99	0.06	0.13	0.04
113089A	1.13	0.07	0.08	0.04
113090A	0.56	0.04	0.31	0.06
113095A	0.63	0.07	-0.67	0.06
113096A	1.08	0.08	-0.53	0.04
113280A	0.63	0.03	-0.67	0.05
113281A	0.63	0.03	-0.04	0.04
113282A	0.12	0.02	-0.20	0.18
113283A	0.62	0.03	-0.61	0.05
114053A	1.16	0.08	-0.14	0.04
114054A	0.58	0.05	0.20	0.07
114055A	0.41	0.04	0.58	0.08
114056A	1.14	0.08	-0.29	0.05
116494A	0.49	0.04	0.48	0.08
116495A	0.22	0.03	-0.48	0.15
116496A	0.36	0.04	0.98	0.14
116497A	0.90	0.06	-0.57	0.04
116574A	0.76	0.07	-1.07	0.05
116576A	0.70	0.07	-1.37	0.07
116618A	0.47	0.03	-0.48	0.06
116620A	0.38	0.02	-0.42	0.07
116621A	0.52	0.03	-0.45	0.05
121279A	1.10	0.08	-1.05	0.04
121426A	0.96	0.08	-0.91	0.04
121567A	0.33	0.05	-0.73	0.11
121569A	0.86	0.08	-0.40	0.06
121580A	0.44	0.03	0.57	0.06
121982A	0.34	0.03	-0.73	0.08
121985A	0.32	0.04	1.03	0.11

IREF	a	SE (a)	b	SE (b)
121988A	0.16	0.04	1.30	0.55
122353A	0.32	0.04	0.15	0.10
122582A	0.34	0.04	-0.09	0.12
124199A	0.31	0.02	0.91	0.10
451634	0.72	0.08	0.54	0.09
451646	0.53	0.07	0.50	0.13
451663	0.72	0.08	0.39	0.10
451679	0.65	0.07	0.73	0.09
451694	0.51	0.07	0.66	0.12
451867	0.44	0.03	-0.73	0.07
451881	0.78	0.03	-0.11	0.04
451895	0.39	0.02	0.11	0.06
451913	0.33	0.02	0.48	0.08
451925	0.68	0.03	0.04	0.04
455543	1.12	0.08	-0.97	0.04
455569	0.43	0.06	-1.14	0.09
455581	0.85	0.08	-1.41	0.06
455593	0.37	0.05	-1.94	0.18
512069	0.33	0.02	0.04	0.08
528771	0.70	0.04	-1.22	0.06
530069	0.57	0.03	0.09	0.04
608475	0.65	0.06	-0.46	0.07
608509	0.66	0.06	-0.62	0.08
608520	0.86	0.06	-0.12	0.06
608524	0.94	0.08	-1.06	0.07
608526	0.84	0.08	-1.03	0.08
608529	0.67	0.06	-0.97	0.09
608531	0.85	0.07	-0.81	0.07
608534	0.67	0.06	-1.12	0.10
608548	1.13	0.09	-0.76	0.05

Table K-3. IRT Parameters for ELA Grade 5

IREF	a	SE (a)	b	SE (b)
114072A	0.91	0.12	-0.41	0.15
114075A	0.73	0.08	0.85	0.07
114329A	0.73	0.09	-0.45	0.09
114331A	0.62	0.08	-0.24	0.12
114332A	0.63	0.09	-0.23	0.12
117109A	0.46	0.03	0.03	0.05
117110A	0.25	0.02	1.52	0.16
117111A	0.86	0.04	-0.59	0.03
117112A	0.53	0.03	0.03	0.04
117523A	0.52	0.03	-0.31	0.05
117524A	0.36	0.02	0.30	0.07
117525A	0.51	0.03	0.08	0.05
119970A	0.45	0.03	0.90	0.07
119971A	0.32	0.02	0.77	0.09
119973A	1.03	0.04	-0.54	0.03
120209A	0.54	0.03	-0.94	0.06
120210A	0.77	0.03	-0.30	0.03
120211A	0.17	0.02	2.03	0.30
120212A	0.22	0.02	1.60	0.20
120909A	0.71	0.03	-0.58	0.04
120910A	0.63	0.03	-0.57	0.04
120913A	0.91	0.06	-0.06	0.05
121325A	0.48	0.03	-0.22	0.05
121457A	0.46	0.07	0.01	0.17
121458A	0.26	0.05	0.91	0.17
121459A	1.45	0.13	0.24	0.05
121478A	0.73	0.03	-0.41	0.03
121479A	0.54	0.03	-0.75	0.05
121733A	0.43	0.07	-0.45	0.13
121735A	0.54	0.08	-0.58	0.10
122062A	0.26	0.02	0.17	0.08

IREF	a	SE (a)	b	SE (b)
124219A	1.25	0.07	-1.30	0.04
451036	0.44	0.07	-0.09	0.09
452001	0.40	0.06	-0.34	0.10
452013	0.69	0.07	0.16	0.06
452038	1.28	0.10	-0.46	0.04
455685	0.97	0.09	-1.23	0.04
455697	0.84	0.09	-0.88	0.05
455709	1.01	0.09	-1.31	0.05
455721	1.03	0.10	-1.48	0.05
461107	0.37	0.04	1.22	0.11
461119	0.48	0.04	0.77	0.07
461131	0.38	0.05	0.93	0.14
461143	0.52	0.05	-0.07	0.08
530710	0.52	0.03	-0.55	0.05
530777	0.84	0.06	-0.30	0.05
540011	0.88	0.04	-0.79	0.03
540053	1.24	0.06	-1.03	0.03
540068	0.61	0.03	-0.55	0.04
540096	0.81	0.04	-0.74	0.04
540124	0.84	0.04	-0.62	0.03
612980	0.36	0.04	-1.11	0.15
612982	0.96	0.08	-0.95	0.06
612984	0.96	0.08	-1.00	0.06
612986	0.84	0.07	-0.73	0.06
612988	0.60	0.07	-1.60	0.13
612990	1.31	0.11	-0.95	0.04
615920	0.62	0.06	-1.22	0.10
615940	1.04	0.09	-1.18	0.07
615955	1.38	0.14	-1.41	0.07
615967	1.36	0.11	-1.01	0.04
615980	1.49	0.14	-1.25	0.05

Table K-4. IRT Parameters for ELA Grade 6

IREF	a	SE (a)	b	SE (b)
113536A	0.63	0.10	-0.08	0.12
113537A	0.53	0.10	-0.04	0.14
113612A	0.76	0.04	0.00	0.03
113614A	0.87	0.04	-0.09	0.03
114381A	0.78	0.06	-1.20	0.09
114382A	1.14	0.05	-0.59	0.03
114439A	1.33	0.06	-1.29	0.03
114441A	1.53	0.07	-1.29	0.03
115181A	0.37	0.02	-0.75	0.07
115183A	0.94	0.04	-0.15	0.03
120011A	0.44	0.09	0.80	0.16
120012A	0.47	0.10	0.21	0.10
120014A	0.77	0.11	0.15	0.06
120379A	0.48	0.03	-0.11	0.06
120380A	0.88	0.05	-0.77	0.05
120381A	0.59	0.04	-0.21	0.05
120382A	0.56	0.04	-0.78	0.07
121225A	0.82	0.04	-0.16	0.03
121226A	0.68	0.04	-0.19	0.04
121327A	1.61	0.07	-1.25	0.03
121328A	1.49	0.06	-1.16	0.03
121329A	1.80	0.08	-1.23	0.02
121358A	1.02	0.13	0.05	0.05
121359A	1.07	0.13	-0.06	0.05
121480A	0.63	0.04	-0.19	0.05
121481A	0.44	0.03	-0.18	0.07
121522A	0.61	0.03	0.65	0.04
121529A	0.42	0.03	0.04	0.05
121764A	0.86	0.11	-0.42	0.06
121768A	0.81	0.11	-0.39	0.07
121775A	0.34	0.08	0.24	0.25
121802A	0.75	0.04	-0.45	0.04
121803A	0.92	0.05	-0.83	0.04
121804A	0.83	0.04	-0.28	0.03
123356A	0.18	0.02	2.44	0.29
127272A	1.01	0.05	-0.35	0.03
127273A	0.89	0.04	-0.62	0.04
127274A	0.65	0.04	-1.10	0.07
127276A	0.37	0.03	-0.41	0.07
127277A	0.99	0.05	-0.44	0.03
452219	0.97	0.06	-0.11	0.04
452231	1.01	0.05	0.26	0.03
452243	0.51	0.04	0.07	0.06
452269	2.00	0.11	-0.30	0.02
452282	1.20	0.08	-0.53	0.04
452299	0.78	0.06	-0.54	0.06
452311	0.83	0.05	0.15	0.04
452335	0.56	0.06	1.79	0.12
452348	1.14	0.06	-0.09	0.03
530821	1.13	0.05	-0.76	0.03
530845	0.72	0.04	-0.58	0.04
540986	0.51	0.06	1.19	0.09
541015	0.73	0.08	0.14	0.08
541043	0.95	0.09	0.29	0.06
541060	0.65	0.07	0.92	0.06
541091	0.81	0.07	-0.16	0.06
608292	0.81	0.07	-0.03	0.06
612701	1.13	0.17	0.60	0.07
612725	0.62	0.06	-0.21	0.07
612751	0.52	0.06	-0.97	0.13
612778	0.97	0.08	-0.54	0.06
612816	0.46	0.07	-0.27	0.14
612841	0.76	0.07	-0.37	0.06

Table K-5. IRT Parameters for ELA Grade 7

IREF	a	SE (a)	b	SE (b)
114593A	1.20	0.05	-0.79	0.03
114594A	0.71	0.03	-0.63	0.04
114596A	0.86	0.04	-0.65	0.04
114643A	1.22	0.05	-0.66	0.03
114645A	0.96	0.04	-0.36	0.03
114646A	0.93	0.04	-0.84	0.04
115431A	1.17	0.05	-0.61	0.03
115432A	0.67	0.03	-0.23	0.04
115433A	0.89	0.04	-0.37	0.03
120072A	0.53	0.10	0.03	0.09
120073A	0.46	0.10	0.21	0.12
120098A	1.17	0.11	-1.33	0.05
120099A	1.18	0.11	-1.29	0.05
121313A	0.69	0.03	-0.38	0.04
121315A	0.70	0.03	-0.18	0.03
121491A	0.62	0.11	0.26	0.10
121493A	1.58	0.13	-1.02	0.03
121497A	0.57	0.08	-1.36	0.09
121499A	0.21	0.04	3.46	0.60
121509A	1.15	0.11	-1.03	0.04
121512A	1.07	0.10	-0.92	0.04
121871A	0.75	0.03	-0.51	0.04
121997A	0.66	0.03	-0.39	0.04
123649A	0.37	0.09	0.38	0.17
123650A	0.34	0.04	-0.22	0.11
127690A	0.38	0.02	0.03	0.06
127691A	0.68	0.03	-0.98	0.05
127692A	0.53	0.03	-0.97	0.06
127693A	0.61	0.03	-0.72	0.05
127694A	0.63	0.03	-0.99	0.06

IREF	a	SE (a)	b	SE (b)
127695A	0.64	0.03	-1.13	0.06
452559	1.40	0.07	-0.73	0.03
452571	0.87	0.05	-0.63	0.04
452583	0.52	0.03	-0.12	0.05
452595	0.61	0.03	0.38	0.05
452607	0.72	0.04	-0.12	0.04
452619	0.45	0.04	0.15	0.09
531700	0.85	0.04	-1.04	0.04
531717	0.77	0.07	-0.87	0.08
531786	0.42	0.04	-0.05	0.10
531798	0.50	0.03	0.22	0.05
537297	1.38	0.12	-0.66	0.03
537309	1.52	0.12	-0.65	0.03
537354	0.40	0.08	0.17	0.22
537369	1.32	0.11	-0.76	0.03
611518	0.55	0.05	-0.61	0.09
611530	0.86	0.07	-0.91	0.07
611542	1.04	0.10	-1.32	0.09
611554	0.67	0.06	-0.89	0.08
611566	0.54	0.05	-1.16	0.12
611578	1.03	0.09	-1.02	0.06
616633	0.76	0.08	0.19	0.07
616691	0.57	0.08	1.81	0.15
616706	0.47	0.06	1.12	0.12
616718	0.63	0.05	-0.23	0.07
616785	0.65	0.05	-0.28	0.07
616799	0.60	0.05	-0.37	0.08
616811	0.49	0.09	0.79	0.13
618684	0.58	0.05	-0.09	0.08

Table K-6. IRT Parameters for ELA Grade 8

IREF	a	SE (a)	b	SE (b)
114228A	0.44	0.03	0.13	0.05
114229A	0.43	0.03	-0.04	0.05
114230A	0.63	0.03	-0.22	0.04
114231A	0.57	0.03	0.11	0.04
114876A	0.93	0.10	-0.60	0.05
114877A	0.24	0.06	0.60	0.37
114879A	0.64	0.09	-0.42	0.08
115285A	0.83	0.04	-0.34	0.03
115286A	0.97	0.04	-0.64	0.03
115288A	0.63	0.04	-0.95	0.05
121030A	1.66	0.13	-1.16	0.03
121031A	0.89	0.10	-0.69	0.05
121032A	0.76	0.09	-1.30	0.07
121036A	0.56	0.06	0.80	0.07
121037A	0.86	0.08	0.12	0.06
121038A	0.74	0.07	0.18	0.07
121040A	0.26	0.07	1.49	0.42
121041A	0.78	0.11	-0.10	0.06
121042A	0.97	0.11	-0.22	0.05
121075A	1.13	0.05	-1.01	0.03
121078A	1.71	0.08	-0.91	0.02
121106A	0.75	0.09	-0.88	0.05
121107A	1.32	0.11	-0.96	0.03
121148A	0.68	0.10	0.21	0.08
121149A	0.57	0.10	-0.47	0.10
121164A	0.36	0.06	-0.28	0.18
121165A	0.40	0.06	0.35	0.11
121805A	0.42	0.03	0.03	0.06
122082A	0.77	0.09	-0.41	0.07
122562A	1.24	0.05	-0.69	0.02
124311A	0.55	0.05	0.82	0.06
127781A	0.60	0.03	-0.89	0.05
127782A	0.90	0.05	-1.13	0.04
127783A	1.37	0.07	-1.10	0.03
127784A	0.26	0.03	-0.68	0.10
127785A	0.76	0.04	-0.87	0.04
127786A	1.30	0.06	-1.17	0.03
449882	0.94	0.04	-0.42	0.03
456235	0.60	0.05	-0.31	0.07
456247	0.84	0.08	0.54	0.06
456259	0.42	0.08	1.46	0.17
459193	1.17	0.07	-0.47	0.04
537726	0.68	0.05	0.47	0.04
537740	0.75	0.05	0.10	0.04
537758	0.85	0.06	-0.14	0.04
537774	1.02	0.06	-0.05	0.03
538809	0.80	0.06	-0.65	0.06
538821	0.45	0.04	0.45	0.10
538833	1.00	0.07	-0.44	0.05
538845	0.68	0.06	-0.62	0.07
538857	0.78	0.06	-0.49	0.06
610044	0.68	0.06	-0.07	0.06
612145	0.60	0.06	-1.07	0.11
612180	0.74	0.07	-1.02	0.09
612192	1.54	0.13	-1.01	0.05
612205	0.55	0.06	-0.99	0.11
612217	1.18	0.09	-0.85	0.05
612229	1.31	0.11	-1.07	0.06
617908	0.67	0.08	0.31	0.08
617920	0.56	0.05	-0.24	0.07
617932	0.72	0.06	-0.35	0.06
617944	0.57	0.08	0.56	0.09
617956	0.73	0.06	-0.14	0.06

Table K-7. IRT Parameters for ELA Grade 11

IREF	a	SE (a)	b	SE (b)
113695A	0.75	0.05	-0.43	0.05
113698A	0.61	0.05	-0.17	0.06
113699A	0.56	0.04	0.23	0.07
114166A	0.75	0.07	1.16	0.06
114167A	0.52	0.06	-0.04	0.10
114193A	0.79	0.10	-0.45	0.06
114205A	1.64	0.15	-1.27	0.04
114207A	1.22	0.13	-1.16	0.04
116323A	1.52	0.15	-0.48	0.07
116324A	1.64	0.15	-0.34	0.06
116325A	0.46	0.03	-0.05	0.05
116326A	0.84	0.08	0.13	0.06
117167A	0.83	0.04	-0.31	0.03
117168A	0.96	0.04	-0.57	0.03
117169A	0.24	0.02	1.03	0.14
121130A	0.51	0.00	-0.04	0.05
121695A	0.65	0.06	0.56	0.06
121702A	0.74	0.10	-0.23	0.06
121703A	1.26	0.12	-0.59	0.04
121711A	0.87	0.07	0.32	0.05
121714A	0.85	0.08	0.07	0.06
121718A	0.87	0.11	-1.07	0.06
121719A	0.66	0.10	-1.05	0.07
121741A	0.65	0.05	-0.40	0.06
121742A	1.32	0.08	-0.55	0.03
121875A	0.75	0.10	-0.55	0.06

IREF	a	SE (a)	b	SE (b)
121953A	0.20	0.03	2.92	0.38
122538A	0.28	0.05	0.14	0.16
124328A	1.02	0.07	0.16	0.04
450048	0.81	0.04	-0.41	0.03
453060	1.00	0.05	-0.53	0.03
453074	0.93	0.07	-0.58	0.05
453087	0.95	0.07	-0.44	0.05
453099	0.77	0.04	-0.08	0.04
453111	0.69	0.04	0.26	0.04
531955	0.62	0.03	-0.30	0.04
539013	0.80	0.04	-0.44	0.03
539025	0.79	0.04	-0.56	0.04
539058	0.78	0.04	-0.25	0.03
539072	0.88	0.04	-0.80	0.04
610997	0.64	0.06	-0.24	0.07
612477	1.60	0.15	-1.08	0.05
612489	1.45	0.13	-1.03	0.05
612502	1.43	0.14	-1.21	0.06
612514	0.61	0.06	-0.68	0.09
612544	1.45	0.14	-1.09	0.05
612580	1.65	0.15	-1.04	0.05
618234	0.98	0.13	1.36	0.10
618247	0.54	0.07	0.44	0.09
618287	0.56	0.05	-0.27	0.08
618316	0.46	0.05	0.00	0.09

Table K-8. IRT Parameters for Mathematics Grade 3

IREF	a	SE (a)	b	SE (b)
110842A	0.79	0.04	-0.58	0.04
110855A	0.73	0.03	0.13	0.03
110862A	0.47	0.03	-0.45	0.06
110873A	0.40	0.03	1.03	0.10
110923A	0.99	0.06	-0.74	0.03
110965A	0.83	0.06	0.30	0.06
110975A	0.63	0.05	0.04	0.05
111377A	0.69	0.05	-0.54	0.04
111386A	0.70	0.04	-0.32	0.04
111387A	0.77	0.08	0.63	0.07
111390A	0.48	0.04	-0.18	0.07
111391A	0.56	0.07	0.19	0.11
111400A	0.56	0.07	0.36	0.10
111406A	0.52	0.05	0.61	0.09
111410A	0.67	0.08	0.67	0.07
111420A	0.93	0.09	0.56	0.06
111421A	0.60	0.05	0.78	0.09
111426A	0.84	0.05	0.33	0.04
111429A	0.57	0.08	-0.37	0.08
111432A	0.53	0.03	0.83	0.06
111434A	0.68	0.04	-1.09	0.05
111649A	0.64	0.08	-1.30	0.14
111650A	0.98	0.10	-0.12	0.05
111881A	1.48	0.11	-0.48	0.04
111883A	0.39	0.02	0.99	0.08
112552A	0.77	0.10	-0.32	0.14
112553A	0.46	0.07	0.61	0.14
112559A	0.57	0.07	-0.49	0.08
112564A	0.53	0.03	-1.23	0.07
112565A	0.46	0.08	0.84	0.17
112569A	0.91	0.08	-0.74	0.05
112585A	0.78	0.06	0.31	0.06
112586A	0.42	0.03	0.96	0.09

IREF	a	SE (a)	b	SE (b)
112595A	0.75	0.04	-0.30	0.04
112600A	0.94	0.08	-0.65	0.05
112601A	1.36	0.13	0.18	0.05
112615A	0.54	0.07	0.72	0.09
112616A	0.37	0.04	1.38	0.13
120682A	1.09	0.13	-0.21	0.10
441770	0.51	0.08	0.16	0.09
442035	0.70	0.07	0.42	0.07
442037	1.40	0.16	-0.24	0.08
442416	0.96	0.08	-0.53	0.05
451098	0.64	0.05	-1.09	0.06
451116	0.72	0.08	0.93	0.07
463081	1.13	0.05	-0.08	0.03
463225	0.87	0.11	-0.44	0.14
528614	1.24	0.07	0.03	0.03
528813	0.94	0.08	-0.37	0.05
529100	0.48	0.06	0.34	0.10
529126	0.66	0.03	-0.33	0.04
529146	0.71	0.08	-0.18	0.06
529175	0.76	0.07	0.25	0.06
595744	0.99	0.07	0.34	0.06
597535	0.72	0.09	0.28	0.08
597576	0.65	0.06	0.40	0.08
597702	0.36	0.05	-0.01	0.12
597774	0.58	0.06	-1.40	0.13
598100	0.75	0.14	1.00	0.11
598213	0.60	0.10	-0.71	0.18
598375	0.59	0.11	1.45	0.16
598429	0.69	0.07	-1.08	0.10
603958	0.91	0.08	0.91	0.09
604123	0.87	0.07	0.91	0.09
604382	1.05	0.08	0.81	0.07

Table K-9. IRT Parameters for Mathematics Grade 4

IREF	a	SE (a)	b	SE (b)
111122A	0.87	0.07	-0.67	0.06
111123A	0.98	0.07	-0.15	0.03
111136A	1.04	0.07	-0.14	0.03
111161A	0.34	0.03	1.28	0.12
111162A	1.33	0.15	-0.05	0.06
111166A	0.91	0.05	0.14	0.03
111185A	0.39	0.05	0.64	0.14
111658A	1.49	0.13	-0.49	0.04
111663A	1.19	0.06	-0.66	0.03
111678A	1.43	0.12	0.37	0.03
111681A	1.65	0.13	0.40	0.03
111685A	0.86	0.11	-0.69	0.06
111686A	0.67	0.04	0.42	0.04
111687A	1.04	0.10	0.41	0.04
111695A	0.55	0.08	-1.03	0.10
111696A	0.88	0.09	0.83	0.05
111700A	0.51	0.04	-0.23	0.05
111707A	0.59	0.08	0.96	0.08
111710A	0.22	0.03	-0.63	0.19
111712A	0.56	0.05	0.57	0.06
111716A	0.96	0.07	-0.06	0.04
111717A	0.98	0.11	0.02	0.07
111722A	0.79	0.08	0.74	0.05
111730A	0.60	0.04	0.44	0.05
111731A	0.77	0.06	0.19	0.05
112783A	1.28	0.12	0.20	0.04
112794A	0.68	0.06	0.13	0.06
112797A	0.23	0.04	1.25	0.29
112812A	0.58	0.08	1.17	0.10
112817A	0.80	0.08	0.97	0.06
112824A	0.74	0.04	0.39	0.04
112837A	0.50	0.07	0.87	0.09
112838A	0.62	0.08	0.58	0.07
112839A	0.46	0.08	0.63	0.15
120551A	0.46	0.04	1.24	0.09
121691A	0.40	0.04	1.08	0.11
122153A	1.30	0.12	0.19	0.04
122357A	0.78	0.06	1.41	0.10
445558	1.11	0.10	0.55	0.04
445572	0.94	0.05	-0.42	0.03
445588	0.79	0.07	0.11	0.05
446443	0.57	0.04	-0.73	0.06
446780	0.57	0.10	0.37	0.19
454751	0.81	0.04	0.25	0.03
455016	0.66	0.09	-0.62	0.07
455024	1.16	0.06	-0.62	0.03
463027	1.25	0.10	0.67	0.04
463034	0.99	0.16	0.78	0.19
463049	1.01	0.08	0.86	0.07
463067	1.42	0.12	-0.24	0.03
529949	0.56	0.06	0.21	0.08
531705	0.79	0.09	0.77	0.08
599462	0.77	0.08	-0.18	0.06
599574	0.55	0.09	0.85	0.12
599940	0.74	0.07	-0.15	0.06
599952	0.39	0.06	0.39	0.12
599954	0.66	0.09	0.98	0.12
600599	0.63	0.09	1.17	0.14
600647	0.80	0.08	0.03	0.05
600654	0.72	0.11	-0.22	0.09
600671	0.40	0.06	0.68	0.14
604209	1.49	0.11	0.23	0.04
604215	1.17	0.09	0.22	0.04

Table K-10. IRT Parameters for Mathematics Grade 5

IREF	a	SE (a)	b	SE (b)
111234A	0.42	0.07	-0.38	0.13
111242A	0.99	0.10	-0.78	0.05
111243A	0.79	0.04	0.11	0.03
111276A	0.52	0.03	0.15	0.05
111277A	0.57	0.04	0.20	0.05
111294A	1.28	0.09	0.28	0.04
111295A	0.64	0.03	0.29	0.04
111302A	0.95	0.11	-0.68	0.07
112335A	0.64	0.08	-0.71	0.07
112346A	0.71	0.04	-0.67	0.04
112348A	0.86	0.07	0.61	0.05
112352A	0.82	0.09	-0.70	0.06
112353A	0.82	0.06	0.12	0.05
112354A	0.47	0.05	1.50	0.12
112358A	0.60	0.04	0.67	0.05
112363A	0.46	0.03	0.73	0.07
112364A	0.41	0.04	1.10	0.10
112368A	0.83	0.07	0.11	0.05
112372A	1.05	0.05	-0.84	0.04
112373A	0.76	0.07	0.15	0.06
112377A	0.77	0.04	-0.82	0.05
112384A	0.95	0.05	0.14	0.03
112385A	0.69	0.06	0.35	0.06
112392A	0.61	0.06	1.47	0.09
112396A	0.31	0.04	-1.57	0.22
112404A	0.60	0.09	0.18	0.15
112408A	0.57	0.09	0.69	0.15
112410A	0.78	0.07	0.27	0.05
113843A	0.80	0.10	-0.05	0.10
113856A	0.40	0.05	0.91	0.09
113872A	0.68	0.06	0.91	0.06
113877A	0.47	0.05	1.47	0.11

IREF	a	SE (a)	b	SE (b)
113884A	0.53	0.03	-0.94	0.07
113889A	0.82	0.09	-0.69	0.06
113892A	0.51	0.09	0.35	0.12
113897A	0.44	0.04	0.81	0.09
113902A	0.67	0.06	1.05	0.06
120730A	1.22	0.14	0.76	0.09
121515A	1.15	0.08	0.70	0.05
449994	0.72	0.05	0.16	0.04
450153	1.16	0.10	-0.67	0.06
450194	0.74	0.06	0.49	0.06
450200	0.71	0.09	-0.19	0.09
450210	0.95	0.10	-0.65	0.05
450339	0.94	0.09	0.44	0.05
450352	0.71	0.07	-0.47	0.07
532745	0.41	0.05	1.04	0.13
532879	0.41	0.06	0.69	0.12
532921	0.56	0.06	-0.05	0.07
532968	0.81	0.06	1.04	0.05
533097	0.87	0.04	1.36	0.06
601583	0.63	0.07	-0.78	0.10
601619	0.82	0.08	-0.57	0.06
601628	0.41	0.05	0.58	0.12
601953	0.57	0.06	0.75	0.10
601986	0.83	0.09	-0.98	0.10
602060	0.68	0.07	-0.75	0.09
602253	0.55	0.06	-0.04	0.08
602432	0.61	0.07	-0.96	0.11
602443	0.43	0.05	-0.04	0.09
602536	0.40	0.05	0.30	0.11
602594	0.48	0.07	0.35	0.10
604399	0.52	0.06	0.33	0.09
604407	0.79	0.08	1.57	0.13

Table K-11. IRT Parameters for Mathematics Grade 6

IREF	a	SE (a)	b	SE (b)
110891A	0.95	0.05	-0.77	0.04
110903A	0.89	0.04	-1.12	0.05
110905A	1.23	0.10	-0.58	0.05
110982A	0.77	0.09	1.11	0.09
110986A	0.74	0.04	-0.33	0.03
110990A	1.26	0.13	-0.42	0.04
111025A	1.06	0.07	-0.33	0.03
111035A	0.64	0.10	-0.12	0.06
111445A	1.43	0.10	0.47	0.03
111446A	0.59	0.03	0.64	0.05
111455A	1.19	0.09	0.24	0.04
111456A	0.87	0.05	0.41	0.03
111465A	0.83	0.07	0.42	0.05
111479A	1.02	0.06	-0.07	0.03
111488A	0.58	0.05	0.34	0.07
111497A	0.83	0.04	-0.24	0.03
111514A	0.80	0.04	-0.16	0.03
111517A	1.15	0.05	-0.46	0.03
111518A	0.85	0.05	0.15	0.03
111630A	1.21	0.06	-0.87	0.03
112633A	0.77	0.11	-0.02	0.11
112653A	0.62	0.05	-0.57	0.07
112655A	0.63	0.06	0.79	0.06
112656A	0.98	0.11	-0.86	0.05
112666A	0.94	0.07	-0.65	0.06
112672A	1.08	0.06	-0.03	0.03
112673A	0.75	0.06	-0.22	0.04
112679A	1.41	0.12	-0.14	0.05
112689A	0.51	0.09	0.03	0.15
112697A	1.49	0.13	-0.25	0.03
112699A	0.76	0.07	0.38	0.06

IREF	a	SE (a)	b	SE (b)
120494A	0.79	0.04	-0.22	0.03
120854A	0.91	0.06	0.26	0.04
442356	1.10	0.09	0.14	0.05
442369	0.47	0.06	0.03	0.08
442538	0.86	0.07	0.58	0.05
442566	1.21	0.05	-0.52	0.03
442628	0.61	0.03	0.63	0.04
442631	0.54	0.06	0.23	0.08
442641	1.04	0.09	0.14	0.05
442683	0.72	0.06	0.08	0.05
450365	0.68	0.06	-0.14	0.05
450436	1.00	0.11	-0.95	0.05
450459	0.59	0.06	0.36	0.09
453664	0.79	0.08	-0.12	0.08
453675	0.95	0.08	-0.58	0.06
453755	0.78	0.08	0.70	0.06
453771	0.76	0.04	0.13	0.03
453780	0.93	0.07	-0.94	0.05
534783	0.83	0.10	-0.15	0.05
534796	0.92	0.04	-0.13	0.03
534823	1.02	0.10	-0.25	0.08
534840	0.98	0.13	0.08	0.10
602859	0.60	0.06	0.20	0.07
603290	0.94	0.08	-0.26	0.05
603329	0.79	0.07	-0.09	0.05
603349	1.03	0.09	-0.67	0.06
603413	0.71	0.06	-0.10	0.06
603458	0.93	0.09	-0.67	0.06
603712	1.49	0.12	-0.71	0.04
604748	0.65	0.06	0.18	0.07
604762	0.57	0.06	-0.20	0.07

Table K-12. IRT Parameters for Mathematics Grade 7

IREF	a	SE (a)	b	SE (b)
111048A	0.71	0.04	-0.16	0.04
111054A	0.88	0.10	-0.95	0.06
111055A	0.62	0.03	0.15	0.04
111059A	0.50	0.03	0.37	0.05
111071A	0.98	0.08	0.07	0.05
111074A	0.99	0.11	-1.13	0.06
111075A	1.37	0.11	-0.20	0.05
111080A	0.51	0.03	0.11	0.05
111085A	0.46	0.05	0.84	0.08
111092A	0.87	0.10	-1.20	0.06
111104A	0.73	0.05	-0.44	0.04
111106A	0.64	0.06	1.47	0.08
111113A	0.45	0.08	0.13	0.22
111131A	0.31	0.02	1.14	0.09
111745A	0.65	0.08	-0.20	0.11
111750A	0.49	0.03	0.10	0.05
111754A	0.57	0.04	0.15	0.05
111764A	1.11	0.08	0.19	0.04
111765A	0.71	0.04	0.31	0.04
111766A	1.14	0.08	0.28	0.04
111774A	0.94	0.07	-0.17	0.05
111778A	0.78	0.04	-1.49	0.06
111783A	1.01	0.09	-1.37	0.09
111784A	0.49	0.03	0.66	0.06
111795A	0.71	0.04	0.39	0.04
111796A	0.77	0.06	0.32	0.06
111804A	0.47	0.05	-0.20	0.07
111841A	0.41	0.03	0.57	0.06
112523A	0.62	0.06	0.59	0.06
112604A	0.84	0.10	-1.32	0.07
112853A	0.80	0.09	-0.19	0.09
112881A	0.62	0.03	0.36	0.04
112887A	0.93	0.07	0.18	0.05

IREF	a	SE (a)	b	SE (b)
112891A	0.53	0.05	0.45	0.09
112901A	0.36	0.03	1.01	0.08
112909A	0.67	0.04	-1.23	0.06
112911A	0.59	0.04	0.35	0.05
113101A	0.92	0.07	0.26	0.05
446474	0.40	0.07	0.75	0.19
446491	1.32	0.11	-0.81	0.05
446543	0.74	0.04	0.33	0.04
446589	0.50	0.05	0.66	0.10
446673	0.86	0.05	-1.21	0.05
446722	0.85	0.07	0.00	0.06
446831	0.70	0.06	0.12	0.06
446838	0.46	0.05	0.26	0.10
446901	1.19	0.12	-1.32	0.05
452439	0.35	0.03	-1.32	0.11
453976	0.44	0.05	0.49	0.13
454049	0.78	0.06	0.31	0.06
454054	0.56	0.07	-0.88	0.09
530309	0.47	0.07	-0.08	0.08
530662	0.52	0.09	1.42	0.15
531205	0.52	0.05	0.07	0.09
531427	0.99	0.08	-0.28	0.05
604870	0.63	0.09	1.71	0.16
604898	0.79	0.07	-0.50	0.06
605009	1.04	0.08	-0.27	0.04
605348	0.42	0.05	0.55	0.12
605361	0.52	0.05	0.81	0.11
605373	0.92	0.07	-0.11	0.05
605460	0.54	0.05	0.40	0.08
605643	0.86	0.09	-1.42	0.11
605668	0.71	0.06	0.34	0.07
606474	0.59	0.05	0.19	0.08
606510	0.89	0.07	-0.57	0.05

Table K-13. IRT Parameters for Mathematics Grade 8

IREF	a	SE (a)	b	SE (b)
111253A	0.34	0.04	0.81	0.13
111281A	0.66	0.06	0.06	0.06
111286A	0.81	0.11	0.14	0.07
111335A	0.60	0.06	-0.01	0.07
111339A	0.57	0.05	0.71	0.06
111352A	0.95	0.04	-0.81	0.04
111560A	0.75	0.03	0.23	0.03
111565A	0.86	0.04	-0.55	0.03
111582A	0.60	0.05	0.55	0.08
111583A	0.50	0.04	0.72	0.06
111588A	1.48	0.13	-0.28	0.04
111593A	0.36	0.07	0.55	0.25
111594A	0.62	0.05	0.28	0.06
111615A	0.69	0.04	-0.41	0.04
111622A	1.22	0.06	0.23	0.02
112464A	0.78	0.04	-0.70	0.04
112467A	0.64	0.03	-0.14	0.04
112469A	1.30	0.12	-0.98	0.07
112470A	0.61	0.03	-0.49	0.04
112474A	1.10	0.10	-1.33	0.05
112475A	0.88	0.06	-0.60	0.06
112486A	0.52	0.04	0.72	0.06
112490A	0.90	0.07	0.06	0.05
112499A	1.26	0.10	-0.87	0.04
112500A	0.37	0.08	0.83	0.27
112506A	0.60	0.04	-0.09	0.05
112510A	0.56	0.05	0.28	0.07
112516A	0.77	0.04	0.17	0.03
113908A	1.08	0.07	-0.15	0.04
113909A	1.19	0.10	-0.81	0.04
113917A	0.88	0.12	-0.40	0.06
113922A	0.70	0.06	0.09	0.07
113923A	0.92	0.06	0.05	0.05
113927A	0.46	0.03	0.36	0.05
113932A	0.75	0.05	0.26	0.04
113937A	0.67	0.04	0.56	0.04
113943A	1.48	0.14	-0.05	0.04
113952A	0.71	0.07	0.30	0.08
113963A	0.69	0.03	0.26	0.04
113964A	1.37	0.08	0.30	0.03
113973A	0.64	0.03	-0.28	0.04
113978A	0.43	0.07	0.03	0.17
117072A	0.66	0.03	0.13	0.04
120568A	0.91	0.07	0.21	0.04
120571A	0.73	0.11	0.29	0.09
120572A	0.84	0.06	0.46	0.04
122051A	0.87	0.06	0.26	0.04
446944	0.42	0.05	-1.08	0.14
446958	0.53	0.05	0.48	0.06
447047	0.75	0.06	0.45	0.05
447054	0.69	0.03	0.02	0.03
447063	0.51	0.05	-0.30	0.08
454069	0.96	0.10	-0.17	0.07
454122	0.78	0.06	-0.55	0.06
516374	1.23	0.11	-0.34	0.05
532251	0.82	0.07	-0.23	0.07
532289	0.50	0.05	0.47	0.09
532339	0.82	0.10	0.22	0.12
532471	1.62	0.15	0.12	0.04
606872	0.38	0.04	0.61	0.12
606892	1.04	0.08	0.23	0.05
607045	0.90	0.09	-1.16	0.10
607825	0.43	0.05	-0.26	0.09
608123	0.65	0.06	-0.03	0.06
608493	0.53	0.05	0.99	0.11
609162	0.54	0.05	0.77	0.10
609908	0.44	0.05	-0.61	0.11
610058	0.74	0.06	0.14	0.06
610515	0.51	0.05	-0.27	0.08

Table K-14. IRT Parameters for Mathematics Grade 11

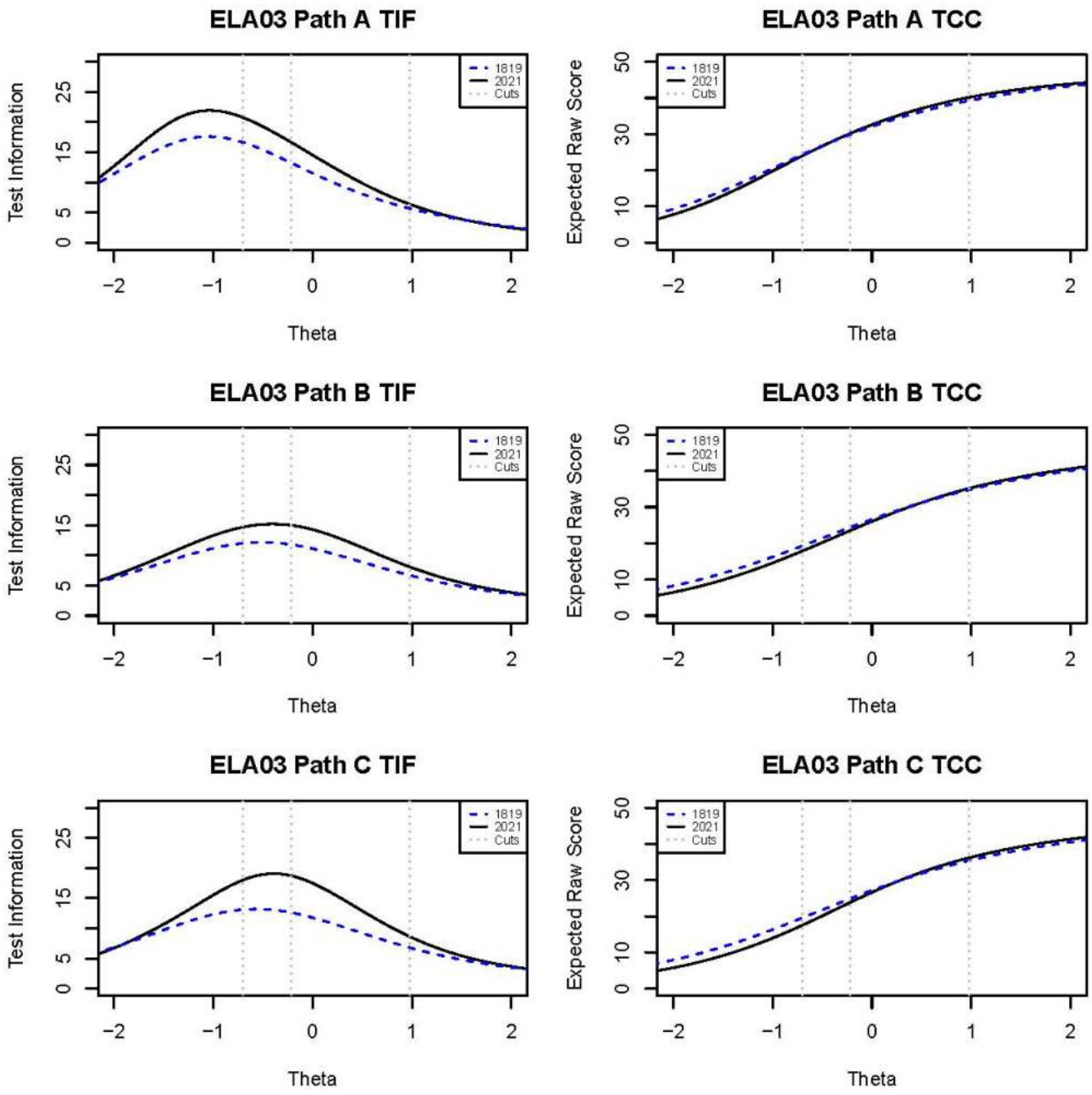
IREF	a	SE (a)	b	SE (b)
110846A	0.96	0.05	0.11	0.03
110858A	0.66	0.05	0.05	0.04
110867A	0.78	0.10	-1.00	0.07
110881A	0.72	0.04	0.06	0.03
110913A	0.95	0.06	0.24	0.03
110914A	1.56	0.13	0.17	0.04
110917A	0.57	0.10	0.11	0.15
110921A	0.96	0.06	0.21	0.03
110936A	0.97	0.05	-0.35	0.03
110968A	0.49	0.07	0.56	0.08
111000A	1.18	0.11	0.18	0.05
111002A	1.15	0.11	-0.05	0.03
111016A	0.83	0.07	0.16	0.05
111033A	0.87	0.13	-0.06	0.09
111533A	1.04	0.12	-0.71	0.05
111534A	1.43	0.11	0.41	0.03
111537A	0.97	0.09	0.66	0.04
111539A	0.93	0.05	0.03	0.03
111548A	0.62	0.05	0.55	0.05
111810A	2.06	0.17	0.11	0.03
111824A	1.22	0.14	-0.23	0.05
111828A	0.67	0.04	0.47	0.04
111829A	0.95	0.06	0.38	0.03
111830A	1.17	0.13	-0.88	0.05
111833A	0.69	0.04	0.40	0.04
111834A	1.06	0.13	-0.23	0.06
112701A	1.53	0.15	-0.64	0.03
112702A	1.25	0.10	0.34	0.04
112708A	0.61	0.10	0.26	0.08
112709A	0.87	0.08	1.03	0.06
112717A	0.97	0.08	0.03	0.04
112718A	1.19	0.06	0.39	0.03
112722A	1.06	0.08	-0.27	0.03
112727A	1.09	0.05	-0.23	0.02

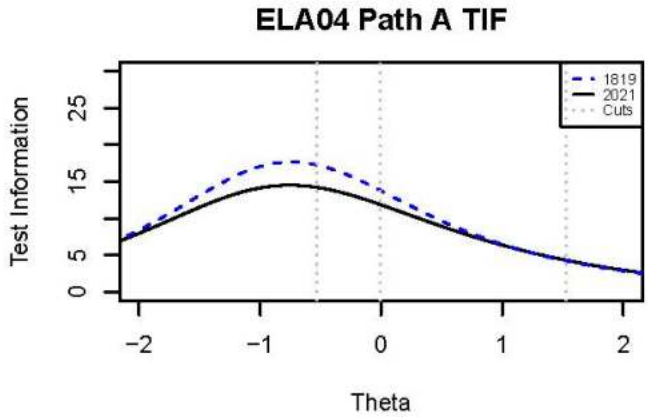
IREF	a	SE (a)	b	SE (b)
112744A	1.18	0.11	0.15	0.05
112924A	0.87	0.04	-0.54	0.04
112929A	0.70	0.11	-0.71	0.07
112934A	0.92	0.10	-0.73	0.08
112940A	0.85	0.08	0.44	0.05
112944A	0.59	0.05	-1.49	0.11
443287	0.46	0.07	1.12	0.11
443381	0.74	0.11	-0.66	0.06
443515	0.82	0.05	-0.92	0.05
443573	0.81	0.12	0.02	0.11
443575	1.23	0.06	-0.55	0.03
454919	0.76	0.08	0.07	0.06
454925	0.53	0.06	-0.25	0.05
454987	1.11	0.08	-0.11	0.03
462343	0.53	0.04	0.61	0.06
462715	0.39	0.05	0.84	0.15
533128	1.05	0.10	0.00	0.04
533133	0.97	0.11	-0.22	0.09
533370	0.54	0.07	0.48	0.08
613392	0.82	0.09	-0.84	0.09
613449	0.59	0.07	0.60	0.10
613648	0.69	0.08	-0.15	0.06
613828	1.30	0.14	-0.86	0.07
613838	1.03	0.09	0.25	0.05
613850	0.93	0.10	-0.77	0.08
613910	0.45	0.06	0.72	0.13
613943	0.86	0.08	-0.06	0.05
613949	0.73	0.07	0.51	0.08
613955	0.91	0.08	-0.02	0.05
613961	0.70	0.07	0.24	0.07
614219	1.17	0.10	-0.18	0.04
614249	0.90	0.08	0.08	0.05

Table K-15. IRT Polytomous Item Parameters for ELA Writing Prompts

Content Area	Grade	ID	a	b	d0	d1	b-d0	b-d1
ELA–Writing	3	125971C	0.68398	0.52105	1.07711	-1.07711	-0.55606	1.59816
		125971I	0.71258	1.80532	1.00420	-1.00420	0.80112	2.80952
		125971O	0.78338	1.59208	1.62804	-1.62804	-0.03596	3.22012
		464856C	0.74181	-0.01993	0.81256	-0.81256	-0.83249	0.79263
		464856I	0.70589	0.15231	0.66056	-0.66056	-0.50825	0.81287
		464856O	0.63943	0.18966	1.35008	-1.35008	-1.16042	1.53974
	4	126163C	0.70446	0.50892	1.00866	-1.00866	-0.49974	1.51758
		126163I	0.74467	1.78377	0.47232	-0.47232	1.31145	2.25609
		126163O	0.73738	2.04400	1.33954	-1.33954	0.70446	3.38354
		469093C	0.85087	-0.15710	0.77239	-0.77239	-0.92949	0.61529
		469093I	0.74068	0.30889	0.52696	-0.52696	-0.21807	0.83585
		469093O	0.74158	0.34883	1.09365	-1.09365	-0.74482	1.44248
	5	126972C	0.81062	0.32102	0.89098	-0.89098	-0.56996	1.21200
		126972I	0.89315	1.64817	0.86922	-0.86922	0.77895	2.51739
		126972O	0.91097	1.35562	0.77263	-0.77263	0.58299	2.12825
		471924C	0.87131	-0.39141	0.68917	-0.68917	-1.08058	0.29776
		471924I	0.84177	0.34358	0.93872	-0.93872	-0.59514	1.28230
		471924O	0.80103	-0.05434	0.98813	-0.98813	-1.04247	0.93379
	6	127286C	0.83532	0.40326	0.73765	-0.73765	-0.33439	1.14091
		127286I	0.78463	0.89850	0.97044	-0.97044	-0.07194	1.86894
		127286O	0.83723	1.53937	1.39749	-1.39749	0.14188	2.93686
		471934C	0.88350	-0.03420	0.64006	-0.64006	-0.67426	0.60586
		471934I	0.98521	0.00058	0.46988	-0.46988	-0.46930	0.47046
		471934O	0.79257	0.35492	1.20380	-1.20380	-0.84888	1.55872
	7	127658C	0.83921	0.29441	0.89902	-0.89902	-0.60461	1.19343
		127658I	0.87351	1.38332	1.03782	-1.03782	0.34550	2.42114
		127658O	1.05405	1.33697	1.64667	-1.64667	-0.30970	2.98364
		471948C	0.64274	0.14086	0.74190	-0.74190	-0.60104	0.88276
		471948I	0.85582	-0.16434	0.54051	-0.54051	-0.70485	0.37617
		471948O	0.89774	0.28496	1.11990	-1.11990	-0.83494	1.40486
	8	127794C	0.90475	-0.10881	0.88777	-0.88777	-0.99658	0.77896
		127794I	1.21506	0.65216	1.11757	-1.11757	-0.46541	1.76973
		127794O	1.27253	0.63475	1.23477	-1.23477	-0.60002	1.86952
		471958C	0.80529	-0.26352	0.54799	-0.54799	-0.81151	0.28447
		471958I	0.75026	0.45575	0.75075	-0.75075	-0.29500	1.20650
		471958O	0.69336	0.96468	1.37239	-1.37239	-0.40771	2.33707
	11	126858C	0.81079	0.17864	0.93822	-0.93822	-0.75958	1.11686
		126858I	0.67969	1.67775	1.23152	-1.23152	0.44623	2.90927
		126858O	0.80161	0.98699	1.64367	-1.64367	-0.65668	2.63066
		471963C	0.81375	-0.34189	0.54268	-0.54268	-0.88457	0.20079
		471963I	0.77286	0.50710	0.92737	-0.92737	-0.42027	1.43447
		471963O	0.74284	0.38288	1.18973	-1.18973	-0.80685	1.57261

APPENDIX L
TEST CHARACTERISTIC CURVES & TEST INFORMATION FUNCTIONS


ELA03 Path A TIF
Test Information
Theta
1819
2021
Cuts
ELA03 Path A TCC
Expected Raw Score
Theta
ELA03 Path B TIF
Test Information
Theta
ELA03 Path B TCC
Expected Raw Score
Theta
ELA03 Path C TIF
Test Information
Theta
ELA03 Path C TCC
Expected Raw Score
Theta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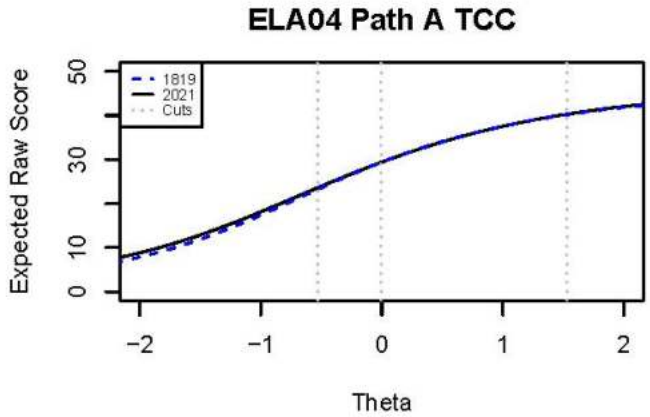
Test Information
Theta
1819
2021
Cuts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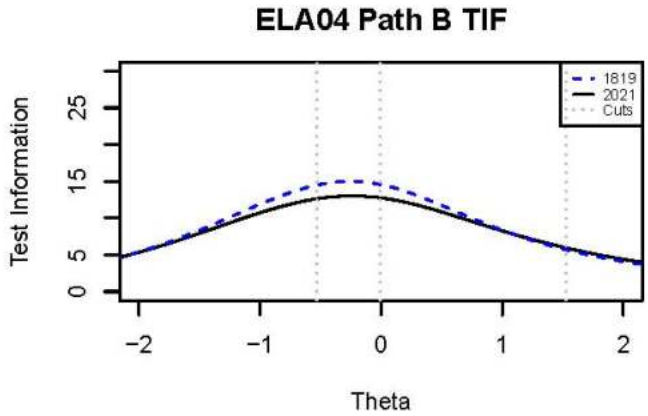
Expected Raw Score
Theta
1819
2021
Cuts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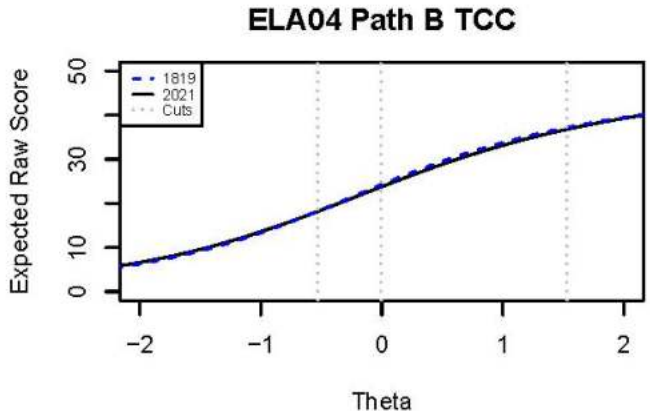
Test Information
Theta
1819
2021
Cuts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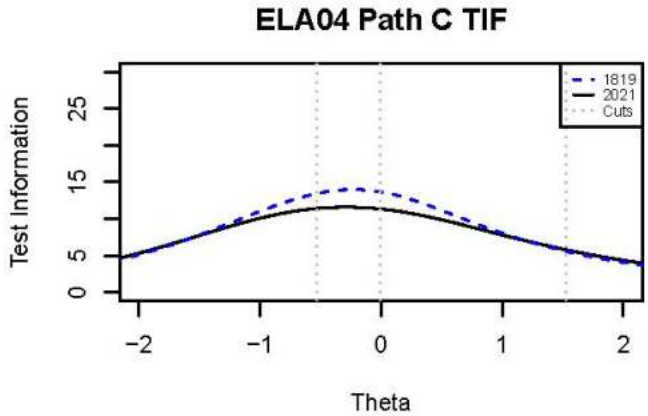
Expected Raw Score
Theta
1819
2021
Cuts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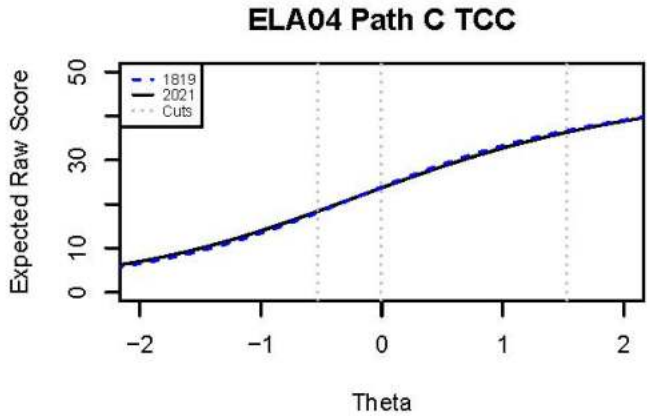
Test Information
Theta
1819
2021
Cuts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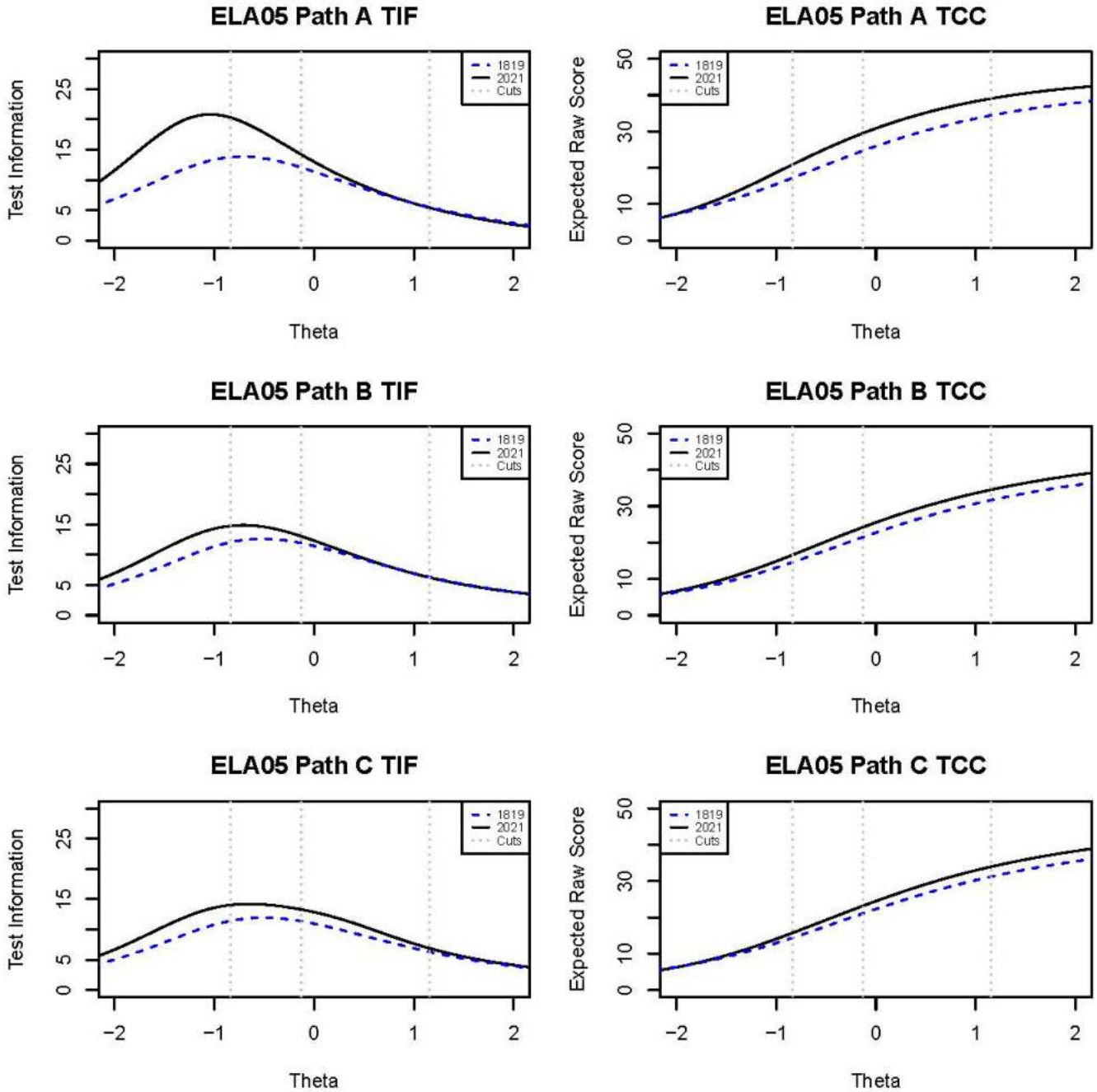
Expected Raw Score
Theta
1819
2021
Cuts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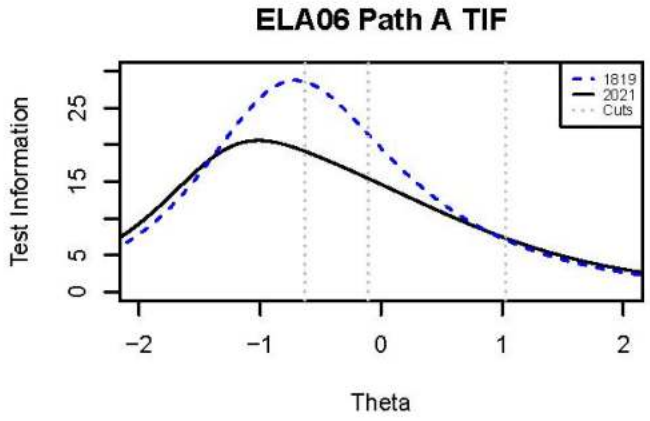
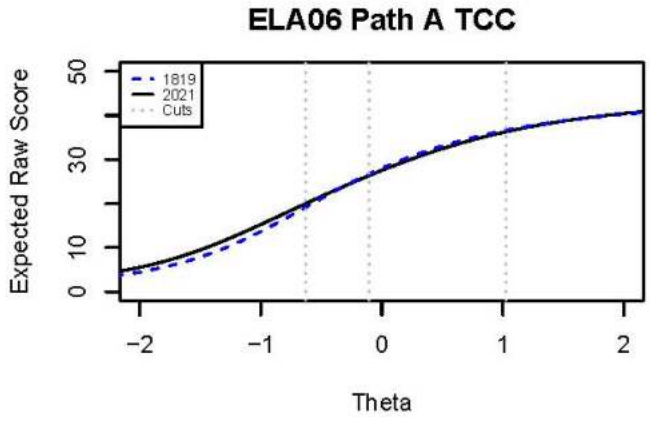
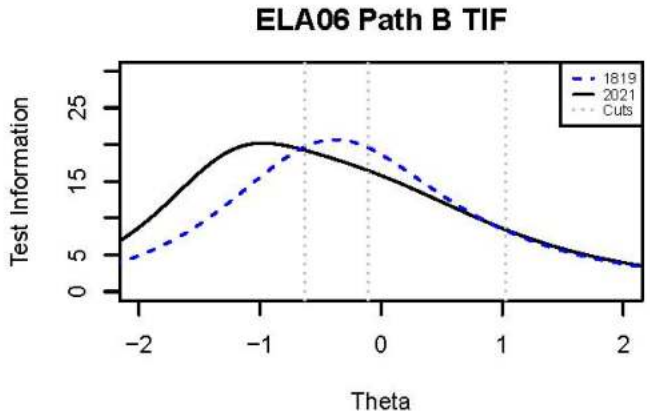
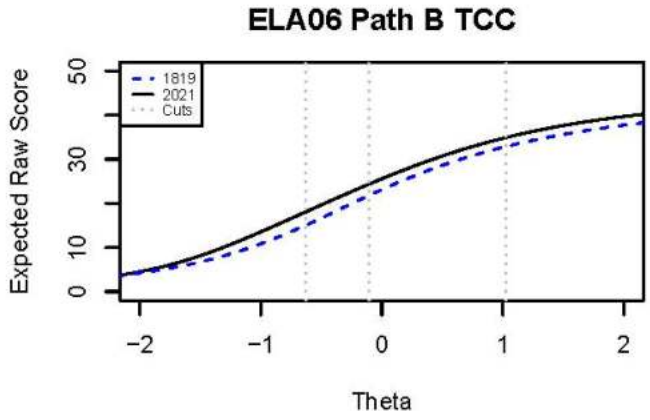
ELA05 Path A TCC
ELA05 Path B TIF
ELA05 Path B TCC
ELA05 Path C TIF
ELA05 Path C TCC
Test Information
Expected Raw Score
Theta
1819
2021
Cuts


ELA06 Path A TIF
Test Information
Theta
1819
2021
Cuts


ELA06 Path A TCC
Expected Raw Score
Theta
1819
2021
Cuts


ELA06 Path B TIF
Test Information
Theta
1819
2021
Cuts


ELA06 Path B TCC
Expected Raw Score
Theta
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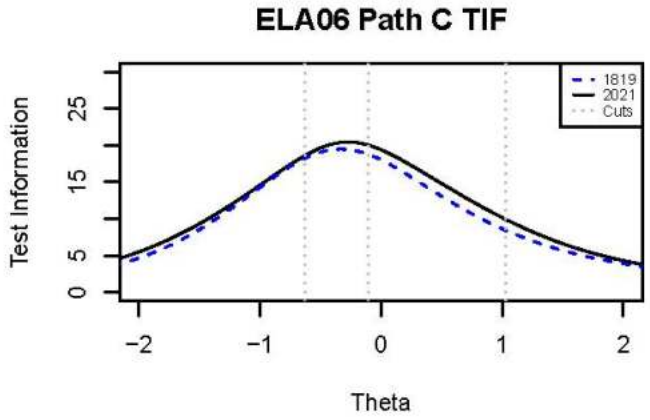
2021
Cuts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Test Information
Theta
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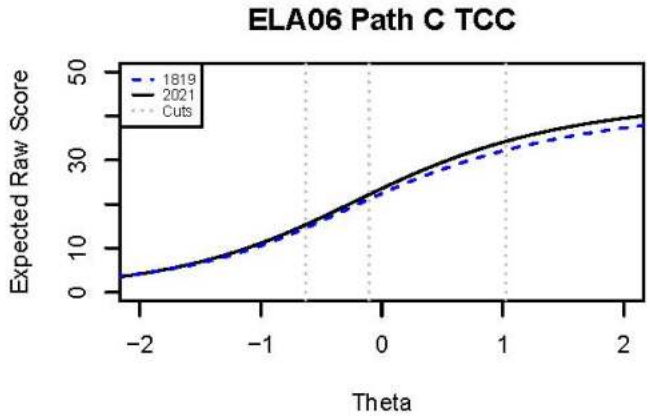
Cuts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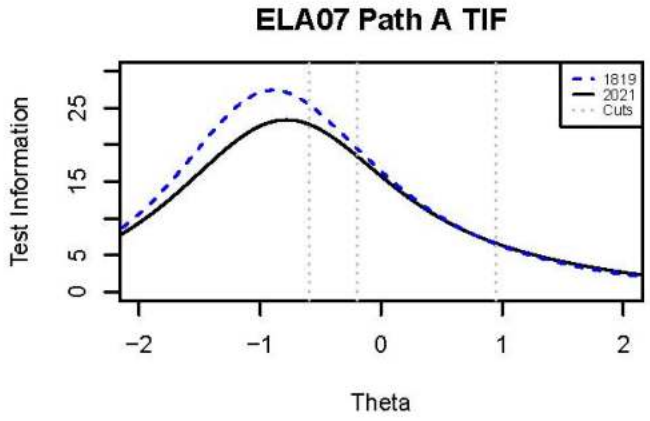
Cuts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Test Information
Theta
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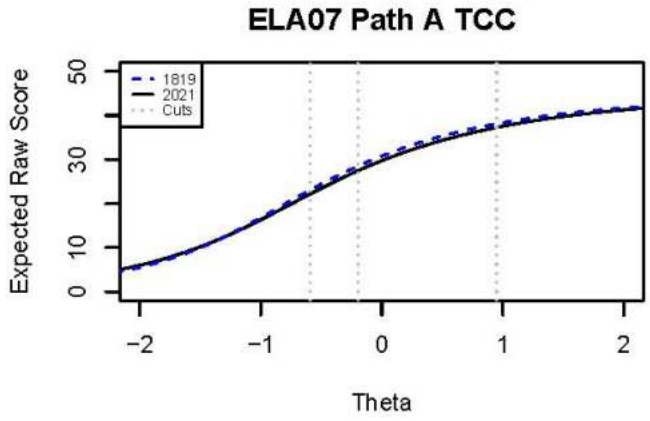
Cuts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Expected Raw Score
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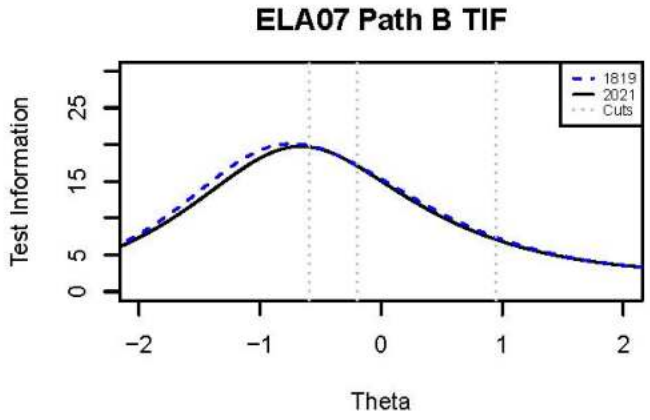
Cuts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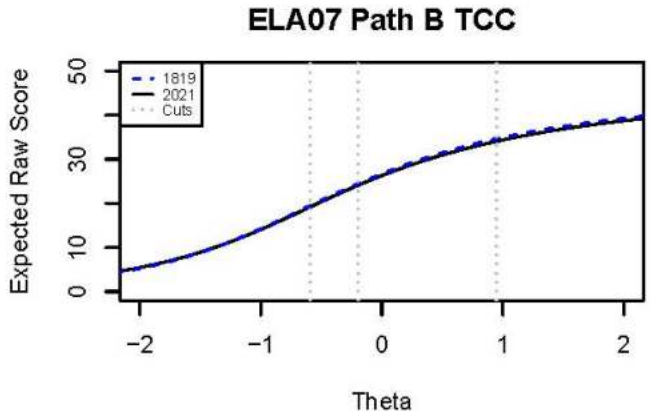
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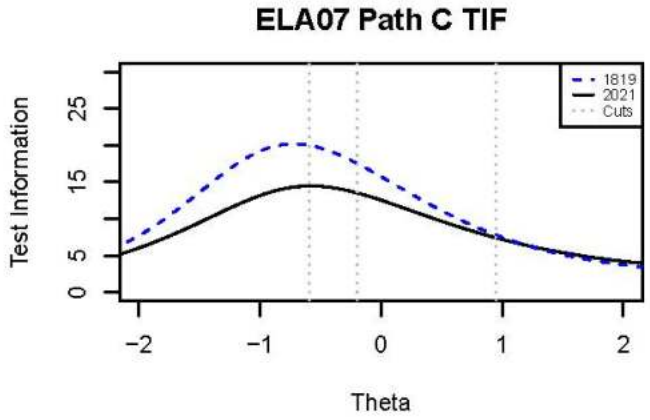
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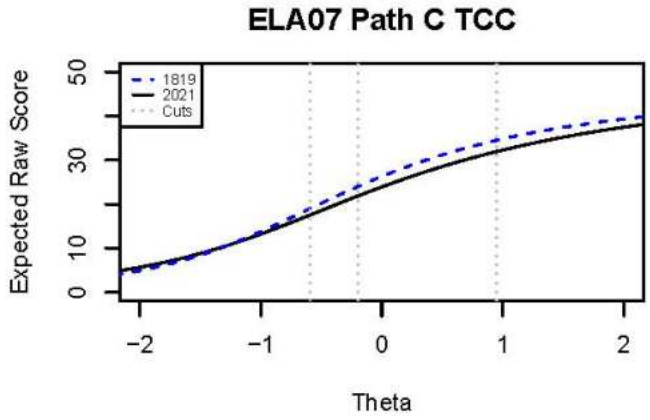
ELA07 Path C TCC
Expected Raw Score
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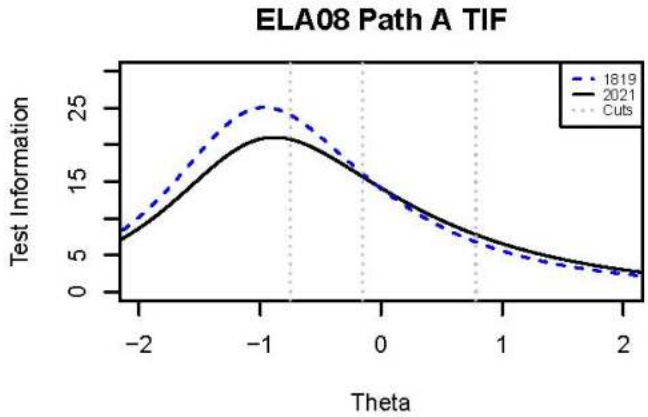
Cuts


ELA08 Path A TIF
Test Information
Theta
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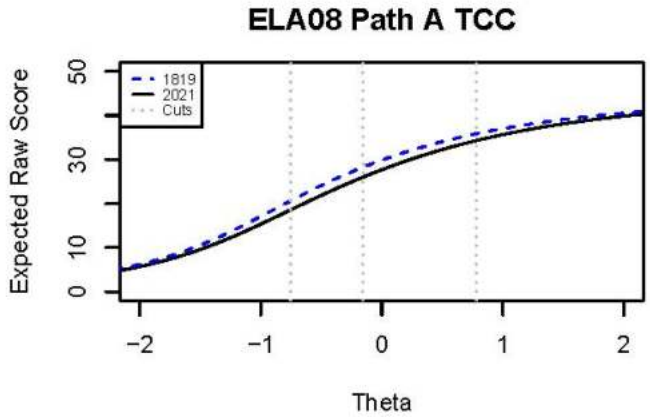
Cuts


ELA08 Path A TCC
Expected Raw Score
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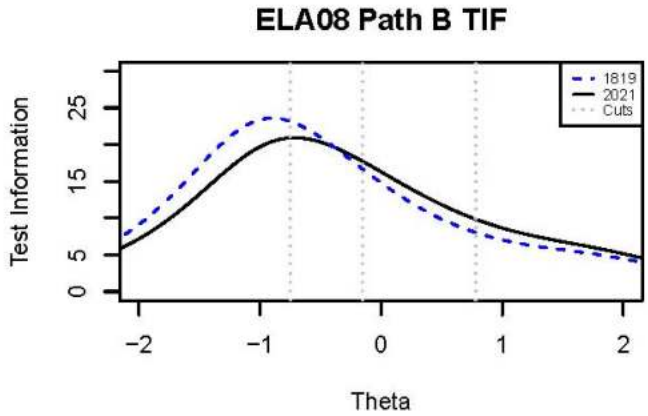
Cuts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Test Information
Theta
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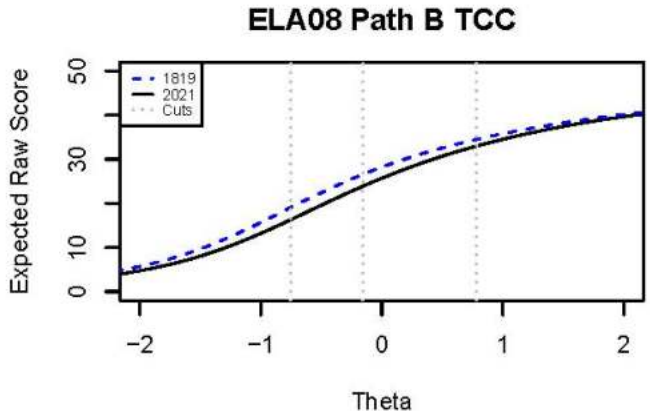
Cuts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Expected Raw Score
Theta
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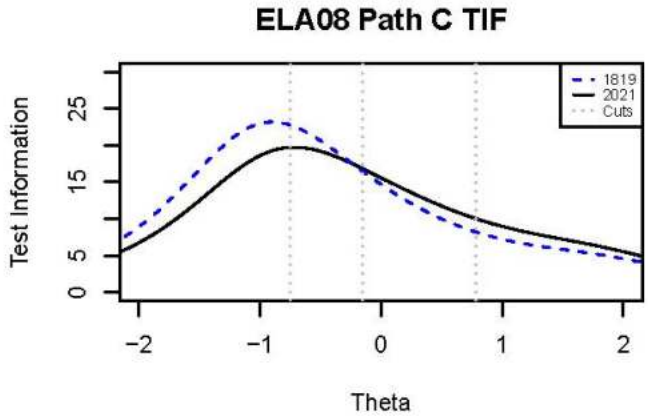
Cuts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Test Information
Theta
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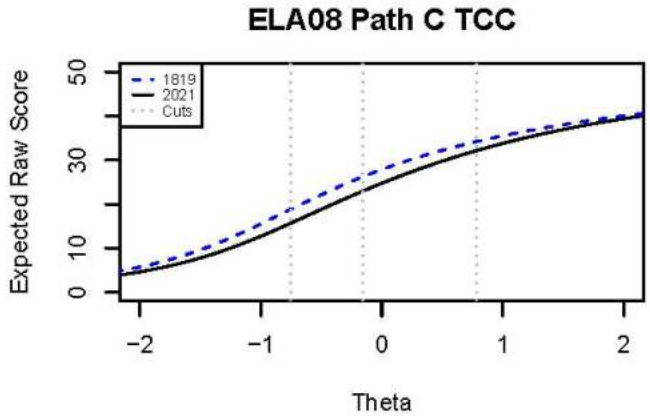
Cuts


ELA08 Path C TCC
Expected Raw Score
Theta
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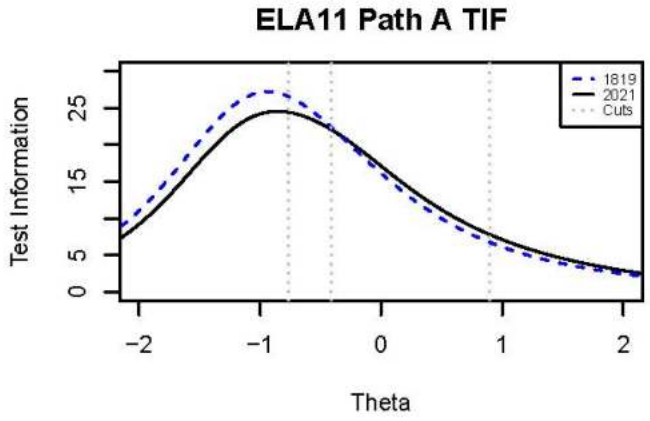
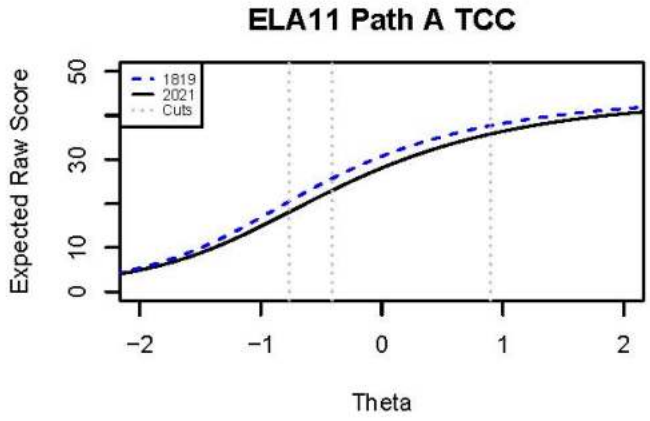
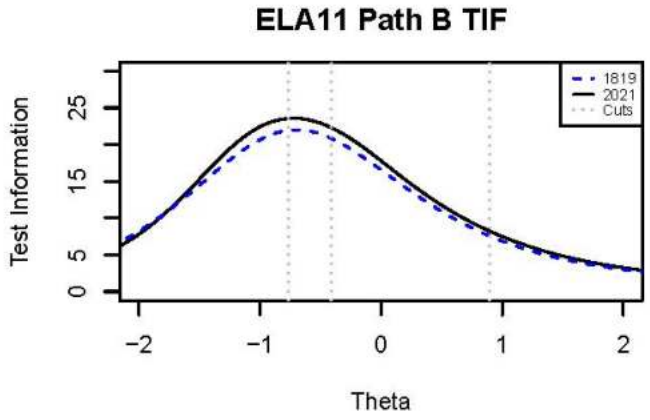
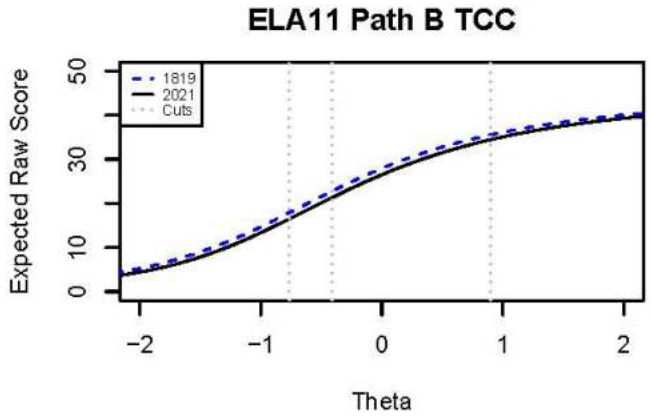
Cuts


ELA11 Path A TIF
Test Information
Theta
1819
2021
Cuts


ELA11 Path A TCC
Expected Raw Score
Theta
1819
2021
Cuts


ELA11 Path B TIF
Test Information
Theta
1819
2021
Cuts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Expected Raw Score
Theta
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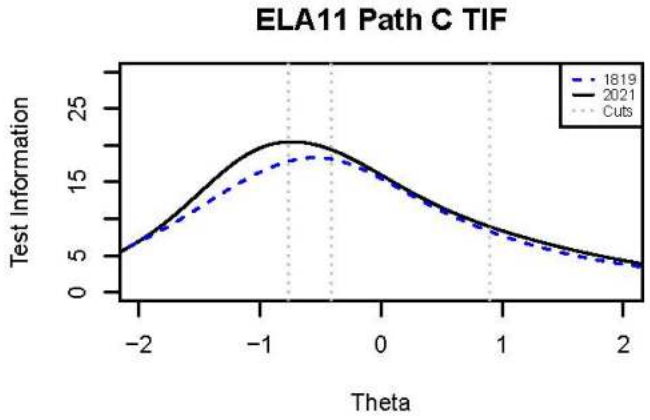
Cuts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Test Information
Theta
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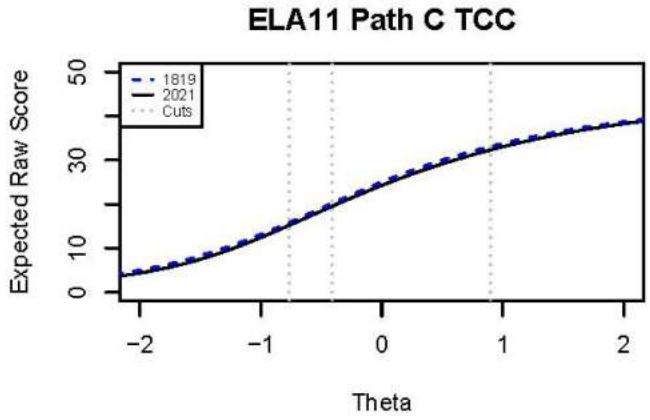
Cuts


ELA11 Path C TCC
Expected Raw Score
Theta
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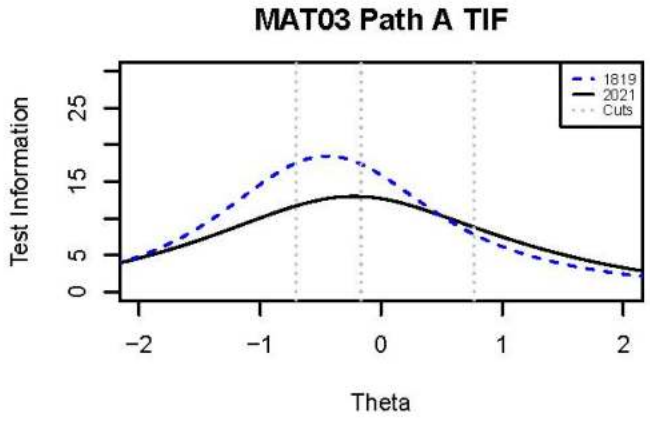
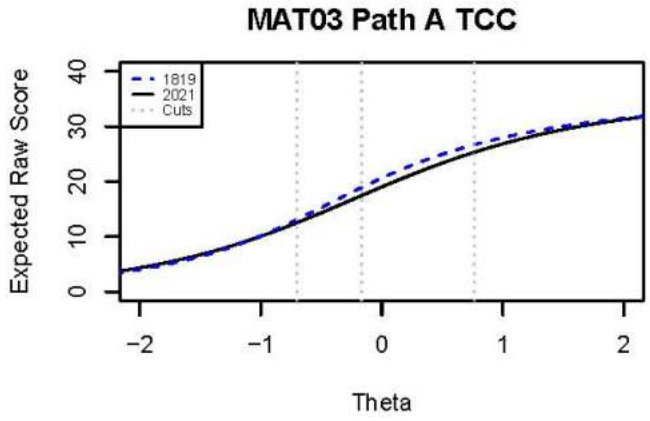
Cuts


MAT03 Path A TIF
Test Information
Theta
1819
2021
Cuts


MAT03 Path A TCC
Expected Raw Score
Theta
1819
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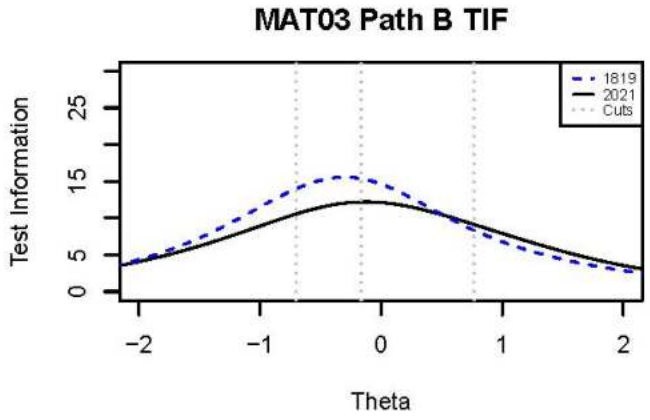
Cuts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Test Information
Theta
1819
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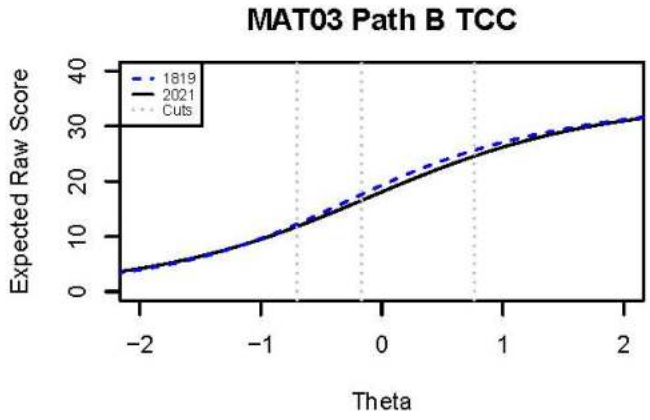
Cuts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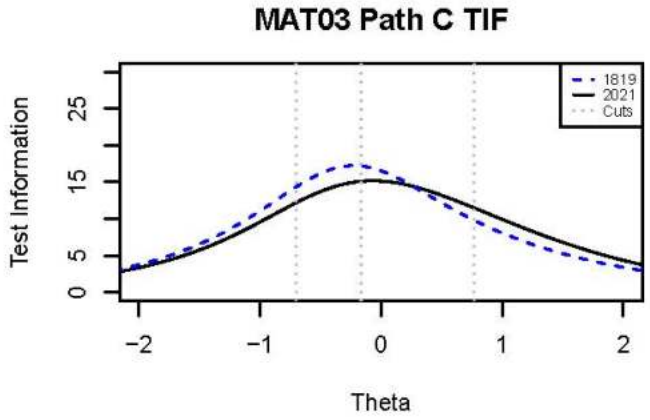
Cuts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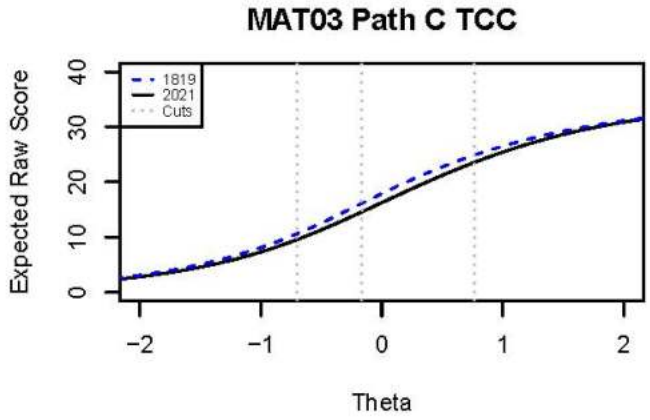
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Expected Raw Score
Theta
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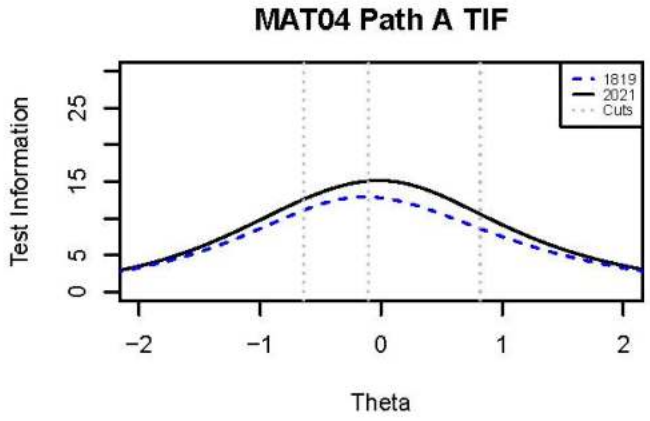
Cuts


MAT04 Path A TIF
Test Information
Theta
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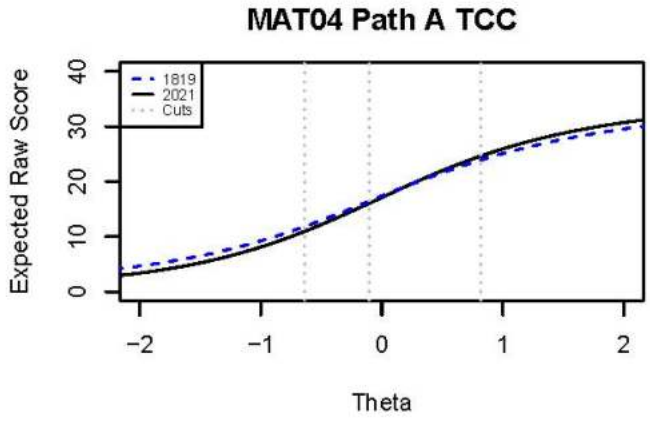
Cuts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Expected Raw Score
Theta
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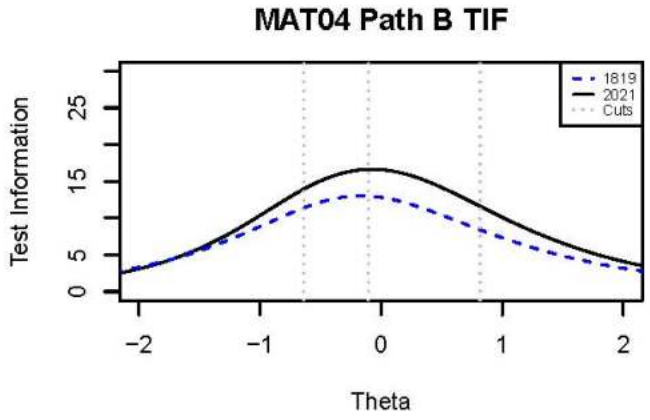
Cuts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Test Information
Theta
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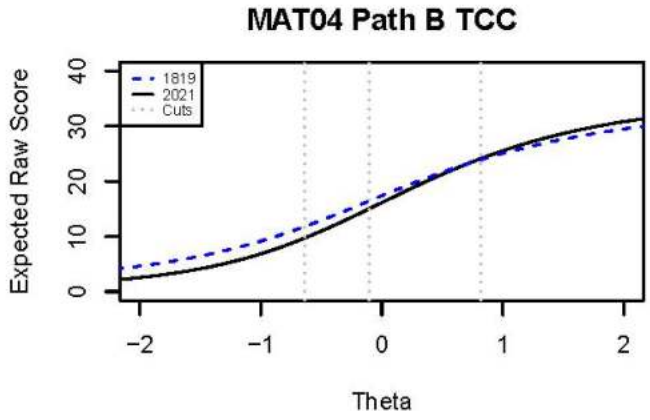
Cuts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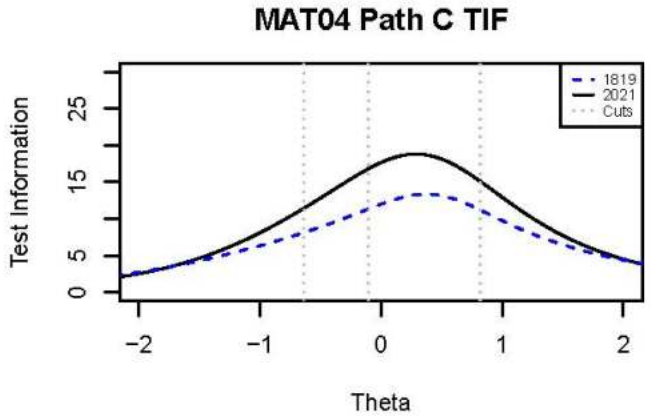
Cuts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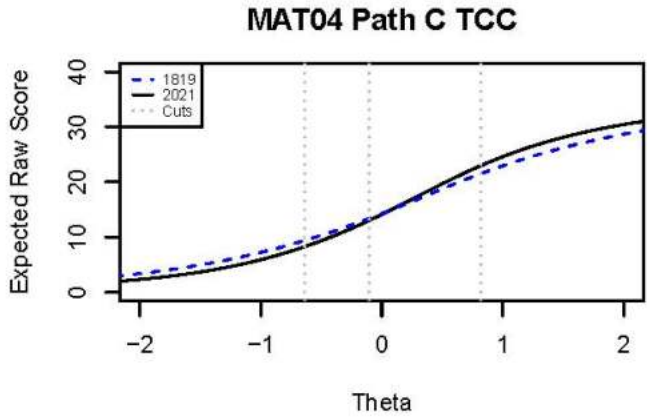
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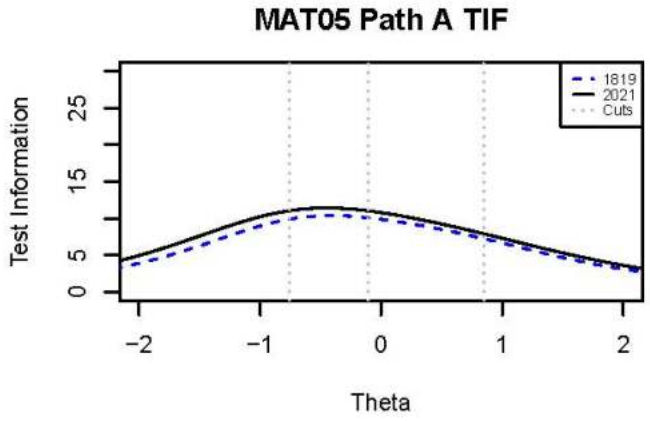
Cuts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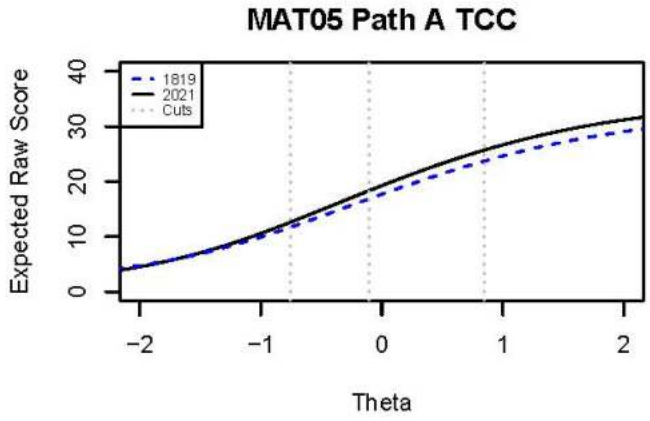
Cuts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Expected Raw Score
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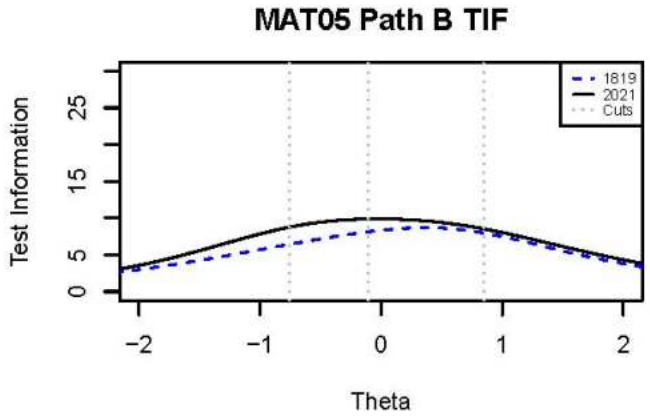
Cuts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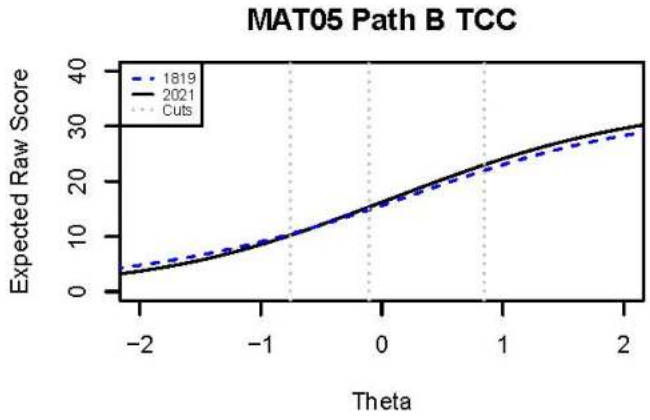
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Expected Raw Score
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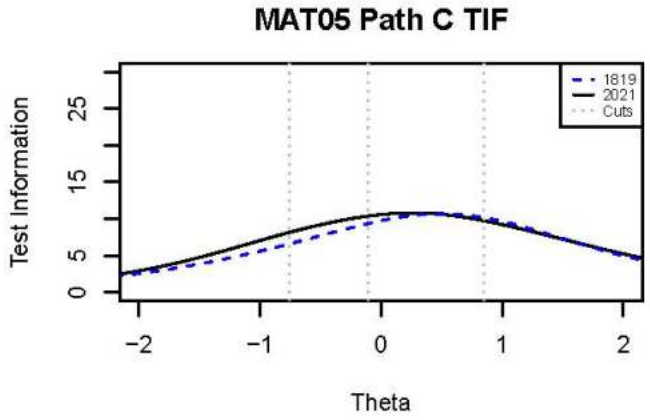
Cuts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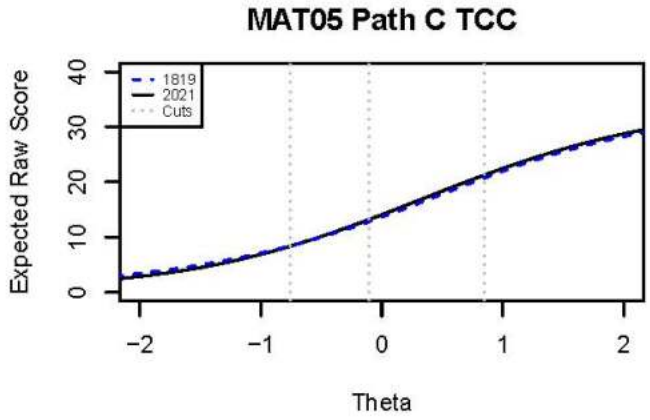
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Expected Raw Score
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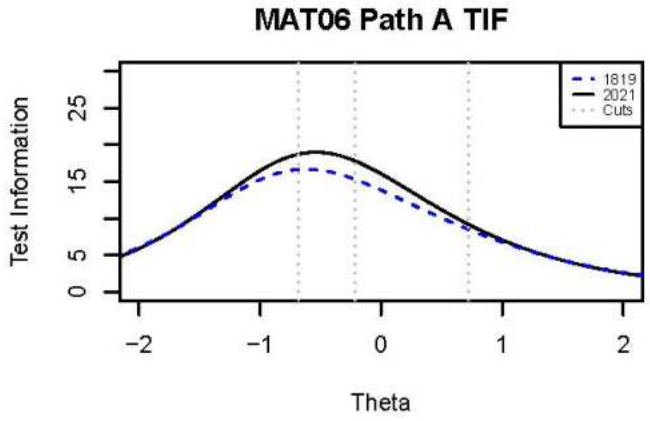
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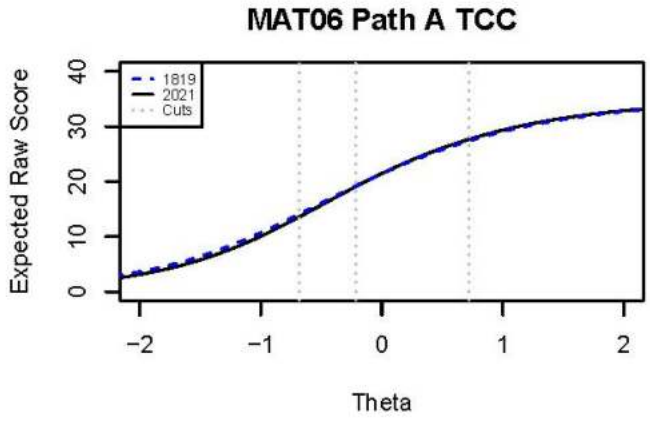
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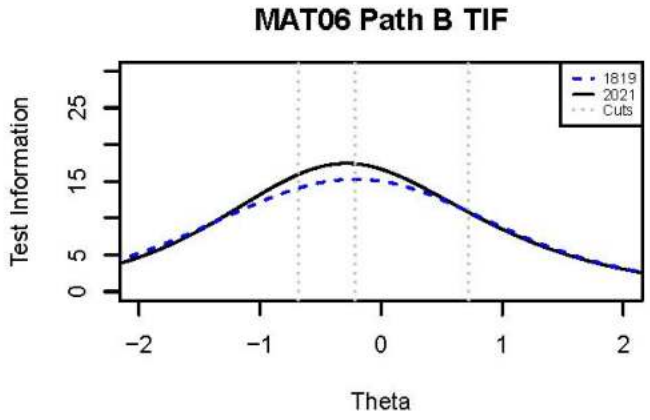
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Test Information
Theta
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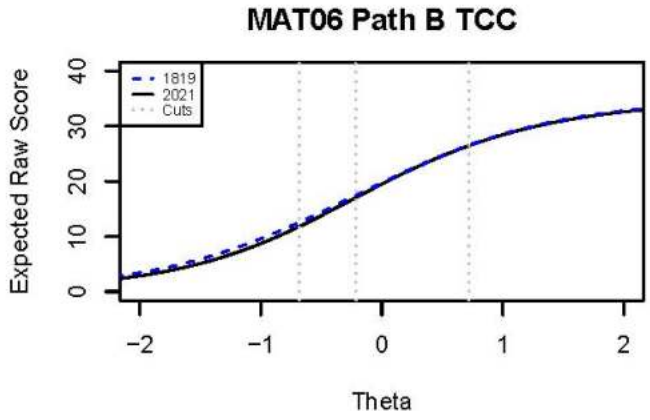
Cuts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Expected Raw Score
Theta
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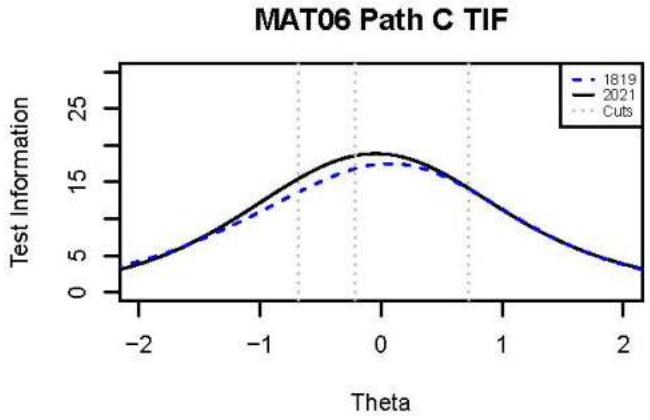
Cuts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Test Information
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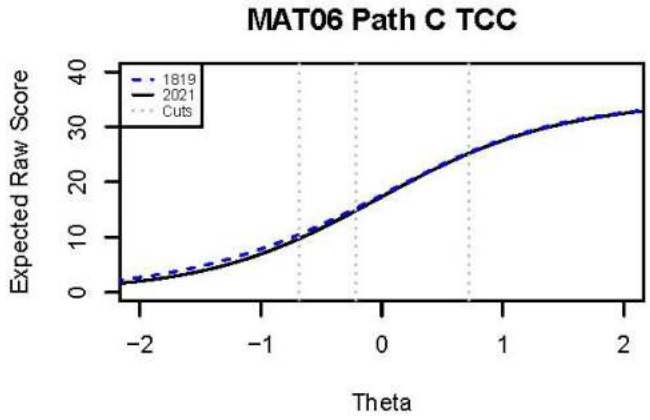
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Expected Raw Score
Theta
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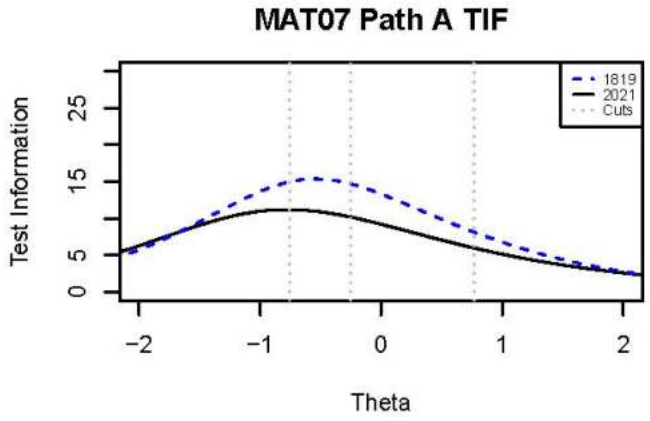
Cuts


MAT07 Path A TIF
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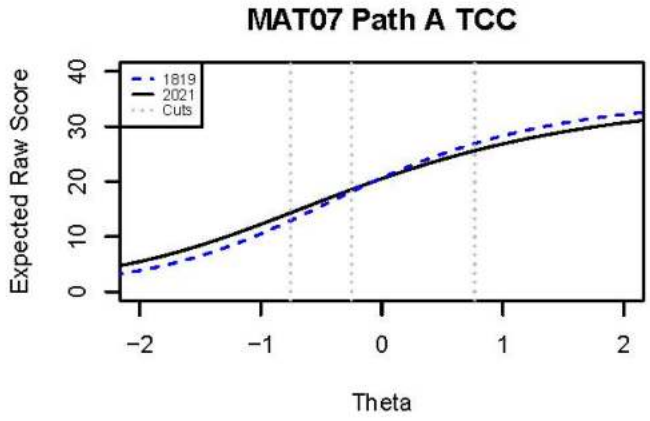
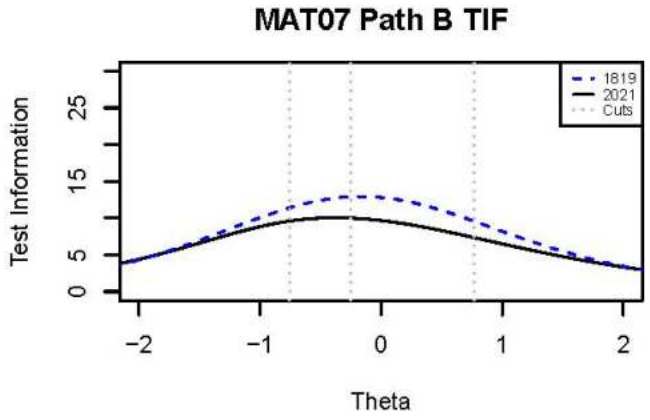
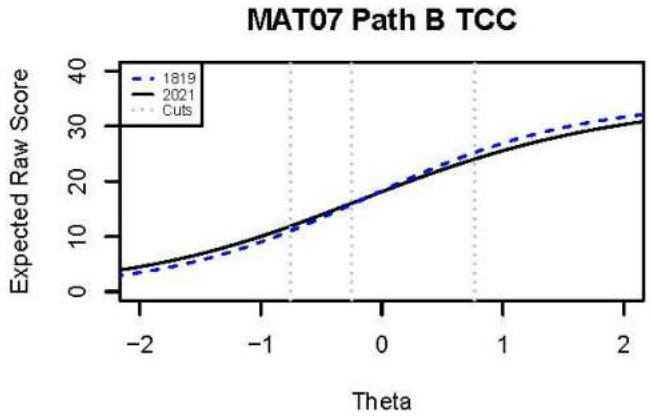
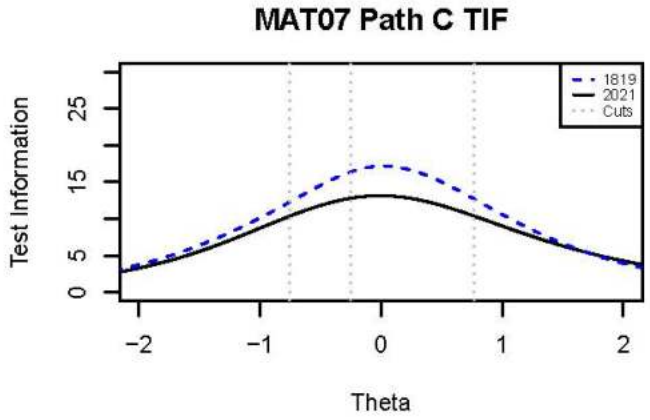
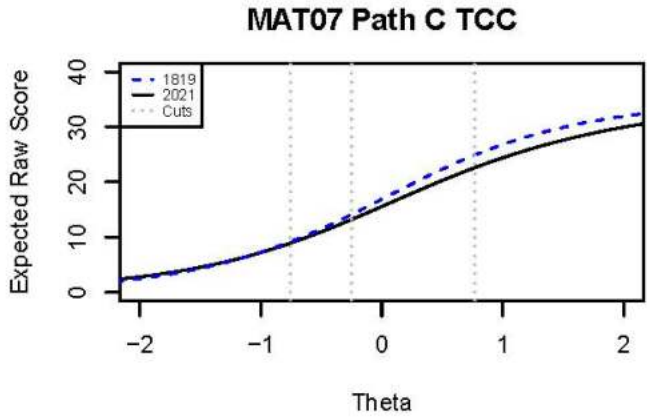
2021
Cuts

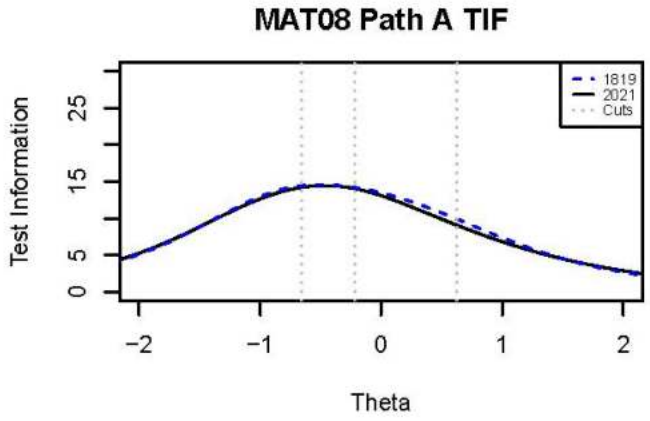

MAT07 Path A TCC
Expected Raw Score
Theta
1819
2021
Cuts

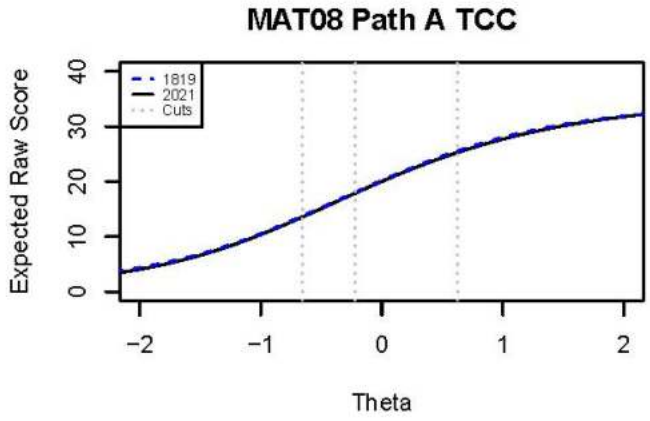

MAT07 Path B TIF
Test Information
Theta
1819
2021
Cuts

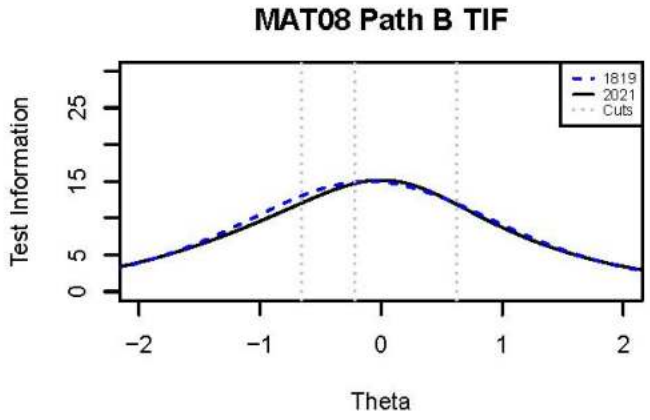

MAT07 Path B TCC
Expected Raw Score
Theta
1819
2021
Cuts

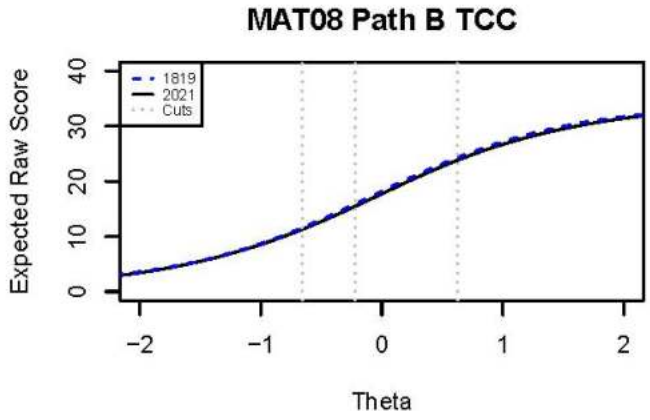

MAT07 Path C TIF
Test Information
Theta
1819
2021
Cuts

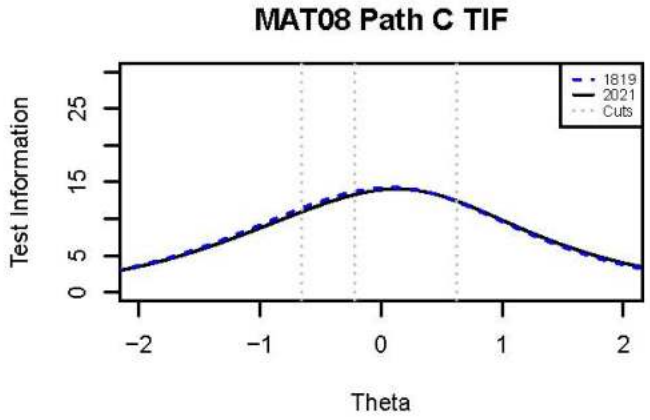

MAT07 Path C TCC
Expected Raw Score
Theta
1819
2021
Cuts

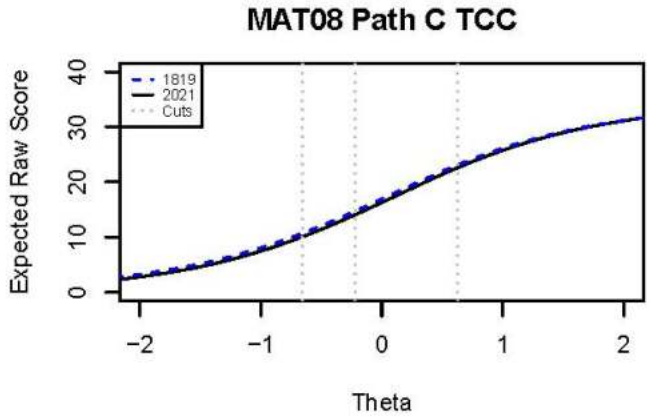

MAT08 Path A TIF
Test Information
Theta
1819
2021
Cuts

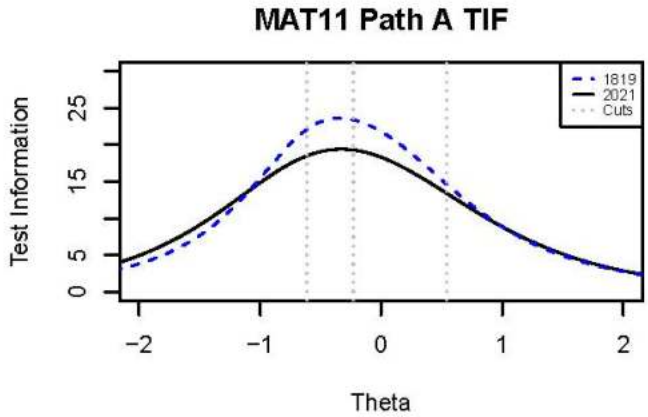

MAT08 Path A TCC
Expected Raw Score
Theta
1819
2021
Cuts

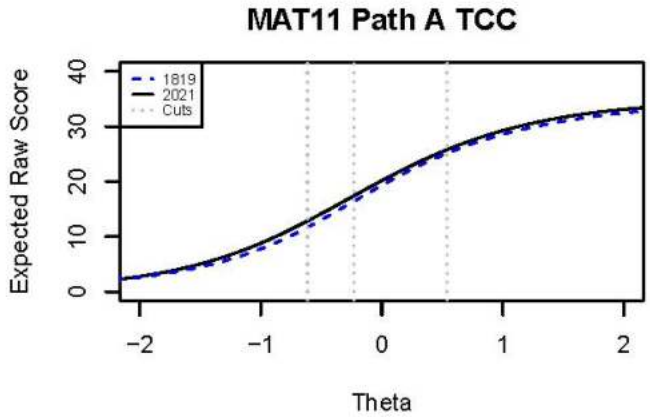

MAT08 Path B TIF
Test Information
Theta
1819
2021
Cuts

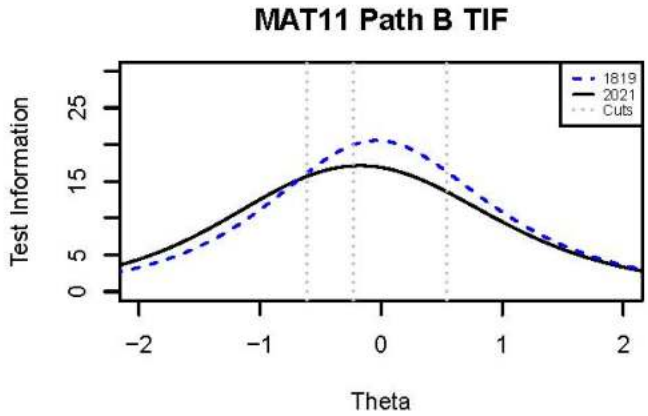

MAT08 Path B TCC
Expected Raw Score
Theta
1819
2021
Cuts

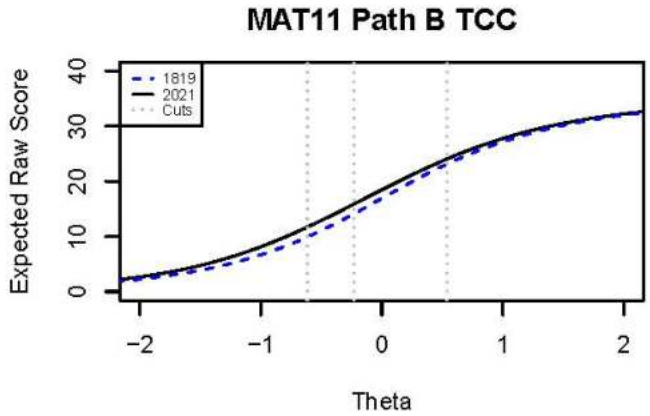

MAT08 Path C TIF
Test Information
Theta
1819
2021
Cuts

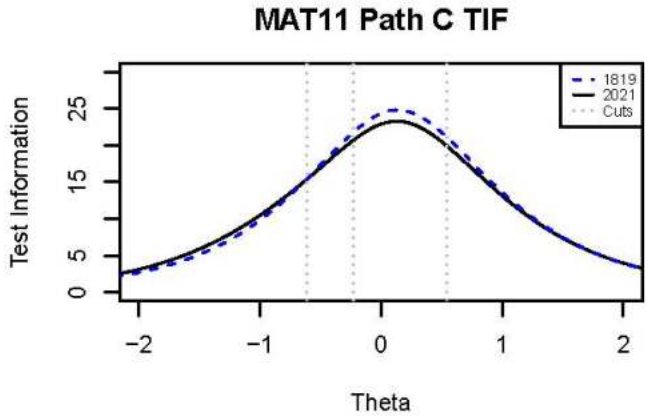

MAT08 Path C TCC
Expected Raw Score
Theta
1819
2021
Cuts

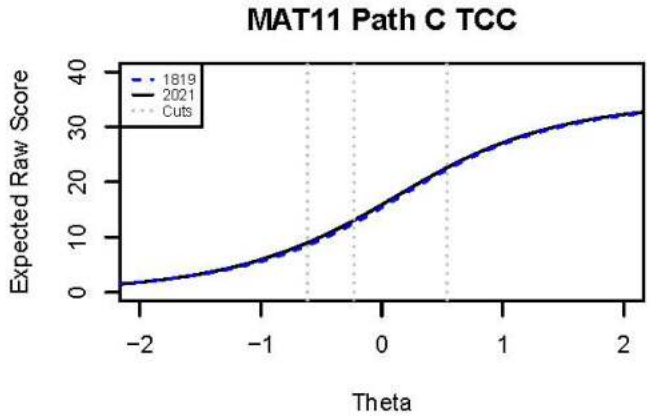

MAT11 Path A TIF
Test Information
Theta
1819
2021
Cuts


MAT11 Path A TCC
Expected Raw Score
Theta
1819
2021
Cuts


MAT11 Path B TIF
Test Information
Theta
1819
2021
Cuts


MAT11 Path B TCC
Expected Raw Score
Theta
1819
2021
Cuts


MAT11 Path C TIF
Test Information
Theta
1819
2021
Cuts


MAT11 Path C TCC
Expected Raw Score
Theta
1819
2021
Cuts

APPENDIX M
RAW TO SCALED SCORE LOOK-UP TABLES

Table M-1. Raw to Scaled Score Look-up Table—ELA Grade 3—2019-to 2021

Path	Raw Score	2021 Scaled Score	2021 Standard Error	2021 Performance Level	2019 Scaled Score	2019 Standard Error	2019 Performance Level
A	0	1200	16.00	1	1200	14.75	1
	1	1200	10.80	1	1200	11.55	1
	2	1204	7.05	1	1200	8.43	1
	3	1209	5.54	1	1205	6.54	1
	4	1212	4.69	1	1208	5.49	1
	5	1214	4.14	1	1211	4.81	1
	6	1216	3.75	1	1213	4.34	1
	7	1217	3.46	1	1215	4.00	1
	8	1219	3.24	1	1217	3.73	1
	9	1220	3.07	1	1218	3.52	1
	10	1221	2.93	1	1220	3.36	1
	11	1222	2.83	1	1221	3.23	1
	12	1224	2.74	1	1222	3.12	1
	13	1224	2.67	1	1223	3.03	1
	14	1225	2.62	1	1224	2.96	1
	15	1226	2.57	1	1225	2.91	1
	16	1227	2.54	1	1226	2.86	1
	17	1228	2.52	1	1227	2.83	1
	18	1229	2.51	1	1228	2.81	1
	19	1230	2.50	1	1229	2.80	1
	20	1231	2.50	1	1230	2.79	1
	21	1231	2.51	1	1231	2.80	1
	22	1232	2.53	1	1232	2.81	1
	23	1233	2.55	1	1233	2.83	1
	24	1234	2.57	2	1233	2.86	1
	25	1235	2.60	2	1234	2.90	2
	26	1236	2.64	2	1235	2.95	2
	27	1236	2.69	2	1236	3.00	2
	28	1237	2.74	2	1237	3.07	2
	29	1238	2.79	2	1239	3.14	2
	30	1239	2.86	2	1240	3.23	3
	31	1240	2.93	3	1241	3.33	3
	32	1241	3.02	3	1242	3.44	3
	33	1243	3.12	3	1243	3.57	3
	34	1244	3.23	3	1245	3.72	3
	35	1245	3.36	3	1246	3.88	3
	36	1246	3.52	3	1248	4.07	3
	37	1248	3.71	3	1249	4.29	3
	38	1249	3.94	3	1251	4.55	3
	39	1251	4.23	3	1253	4.84	3
	40	1253	4.58	3	1255	5.20	4
	41	1256	5.03	4	1258	5.63	4
	42	1258	5.63	4	1261	6.19	4
	43	1262	6.43	4	1264	6.95	4
	44	1266	7.63	4	1269	8.09	4
	45	1272	9.66	4	1275	10.06	4
	46	1283	14.49	4	1286	14.77	4
	47	1290	18.09	4	1290	16.54	4

continued

Path	Raw Score	2021 Scaled Score	2021 Standard Error	2021 Performance Level	2019 Scaled Score	2019 Standard Error	2019 Performance Level
B	0	1200	17.38	1	1200	16.54	1
	1	1200	12.66	1	1200	13.45	1
	2	1203	8.66	1	1200	10.81	1
	3	1209	6.87	1	1202	8.39	1
	4	1212	5.86	1	1207	7.04	1
	5	1215	5.19	1	1211	6.16	1
	6	1218	4.72	1	1214	5.55	1
	7	1220	4.37	1	1216	5.10	1
	8	1222	4.09	1	1218	4.75	1
	9	1223	3.88	1	1220	4.47	1
	10	1225	3.70	1	1222	4.25	1
	11	1226	3.55	1	1223	4.06	1
	12	1227	3.44	1	1225	3.91	1
	13	1229	3.34	1	1226	3.78	1
	14	1230	3.25	1	1228	3.68	1
	15	1231	3.19	1	1229	3.59	1
	16	1232	3.13	1	1230	3.52	1
	17	1233	3.09	1	1231	3.46	1
	18	1234	3.05	2	1232	3.42	1
	19	1235	3.03	2	1233	3.39	1
	20	1236	3.01	2	1235	3.37	2
	21	1237	3.01	2	1236	3.36	2
	22	1238	3.01	2	1237	3.37	2
	23	1239	3.02	2	1238	3.38	2
	24	1240	3.04	3	1239	3.40	2
	25	1241	3.06	3	1240	3.44	3
	26	1242	3.10	3	1241	3.48	3
	27	1243	3.15	3	1243	3.54	3
	28	1244	3.20	3	1244	3.61	3
	29	1245	3.28	3	1245	3.70	3
	30	1246	3.36	3	1246	3.79	3
	31	1248	3.46	3	1248	3.91	3
	32	1249	3.58	3	1249	4.04	3
	33	1250	3.72	3	1251	4.20	3
	34	1252	3.89	3	1252	4.37	3
	35	1253	4.09	3	1254	4.58	4
	36	1255	4.32	4	1256	4.81	4
	37	1257	4.58	4	1258	5.08	4
	38	1259	4.89	4	1260	5.38	4
	39	1261	5.26	4	1262	5.73	4
	40	1264	5.68	4	1265	6.13	4
	41	1267	6.16	4	1268	6.57	4
	42	1270	6.71	4	1272	7.08	4
	43	1274	7.35	4	1276	7.70	4
	44	1279	8.20	4	1281	8.60	4
	45	1285	9.64	4	1288	10.31	4
	46	1289	10.71	4	1289	10.56	4
	47	1290	10.71	4	1290	10.56	4

continued

Path	Raw Score	2021 Scaled Score	2021 Standard Error	2021 Performance Level	2019 Scaled Score	2019 Standard Error	2019 Performance Level
C	0	1200	18.39	1	1200	16.64	1
	1	1200	12.21	1	1200	13.21	1
	2	1205	8.14	1	1200	10.08	1
	3	1211	6.46	1	1204	7.82	1
	4	1214	5.50	1	1208	6.57	1
	5	1217	4.88	1	1212	5.76	1
	6	1219	4.43	1	1214	5.20	1
	7	1221	4.09	1	1217	4.78	1
	8	1223	3.83	1	1219	4.46	1
	9	1224	3.61	1	1221	4.21	1
	10	1226	3.44	1	1222	4.01	1
	11	1227	3.29	1	1224	3.84	1
	12	1228	3.16	1	1225	3.70	1
	13	1229	3.06	1	1226	3.59	1
	14	1230	2.97	1	1228	3.50	1
	15	1231	2.90	1	1229	3.42	1
	16	1232	2.83	1	1230	3.36	1
	17	1233	2.78	1	1231	3.31	1
	18	1234	2.74	2	1232	3.27	1
	19	1235	2.71	2	1233	3.25	1
	20	1236	2.69	2	1234	3.23	2
	21	1237	2.68	2	1235	3.23	2
	22	1238	2.68	2	1236	3.23	2
	23	1239	2.69	2	1237	3.25	2
	24	1240	2.71	3	1239	3.27	2
	25	1241	2.74	3	1240	3.30	3
	26	1241	2.78	3	1241	3.35	3
	27	1242	2.82	3	1242	3.41	3
	28	1243	2.88	3	1243	3.47	3
	29	1244	2.95	3	1244	3.55	3
	30	1245	3.03	3	1245	3.65	3
	31	1247	3.13	3	1247	3.76	3
	32	1248	3.24	3	1248	3.89	3
	33	1249	3.38	3	1250	4.03	3
	34	1250	3.54	3	1251	4.21	3
	35	1252	3.72	3	1253	4.41	3
	36	1253	3.95	3	1255	4.64	4
	37	1255	4.21	4	1257	4.91	4
	38	1257	4.53	4	1259	5.22	4
	39	1259	4.91	4	1261	5.59	4
	40	1262	5.37	4	1264	6.01	4
	41	1264	5.90	4	1267	6.50	4
	42	1268	6.53	4	1271	7.05	4
	43	1272	7.25	4	1275	7.70	4
	44	1277	8.12	4	1280	8.60	4
	45	1283	9.49	4	1287	10.27	4
	46	1289	11.18	4	1289	10.83	4
	47	1290	11.18	4	1290	10.83	4

Table M-2. Raw to Scaled Score Look-up Table—ELA Grade 4—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	18.06	1	1200	17.16	1
	1	1200	14.62	1	1200	13.48	1
	2	1200	11.69	1	1200	10.02	1
	3	1200	8.78	1	1202	7.70	1
	4	1203	7.12	1	1206	6.38	1
	5	1207	6.10	1	1209	5.52	1
	6	1210	5.41	1	1212	4.91	1
	7	1212	4.91	1	1214	4.47	1
	8	1214	4.53	1	1216	4.12	1
	9	1216	4.24	1	1218	3.85	1
	10	1218	4.01	1	1219	3.64	1
	11	1219	3.82	1	1221	3.46	1
	12	1221	3.67	1	1222	3.32	1
	13	1222	3.54	1	1223	3.21	1
	14	1223	3.44	1	1224	3.11	1
	15	1225	3.36	1	1226	3.04	1
	16	1226	3.30	1	1227	2.98	1
	17	1227	3.25	1	1228	2.93	1
	18	1228	3.21	1	1229	2.90	1
	19	1229	3.19	1	1230	2.88	1
	20	1230	3.17	1	1231	2.87	1
	21	1231	3.17	1	1232	2.87	1
A	22	1232	3.17	1	1233	2.88	1
	23	1233	3.19	1	1233	2.90	1
	24	1234	3.21	2	1234	2.93	2
	25	1235	3.24	2	1235	2.96	2
	26	1236	3.28	2	1236	3.01	2
	27	1237	3.34	2	1237	3.07	2
	28	1238	3.40	2	1239	3.13	2
	29	1239	3.47	2	1239	3.22	2
	30	1241	3.56	3	1241	3.31	3
	31	1242	3.65	3	1242	3.42	3
	32	1243	3.77	3	1243	3.55	3
	33	1245	3.89	3	1245	3.70	3
	34	1246	4.04	3	1246	3.87	3
	35	1248	4.21	3	1248	4.07	3
	36	1249	4.41	3	1249	4.31	3
	37	1251	4.64	3	1251	4.58	3
	38	1253	4.92	3	1253	4.90	3
	39	1255	5.26	3	1255	5.29	3
	40	1258	5.68	3	1258	5.78	3
	41	1261	6.23	4	1261	6.43	4
	42	1264	6.99	4	1265	7.33	4
	43	1268	8.11	4	1270	8.75	4
	44	1274	9.98	4	1277	11.39	4

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	45	1283	13.70	4	1288	16.87	4
A	46	1288	16.24	4	1290	16.87	4
	47	1290	16.24	4	NA	NA	NA
	0	1200	20.58	1	1200	19.33	1
	1	1200	15.64	1	1200	14.61	1
	2	1200	11.27	1	1200	10.42	1
	3	1203	8.53	1	1204	8.12	1
	4	1208	7.06	1	1209	6.80	1
	5	1211	6.14	1	1212	5.94	1
	6	1214	5.51	1	1215	5.33	1
	7	1217	5.04	1	1218	4.87	1
	8	1219	4.69	1	1220	4.51	1
	9	1221	4.41	1	1222	4.23	1
	10	1223	4.19	1	1223	4.00	1
	11	1224	4.01	1	1225	3.81	1
	12	1226	3.86	1	1226	3.66	1
	13	1227	3.74	1	1228	3.53	1
	14	1229	3.64	1	1229	3.43	1
	15	1230	3.56	1	1230	3.35	1
	16	1231	3.49	1	1231	3.28	1
	17	1232	3.44	1	1232	3.22	1
	18	1233	3.40	1	1233	3.18	1
	19	1235	3.37	2	1235	3.15	2
	20	1236	3.35	2	1236	3.13	2
	21	1237	3.34	2	1237	3.12	2
B	22	1238	3.35	2	1238	3.12	2
	23	1239	3.36	2	1239	3.13	2
	24	1240	3.38	3	1239	3.15	2
	25	1241	3.42	3	1241	3.19	3
	26	1243	3.46	3	1242	3.24	3
	27	1244	3.52	3	1243	3.30	3
	28	1245	3.59	3	1244	3.38	3
	29	1246	3.68	3	1245	3.47	3
	30	1248	3.77	3	1247	3.58	3
	31	1249	3.89	3	1248	3.71	3
	32	1250	4.02	3	1249	3.86	3
	33	1252	4.17	3	1251	4.03	3
	34	1253	4.34	3	1253	4.22	3
	35	1255	4.53	3	1254	4.45	3
	36	1257	4.75	3	1256	4.71	3
	37	1259	5.01	4	1258	5.00	3
	38	1261	5.30	4	1260	5.35	4
	39	1263	5.65	4	1263	5.75	4
	40	1266	6.05	4	1266	6.23	4
	41	1269	6.55	4	1269	6.81	4
	42	1273	7.16	4	1273	7.56	4
	43	1277	7.98	4	1278	8.59	4
	44	1282	9.18	4	1285	10.30	4

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	45	1288	10.92	4	1288	11.47	4
B	46	1288	10.92	4	1290	11.47	4
	47	1290	10.92	4	NA	NA	NA
	0	1200	20.75	1	1200	19.14	1
	1	1200	16.15	1	1200	14.83	1
	2	1200	12.16	1	1200	10.97	1
	3	1201	9.04	1	1203	8.55	1
	4	1206	7.41	1	1208	7.17	1
	5	1210	6.40	1	1212	6.25	1
	6	1213	5.72	1	1215	5.60	1
	7	1216	5.22	1	1217	5.11	1
	8	1218	4.85	1	1219	4.73	1
	9	1220	4.56	1	1221	4.43	1
	10	1222	4.33	1	1223	4.18	1
	11	1224	4.15	1	1225	3.98	1
	12	1225	4.00	1	1226	3.81	1
	13	1227	3.89	1	1228	3.68	1
	14	1228	3.79	1	1229	3.57	1
	15	1229	3.72	1	1230	3.47	1
	16	1231	3.66	1	1231	3.40	1
	17	1232	3.61	1	1232	3.34	1
	18	1233	3.58	1	1233	3.29	1
	19	1234	3.56	2	1235	3.26	2
	20	1236	3.55	2	1236	3.24	2
	21	1237	3.54	2	1237	3.23	2
C	22	1238	3.55	2	1238	3.23	2
	23	1239	3.57	2	1239	3.24	2
	24	1240	3.59	3	1240	3.27	3
	25	1242	3.63	3	1241	3.31	3
	26	1243	3.67	3	1242	3.36	3
	27	1244	3.73	3	1244	3.43	3
	28	1245	3.80	3	1245	3.51	3
	29	1247	3.88	3	1246	3.61	3
	30	1248	3.98	3	1247	3.73	3
	31	1250	4.09	3	1249	3.87	3
	32	1251	4.21	3	1250	4.02	3
	33	1253	4.36	3	1252	4.20	3
	34	1254	4.53	3	1253	4.41	3
	35	1256	4.72	3	1255	4.64	3
	36	1258	4.94	3	1257	4.91	3
	37	1260	5.20	4	1259	5.21	4
	38	1262	5.50	4	1262	5.56	4
	39	1265	5.84	4	1264	5.97	4
	40	1267	6.26	4	1267	6.45	4
	41	1271	6.76	4	1271	7.04	4
	42	1274	7.40	4	1275	7.79	4
	43	1279	8.25	4	1280	8.85	4
	44	1284	9.54	4	1287	10.65	4

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	45	1288	10.74	4	1288	11.22	4
	46	1288	10.74	4	1290	11.22	4
	47	1290	10.74	4	NA	NA	NA

Table M-3. Raw to Scaled Score Look-up Table—ELA Grade 5—2019-to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	17.80	1	1200	19.32	1
	1	1200	12.51	1	1200	14.94	1
	2	1201	8.03	1	1200	10.97	1
	3	1206	6.21	1	1203	8.35	1
	4	1210	5.19	1	1207	6.90	1
	5	1212	4.54	1	1211	5.98	1
	6	1214	4.08	1	1214	5.34	1
	7	1216	3.75	1	1216	4.86	1
	8	1218	3.50	1	1218	4.50	1
	9	1219	3.31	1	1220	4.22	1
	10	1220	3.15	1	1222	4.00	1
	11	1222	3.04	1	1223	3.82	1
	12	1223	2.94	1	1225	3.68	1
	13	1224	2.87	1	1226	3.57	1
	14	1225	2.81	1	1227	3.49	1
	15	1226	2.77	1	1229	3.42	1
	16	1227	2.75	1	1230	3.38	1
	17	1228	2.73	1	1231	3.35	1
	18	1229	2.72	1	1232	3.34	2
	19	1229	2.73	1	1233	3.34	2
	20	1230	2.74	1	1234	3.35	2
	21	1232	2.76	2	1236	3.38	2
	22	1232	2.79	2	1237	3.42	2
	23	1233	2.83	2	1238	3.47	2
	24	1234	2.88	2	1239	3.53	2
	25	1235	2.93	2	1240	3.60	3
	26	1236	2.99	2	1242	3.69	3
	27	1237	3.07	2	1243	3.79	3
	28	1238	3.15	2	1244	3.91	3
	29	1239	3.24	2	1246	4.05	3
	30	1241	3.35	3	1247	4.21	3
	31	1242	3.46	3	1249	4.39	3
	32	1243	3.60	3	1251	4.60	3
	33	1244	3.74	3	1253	4.85	3
	34	1246	3.91	3	1255	5.15	3
	35	1248	4.11	3	1257	5.52	4

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	36	1249	4.33	3	1260	5.98	4
	37	1251	4.60	3	1263	6.60	4
	38	1253	4.92	3	1267	7.48	4
	39	1255	5.31	3	1272	8.82	4
	40	1259	5.82	4	1279	11.09	4
	41	1262	6.53	4	1289	15.50	4
	42	1266	7.61	4	1290	16.68	4
	43	1272	9.58	4	1290	16.68	4
	44	1283	14.57	4	NA	NA	NA
	45	1290	19.77	4	NA	NA	NA
B	0	1200	20.69	1	1200	22.88	1
	1	1200	15.58	1	1200	17.35	1
	2	1200	10.91	1	1200	12.50	1
	3	1204	8.16	1	1203	9.24	1
	4	1209	6.66	1	1209	7.50	1
	5	1212	5.71	1	1213	6.40	1
	6	1215	5.05	1	1216	5.65	1
	7	1217	4.59	1	1218	5.10	1
	8	1219	4.24	1	1221	4.69	1
	9	1221	3.97	1	1223	4.38	1
	10	1223	3.77	1	1224	4.14	1
	11	1224	3.61	1	1226	3.95	1
	12	1226	3.49	1	1228	3.80	1
	13	1227	3.40	1	1229	3.69	1
	14	1228	3.33	1	1230	3.61	1
	15	1229	3.28	1	1232	3.56	2
	16	1231	3.25	1	1233	3.52	2
	17	1232	3.23	2	1234	3.50	2
	18	1233	3.22	2	1236	3.50	2
	19	1234	3.23	2	1237	3.51	2
	20	1235	3.24	2	1238	3.54	2
	21	1236	3.27	2	1239	3.57	2
	22	1237	3.31	2	1241	3.62	3
	23	1239	3.36	2	1242	3.69	3
	24	1239	3.42	2	1243	3.76	3
	25	1241	3.50	3	1245	3.86	3
	26	1242	3.58	3	1246	3.96	3
	27	1244	3.68	3	1248	4.08	3
	28	1245	3.79	3	1249	4.22	3
	29	1246	3.91	3	1251	4.38	3
	30	1248	4.05	3	1253	4.57	3
	31	1249	4.21	3	1255	4.78	3
	32	1251	4.39	3	1257	5.02	4
	33	1253	4.60	3	1259	5.30	4

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	34	1255	4.83	3	1261	5.62	4
	35	1257	5.09	4	1264	5.98	4
	36	1259	5.39	4	1267	6.40	4
	37	1262	5.73	4	1271	6.92	4
	38	1265	6.10	4	1275	7.67	4
	39	1268	6.55	4	1280	8.93	4
	40	1272	7.13	4	1287	11.48	4
	41	1276	7.99	4	1290	13.33	4
	42	1282	9.56	4	1290	13.33	4
	43	1290	13.14	4	1290	13.33	4
	44	1290	13.40	4	NA	NA	NA
	45	1290	13.40	4	NA	NA	NA
C	0	1200	21.11	1	1200	23.35	1
	1	1200	15.44	1	1200	17.79	1
	2	1200	10.41	1	1200	12.94	1
	3	1206	7.84	1	1203	9.48	1
	4	1210	6.43	1	1208	7.66	1
	5	1213	5.54	1	1213	6.53	1
	6	1216	4.94	1	1216	5.75	1
	7	1218	4.50	1	1218	5.19	1
	8	1220	4.18	1	1221	4.77	1
	9	1222	3.94	1	1223	4.45	1
	10	1224	3.76	1	1225	4.21	1
	11	1225	3.62	1	1226	4.02	1
	12	1227	3.51	1	1228	3.88	1
	13	1228	3.43	1	1229	3.78	1
	14	1229	3.37	1	1231	3.70	1
	15	1230	3.33	1	1232	3.65	2
	16	1232	3.31	2	1233	3.61	2
	17	1233	3.30	2	1235	3.60	2
	18	1234	3.30	2	1236	3.60	2
	19	1235	3.30	2	1237	3.61	2
	20	1236	3.32	2	1239	3.64	2
	21	1237	3.34	2	1239	3.68	2
	22	1239	3.37	2	1241	3.74	3
	23	1239	3.40	2	1243	3.80	3
	24	1241	3.44	3	1244	3.88	3
	25	1242	3.49	3	1245	3.97	3
	26	1244	3.55	3	1247	4.08	3
	27	1245	3.63	3	1248	4.20	3
	28	1246	3.72	3	1250	4.34	3
	29	1248	3.82	3	1252	4.50	3
	30	1249	3.96	3	1254	4.69	3
	31	1251	4.11	3	1255	4.90	3

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	32	1252	4.29	3	1258	5.14	4
	33	1254	4.50	3	1260	5.41	4
	34	1256	4.74	4	1262	5.72	4
	35	1258	5.01	4	1265	6.08	4
	36	1260	5.31	4	1268	6.50	4
	37	1263	5.65	4	1272	7.04	4
	38	1266	6.02	4	1276	7.84	4
	39	1269	6.46	4	1281	9.22	4
	40	1273	7.04	4	1289	12.03	4
	41	1277	7.91	4	1290	13.04	4
	42	1283	9.45	4	1290	13.04	4
	43	1290	12.82	4	1290	13.04	4
	44	1290	12.86	4	NA	NA	NA
	45	1290	12.86	4	NA	NA	NA

Table M-4. Raw to Scaled Score Look-up Table—ELA Grade 6—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	22.31	1	1200	26.94	1
	1	1200	13.81	1	1200	14.02	1
	2	1200	8.39	1	1203	8.01	1
	3	1206	6.25	1	1208	5.88	1
	4	1209	5.08	1	1212	4.78	1
	5	1212	4.35	1	1214	4.10	1
	6	1214	3.86	1	1216	3.64	1
	7	1216	3.51	1	1218	3.31	1
	8	1217	3.27	1	1219	3.06	1
	9	1219	3.08	1	1221	2.87	1
	10	1220	2.95	1	1222	2.72	1
	11	1221	2.86	1	1223	2.61	1
	12	1222	2.79	1	1224	2.51	1
	13	1223	2.75	1	1225	2.44	1
	14	1224	2.73	1	1226	2.39	1
	15	1225	2.72	1	1227	2.35	1
	16	1226	2.73	1	1227	2.32	1
	17	1227	2.74	1	1228	2.31	1
	18	1228	2.76	1	1229	2.30	1
	19	1229	2.79	1	1230	2.31	1
	20	1231	2.83	2	1231	2.32	2
	21	1231	2.86	2	1232	2.35	2
	22	1232	2.91	2	1232	2.38	2
	23	1233	2.95	2	1233	2.42	2
	24	1234	3.00	2	1234	2.48	2

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	25	1235	3.06	2	1235	2.54	2
	26	1236	3.12	2	1236	2.61	2
	27	1237	3.19	3	1237	2.70	3
	28	1238	3.27	3	1238	2.79	3
	29	1240	3.35	3	1239	2.91	3
	30	1241	3.45	3	1240	3.03	3
	31	1242	3.56	3	1241	3.18	3
	32	1243	3.69	3	1243	3.35	3
	33	1245	3.84	3	1244	3.54	3
	34	1246	4.01	3	1245	3.77	3
	35	1248	4.23	3	1247	4.05	3
	36	1250	4.48	3	1249	4.39	3
	37	1252	4.80	4	1251	4.81	4
	38	1254	5.22	4	1254	5.36	4
	39	1257	5.78	4	1257	6.11	4
	40	1261	6.58	4	1261	7.20	4
	41	1265	7.85	4	1267	8.99	4
	42	1272	10.29	4	1275	12.58	4
	43	1285	17.61	4	1287	19.11	4
	44	1290	18.87	4	1290	19.11	4
B	0	1200	22.88	1	1200	26.79	1
	1	1200	11.11	1	1200	16.20	1
	2	1204	7.09	1	1202	9.66	1
	3	1209	5.42	1	1208	7.14	1
	4	1212	4.50	1	1212	5.80	1
	5	1214	3.92	1	1215	4.96	1
	6	1216	3.54	1	1218	4.39	1
	7	1218	3.28	1	1220	3.98	1
	8	1219	3.09	1	1222	3.67	1
	9	1220	2.96	1	1223	3.44	1
	10	1222	2.87	1	1224	3.25	1
	11	1223	2.81	1	1226	3.11	1
	12	1224	2.77	1	1227	3.00	1
	13	1225	2.75	1	1228	2.91	1
	14	1226	2.75	1	1229	2.84	1
	15	1227	2.76	1	1230	2.78	1
	16	1228	2.77	1	1231	2.75	2
	17	1229	2.79	1	1232	2.73	2
	18	1230	2.82	1	1233	2.72	2
	19	1231	2.84	2	1234	2.72	2
	20	1232	2.87	2	1235	2.74	2
	21	1233	2.91	2	1236	2.76	2
	22	1234	2.94	2	1237	2.80	3
	23	1235	2.98	2	1238	2.85	3
	24	1236	3.03	2	1239	2.92	3

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	25	1237	3.08	3	1240	3.00	3
	26	1238	3.13	3	1241	3.09	3
	27	1239	3.20	3	1242	3.20	3
	28	1241	3.27	3	1243	3.32	3
	29	1242	3.36	3	1244	3.47	3
	30	1243	3.45	3	1246	3.63	3
	31	1244	3.57	3	1247	3.83	3
	32	1246	3.70	3	1249	4.05	3
	33	1247	3.86	3	1251	4.31	4
	34	1249	4.05	3	1253	4.62	4
	35	1251	4.27	4	1255	4.98	4
	36	1253	4.54	4	1257	5.41	4
	37	1255	4.87	4	1260	5.92	4
	38	1257	5.27	4	1263	6.53	4
	39	1260	5.78	4	1267	7.29	4
	40	1264	6.45	4	1272	8.27	4
	41	1268	7.35	4	1278	9.76	4
	42	1274	8.73	4	1287	12.78	4
	43	1283	11.86	4	1287	12.78	4
	44	1290	13.79	4	1290	12.78	4
C	0	1200	22.42	1	1200	27.41	1
	1	1200	11.67	1	1200	16.76	1
	2	1204	7.89	1	1202	9.87	1
	3	1209	6.29	1	1208	7.28	1
	4	1213	5.38	1	1212	5.91	1
	5	1215	4.77	1	1216	5.07	1
	6	1218	4.34	1	1218	4.49	1
	7	1219	4.02	1	1220	4.08	1
	8	1221	3.76	1	1222	3.77	1
	9	1223	3.56	1	1223	3.54	1
	10	1224	3.39	1	1225	3.35	1
	11	1225	3.25	1	1226	3.20	1
	12	1226	3.13	1	1227	3.09	1
	13	1228	3.04	1	1228	3.00	1
	14	1229	2.95	1	1229	2.92	1
	15	1230	2.88	1	1231	2.87	2
	16	1231	2.83	2	1232	2.83	2
	17	1232	2.78	2	1233	2.81	2
	18	1233	2.75	2	1233	2.80	2
	19	1234	2.74	2	1234	2.80	2
	20	1234	2.73	2	1235	2.82	2
	21	1235	2.74	2	1236	2.85	2
	22	1236	2.76	2	1237	2.89	3
	23	1237	2.79	3	1238	2.94	3
	24	1238	2.82	3	1239	3.01	3

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	25	1239	2.87	3	1241	3.09	3
	26	1240	2.93	3	1242	3.19	3
	27	1241	3.00	3	1243	3.30	3
	28	1242	3.08	3	1244	3.43	3
	29	1243	3.16	3	1245	3.58	3
	30	1245	3.27	3	1247	3.75	3
	31	1246	3.38	3	1248	3.95	3
	32	1247	3.52	3	1250	4.19	3
	33	1249	3.68	3	1252	4.45	4
	34	1250	3.86	3	1254	4.77	4
	35	1252	4.09	4	1256	5.14	4
	36	1254	4.36	4	1259	5.58	4
	37	1256	4.70	4	1262	6.10	4
	38	1258	5.12	4	1265	6.73	4
	39	1261	5.64	4	1269	7.50	4
	40	1264	6.33	4	1274	8.53	4
	41	1269	7.26	4	1281	10.19	4
	42	1275	8.66	4	1287	12.49	4
	43	1284	11.80	4	1287	12.49	4
	44	1290	13.46	4	1290	12.49	4

Table M-5. Raw to Scaled Score Look-up Table—ELA Grade 7—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	18.90	1	1200	20.41	1
	1	1200	11.74	1	1200	10.93	1
	2	1205	7.75	1	1207	7.08	1
	3	1210	6.07	1	1211	5.50	1
	4	1213	5.10	1	1214	4.60	1
	5	1216	4.47	1	1217	4.02	1
	6	1218	4.03	1	1219	3.62	1
	7	1220	3.70	1	1220	3.32	1
	8	1221	3.44	1	1222	3.09	1
	9	1222	3.24	1	1223	2.91	1
	10	1224	3.08	1	1224	2.77	1
	11	1225	2.95	1	1225	2.66	1
	12	1226	2.85	1	1226	2.57	1
	13	1227	2.76	1	1227	2.50	1
	14	1228	2.70	1	1228	2.45	1
	15	1229	2.64	1	1229	2.41	1
	16	1230	2.60	1	1229	2.38	1
	17	1231	2.57	1	1230	2.36	1
	18	1232	2.55	1	1231	2.35	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	19	1232	2.54	1	1232	2.35	1
	20	1233	2.54	1	1233	2.36	1
	21	1234	2.55	1	1233	2.38	1
	22	1235	2.57	1	1234	2.40	1
	23	1236	2.60	2	1235	2.44	1
	24	1237	2.64	2	1236	2.48	2
	25	1238	2.69	2	1237	2.53	2
	26	1239	2.75	2	1238	2.59	2
	27	1239	2.83	2	1239	2.66	2
	28	1241	2.91	3	1239	2.74	2
	29	1242	3.01	3	1241	2.84	3
	30	1243	3.13	3	1242	2.94	3
	31	1244	3.27	3	1243	3.06	3
	32	1245	3.43	3	1244	3.21	3
	33	1247	3.61	3	1245	3.37	3
	34	1248	3.82	3	1247	3.56	3
	35	1250	4.07	3	1248	3.78	3
	36	1251	4.35	3	1250	4.05	3
	37	1254	4.68	3	1252	4.37	3
	38	1256	5.09	4	1254	4.77	3
	39	1259	5.59	4	1256	5.28	4
	40	1262	6.25	4	1260	5.95	4
	41	1266	7.22	4	1264	6.94	4
	42	1271	8.92	4	1269	8.67	4
	43	1281	13.09	4	1279	13.13	4
	44	1290	20.18	4	1290	22.58	4
B	0	1200	20.88	1	1200	20.96	1
	1	1200	13.03	1	1200	12.23	1
	2	1205	8.37	1	1206	7.93	1
	3	1210	6.49	1	1211	6.16	1
	4	1214	5.45	1	1215	5.17	1
	5	1217	4.77	1	1217	4.52	1
	6	1219	4.30	1	1219	4.07	1
	7	1221	3.95	1	1221	3.74	1
	8	1223	3.68	1	1223	3.49	1
	9	1224	3.46	1	1224	3.29	1
	10	1225	3.29	1	1226	3.14	1
	11	1227	3.16	1	1227	3.03	1
	12	1228	3.05	1	1228	2.94	1
	13	1229	2.96	1	1229	2.87	1
	14	1230	2.89	1	1230	2.81	1
	15	1231	2.84	1	1231	2.78	1
	16	1232	2.80	1	1232	2.75	1
	17	1233	2.78	1	1233	2.74	1
	18	1234	2.77	1	1234	2.74	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	19	1235	2.77	1	1235	2.75	1
	20	1236	2.79	2	1236	2.77	2
	21	1237	2.81	2	1237	2.80	2
	22	1238	2.85	2	1238	2.84	2
	23	1239	2.90	2	1239	2.88	2
	24	1239	2.97	2	1239	2.94	2
	25	1241	3.05	3	1241	3.00	3
	26	1242	3.14	3	1242	3.08	3
	27	1243	3.25	3	1243	3.17	3
	28	1244	3.37	3	1244	3.27	3
	29	1246	3.51	3	1245	3.39	3
	30	1247	3.68	3	1246	3.53	3
	31	1249	3.86	3	1248	3.69	3
	32	1250	4.08	3	1249	3.87	3
	33	1252	4.32	3	1251	4.09	3
	34	1254	4.60	3	1253	4.34	3
	35	1256	4.92	4	1255	4.63	4
	36	1259	5.29	4	1257	4.98	4
	37	1261	5.70	4	1260	5.38	4
	38	1264	6.16	4	1262	5.84	4
	39	1268	6.64	4	1266	6.35	4
	40	1272	7.14	4	1270	6.87	4
	41	1278	7.78	4	1275	7.44	4
	42	1284	9.25	4	1281	8.42	4
	43	1290	12.25	4	1290	11.70	4
	44	1290	12.25	4	1290	12.43	4
C	0	1200	19.76	1	1200	21.51	1
	1	1200	13.65	1	1200	11.58	1
	2	1203	9.06	1	1208	7.56	1
	3	1209	7.16	1	1212	5.91	1
	4	1213	6.08	1	1216	4.98	1
	5	1216	5.37	1	1218	4.38	1
	6	1219	4.86	1	1220	3.96	1
	7	1221	4.47	1	1222	3.65	1
	8	1223	4.18	1	1223	3.42	1
	9	1224	3.95	1	1225	3.24	1
	10	1226	3.76	1	1226	3.10	1
	11	1227	3.61	1	1227	2.99	1
	12	1229	3.50	1	1228	2.90	1
	13	1230	3.40	1	1229	2.84	1
	14	1231	3.34	1	1230	2.80	1
	15	1232	3.29	1	1231	2.76	1
	16	1233	3.25	1	1232	2.74	1
	17	1235	3.24	1	1233	2.74	1
	18	1236	3.23	2	1234	2.74	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	19	1237	3.25	2	1236	2.75	2
	20	1238	3.27	2	1236	2.77	2
	21	1239	3.30	2	1237	2.80	2
	22	1240	3.35	3	1238	2.84	2
	23	1241	3.41	3	1239	2.88	2
	24	1243	3.48	3	1240	2.94	3
	25	1244	3.56	3	1241	3.00	3
	26	1245	3.66	3	1242	3.08	3
	27	1246	3.76	3	1243	3.16	3
	28	1248	3.88	3	1244	3.26	3
	29	1249	4.02	3	1246	3.38	3
	30	1251	4.17	3	1247	3.51	3
	31	1252	4.34	3	1248	3.66	3
	32	1255	4.53	4	1250	3.83	3
	33	1256	4.74	4	1251	4.04	3
	34	1258	4.98	4	1253	4.28	3
	35	1260	5.24	4	1255	4.55	4
	36	1263	5.53	4	1257	4.88	4
	37	1266	5.84	4	1260	5.26	4
	38	1269	6.16	4	1263	5.71	4
	39	1272	6.52	4	1266	6.20	4
	40	1276	6.97	4	1270	6.73	4
	41	1281	7.75	4	1275	7.32	4
	42	1288	9.58	4	1281	8.30	4
	43	1290	11.10	4	1290	11.45	4
	44	1290	11.10	4	1290	12.37	4

Table M-6. Raw to Scaled Score Look-up Table—ELA Grade 8—2019-to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	22.07	1	1200	21.14	1
	1	1200	13.79	1	1200	14.43	1
	2	1201	8.54	1	1200	8.88	1
	3	1206	6.51	1	1205	6.63	1
	4	1210	5.38	1	1209	5.39	1
	5	1213	4.66	1	1212	4.60	1
	6	1215	4.16	1	1214	4.06	1
	7	1217	3.80	1	1216	3.67	1
	8	1218	3.52	1	1217	3.38	1
	9	1220	3.31	1	1219	3.15	1
	10	1221	3.15	1	1220	2.98	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	11	1222	3.03	1	1221	2.85	1
	12	1223	2.93	1	1222	2.74	1
	13	1224	2.86	1	1223	2.66	1
	14	1226	2.81	1	1224	2.60	1
	15	1227	2.77	1	1225	2.56	1
	16	1227	2.76	1	1226	2.53	1
	17	1228	2.75	1	1227	2.52	1
	18	1229	2.76	1	1228	2.52	1
	19	1230	2.78	2	1229	2.53	1
	20	1231	2.81	2	1229	2.55	1
	21	1232	2.84	2	1230	2.58	2
	22	1233	2.89	2	1231	2.62	2
	23	1234	2.95	2	1232	2.68	2
	24	1235	3.02	2	1233	2.74	2
	25	1236	3.09	2	1234	2.81	2
	26	1237	3.18	2	1235	2.90	2
	27	1239	3.28	3	1236	3.00	2
	28	1240	3.39	3	1237	3.11	2
	29	1241	3.52	3	1238	3.24	3
	30	1242	3.66	3	1240	3.39	3
	31	1244	3.81	3	1241	3.56	3
	32	1245	4.00	3	1242	3.75	3
	33	1247	4.20	3	1244	3.97	3
	34	1249	4.44	3	1246	4.23	3
	35	1251	4.72	4	1248	4.54	3
	36	1253	5.05	4	1250	4.90	4
	37	1255	5.45	4	1252	5.34	4
	38	1258	5.94	4	1255	5.89	4
	39	1261	6.58	4	1258	6.58	4
	40	1265	7.43	4	1262	7.48	4
	41	1270	8.67	4	1267	8.76	4
	42	1278	10.79	4	1274	10.84	4
	43	1290	16.12	4	1286	15.85	4
	44	1290	16.22	4	1290	17.77	4
B	0	1200	22.55	1	1200	21.95	1
	1	1200	12.46	1	1200	14.15	1
	2	1204	8.08	1	1201	8.70	1
	3	1209	6.25	1	1206	6.51	1
	4	1212	5.21	1	1210	5.31	1
	5	1215	4.54	1	1213	4.56	1
	6	1217	4.07	1	1215	4.04	1
	7	1219	3.73	1	1217	3.66	1
	8	1221	3.47	1	1218	3.38	1
	9	1222	3.27	1	1220	3.17	1
	10	1223	3.12	1	1221	3.00	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	11	1224	3.00	1	1222	2.88	1
	12	1226	2.92	1	1223	2.78	1
	13	1227	2.85	1	1224	2.71	1
	14	1228	2.80	1	1225	2.66	1
	15	1229	2.78	1	1226	2.62	1
	16	1229	2.76	1	1227	2.60	1
	17	1231	2.76	2	1228	2.60	1
	18	1232	2.76	2	1229	2.60	1
	19	1233	2.78	2	1229	2.62	1
	20	1234	2.81	2	1231	2.65	2
	21	1235	2.84	2	1232	2.68	2
	22	1236	2.89	2	1233	2.73	2
	23	1237	2.94	2	1234	2.79	2
	24	1238	3.00	3	1235	2.86	2
	25	1239	3.07	3	1236	2.94	2
	26	1240	3.15	3	1237	3.03	2
	27	1241	3.24	3	1238	3.13	3
	28	1242	3.34	3	1239	3.25	3
	29	1243	3.45	3	1240	3.39	3
	30	1245	3.57	3	1242	3.54	3
	31	1246	3.71	3	1243	3.71	3
	32	1248	3.86	3	1245	3.90	3
	33	1250	4.02	4	1246	4.11	3
	34	1251	4.19	4	1248	4.33	3
	35	1253	4.37	4	1250	4.57	4
	36	1255	4.56	4	1253	4.80	4
	37	1257	4.75	4	1255	5.02	4
	38	1260	4.97	4	1258	5.24	4
	39	1263	5.26	4	1261	5.48	4
	40	1266	5.75	4	1264	5.87	4
	41	1270	6.68	4	1268	6.67	4
	42	1276	8.74	4	1274	8.57	4
	43	1287	14.81	4	1285	14.38	4
	44	1290	16.93	4	1290	18.16	4
C	0	1200	22.62	1	1200	22.30	1
	1	1200	12.84	1	1200	14.92	1
	2	1204	8.34	1	1200	9.05	1
	3	1209	6.42	1	1206	6.71	1
	4	1212	5.33	1	1210	5.43	1
	5	1215	4.63	1	1213	4.63	1
	6	1217	4.14	1	1215	4.09	1
	7	1219	3.78	1	1217	3.70	1
	8	1221	3.52	1	1218	3.41	1
	9	1222	3.32	1	1220	3.19	1
	10	1224	3.17	1	1221	3.02	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	11	1225	3.05	1	1222	2.90	1
	12	1226	2.97	1	1223	2.80	1
	13	1227	2.91	1	1224	2.73	1
	14	1228	2.87	1	1225	2.67	1
	15	1229	2.85	1	1226	2.64	1
	16	1230	2.84	2	1227	2.62	1
	17	1231	2.84	2	1228	2.62	1
	18	1232	2.86	2	1229	2.63	1
	19	1233	2.88	2	1230	2.65	2
	20	1234	2.92	2	1231	2.68	2
	21	1235	2.96	2	1232	2.72	2
	22	1236	3.01	2	1233	2.77	2
	23	1238	3.07	3	1234	2.83	2
	24	1239	3.14	3	1235	2.90	2
	25	1240	3.22	3	1236	2.99	2
	26	1241	3.30	3	1237	3.08	2
	27	1242	3.39	3	1238	3.19	3
	28	1243	3.49	3	1240	3.31	3
	29	1245	3.59	3	1241	3.45	3
	30	1246	3.71	3	1242	3.60	3
	31	1248	3.83	3	1244	3.77	3
	32	1249	3.96	3	1245	3.95	3
	33	1251	4.10	4	1247	4.15	3
	34	1252	4.24	4	1249	4.36	3
	35	1254	4.39	4	1251	4.58	4
	36	1256	4.54	4	1253	4.80	4
	37	1259	4.71	4	1256	5.01	4
	38	1261	4.91	4	1258	5.21	4
	39	1264	5.21	4	1261	5.47	4
	40	1267	5.71	4	1265	5.89	4
	41	1271	6.60	4	1269	6.76	4
	42	1276	8.46	4	1275	8.76	4
	43	1286	13.40	4	1286	14.76	4
	44	1290	15.92	4	1290	17.81	4

Table M-7. Raw to Scaled Score Look-up Table—ELA Grade 11—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	22.70	1	1200	20.28	1
	1	1203	11.61	1	1204	10.07	1
	2	1212	7.04	1	1212	6.39	1
	3	1216	5.29	1	1216	4.93	1
	4	1219	4.34	1	1218	4.12	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	5	1221	3.75	1	1221	3.61	1
	6	1223	3.35	1	1222	3.25	1
	7	1225	3.07	1	1224	2.99	1
	8	1226	2.86	1	1225	2.80	1
	9	1227	2.70	1	1226	2.65	1
	10	1228	2.59	1	1227	2.53	1
	11	1229	2.50	1	1228	2.44	1
	12	1230	2.43	1	1229	2.36	1
	13	1231	2.39	1	1230	2.31	1
	14	1232	2.35	1	1231	2.27	1
	15	1233	2.33	1	1231	2.24	1
	16	1234	2.32	1	1232	2.22	1
	17	1235	2.32	1	1233	2.21	1
	18	1235	2.32	1	1234	2.20	1
	19	1236	2.34	2	1234	2.21	1
	20	1237	2.35	2	1235	2.22	1
	21	1238	2.38	2	1236	2.24	2
	22	1239	2.41	2	1237	2.27	2
	23	1240	2.45	3	1237	2.30	2
	24	1240	2.49	3	1238	2.34	2
	25	1241	2.55	3	1239	2.39	2
	26	1242	2.61	3	1240	2.45	3
	27	1243	2.68	3	1241	2.51	3
	28	1244	2.77	3	1242	2.59	3
	29	1245	2.87	3	1242	2.68	3
	30	1246	2.99	3	1243	2.78	3
	31	1247	3.12	3	1245	2.90	3
	32	1249	3.28	3	1246	3.03	3
	33	1250	3.45	3	1247	3.19	3
	34	1252	3.66	3	1248	3.37	3
	35	1253	3.90	3	1250	3.59	3
	36	1255	4.19	4	1251	3.86	3
	37	1257	4.53	4	1253	4.17	3
	38	1259	4.97	4	1255	4.57	4
	39	1262	5.54	4	1258	5.06	4
	40	1266	6.34	4	1261	5.72	4
	41	1270	7.60	4	1265	6.65	4
	42	1277	10.13	4	1270	8.21	4
	43	1290	17.68	4	1279	12.04	4
	44	1290	17.68	4	1290	19.86	4
B	0	1200	24.10	1	1200	20.17	1
	1	1204	11.70	1	1203	11.31	1
	2	1213	7.08	1	1211	7.21	1
	3	1217	5.33	1	1215	5.58	1
	4	1220	4.38	1	1218	4.69	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	5	1222	3.80	1	1221	4.11	1
	6	1224	3.40	1	1223	3.71	1
	7	1226	3.12	1	1224	3.42	1
	8	1227	2.91	1	1226	3.19	1
	9	1228	2.76	1	1227	3.02	1
	10	1229	2.64	1	1228	2.88	1
	11	1231	2.55	1	1229	2.77	1
	12	1231	2.49	1	1230	2.68	1
	13	1232	2.44	1	1231	2.61	1
	14	1233	2.41	1	1232	2.56	1
	15	1234	2.38	1	1233	2.51	1
	16	1235	2.37	1	1234	2.48	1
	17	1236	2.37	2	1235	2.46	1
	18	1237	2.37	2	1236	2.45	2
	19	1238	2.38	2	1236	2.45	2
	20	1238	2.40	2	1237	2.46	2
	21	1239	2.42	2	1238	2.47	2
	22	1240	2.46	3	1239	2.49	2
	23	1241	2.50	3	1240	2.53	3
	24	1242	2.55	3	1241	2.57	3
	25	1243	2.61	3	1241	2.62	3
	26	1244	2.68	3	1242	2.68	3
	27	1245	2.77	3	1243	2.75	3
	28	1246	2.87	3	1244	2.83	3
	29	1247	2.98	3	1245	2.93	3
	30	1248	3.12	3	1246	3.05	3
	31	1249	3.27	3	1248	3.18	3
	32	1251	3.44	3	1249	3.34	3
	33	1252	3.65	3	1250	3.53	3
	34	1254	3.89	3	1252	3.75	3
	35	1256	4.18	4	1254	4.02	3
	36	1258	4.52	4	1255	4.34	4
	37	1260	4.95	4	1258	4.73	4
	38	1263	5.48	4	1260	5.22	4
	39	1266	6.15	4	1263	5.84	4
	40	1270	7.01	4	1267	6.61	4
	41	1276	8.16	4	1272	7.59	4
	42	1283	10.15	4	1278	9.00	4
	43	1290	12.99	4	1288	12.31	4
	44	1290	12.99	4	1290	13.29	4
C	0	1200	23.85	1	1200	21.22	1
	1	1203	12.70	1	1201	12.62	1
	2	1212	7.68	1	1210	7.87	1
	3	1217	5.71	1	1215	6.06	1
	4	1220	4.64	1	1218	5.07	1

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	5	1223	3.98	1	1221	4.44	1
	6	1225	3.54	1	1223	4.01	1
	7	1226	3.24	1	1225	3.70	1
	8	1228	3.02	1	1226	3.46	1
	9	1229	2.86	1	1228	3.28	1
	10	1230	2.75	1	1229	3.13	1
	11	1231	2.67	1	1230	3.02	1
	12	1232	2.61	1	1231	2.93	1
	13	1233	2.57	1	1233	2.86	1
	14	1234	2.55	1	1234	2.80	1
	15	1235	2.54	1	1235	2.76	1
	16	1236	2.54	2	1236	2.72	2
	17	1237	2.55	2	1236	2.70	2
	18	1238	2.57	2	1237	2.69	2
	19	1239	2.59	2	1238	2.69	2
	20	1240	2.63	3	1239	2.70	2
	21	1241	2.67	3	1240	2.72	3
	22	1242	2.72	3	1241	2.75	3
	23	1243	2.79	3	1242	2.80	3
	24	1244	2.86	3	1243	2.85	3
	25	1245	2.94	3	1244	2.92	3
	26	1246	3.03	3	1245	3.00	3
	27	1247	3.14	3	1246	3.10	3
	28	1249	3.25	3	1247	3.20	3
	29	1250	3.37	3	1249	3.33	3
	30	1251	3.50	3	1250	3.46	3
	31	1253	3.64	3	1251	3.62	3
	32	1254	3.80	3	1253	3.79	3
	33	1256	3.97	4	1254	3.99	3
	34	1257	4.17	4	1256	4.22	4
	35	1259	4.39	4	1258	4.48	4
	36	1261	4.66	4	1260	4.79	4
	37	1264	4.99	4	1263	5.16	4
	38	1267	5.41	4	1265	5.61	4
	39	1270	5.96	4	1269	6.16	4
	40	1274	6.70	4	1272	6.85	4
	41	1278	7.82	4	1277	7.83	4
	42	1285	9.89	4	1284	9.55	4
	43	1290	11.84	4	1290	11.94	4
	44	1290	11.84	4	1290	11.94	4

Table M-8. Raw to Scaled Score Look-up Table—Mathematics Grade 3—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	22.83	1	1200	29.82	1
	1	1200	13.46	1	1200	16.62	1
	2	1206	9.21	1	1207	9.81	1
	3	1212	7.41	1	1213	7.33	1
	4	1216	6.38	1	1217	6.00	1
	5	1220	5.69	1	1221	5.16	1
	6	1222	5.20	1	1223	4.58	1
	7	1225	4.83	1	1225	4.17	1
	8	1227	4.54	1	1227	3.86	1
	9	1229	4.31	1	1229	3.62	1
	10	1230	4.13	1	1230	3.44	1
	11	1232	3.99	1	1232	3.30	1
	12	1234	3.87	1	1233	3.20	1
	13	1235	3.78	2	1234	3.12	1
	14	1237	3.71	2	1236	3.07	2
	15	1238	3.66	2	1237	3.04	2
	16	1239	3.63	2	1238	3.04	2
	17	1241	3.62	2	1239	3.05	2
	18	1242	3.63	3	1240	3.08	2
	19	1244	3.66	3	1242	3.14	3
	20	1245	3.72	3	1243	3.21	3
	21	1247	3.79	3	1244	3.32	3
	22	1248	3.89	3	1246	3.45	3
	23	1250	4.01	3	1247	3.62	3
	24	1251	4.15	3	1249	3.83	3
	25	1253	4.33	3	1250	4.09	3
	26	1255	4.55	4	1252	4.41	3
	27	1257	4.82	4	1254	4.80	4
	28	1259	5.15	4	1257	5.28	4
	29	1262	5.57	4	1260	5.89	4
	30	1265	6.13	4	1263	6.67	4
	31	1269	6.93	4	1267	7.72	4
	32	1273	8.16	4	1273	9.29	4
	33	1280	10.34	4	1281	12.04	4
	34	1290	15.50	4	1290	19.38	4
	35	1290	18.00	4	1290	19.47	4
B	0	1200	22.89	1	1200	25.07	1
	1	1200	13.61	1	1200	14.02	1
	2	1207	9.46	1	1208	9.33	1
	3	1213	7.67	1	1214	7.35	1
	4	1217	6.62	1	1218	6.22	1
	5	1220	5.91	1	1221	5.47	1
	6	1223	5.40	1	1224	4.93	1
	7	1226	5.02	1	1226	4.53	1
	8	1228	4.71	1	1228	4.22	1
	9	1230	4.47	1	1230	3.97	1
	10	1232	4.28	1	1231	3.78	1
	11	1233	4.12	1	1233	3.63	1
	12	1235	3.99	2	1234	3.51	1
	13	1236	3.90	2	1236	3.43	2
	14	1238	3.82	2	1237	3.36	2
	15	1239	3.77	2	1238	3.33	2
	16	1241	3.74	2	1239	3.31	2
	17	1242	3.74	3	1241	3.32	2

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	18	1244	3.75	3	1242	3.34	3
	19	1245	3.78	3	1243	3.40	3
	20	1246	3.83	3	1245	3.47	3
	21	1248	3.90	3	1246	3.58	3
	22	1249	3.98	3	1247	3.71	3
	23	1251	4.09	3	1249	3.88	3
	24	1253	4.23	3	1251	4.08	3
	25	1254	4.39	4	1252	4.33	3
	26	1256	4.60	4	1254	4.63	4
	27	1258	4.85	4	1257	4.98	4
	28	1261	5.17	4	1259	5.41	4
	29	1263	5.58	4	1262	5.93	4
	30	1266	6.15	4	1265	6.60	4
	31	1270	6.96	4	1269	7.50	4
	32	1275	8.22	4	1274	8.80	4
	33	1281	10.44	4	1281	10.97	4
	34	1290	15.69	4	1290	15.93	4
	35	1290	17.33	4	1290	17.63	4
C	0	1200	28.53	1	1200	28.44	1
	1	1204	12.66	1	1202	13.31	1
	2	1213	8.62	1	1212	8.78	1
	3	1218	6.87	1	1217	6.90	1
	4	1222	5.85	1	1221	5.83	1
	5	1225	5.16	1	1224	5.12	1
	6	1228	4.67	1	1226	4.62	1
	7	1230	4.31	1	1229	4.24	1
	8	1232	4.04	1	1230	3.95	1
	9	1234	3.83	1	1232	3.72	1
	10	1235	3.67	2	1234	3.54	1
	11	1237	3.56	2	1235	3.40	2
	12	1238	3.47	2	1236	3.29	2
	13	1239	3.41	2	1238	3.22	2
	14	1241	3.37	2	1239	3.17	2
	15	1242	3.35	3	1240	3.15	2
	16	1243	3.35	3	1241	3.15	2
	17	1245	3.37	3	1243	3.17	3
	18	1246	3.40	3	1244	3.22	3
	19	1247	3.44	3	1245	3.29	3
	20	1249	3.50	3	1246	3.37	3
	21	1250	3.58	3	1248	3.49	3
	22	1251	3.67	3	1249	3.62	3
	23	1253	3.78	3	1251	3.78	3
	24	1254	3.91	4	1252	3.97	3
	25	1256	4.07	4	1254	4.19	4
	26	1258	4.26	4	1256	4.45	4
	27	1260	4.49	4	1258	4.75	4
	28	1262	4.78	4	1260	5.12	4
	29	1264	5.15	4	1263	5.57	4
	30	1267	5.65	4	1266	6.16	4
	31	1270	6.35	4	1269	6.95	4
	32	1274	7.41	4	1274	8.13	4
	33	1280	9.27	4	1280	10.12	4
	34	1290	13.67	4	1290	14.72	4
	35	1290	16.83	4	1290	17.39	4

Table M-9. Raw to Scaled Score Look-up Table—Mathematics Grade 4—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	32.07	1	1200	28.31	1
	1	1200	16.85	1	1200	20.78	1
	2	1205	10.13	1	1200	14.12	1
	3	1212	7.63	1	1204	10.28	1
	4	1216	6.30	1	1211	8.16	1
	5	1219	5.47	1	1215	6.85	1
	6	1222	4.91	1	1219	5.97	1
	7	1225	4.52	1	1222	5.35	1
	8	1227	4.22	1	1224	4.89	1
	9	1228	4.00	1	1226	4.54	1
	10	1230	3.82	1	1228	4.27	1
	11	1232	3.69	2	1230	4.06	1
	12	1233	3.58	2	1232	3.91	2
	13	1234	3.50	2	1233	3.79	2
	14	1236	3.44	2	1235	3.71	2
	15	1237	3.40	2	1236	3.67	2
	16	1238	3.38	2	1238	3.65	2
	17	1240	3.37	3	1239	3.65	3
	18	1241	3.38	3	1241	3.69	3
	19	1242	3.41	3	1242	3.75	3
	20	1244	3.46	3	1244	3.83	3
	21	1245	3.53	3	1245	3.94	3
	22	1246	3.63	3	1247	4.09	3
	23	1248	3.75	3	1249	4.27	3
	24	1250	3.91	3	1251	4.49	4
	25	1251	4.11	4	1253	4.76	4
	26	1253	4.36	4	1255	5.09	4
	27	1255	4.67	4	1258	5.51	4
	28	1257	5.06	4	1261	6.05	4
	29	1260	5.57	4	1264	6.77	4
	30	1263	6.27	4	1268	7.78	4
	31	1267	7.27	4	1273	9.31	4
	32	1273	8.87	4	1281	11.88	4
	33	1281	11.86	4	1290	16.84	4
	34	1290	17.79	4	1290	16.92	4
	35	1290	17.79	4	1290	16.92	4
B	0	1200	37.27	1	1200	38.43	1
	1	1200	14.51	1	1200	27.04	1
	2	1210	8.79	1	1200	17.38	1
	3	1216	6.66	1	1203	11.21	1
	4	1220	5.53	1	1210	8.48	1
	5	1223	4.83	1	1215	6.96	1
	6	1225	4.36	1	1218	6.00	1
	7	1227	4.02	1	1221	5.35	1
	8	1229	3.78	1	1224	4.87	1
	9	1230	3.60	1	1226	4.52	1
	10	1232	3.47	2	1228	4.25	1
	11	1233	3.37	2	1230	4.05	1
	12	1235	3.30	2	1232	3.89	2
	13	1236	3.25	2	1233	3.78	2
	14	1237	3.23	2	1235	3.71	2
	15	1238	3.21	2	1236	3.67	2
	16	1240	3.22	3	1238	3.66	2
	17	1241	3.23	3	1239	3.67	3

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	18	1242	3.26	3	1241	3.71	3
	19	1243	3.31	3	1242	3.78	3
	20	1245	3.37	3	1244	3.88	3
	21	1246	3.46	3	1245	4.01	3
	22	1247	3.56	3	1247	4.17	3
	23	1249	3.68	3	1249	4.38	3
	24	1250	3.83	3	1251	4.63	4
	25	1252	4.01	4	1253	4.94	4
	26	1254	4.23	4	1255	5.32	4
	27	1256	4.49	4	1258	5.81	4
	28	1258	4.83	4	1261	6.45	4
	29	1260	5.26	4	1265	7.30	4
	30	1263	5.83	4	1269	8.48	4
	31	1267	6.64	4	1275	10.24	4
	32	1271	7.89	4	1283	13.08	4
	33	1278	10.13	4	1290	16.70	4
	34	1290	15.77	4	1290	16.70	4
	35	1290	17.31	4	1290	16.70	4
C	0	1200	38.58	1	1200	32.27	1
	1	1200	14.98	1	1200	19.38	1
	2	1211	9.13	1	1203	11.67	1
	3	1217	6.93	1	1211	8.83	1
	4	1221	5.77	1	1216	7.36	1
	5	1224	5.05	1	1220	6.45	1
	6	1227	4.56	1	1223	5.83	1
	7	1229	4.21	1	1226	5.39	1
	8	1231	3.94	1	1228	5.04	1
	9	1233	3.72	2	1230	4.76	1
	10	1234	3.55	2	1232	4.53	2
	11	1236	3.41	2	1234	4.33	2
	12	1237	3.29	2	1236	4.15	2
	13	1238	3.20	2	1238	3.99	2
	14	1240	3.13	3	1239	3.86	3
	15	1241	3.07	3	1241	3.75	3
	16	1242	3.04	3	1242	3.67	3
	17	1243	3.02	3	1244	3.63	3
	18	1244	3.03	3	1245	3.62	3
	19	1246	3.05	3	1247	3.66	3
	20	1247	3.09	3	1248	3.75	3
	21	1248	3.16	3	1250	3.88	3
	22	1249	3.25	3	1251	4.06	4
	23	1251	3.37	4	1253	4.29	4
	24	1252	3.53	4	1255	4.56	4
	25	1254	3.72	4	1257	4.87	4
	26	1255	3.97	4	1259	5.23	4
	27	1257	4.27	4	1262	5.65	4
	28	1259	4.66	4	1265	6.16	4
	29	1262	5.15	4	1268	6.79	4
	30	1265	5.80	4	1272	7.63	4
	31	1268	6.70	4	1276	8.82	4
	32	1273	8.03	4	1283	10.73	4
	33	1279	10.29	4	1290	14.30	4
	34	1290	15.63	4	1290	14.30	4
	35	1290	16.31	4	1290	14.30	4

Table M-10. Raw to Scaled Score Look-up Table—Mathematics Grade 5—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	23.82	1	1200	26.36	1
	1	1200	14.22	1	1200	18.63	1
	2	1203	9.34	1	1200	12.29	1
	3	1209	7.38	1	1207	9.22	1
	4	1213	6.29	1	1212	7.51	1
	5	1217	5.60	1	1216	6.43	1
	6	1219	5.11	1	1219	5.70	1
	7	1222	4.76	1	1222	5.18	1
	8	1224	4.50	1	1224	4.82	1
	9	1226	4.31	1	1227	4.55	1
	10	1227	4.16	1	1228	4.36	1
	11	1229	4.05	1	1230	4.22	1
	12	1231	3.97	1	1232	4.14	2
	13	1232	3.92	2	1234	4.08	2
	14	1234	3.89	2	1235	4.06	2
	15	1235	3.87	2	1237	4.06	2
	16	1237	3.88	2	1239	4.09	2
	17	1238	3.89	2	1240	4.13	3
	18	1239	3.93	2	1242	4.18	3
	19	1241	3.97	3	1244	4.25	3
	20	1243	4.03	3	1245	4.33	3
	21	1244	4.09	3	1247	4.44	3
	22	1246	4.18	3	1249	4.56	3
	23	1247	4.27	3	1251	4.72	3
	24	1249	4.39	3	1253	4.92	4
	25	1251	4.53	3	1255	5.18	4
	26	1253	4.71	4	1258	5.52	4
	27	1255	4.92	4	1261	5.97	4
	28	1258	5.20	4	1264	6.56	4
	29	1260	5.56	4	1267	7.37	4
	30	1263	6.04	4	1272	8.49	4
	31	1267	6.72	4	1277	10.07	4
	32	1271	7.77	4	1285	12.50	4
	33	1277	9.64	4	1290	15.74	4
	34	1288	14.20	4	1290	15.74	4
	35	1290	17.62	4	1290	15.74	4
B	0	1200	25.77	1	1200	25.92	1
	1	1200	14.56	1	1200	18.60	1
	2	1206	9.81	1	1200	12.75	1
	3	1212	7.79	1	1206	9.91	1
	4	1216	6.64	1	1212	8.35	1
	5	1220	5.91	1	1216	7.36	1
	6	1223	5.40	1	1220	6.67	1
	7	1225	5.04	1	1223	6.17	1
	8	1227	4.78	1	1226	5.79	1
	9	1229	4.58	1	1228	5.49	1
	10	1231	4.44	1	1231	5.25	1
	11	1233	4.34	2	1233	5.06	2
	12	1235	4.26	2	1235	4.90	2
	13	1236	4.21	2	1237	4.76	2
	14	1238	4.18	2	1239	4.66	2
	15	1239	4.16	2	1240	4.57	3
	16	1241	4.16	3	1242	4.50	3
	17	1243	4.16	3	1244	4.46	3

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	18	1244	4.18	3	1246	4.44	3
	19	1246	4.21	3	1247	4.44	3
	20	1247	4.25	3	1249	4.47	3
	21	1249	4.31	3	1251	4.53	3
	22	1251	4.38	3	1253	4.63	4
	23	1253	4.48	4	1254	4.78	4
	24	1254	4.60	4	1256	4.97	4
	25	1256	4.76	4	1259	5.23	4
	26	1258	4.96	4	1261	5.56	4
	27	1261	5.22	4	1264	5.98	4
	28	1263	5.54	4	1267	6.52	4
	29	1266	5.97	4	1270	7.23	4
	30	1269	6.53	4	1274	8.18	4
	31	1273	7.33	4	1279	9.54	4
	32	1277	8.55	4	1286	11.67	4
	33	1284	10.69	4	1290	14.40	4
	34	1290	14.73	4	1290	14.40	4
	35	1290	14.73	4	1290	14.40	4
C	0	1200	29.45	1	1200	28.67	1
	1	1200	14.02	1	1200	17.16	1
	2	1210	9.38	1	1205	11.28	1
	3	1216	7.45	1	1213	8.86	1
	4	1220	6.37	1	1218	7.51	1
	5	1223	5.68	1	1222	6.64	1
	6	1226	5.22	1	1225	6.03	1
	7	1229	4.89	1	1228	5.57	1
	8	1231	4.65	1	1231	5.22	1
	9	1233	4.47	2	1233	4.94	2
	10	1235	4.33	2	1235	4.71	2
	11	1236	4.22	2	1237	4.53	2
	12	1238	4.14	2	1239	4.38	2
	13	1239	4.07	2	1240	4.25	3
	14	1241	4.02	3	1242	4.16	3
	15	1243	3.99	3	1244	4.09	3
	16	1244	3.98	3	1245	4.04	3
	17	1246	3.98	3	1247	4.01	3
	18	1247	4.00	3	1248	4.00	3
	19	1249	4.04	3	1250	4.02	3
	20	1250	4.09	3	1251	4.06	3
	21	1252	4.16	3	1253	4.12	4
	22	1254	4.26	4	1254	4.21	4
	23	1255	4.37	4	1256	4.33	4
	24	1257	4.50	4	1258	4.49	4
	25	1259	4.67	4	1260	4.70	4
	26	1261	4.86	4	1262	4.96	4
	27	1263	5.11	4	1264	5.30	4
	28	1266	5.42	4	1267	5.73	4
	29	1268	5.82	4	1270	6.29	4
	30	1271	6.36	4	1273	7.05	4
	31	1275	7.12	4	1278	8.12	4
	32	1280	8.29	4	1283	9.77	4
	33	1286	10.34	4	1290	12.69	4
	34	1290	13.43	4	1290	13.54	4
	35	1290	13.43	4	1290	13.54	4

Table M-11. Raw to Scaled Score Look-up Table—Mathematics Grade 6—2019 to 2021

Path	Raw Score	2021 Scaled Score	2021 Standard Error	2021 Performance Level	2019 Scaled Score	2019 Standard Error	2019 Performance Level
A	0	1200	27.13	1	1200	24.61	1
	1	1204	9.81	1	1201	10.51	1
	2	1211	6.70	1	1209	7.18	1
	3	1215	5.41	1	1213	5.77	1
	4	1218	4.67	1	1217	4.97	1
	5	1220	4.19	1	1219	4.45	1
	6	1222	3.85	1	1221	4.08	1
	7	1224	3.61	1	1223	3.81	1
	8	1226	3.42	1	1225	3.61	1
	9	1227	3.28	1	1226	3.46	1
	10	1228	3.17	1	1227	3.35	1
	11	1230	3.08	1	1229	3.26	1
	12	1231	3.02	1	1230	3.20	1
	13	1232	2.98	1	1231	3.16	1
	14	1233	2.95	2	1232	3.14	1
	15	1234	2.94	2	1234	3.14	2
	16	1235	2.95	2	1235	3.15	2
	17	1236	2.96	2	1236	3.17	2
	18	1237	2.99	2	1237	3.21	2
	19	1238	3.03	2	1238	3.26	2
	20	1240	3.09	3	1239	3.33	3
	21	1241	3.16	3	1241	3.41	3
	22	1242	3.25	3	1242	3.50	3
	23	1243	3.36	3	1243	3.62	3
	24	1245	3.48	3	1245	3.75	3
	25	1246	3.64	3	1246	3.90	3
	26	1248	3.82	3	1248	4.08	3
	27	1249	4.05	3	1250	4.30	3
	28	1251	4.33	4	1252	4.57	4
	29	1253	4.68	4	1254	4.91	4
	30	1256	5.14	4	1256	5.36	4
	31	1259	5.78	4	1260	5.97	4
	32	1263	6.72	4	1263	6.90	4
	33	1268	8.33	4	1269	8.49	4
	34	1277	12.02	4	1278	12.21	4
	35	1290	23.28	4	1290	22.55	4
B	0	1200	28.00	1	1200	24.69	1
	1	1204	10.45	1	1202	10.48	1
	2	1212	7.15	1	1210	7.32	1
	3	1216	5.77	1	1214	5.97	1
	4	1219	4.98	1	1217	5.21	1
	5	1222	4.47	1	1220	4.71	1
	6	1224	4.11	1	1222	4.35	1
	7	1226	3.85	1	1224	4.10	1
	8	1227	3.64	1	1226	3.90	1
	9	1229	3.49	1	1228	3.75	1
	10	1230	3.36	1	1229	3.62	1
	11	1232	3.27	1	1230	3.53	1
	12	1233	3.20	2	1232	3.45	1
	13	1234	3.14	2	1233	3.39	2
	14	1235	3.10	2	1234	3.35	2
	15	1236	3.08	2	1236	3.31	2
	16	1237	3.07	2	1237	3.29	2
	17	1238	3.07	2	1238	3.28	2

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	18	1240	3.09	3	1239	3.28	3
	19	1241	3.12	3	1240	3.29	3
	20	1242	3.17	3	1242	3.32	3
	21	1243	3.22	3	1243	3.35	3
	22	1244	3.30	3	1244	3.40	3
	23	1245	3.39	3	1245	3.47	3
	24	1247	3.51	3	1247	3.55	3
	25	1248	3.64	3	1248	3.66	3
	26	1250	3.81	3	1250	3.80	3
	27	1251	4.01	4	1251	3.97	4
	28	1253	4.27	4	1253	4.19	4
	29	1255	4.59	4	1255	4.47	4
	30	1258	5.02	4	1257	4.85	4
	31	1260	5.62	4	1260	5.39	4
	32	1264	6.51	4	1263	6.20	4
	33	1269	8.05	4	1268	7.60	4
	34	1278	11.61	4	1276	10.85	4
	35	1290	22.17	4	1290	23.32	4
C	0	1200	33.35	1	1200	27.61	1
	1	1209	9.47	1	1205	10.36	1
	2	1216	6.57	1	1212	7.26	1
	3	1220	5.34	1	1217	5.94	1
	4	1223	4.65	1	1220	5.18	1
	5	1225	4.20	1	1223	4.68	1
	6	1227	3.89	1	1225	4.33	1
	7	1229	3.65	1	1227	4.05	1
	8	1230	3.48	1	1229	3.84	1
	9	1232	3.34	1	1230	3.67	1
	10	1233	3.23	2	1232	3.53	1
	11	1234	3.15	2	1233	3.42	2
	12	1235	3.08	2	1235	3.32	2
	13	1236	3.03	2	1236	3.25	2
	14	1238	2.99	2	1237	3.19	2
	15	1239	2.97	3	1238	3.14	2
	16	1240	2.96	3	1239	3.10	3
	17	1241	2.95	3	1240	3.08	3
	18	1242	2.96	3	1242	3.07	3
	19	1243	2.98	3	1243	3.07	3
	20	1244	3.01	3	1244	3.08	3
	21	1245	3.05	3	1245	3.10	3
	22	1246	3.10	3	1246	3.14	3
	23	1248	3.18	3	1247	3.20	3
	24	1249	3.27	3	1249	3.28	3
	25	1250	3.38	3	1250	3.37	3
	26	1252	3.53	4	1251	3.50	4
	27	1253	3.71	4	1253	3.66	4
	28	1255	3.94	4	1255	3.87	4
	29	1257	4.23	4	1256	4.15	4
	30	1259	4.63	4	1259	4.52	4
	31	1262	5.18	4	1261	5.05	4
	32	1265	5.99	4	1264	5.85	4
	33	1270	7.38	4	1269	7.25	4
	34	1277	10.56	4	1277	10.57	4
	35	1290	21.61	4	1290	22.64	4

Table M-12. Raw to Scaled Score Look-up Table—Mathematics Grade 7—2019 to 2021

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	21.48	1	1200	24.86	1
	1	1200	14.16	1	1201	11.43	1
	2	1203	9.14	1	1210	7.68	1
	3	1209	7.16	1	1214	6.15	1
	4	1213	6.08	1	1218	5.29	1
	5	1216	5.40	1	1221	4.73	1
	6	1219	4.94	1	1223	4.34	1
	7	1221	4.61	1	1225	4.06	1
	8	1223	4.37	1	1227	3.84	1
	9	1225	4.19	1	1228	3.68	1
	10	1227	4.06	1	1230	3.55	1
	11	1228	3.97	1	1231	3.45	1
	12	1230	3.91	1	1232	3.38	1
	13	1232	3.87	1	1234	3.33	2
	14	1233	3.86	1	1235	3.30	2
	15	1235	3.87	2	1236	3.29	2
	16	1236	3.89	2	1237	3.30	2
	17	1238	3.94	2	1239	3.32	2
	18	1239	4.01	2	1239	3.36	2
	19	1241	4.09	3	1241	3.41	3
	20	1242	4.20	3	1242	3.48	3
	21	1244	4.32	3	1244	3.57	3
	22	1246	4.47	3	1245	3.67	3
	23	1248	4.65	3	1247	3.79	3
	24	1250	4.86	3	1248	3.94	3
	25	1252	5.11	3	1250	4.11	3
	26	1254	5.41	4	1251	4.31	3
	27	1257	5.77	4	1254	4.55	4
	28	1259	6.20	4	1255	4.86	4
	29	1263	6.75	4	1258	5.24	4
	30	1266	7.45	4	1261	5.75	4
	31	1271	8.40	4	1264	6.46	4
	32	1276	9.81	4	1268	7.54	4
	33	1284	12.20	4	1274	9.42	4
	34	1290	16.68	4	1284	13.87	4
	35	1290	16.68	4	1290	20.52	4
B	0	1200	23.38	1	1200	26.00	1
	1	1200	14.64	1	1202	12.20	1
	2	1205	9.71	1	1211	8.29	1
	3	1211	7.68	1	1216	6.67	1
	4	1216	6.55	1	1219	5.76	1
	5	1219	5.83	1	1222	5.17	1
	6	1222	5.33	1	1225	4.77	1
	7	1224	4.96	1	1227	4.47	1
	8	1226	4.70	1	1229	4.24	1
	9	1228	4.49	1	1230	4.07	1
	10	1230	4.34	1	1232	3.93	1
	11	1232	4.23	1	1233	3.82	1
	12	1234	4.16	2	1235	3.74	2
	13	1235	4.11	2	1236	3.68	2
	14	1237	4.08	2	1238	3.64	2
	15	1238	4.07	2	1239	3.61	2
	16	1240	4.08	3	1240	3.59	3
	17	1242	4.11	3	1242	3.59	3

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	18	1243	4.15	3	1243	3.60	3
	19	1245	4.20	3	1244	3.63	3
	20	1246	4.27	3	1245	3.67	3
	21	1248	4.36	3	1247	3.72	3
	22	1250	4.47	3	1248	3.79	3
	23	1251	4.60	3	1250	3.88	3
	24	1253	4.76	3	1251	3.99	3
	25	1255	4.95	4	1253	4.14	3
	26	1257	5.17	4	1254	4.31	4
	27	1259	5.45	4	1256	4.53	4
	28	1262	5.80	4	1258	4.81	4
	29	1265	6.25	4	1261	5.17	4
	30	1268	6.84	4	1263	5.66	4
	31	1272	7.66	4	1267	6.34	4
	32	1277	8.89	4	1271	7.38	4
	33	1284	11.01	4	1276	9.21	4
	34	1290	15.73	4	1286	13.56	4
	35	1290	15.73	4	1290	18.85	4
C	0	1200	28.55	1	1200	29.75	1
	1	1204	12.65	1	1207	10.69	1
	2	1213	8.59	1	1215	7.44	1
	3	1218	6.85	1	1220	6.08	1
	4	1222	5.86	1	1223	5.30	1
	5	1225	5.20	1	1226	4.78	1
	6	1228	4.75	1	1228	4.41	1
	7	1230	4.42	1	1230	4.12	1
	8	1232	4.18	1	1232	3.90	1
	9	1234	4.00	2	1233	3.71	1
	10	1235	3.86	2	1235	3.56	2
	11	1237	3.75	2	1236	3.44	2
	12	1238	3.67	2	1237	3.34	2
	13	1239	3.62	2	1239	3.26	2
	14	1241	3.58	3	1239	3.19	2
	15	1242	3.56	3	1241	3.15	3
	16	1244	3.56	3	1242	3.12	3
	17	1245	3.58	3	1243	3.11	3
	18	1247	3.61	3	1245	3.12	3
	19	1248	3.67	3	1246	3.14	3
	20	1249	3.73	3	1247	3.18	3
	21	1251	3.82	3	1248	3.23	3
	22	1252	3.93	3	1249	3.30	3
	23	1254	4.06	4	1251	3.39	3
	24	1255	4.22	4	1252	3.50	3
	25	1257	4.42	4	1254	3.64	4
	26	1259	4.65	4	1255	3.80	4
	27	1261	4.93	4	1256	4.01	4
	28	1264	5.28	4	1258	4.27	4
	29	1266	5.71	4	1260	4.60	4
	30	1269	6.27	4	1263	5.04	4
	31	1273	7.02	4	1266	5.65	4
	32	1277	8.13	4	1269	6.57	4
	33	1284	10.00	4	1274	8.15	4
	34	1290	14.34	4	1283	11.86	4
	35	1290	14.66	4	1290	19.59	4

Table M-13. Raw to Scaled Score Look-up Table—Mathematics Grade 8—2019 to 2021

Path	Raw Score	2021 Scaled Score	2021 Standard Error	2021 Performance Level	2019 Scaled Score	2019 Standard Error	2019 Performance Level
A	0	1200	24.96	1	1200	29.54	1
	1	1200	13.60	1	1200	18.01	1
	2	1207	8.81	1	1204	10.24	1
	3	1212	6.84	1	1210	7.53	1
	4	1216	5.75	1	1215	6.14	1
	5	1219	5.07	1	1218	5.30	1
	6	1221	4.60	1	1221	4.73	1
	7	1224	4.27	1	1223	4.33	1
	8	1225	4.02	1	1225	4.05	1
	9	1227	3.84	1	1227	3.84	1
	10	1229	3.71	1	1228	3.68	1
	11	1230	3.60	1	1230	3.57	1
	12	1232	3.53	1	1231	3.50	1
	13	1233	3.48	1	1233	3.45	1
	14	1234	3.44	2	1234	3.42	2
	15	1236	3.43	2	1235	3.41	2
	16	1237	3.43	2	1237	3.41	2
	17	1238	3.45	2	1238	3.43	2
	18	1240	3.48	3	1239	3.45	2
	19	1241	3.53	3	1241	3.49	3
	20	1242	3.60	3	1242	3.54	3
	21	1244	3.69	3	1243	3.60	3
	22	1245	3.79	3	1245	3.67	3
	23	1247	3.92	3	1246	3.77	3
	24	1248	4.08	3	1248	3.89	3
	25	1250	4.27	3	1250	4.04	3
	26	1252	4.49	4	1251	4.23	4
	27	1254	4.76	4	1253	4.47	4
	28	1256	5.10	4	1255	4.79	4
	29	1259	5.52	4	1258	5.23	4
	30	1262	6.08	4	1261	5.84	4
	31	1265	6.85	4	1264	6.75	4
	32	1270	8.00	4	1269	8.23	4
	33	1276	9.98	4	1277	11.08	4
	34	1287	14.59	4	1290	19.52	4
	35	1290	19.24	4	1290	21.60	4
B	0	1200	26.79	1	1200	34.08	1
	1	1200	13.04	1	1200	17.17	1
	2	1209	8.75	1	1207	9.83	1
	3	1215	7.00	1	1214	7.39	1
	4	1218	6.02	1	1218	6.13	1
	5	1222	5.38	1	1221	5.36	1
	6	1224	4.93	1	1224	4.84	1
	7	1226	4.60	1	1226	4.46	1
	8	1228	4.33	1	1228	4.18	1
	9	1230	4.12	1	1230	3.97	1
	10	1232	3.94	1	1231	3.80	1
	11	1233	3.79	1	1233	3.67	1
	12	1235	3.67	2	1234	3.57	2
	13	1236	3.57	2	1236	3.49	2
	14	1238	3.48	2	1237	3.43	2
	15	1239	3.42	2	1238	3.40	2
	16	1240	3.37	3	1240	3.37	3
	17	1241	3.35	3	1241	3.37	3

continued

Path	Raw Score	2021 Scaled Score	2021 Standard Error	2021 Performance Level	2019 Scaled Score	2019 Standard Error	2019 Performance Level
B	18	1243	3.34	3	1242	3.37	3
	19	1244	3.36	3	1243	3.39	3
	20	1245	3.40	3	1245	3.42	3
	21	1247	3.46	3	1246	3.47	3
	22	1248	3.55	3	1247	3.54	3
	23	1249	3.66	3	1249	3.62	3
	24	1251	3.81	4	1250	3.73	3
	25	1252	3.99	4	1252	3.87	4
	26	1254	4.22	4	1253	4.04	4
	27	1256	4.49	4	1255	4.27	4
	28	1258	4.84	4	1257	4.55	4
	29	1260	5.27	4	1259	4.94	4
	30	1263	5.84	4	1262	5.47	4
	31	1267	6.61	4	1265	6.25	4
	32	1271	7.78	4	1270	7.51	4
	33	1277	9.77	4	1276	9.95	4
	34	1288	14.49	4	1290	17.48	4
	35	1290	18.33	4	1290	21.11	4
C	0	1200	29.02	1	1200	27.98	1
	1	1203	11.99	1	1200	13.79	1
	2	1212	8.25	1	1209	9.07	1
	3	1217	6.70	1	1215	7.15	1
	4	1221	5.81	1	1219	6.09	1
	5	1224	5.24	1	1222	5.40	1
	6	1226	4.83	1	1225	4.93	1
	7	1228	4.52	1	1227	4.58	1
	8	1230	4.29	1	1229	4.32	1
	9	1232	4.10	1	1231	4.11	1
	10	1233	3.95	1	1233	3.94	1
	11	1235	3.82	2	1234	3.81	2
	12	1237	3.72	2	1236	3.71	2
	13	1238	3.64	2	1237	3.62	2
	14	1239	3.58	2	1239	3.55	2
	15	1241	3.53	3	1240	3.50	3
	16	1242	3.50	3	1241	3.47	3
	17	1243	3.48	3	1242	3.45	3
	18	1244	3.48	3	1244	3.45	3
	19	1246	3.49	3	1245	3.46	3
	20	1247	3.52	3	1246	3.49	3
	21	1248	3.57	3	1248	3.54	3
	22	1250	3.64	3	1249	3.61	3
	23	1251	3.74	4	1250	3.70	3
	24	1253	3.86	4	1252	3.82	4
	25	1254	4.01	4	1253	3.98	4
	26	1256	4.21	4	1255	4.17	4
	27	1258	4.45	4	1257	4.42	4
	28	1260	4.76	4	1259	4.74	4
	29	1262	5.15	4	1261	5.16	4
	30	1265	5.67	4	1264	5.73	4
	31	1268	6.40	4	1268	6.54	4
	32	1272	7.49	4	1272	7.79	4
	33	1278	9.38	4	1279	10.01	4
	34	1288	13.81	4	1290	15.45	4
	35	1290	17.48	4	1290	18.01	4

Table M-14. Raw to Scaled Score Look-up Table—Mathematics Grade 11—2019 to 2021

Path	Raw Score	2021 Scaled Score	2021 Standard Error	2021 Performance Level	2019 Scaled Score	2019 Standard Error	2019 Performance Level
A	0	1200	28.09	1	1200	30.27	1
	1	1205	10.18	1	1204	12.12	1
	2	1213	6.98	1	1213	7.94	1
	3	1217	5.62	1	1218	6.13	1
	4	1220	4.84	1	1222	5.08	1
	5	1223	4.33	1	1224	4.38	1
	6	1225	3.97	1	1226	3.89	1
	7	1227	3.70	1	1228	3.53	1
	8	1228	3.50	1	1230	3.26	1
	9	1230	3.35	1	1231	3.06	1
	10	1231	3.23	1	1233	2.92	1
	11	1232	3.13	1	1234	2.82	1
	12	1234	3.07	1	1235	2.75	2
	13	1235	3.01	2	1236	2.70	2
	14	1236	2.98	2	1237	2.68	2
	15	1237	2.96	2	1238	2.67	2
	16	1238	2.95	2	1239	2.68	2
	17	1239	2.95	2	1240	2.70	3
	18	1240	2.97	3	1241	2.73	3
	19	1241	2.99	3	1242	2.77	3
	20	1242	3.03	3	1243	2.82	3
	21	1243	3.08	3	1244	2.89	3
	22	1245	3.14	3	1245	2.97	3
	23	1246	3.22	3	1247	3.08	3
	24	1247	3.31	3	1248	3.21	3
	25	1248	3.43	3	1249	3.37	3
	26	1250	3.58	4	1251	3.57	4
	27	1251	3.76	4	1252	3.82	4
	28	1253	3.99	4	1254	4.14	4
	29	1255	4.28	4	1256	4.56	4
	30	1257	4.67	4	1259	5.11	4
	31	1260	5.22	4	1262	5.89	4
	32	1263	6.04	4	1266	7.06	4
	33	1268	7.46	4	1272	9.12	4
	34	1276	10.78	4	1283	14.06	4
	35	1290	25.66	4	1290	22.12	4
B	0	1200	29.89	1	1200	32.43	1
	1	1206	10.60	1	1207	11.38	1
	2	1213	7.22	1	1215	7.64	1
	3	1218	5.82	1	1220	6.05	1
	4	1221	5.02	1	1223	5.13	1
	5	1224	4.51	1	1226	4.54	1
	6	1226	4.15	1	1228	4.11	1
	7	1228	3.89	1	1230	3.80	1
	8	1229	3.69	1	1232	3.56	1
	9	1231	3.54	1	1233	3.37	1
	10	1232	3.42	1	1235	3.22	2
	11	1234	3.33	1	1236	3.11	2
	12	1235	3.26	2	1237	3.02	2
	13	1236	3.21	2	1238	2.96	2

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	14	1237	3.18	2	1239	2.91	2
	15	1238	3.15	2	1240	2.88	3
	16	1240	3.14	3	1242	2.87	3
	17	1241	3.14	3	1243	2.87	3
	18	1242	3.15	3	1244	2.88	3
	19	1243	3.18	3	1245	2.91	3
	20	1244	3.21	3	1246	2.96	3
	21	1245	3.26	3	1247	3.02	3
	22	1247	3.33	3	1248	3.10	3
	23	1248	3.41	3	1249	3.20	3
	24	1249	3.51	3	1251	3.32	4
	25	1251	3.65	4	1252	3.48	4
	26	1252	3.81	4	1253	3.66	4
	27	1254	4.02	4	1255	3.90	4
	28	1256	4.28	4	1257	4.19	4
	29	1258	4.63	4	1259	4.57	4
	30	1261	5.10	4	1262	5.08	4
	31	1263	5.77	4	1265	5.78	4
	32	1267	6.79	4	1268	6.85	4
	33	1273	8.58	4	1274	8.71	4
	34	1282	12.86	4	1284	13.11	4
	35	1290	21.00	4	1290	20.12	4
C	0	1200	35.74	1	1200	35.49	1
	1	1210	10.19	1	1209	11.54	1
	2	1217	6.99	1	1217	7.65	1
	3	1222	5.65	1	1222	6.00	1
	4	1225	4.87	1	1225	5.05	1
	5	1228	4.36	1	1228	4.43	1
	6	1230	3.99	1	1230	3.99	1
	7	1231	3.71	1	1232	3.66	1
	8	1233	3.49	1	1234	3.41	1
	9	1235	3.31	2	1235	3.22	2
	10	1236	3.17	2	1237	3.06	2
	11	1237	3.04	2	1238	2.93	2
	12	1238	2.94	2	1239	2.83	2
	13	1239	2.86	2	1240	2.75	3
	14	1241	2.79	3	1241	2.69	3
	15	1242	2.75	3	1242	2.64	3
	16	1243	2.71	3	1243	2.62	3
	17	1244	2.70	3	1244	2.61	3
	18	1245	2.69	3	1245	2.61	3
	19	1246	2.71	3	1246	2.64	3
	20	1247	2.74	3	1247	2.67	3
	21	1248	2.79	3	1248	2.73	3
	22	1249	2.86	3	1249	2.80	3
	23	1250	2.94	4	1250	2.89	4
	24	1251	3.05	4	1251	3.01	4
	25	1252	3.18	4	1253	3.15	4
	26	1254	3.35	4	1254	3.33	4
	27	1255	3.55	4	1256	3.55	4
	28	1257	3.81	4	1257	3.82	4
	29	1259	4.14	4	1259	4.18	4
	30	1261	4.58	4	1262	4.66	4

continued

Path	Raw Score	2021			2019		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	31	1264	5.21	4	1264	5.35	4
	32	1267	6.15	4	1268	6.42	4
	33	1272	7.80	4	1273	8.32	4
	34	1281	11.74	4	1283	12.87	4
	35	1290	21.29	4	1290	20.64	4

APPENDIX N
SCORE DISTRIBUTIONS

Figure N-1. Performance Level Distributions Graph—ELA

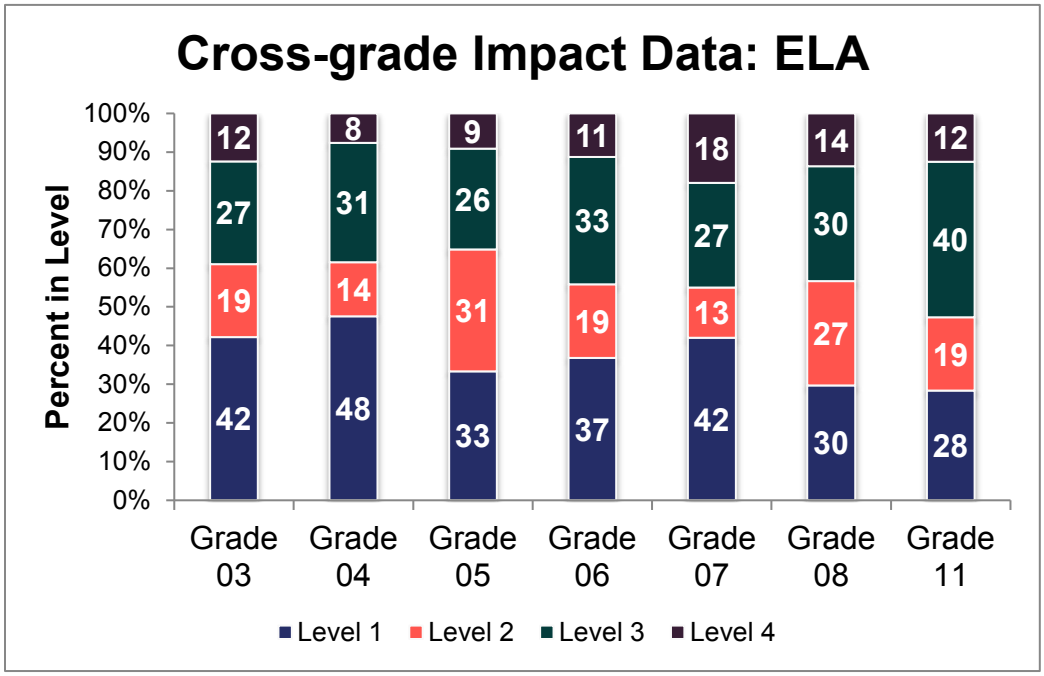


Figure N-2. Performance Level Distributions Graph—Mathematics

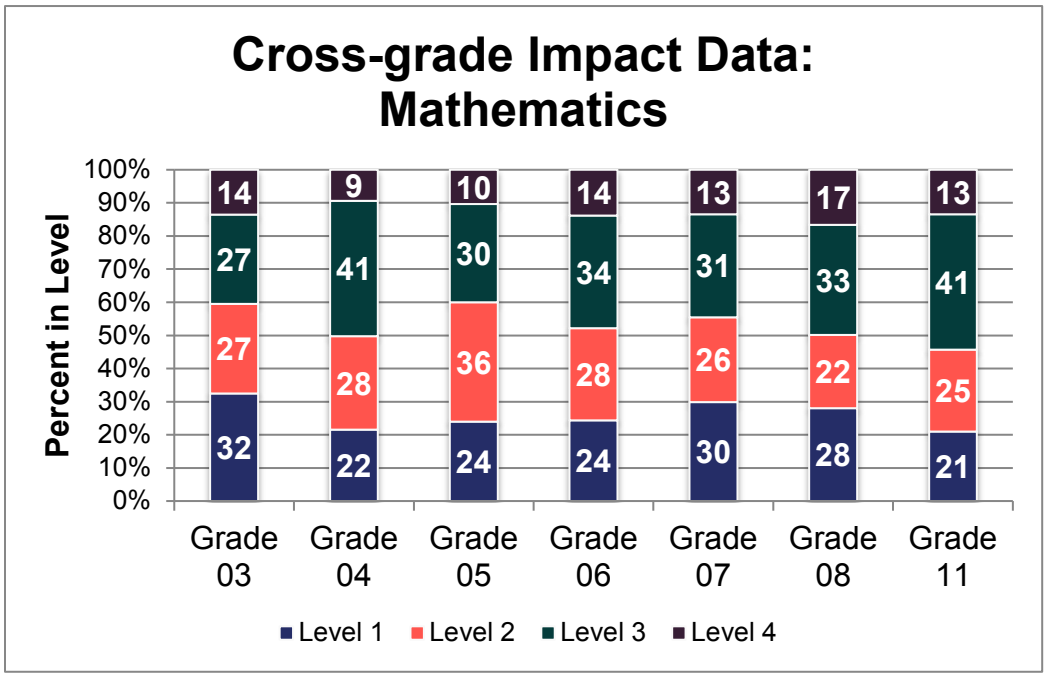
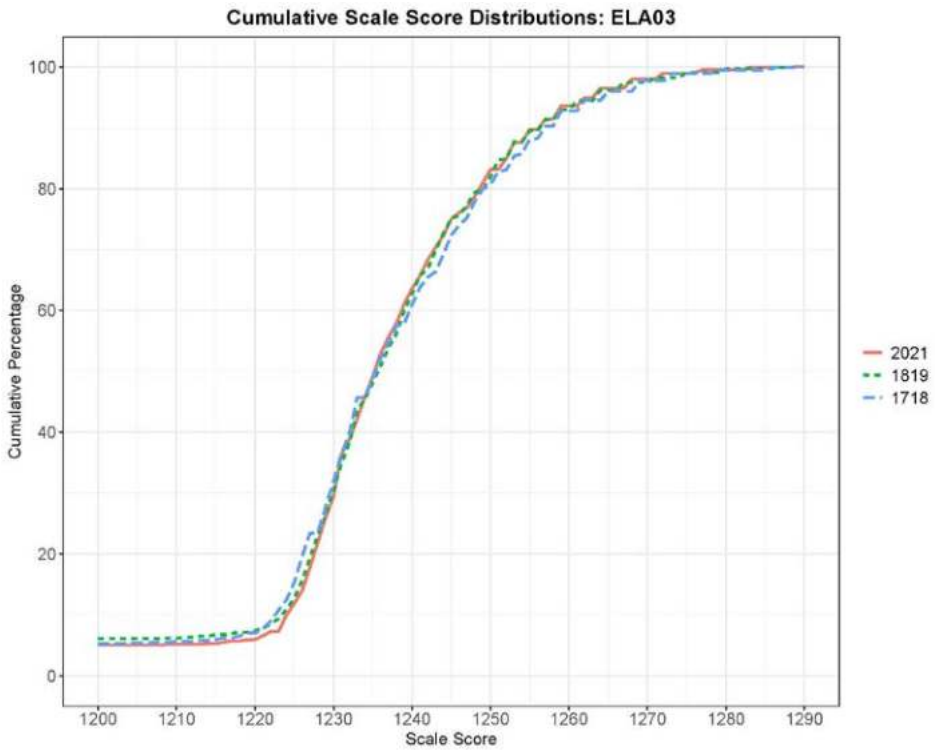


Figure N-3. Cumulative Score Distributions
Top: ELA Grade 3 Bottom: ELA Grade 4



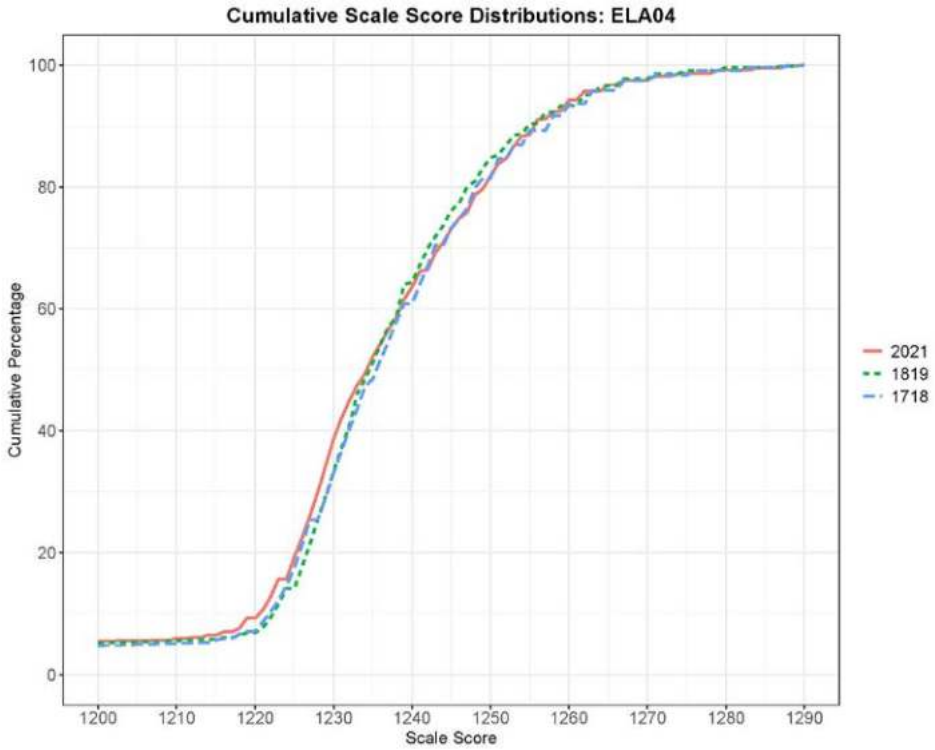
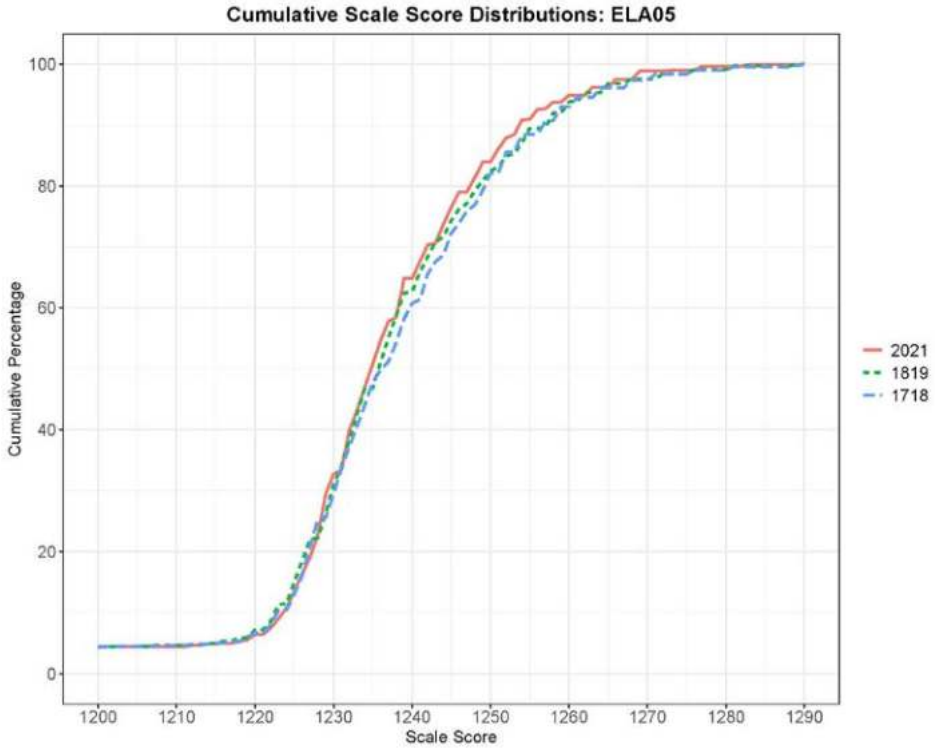


Figure N-4. Cumulative Score Distributions
Top: ELA Grade 5 Bottom: ELA Grade 6



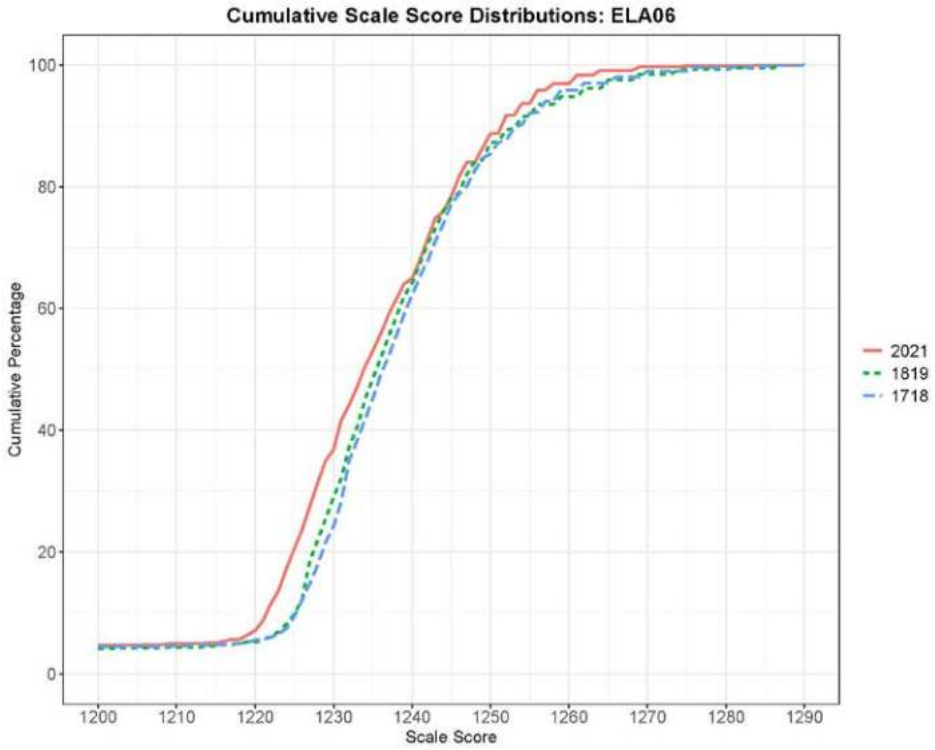
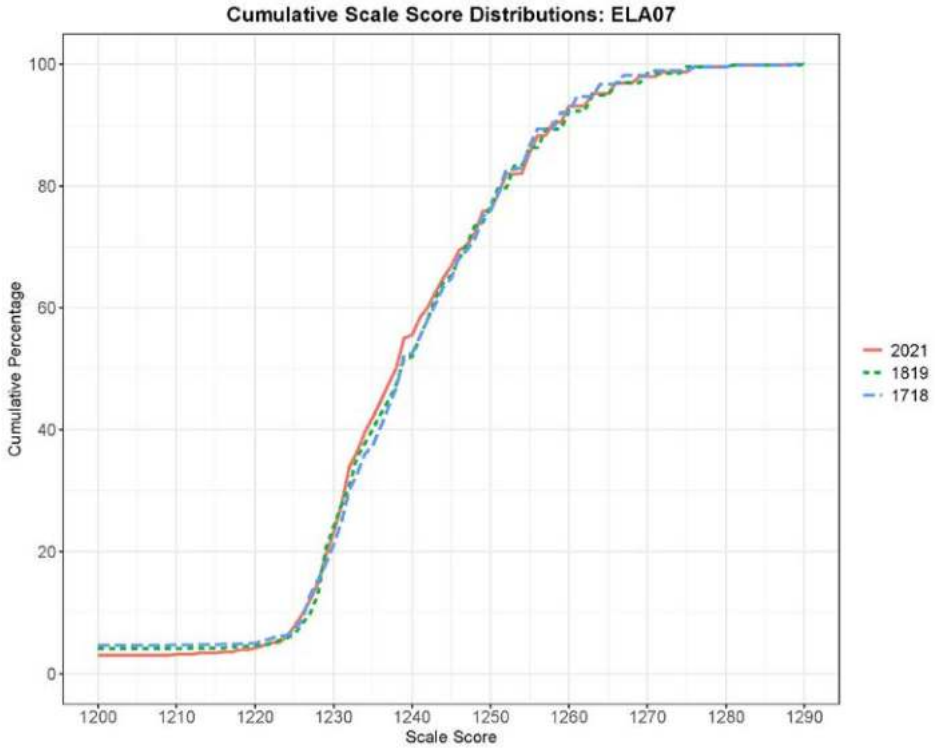


Figure N-5. Cumulative Score Distributions
Top: ELA Grade 7 Bottom: ELA Grade 8



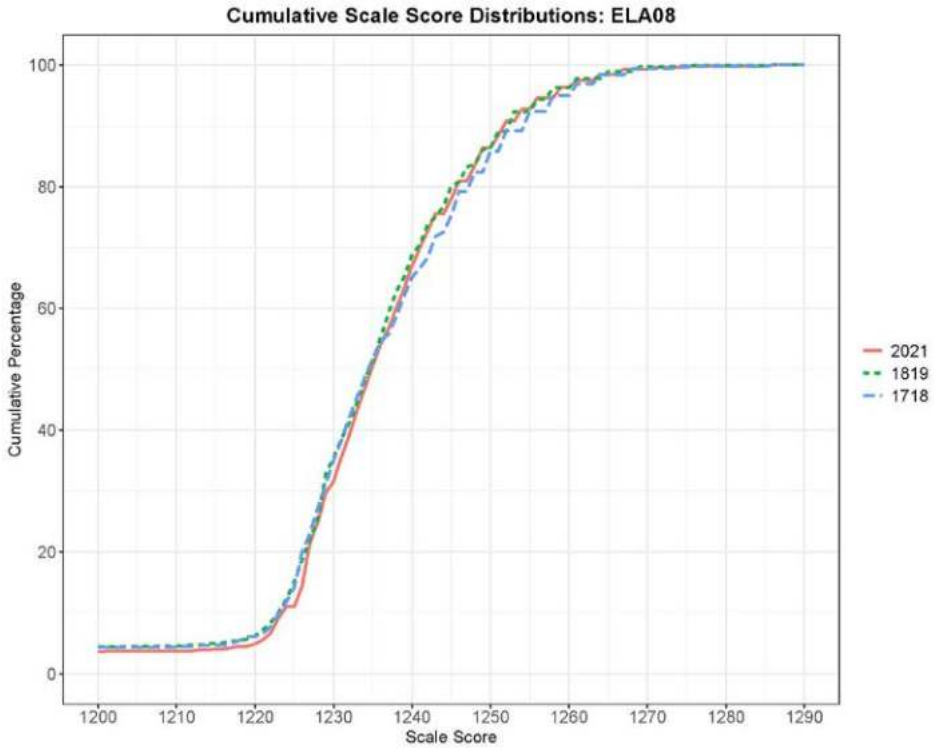


Figure N-6. Cumulative Score Distribution
ELA Grade 11

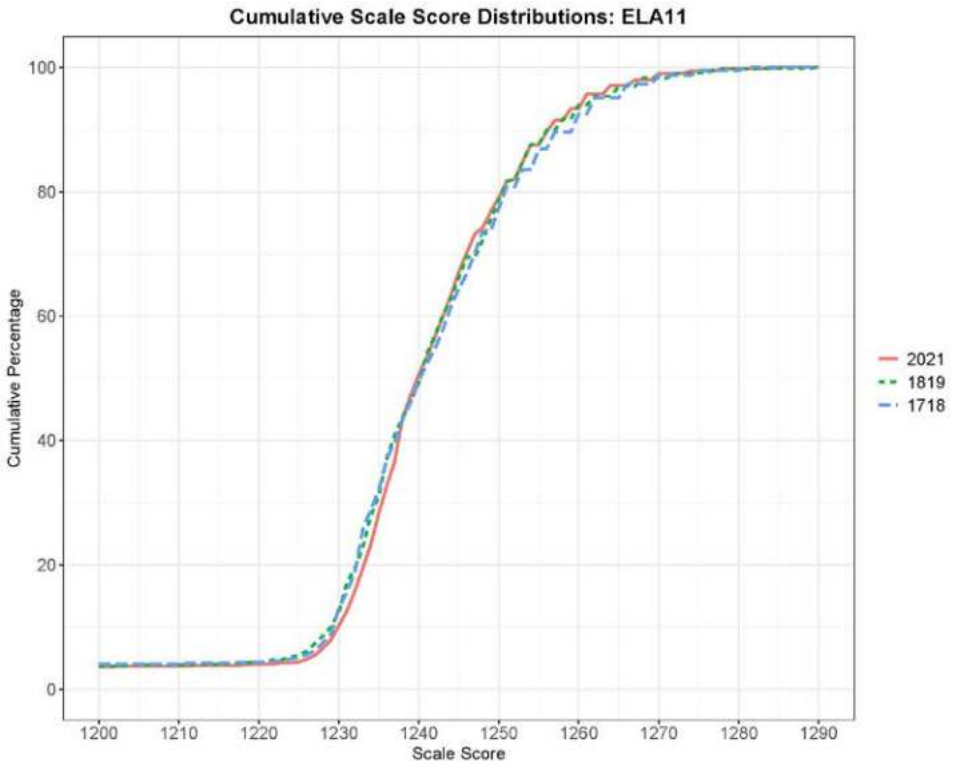
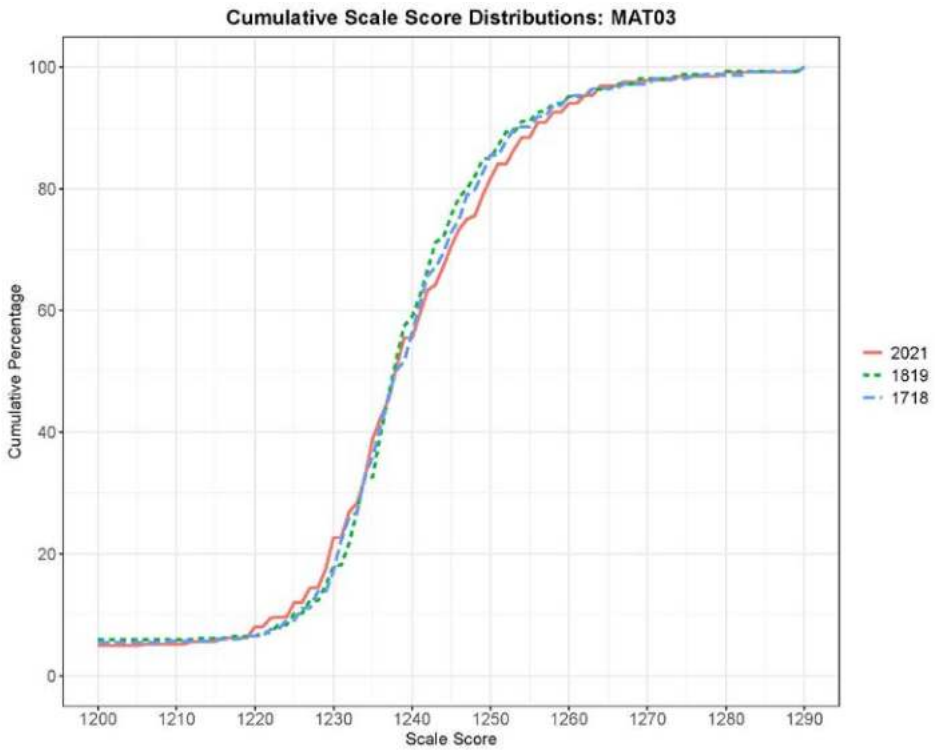


Figure N-7. Cumulative Score Distributions
Top: Mathematics Grade 3 Bottom: Mathematics Grade 4



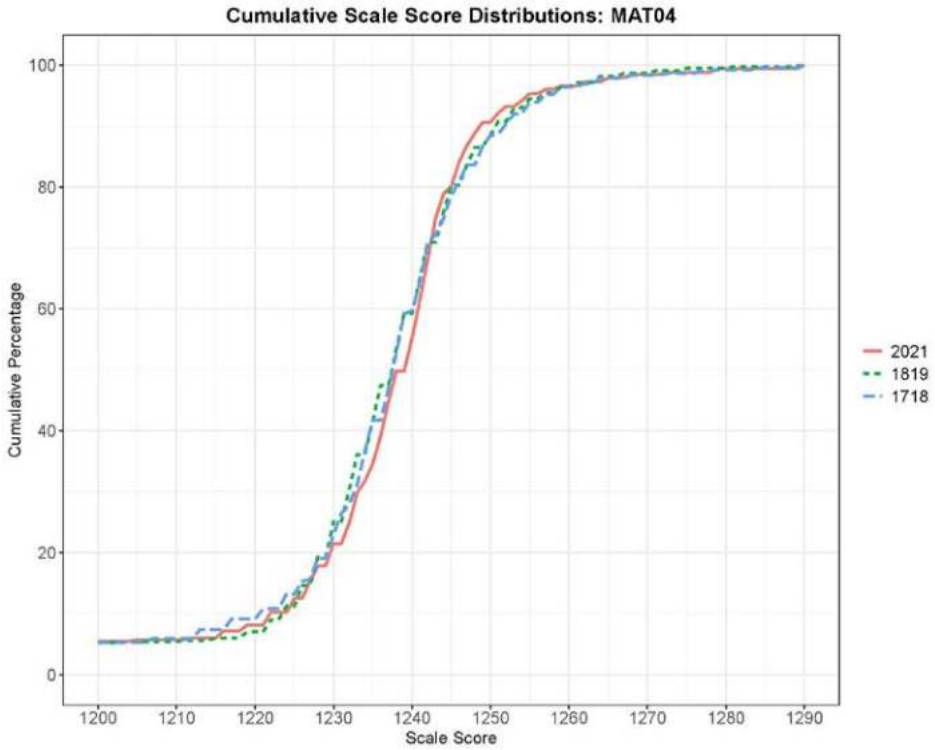
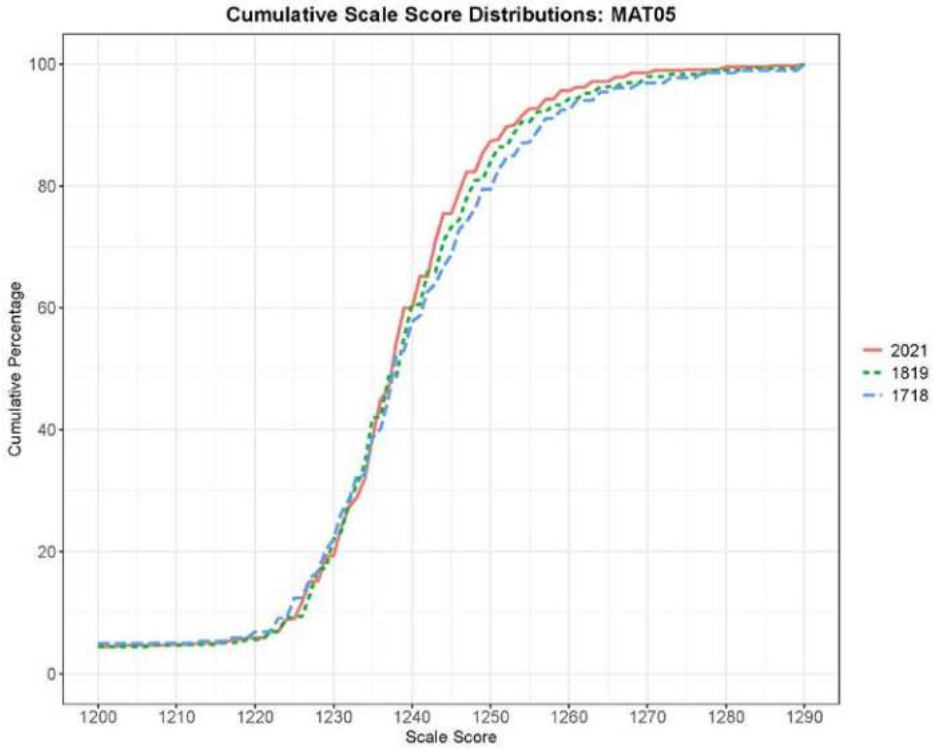


Figure N-9. Cumulative Score Distributions
Top: Mathematics Grade 5 Bottom: Mathematics Grade 6



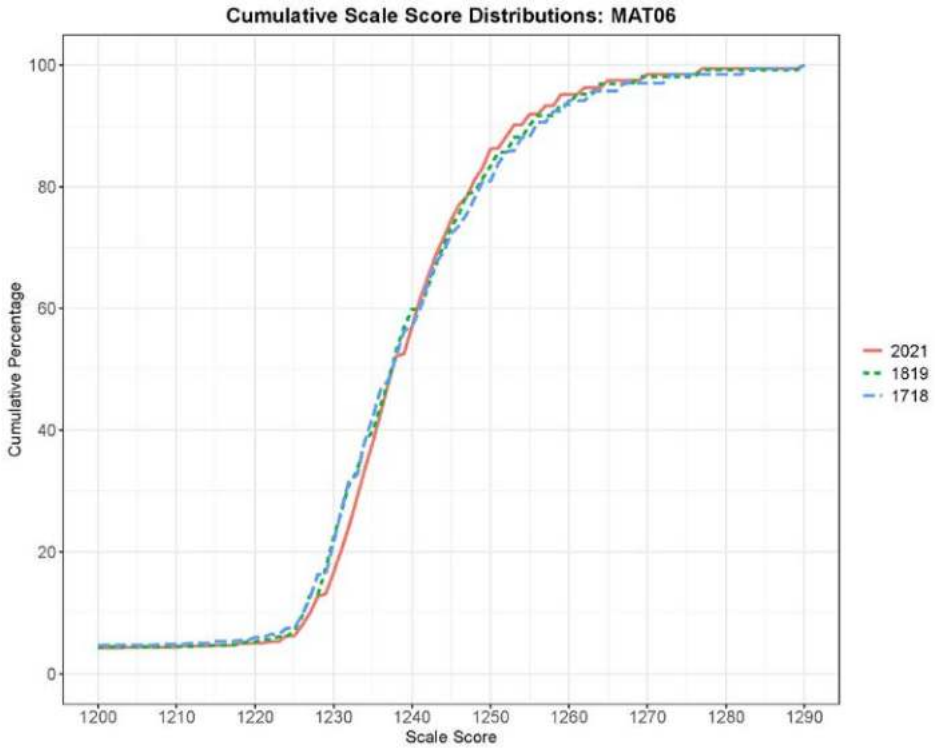
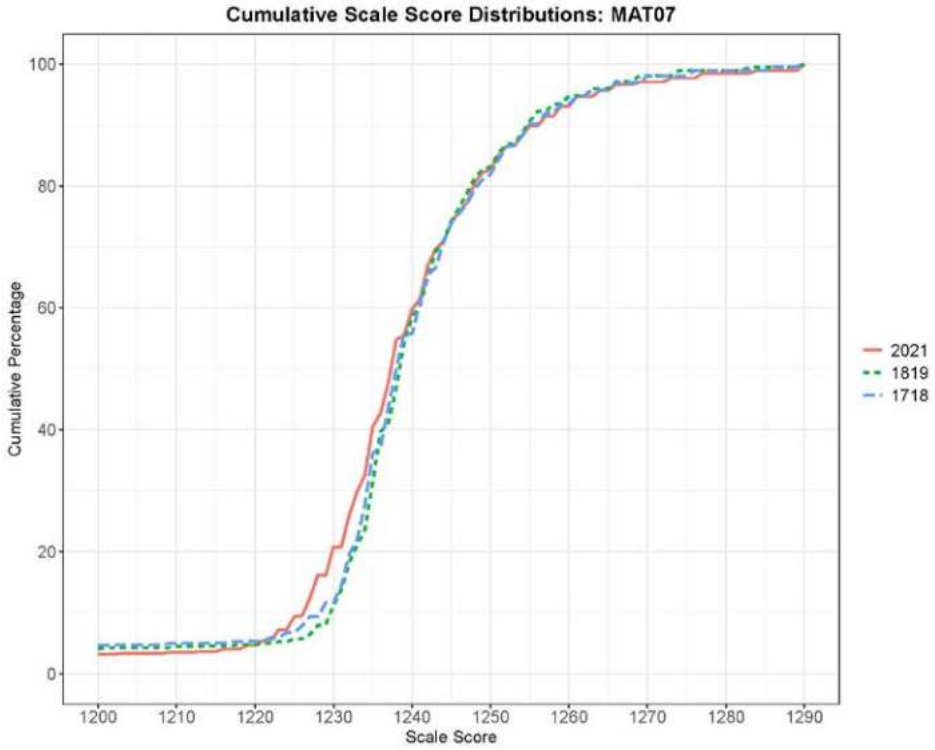


Figure N-10. Cumulative Score Distributions
Top: Mathematics Grade 7 Bottom: Mathematics Grade 8



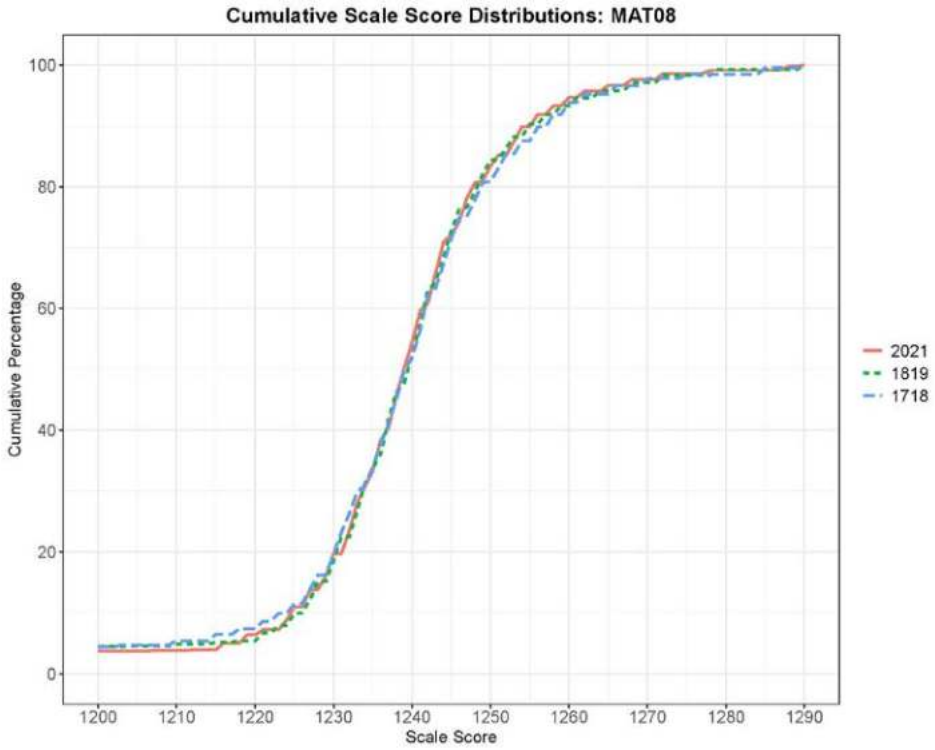
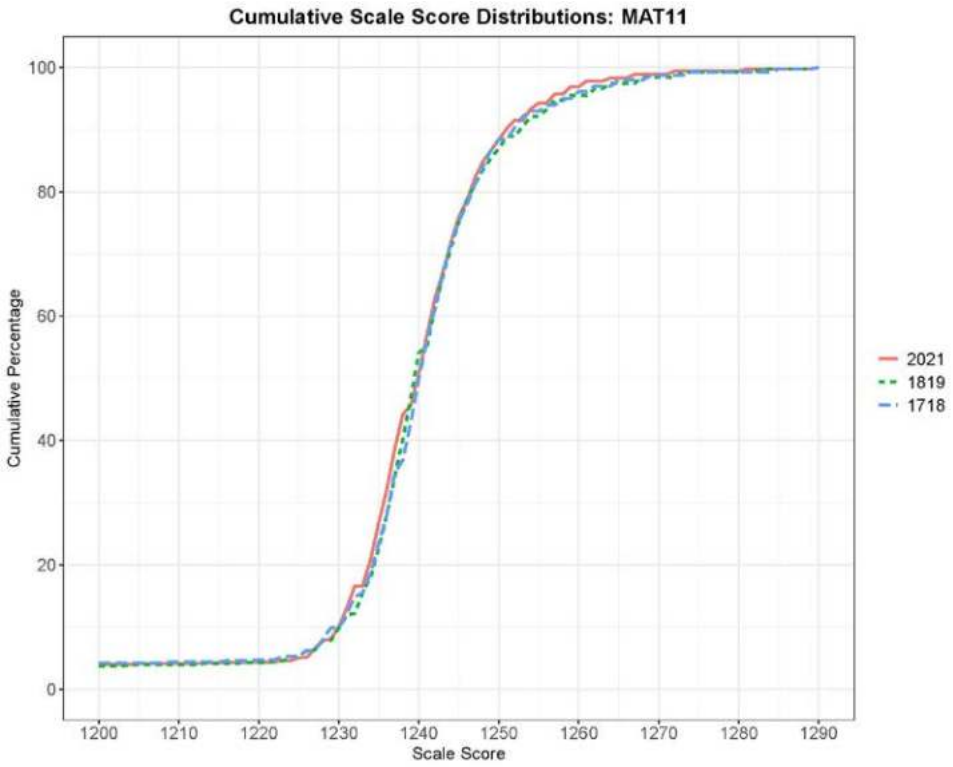


Figure N-11. Cumulative Score Distribution
Mathematics Grade 11



APPENDIX O
IRT SUBGROUP RELIABILITY

Note: Values are calculated only for subgroups with 100 or more students.

Table O-1. IRT Subgroup Reliability: ELA Grade 3

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,395	1200	1289	1240.6	12.94	0.92	3.45
Female	444	1200	1283	1240.4	12.75	0.92	3.40
Male	860	1200	1289	1240.6	13.06	0.91	3.48
Gender Undefined	91	1221	1283	1241.4	12.94	NA	NA
Hispanic or Latino	344	1200	1283	1238.8	11.96	0.91	3.29
American Indian or Alaska Native	29	1225	1272	1240.1	10.73	NA	NA
Asian	33	1209	1259	1234.0	9.15	NA	NA
Black or African American	239	1200	1289	1241.2	14.54	0.92	3.60
Native Hawaiian or Pacific Islander	13	1225	1250	1236.3	7.53	NA	NA
White (non-Hispanic)	545	1200	1283	1241.7	13.14	0.91	3.57
Two or More Races (non-Hispanic)	71	1224	1264	1239.6	11.20	NA	NA
No Primary race/Ethnicity Undefined	121	1221	1283	1242.6	13.14	0.92	3.51
Currently receiving LEP services	35	1217	1259	1233.6	8.12	NA	NA
Not receiving LEP services	689	1200	1289	1241.9	13.76	0.92	3.61
LEP: All Other Students	671	1200	1283	1239.6	12.06	0.91	3.33
Economically Disadvantaged Students	278	1200	1283	1243.5	14.72	0.92	3.79
Non-economically Disadvantaged Students	440	1200	1289	1240.4	12.85	0.91	3.44
SES: All Other Students	677	1200	1283	1239.5	12.04	0.91	3.32
Non-migrant	714	1200	1289	1241.6	13.69	0.92	3.58
Undefined Migrant Status	679	1200	1283	1239.5	12.02	0.91	3.32
Augmentative Communication	257	1200	1272	1234.1	10.47	0.89	3.14
No Augmentative Communication	1,131	1200	1289	1242.1	13.01	0.91	3.53
Undefined Augmentative Communications	7	1224	1259	1238.3	11.73	NA	NA
Hearing Loss	23	1217	1255	1232.3	9.46	NA	NA
Within Normal Limits	1,370	1200	1289	1240.7	12.94	0.91	3.46
Visual Impairment	44	1200	1268	1234.1	13.96	NA	NA
Within Normal Limits	1,347	1200	1289	1240.8	12.87	0.92	3.45
Undefined Visual Impairment	4	1226	1250	1234.8	10.87	NA	NA
Sensory Stimuli Response	98	1200	1268	1229.2	11.89	NA	NA
Follow Directions	1,297	1200	1289	1241.4	12.62	0.91	3.44
Special School	52	1214	1249	1231.7	7.15	NA	NA
Regular School Self-contained	947	1200	1289	1239.9	12.92	0.91	3.43
Regular School Primarily Self-contained	227	1200	1283	1243.1	13.39	0.91	3.64
Regular School Resource Room	118	1222	1277	1244.1	12.10	0.90	3.54
Regular School General Education	51	1224	1277	1243.7	12.20	NA	NA
Communicates Primarily Through Cries	65	1200	1257	1229.6	10.66	NA	NA
Uses Intentional Communication	333	1200	1289	1235.0	11.38	0.90	3.17
Uses Symbolic Language	997	1200	1283	1243.2	12.60	0.91	3.56

Table O-2. IRT Subgroup Reliability: ELA Grade 4

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,526	1200	1290	1239.9	14.33	0.91	4.02
Female	464	1200	1290	1240.6	13.52	0.90	3.97
Male	974	1200	1290	1239.5	14.49	0.91	4.02
Gender Undefined	88	1200	1284	1240.2	16.47	NA	NA
Hispanic or Latino	374	1210	1284	1238.0	12.45	0.91	3.72
American Indian or Alaska Native	49	1219	1279	1240.8	13.91	NA	NA
Asian	32	1200	1288	1235.8	15.61	NA	NA
Black or African American	259	1200	1290	1242.3	16.66	0.91	4.47
Native Hawaiian or Pacific Islander	16	1225	1271	1240.8	14.04	NA	NA
White (non-Hispanic)	628	1200	1288	1239.8	13.78	0.91	3.96
Two or More Races (non-Hispanic)	53	1200	1284	1241.7	15.57	NA	NA
No Primary race/Ethnicity Undefined	115	1200	1284	1240.8	15.75	0.91	4.22
Currently receiving LEP services	41	1216	1271	1236.3	12.01	NA	NA
Not receiving LEP services	777	1200	1290	1240.7	14.87	0.90	4.15
LEP: All Other Students	708	1200	1288	1239.2	13.78	0.91	3.90
Economically Disadvantaged Students	317	1200	1290	1243.1	16.49	0.92	4.35
Non-economically Disadvantaged Students	499	1200	1288	1238.8	13.33	0.89	3.98
SES: All Other Students	710	1200	1288	1239.2	13.77	0.91	3.90
Non-migrant	813	1200	1290	1240.5	14.80	0.90	4.13
Undefined Migrant Status	712	1200	1288	1239.2	13.76	0.91	3.90
Augmentative Communication	221	1200	1279	1231.1	11.55	0.87	3.77
No Augmentative Communication	1,294	1200	1290	1241.4	14.23	0.90	4.07
Undefined Augmentative Communications	11	1229	1267	1245.5	11.48	NA	NA
Hearing Loss	38	1200	1271	1229.3	13.14	NA	NA
Within Normal Limits	1,485	1200	1290	1240.2	14.26	0.91	4.02
Visual Impairment	49	1200	1260	1233.0	12.61	NA	NA
Within Normal Limits	1,467	1200	1290	1240.1	14.30	0.91	4.03
Undefined Visual Impairment	10	1223	1274	1244.2	18.53	NA	NA
Sensory Stimuli Response	94	1200	1267	1225.3	13.41	NA	NA
Follow Directions	1,432	1200	1290	1240.9	13.86	0.91	3.96
Special School	67	1200	1262	1230.5	13.47	NA	NA
Regular School Self-contained	1,037	1200	1290	1239.1	14.58	0.91	4.02
Regular School Primarily Self-contained	238	1216	1284	1242.1	12.17	0.89	3.86
Regular School Resource Room	132	1200	1288	1243.4	13.11	0.89	4.04
Regular School General Education	52	1225	1284	1249.2	13.48	NA	NA
Communicates Primarily Through Cries	76	1200	1260	1225.0	12.08	NA	NA
Uses Intentional Communication	324	1200	1290	1232.4	11.57	0.86	3.81
Uses Symbolic Language	1,126	1200	1290	1243.1	13.73	0.90	4.04

Table O-3. IRT Subgroup Reliability: ELA Grade 5

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,657	1200	1290	1239.7	12.49	0.90	3.66
Female	590	1200	1283	1239.8	12.95	0.91	3.70
Male	978	1200	1290	1239.7	12.32	0.90	3.66
Gender Undefined	89	1220	1277	1238.5	11.25	NA	NA
Hispanic or Latino	408	1200	1283	1237.7	11.35	0.89	3.49
American Indian or Alaska Native	34	1200	1269	1236.6	11.93	NA	NA
Asian	32	1218	1269	1234.6	10.78	NA	NA
Black or African American	279	1201	1283	1241.7	13.35	0.91	3.79
Native Hawaiian or Pacific Islander	18	1212	1252	1233.2	8.95	NA	NA
White (non-Hispanic)	697	1200	1283	1240.7	12.75	0.90	3.76
Two or More Races (non-Hispanic)	71	1220	1290	1239.9	13.73	NA	NA
No Primary race/Ethnicity Undefined	118	1212	1277	1238.6	11.40	0.90	3.49
Currently receiving LEP services	46	1201	1269	1236.2	10.76	NA	NA
Not receiving LEP services	878	1200	1290	1241.6	13.01	0.90	3.81
LEP: All Other Students	733	1200	1283	1237.5	11.53	0.89	3.51
Economically Disadvantaged Students	360	1201	1290	1243.3	13.96	0.91	3.93
Non-economically Disadvantaged Students	563	1200	1283	1240.2	12.08	0.89	3.69
SES: All Other Students	734	1200	1283	1237.5	11.57	0.90	3.51
Non-migrant	918	1200	1290	1241.4	12.95	0.90	3.79
Undefined Migrant Status	739	1200	1283	1237.5	11.54	0.89	3.51
Augmentative Communication	235	1200	1277	1231.6	9.51	0.86	3.27
No Augmentative Communication	1,410	1200	1290	1241.0	12.44	0.90	3.73
Undefined Augmentative Communications	12	1219	1254	1235.3	8.81	NA	NA
Hearing Loss	26	1222	1269	1235.5	10.89	NA	NA
Within Normal Limits	1,623	1200	1290	1239.7	12.53	0.90	3.67
Undefined Hearing Loss	8	1225	1245	1236.1	6.94	NA	NA
Visual Impairment	52	1212	1269	1234.5	12.20	NA	NA
Within Normal Limits	1,592	1200	1290	1239.9	12.46	0.90	3.67
Undefined Visual Impairment	13	1210	1256	1231.4	11.00	NA	NA
Sensory Stimuli Response	88	1200	1258	1228.7	9.55	NA	NA
Follow Directions	1,569	1200	1290	1240.3	12.36	0.90	3.68
Special School	76	1200	1266	1231.5	12.60	NA	NA
Regular School Self-contained	1,073	1200	1283	1238.7	11.99	0.90	3.56
Regular School Primarily Self-contained	309	1212	1290	1242.0	12.22	0.90	3.74
Regular School Resource Room	133	1212	1283	1244.3	13.27	0.90	3.97
Regular School General Education	66	1200	1269	1243.9	13.23	NA	NA
Communicates Primarily Through Cries	74	1200	1251	1226.2	8.77	NA	NA
Uses Intentional Communication	317	1200	1277	1234.2	11.57	0.88	3.49
Uses Symbolic Language	1,266	1201	1290	1241.8	11.98	0.90	3.71

Table O-4. IRT Subgroup Reliability: ELA Grade 6

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,711	1200	1290	1237.8	11.95	0.88	3.55
Female	598	1200	1275	1237.3	11.54	0.89	3.43
Male	1,014	1200	1290	1238.0	12.29	0.87	3.64
Gender Undefined	99	1200	1269	1238.7	10.80	NA	NA
Hispanic or Latino	362	1200	1269	1235.9	11.75	0.85	3.60
American Indian or Alaska Native	40	1214	1254	1233.3	10.08	NA	NA
Asian	30	1200	1258	1236.6	12.66	NA	NA
Black or African American	309	1200	1269	1238.3	11.69	0.90	3.45
Native Hawaiian or Pacific Islander	17	1200	1249	1229.7	9.90	NA	NA
White (non-Hispanic)	782	1200	1290	1238.6	12.17	0.88	3.58
Two or More Races (non-Hispanic)	52	1200	1269	1240.2	12.64	NA	NA
No Primary race/Ethnicity Undefined	119	1200	1269	1239.0	10.83	0.90	3.39
Currently receiving LEP services	42	1219	1264	1232.6	11.37	NA	NA
Not receiving LEP services	914	1200	1284	1239.2	12.05	0.88	3.62
LEP: All Other Students	755	1200	1290	1236.4	11.63	0.87	3.50
Economically Disadvantaged Students	358	1200	1284	1240.1	12.08	0.89	3.58
Non-economically Disadvantaged Students	598	1200	1275	1238.1	11.96	0.88	3.57
SES: All Other Students	755	1200	1290	1236.5	11.71	0.87	3.53
Non-migrant	950	1200	1284	1238.9	12.05	0.88	3.58
Undefined Migrant Status	760	1200	1290	1236.4	11.69	0.87	3.52
Augmentative Communication	219	1200	1269	1228.5	10.23	0.75	3.67
No Augmentative Communication	1,480	1200	1290	1239.2	11.59	0.88	3.54
Undefined Augmentative Communications	12	1221	1250	1237.0	8.88	NA	NA
Hearing Loss	44	1200	1261	1229.0	14.14	NA	NA
Within Normal Limits	1,660	1200	1290	1238.0	11.82	0.88	3.53
Undefined Hearing Loss	7	1223	1247	1236.7	7.32	NA	NA
Visual Impairment	60	1200	1256	1229.0	12.77	NA	NA
Within Normal Limits	1,641	1200	1290	1238.2	11.81	0.88	3.53
Undefined Visual Impairment	10	1222	1249	1232.7	8.67	NA	NA
Sensory Stimuli Response	95	1200	1254	1223.9	11.74	NA	NA
Follow Directions	1,616	1200	1290	1238.6	11.45	0.89	3.45
Special School	101	1200	1261	1229.9	11.61	0.82	3.67
Regular School Self-contained	1,137	1200	1284	1237.2	11.55	0.88	3.47
Regular School Primarily Self-contained	288	1200	1290	1239.5	12.31	0.88	3.66
Regular School Resource Room	131	1200	1275	1243.6	11.29	0.86	3.83
Regular School General Education	54	1200	1261	1241.4	11.02	NA	NA
Communicates Primarily Through Cries	72	1200	1256	1223.7	11.62	NA	NA
Uses Intentional Communication	302	1200	1261	1230.2	10.36	0.81	3.48
Uses Symbolic Language	1,337	1200	1290	1240.3	11.03	0.89	3.48

Table O-5. IRT Subgroup Reliability: ELA Grade 7

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,788	1200	1290	1242.6	12.97	0.91	3.67
Female	621	1200	1288	1242.0	12.15	0.90	3.59
Male	1,079	1200	1290	1243.0	13.49	0.91	3.73
Gender Undefined	88	1222	1269	1242.6	11.85	NA	NA
Hispanic or Latino	429	1200	1288	1240.9	12.52	0.90	3.62
American Indian or Alaska Native	55	1220	1263	1240.0	10.44	NA	NA
Asian	40	1213	1260	1235.6	10.02	NA	NA
Black or African American	303	1213	1290	1243.8	12.45	0.90	3.68
White (non-Hispanic)	782	1200	1288	1243.4	13.66	0.91	3.75
Two or More Races (non-Hispanic)	67	1216	1281	1244.6	13.52	NA	NA
No Primary race/Ethnicity Undefined	105	1222	1269	1243.3	11.39	0.89	3.58
Currently receiving LEP services	58	1224	1263	1239.1	10.18	NA	NA
Not receiving LEP services	951	1200	1290	1243.9	13.40	0.91	3.78
LEP: All Other Students	779	1200	1288	1241.2	12.41	0.90	3.57
Economically Disadvantaged Students	370	1213	1290	1245.6	13.77	0.91	3.88
Non-economically Disadvantaged Students	637	1200	1288	1242.5	12.89	0.90	3.68
SES: All Other Students	781	1200	1288	1241.2	12.40	0.90	3.57
Non-migrant	1,005	1200	1290	1243.7	13.30	0.91	3.75
Undefined Migrant Status	783	1200	1288	1241.2	12.39	0.90	3.56
Augmentative Communication	229	1200	1272	1232.4	8.30	0.85	2.99
No Augmentative Communication	1,550	1200	1290	1244.1	12.84	0.90	3.77
Undefined Augmentative Communications	9	1228	1272	1241.4	15.03	NA	NA
Hearing Loss	43	1200	1255	1232.4	9.74	NA	NA
Within Normal Limits	1,740	1200	1290	1242.8	12.92	0.91	3.67
Visual Impairment	59	1200	1269	1236.4	12.63	NA	NA
Within Normal Limits	1,718	1200	1290	1242.9	12.94	0.91	3.68
Undefined Visual Impairment	11	1227	1260	1237.6	9.76	NA	NA
Sensory Stimuli Response	98	1200	1251	1227.4	8.36	NA	NA
Follow Directions	1,690	1200	1290	1243.5	12.63	0.90	3.68
Special School	106	1210	1269	1235.0	11.10	0.91	3.19
Regular School Self-contained	1,227	1200	1290	1241.8	12.74	0.91	3.61
Regular School Primarily Self-contained	281	1200	1288	1246.9	13.88	0.90	4.04
Regular School Resource Room	130	1221	1269	1246.0	10.26	0.86	3.78
Regular School General Education	44	1220	1276	1247.3	12.32	NA	NA
Communicates Primarily Through Cries	79	1200	1266	1227.9	9.22	NA	NA
Uses Intentional Communication	326	1200	1276	1235.6	10.97	0.89	3.25
Uses Symbolic Language	1,383	1200	1290	1245.1	12.41	0.90	3.78

Table O-6. IRT Subgroup Reliability: ELA Grade 8

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,813	1200	1286	1238.9	11.29	0.89	3.43
Female	616	1200	1286	1239.4	11.36	0.89	3.47
Male	1,103	1200	1286	1238.9	11.34	0.90	3.42
Gender Undefined	94	1200	1259	1236.1	9.71	NA	NA
Hispanic or Latino	426	1200	1271	1237.5	10.60	0.89	3.33
American Indian or Alaska Native	47	1218	1264	1235.3	10.02	NA	NA
Asian	34	1217	1256	1235.7	9.26	NA	NA
Black or African American	308	1213	1276	1239.0	10.23	0.89	3.34
Native Hawaiian or Pacific Islander	11	1233	1267	1243.5	10.20	NA	NA
White (non-Hispanic)	816	1200	1286	1240.4	11.99	0.90	3.56
Two or More Races (non-Hispanic)	52	1201	1286	1235.8	11.90	NA	NA
No Primary race/Ethnicity Undefined	119	1200	1271	1237.0	10.64	0.87	3.39
Currently receiving LEP services	46	1217	1267	1238.8	10.25	NA	NA
Not receiving LEP services	986	1200	1286	1240.0	11.35	0.90	3.48
LEP: All Other Students	781	1200	1286	1237.6	11.13	0.89	3.39
Economically Disadvantaged Students	353	1215	1286	1240.1	10.97	0.89	3.44
Non-economically Disadvantaged Students	675	1200	1276	1240.0	11.42	0.89	3.49
SES: All Other Students	785	1200	1286	1237.5	11.16	0.89	3.39
Non-migrant	1,025	1200	1286	1240.0	11.28	0.89	3.47
Undefined Migrant Status	788	1200	1286	1237.5	11.14	0.89	3.39
Augmentative Communication	208	1200	1267	1231.2	9.29	0.83	3.25
No Augmentative Communication	1,590	1200	1286	1239.9	11.12	0.89	3.46
Undefined Augmentative Communications	15	1221	1271	1240.9	13.53	NA	NA
Hearing Loss	46	1217	1254	1232.1	8.09	NA	NA
Within Normal Limits	1,759	1200	1286	1239.1	11.29	0.89	3.45
Undefined Hearing Loss	8	1213	1251	1232.5	12.11	NA	NA
Visual Impairment	63	1200	1259	1234.2	10.84	NA	NA
Within Normal Limits	1,743	1200	1286	1239.1	11.28	0.89	3.44
Undefined Visual Impairment	7	1227	1254	1237.7	8.96	NA	NA
Sensory Stimuli Response	69	1200	1249	1227.3	8.84	NA	NA
Follow Directions	1,744	1200	1286	1239.4	11.13	0.89	3.43
Special School	88	1201	1267	1232.9	11.36	NA	NA
Regular School Self-contained	1,196	1200	1286	1237.9	10.93	0.89	3.37
Regular School Primarily Self-contained	351	1200	1276	1241.9	11.87	0.89	3.64
Regular School Resource Room	130	1213	1267	1241.3	9.26	0.86	3.43
Regular School General Education	48	1229	1286	1245.9	11.24	NA	NA
Communicates Primarily Through Cries	65	1200	1242	1226.3	8.25	NA	NA
Uses Intentional Communication	279	1200	1267	1232.0	8.92	0.86	3.12
Uses Symbolic Language	1,469	1200	1286	1240.8	10.93	0.89	3.49

Table O-7. IRT Subgroup Reliability: ELA Grade 11

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,684	1200	1285	1243.6	11.28	0.88	3.28
Female	582	1200	1278	1242.7	11.38	0.86	3.35
Male	963	1200	1285	1243.9	11.34	0.88	3.26
Gender Undefined	139	1223	1274	1245.3	10.23	0.90	3.14
Hispanic or Latino	331	1200	1278	1241.7	10.54	0.88	3.07
American Indian or Alaska Native	42	1200	1267	1243.3	11.75	NA	NA
Asian	27	1229	1270	1242.6	10.12	NA	NA
Black or African American	261	1200	1278	1244.6	10.57	0.89	3.18
Native Hawaiian or Pacific Islander	10	1227	1249	1238.0	8.18	NA	NA
White (non-Hispanic)	756	1200	1285	1244.3	11.92	0.87	3.43
Two or More Races (non-Hispanic)	43	1227	1261	1241.1	9.53	NA	NA
No Primary race/Ethnicity Undefined	214	1200	1274	1243.6	11.04	0.87	3.27
Currently receiving LEP services	30	1225	1278	1243.4	11.49	NA	NA
Not receiving LEP services	879	1200	1285	1244.9	11.68	0.88	3.39
LEP: All Other Students	775	1200	1278	1242.1	10.62	0.87	3.16
Economically Disadvantaged Students	262	1200	1285	1246.2	11.27	0.89	3.32
Non-economically Disadvantaged Students	650	1200	1285	1244.3	11.78	0.87	3.40
SES: All Other Students	772	1200	1278	1242.1	10.63	0.87	3.17
Non-migrant	909	1200	1285	1244.9	11.67	0.88	3.38
Undefined Migrant Status	775	1200	1278	1242.1	10.62	0.87	3.16
Augmentative Communication	147	1200	1267	1234.7	10.93	0.71	3.72
No Augmentative Communication	1,531	1200	1285	1244.4	10.94	0.88	3.23
Undefined Augmentative Communications	6	1235	1270	1250.2	12.86	NA	NA
Hearing Loss	38	1200	1261	1237.6	12.03	NA	NA
Within Normal Limits	1,644	1200	1285	1243.7	11.23	0.88	3.27
Visual Impairment	61	1200	1270	1238.1	14.47	NA	NA
Within Normal Limits	1,611	1200	1285	1243.8	11.08	0.88	3.25
Undefined Visual Impairment	12	1236	1278	1247.6	13.69	NA	NA
Sensory Stimuli Response	64	1200	1254	1229.2	14.44	NA	NA
Follow Directions	1,620	1200	1285	1244.2	10.76	0.89	3.18
Special School	104	1200	1270	1236.1	13.25	0.80	3.89
Regular School Self-contained	1,105	1200	1285	1243.1	11.13	0.87	3.23
Regular School Primarily Self-contained	318	1216	1278	1246.1	9.72	0.88	3.17
Regular School Resource Room	117	1200	1285	1248.2	11.97	0.88	3.60
Regular School General Education	40	1231	1257	1244.2	7.81	NA	NA
Communicates Primarily Through Cries	58	1200	1254	1227.2	15.57	NA	NA
Uses Intentional Communication	198	1200	1267	1236.9	10.10	0.82	3.14
Uses Symbolic Language	1,428	1200	1285	1245.2	10.34	0.89	3.15

Table O-8. IRT Subgroup Reliability: Mathematics Grade 3

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,445	1200	1290	1242.3	12.83	0.87	4.30
Female	452	1200	1290	1242.0	13.27	0.87	4.34
Male	907	1200	1290	1242.3	12.63	0.86	4.28
Gender Undefined	86	1225	1280	1243.8	12.55	NA	NA
Hispanic or Latino	357	1200	1290	1241.5	12.14	0.86	4.20
American Indian or Alaska Native	33	1222	1264	1240.0	9.80	NA	NA
Asian	40	1206	1254	1235.6	10.80	NA	NA
Black or African American	248	1206	1290	1244.4	14.56	0.88	4.50
Native Hawaiian or Pacific Islander	13	1222	1258	1236.5	9.96	NA	NA
White (non-Hispanic)	566	1200	1290	1242.4	12.48	0.85	4.31
Two or More Races (non-Hispanic)	71	1212	1290	1242.3	14.67	NA	NA
No Primary race/Ethnicity Undefined	117	1225	1280	1243.5	12.05	0.88	4.12
Currently receiving LEP services	33	1212	1250	1237.3	8.09	NA	NA
Not receiving LEP services	717	1200	1290	1243.5	13.75	0.87	4.42
LEP: All Other Students	695	1200	1290	1241.3	11.86	0.86	4.18
Economically Disadvantaged Students	282	1200	1290	1245.4	14.38	0.87	4.54
Non-economically Disadvantaged Students	463	1200	1290	1242.0	13.00	0.87	4.32
SES: All Other Students	700	1200	1290	1241.2	11.83	0.86	4.18
Non-migrant	741	1200	1290	1243.3	13.63	0.87	4.40
Undefined Migrant Status	702	1200	1290	1241.3	11.84	0.86	4.18
Augmentative Communication	270	1200	1267	1235.9	11.04	0.79	4.42
No Augmentative Communication	1,167	1200	1290	1243.8	12.76	0.87	4.27
Undefined Augmentative Communications	8	1223	1260	1240.8	11.91	NA	NA
Hearing Loss	24	1206	1264	1234.7	12.32	NA	NA
Within Normal Limits	1,419	1200	1290	1242.4	12.80	0.86	4.29
Visual Impairment	47	1200	1264	1234.3	12.57	NA	NA
Within Normal Limits	1,394	1200	1290	1242.6	12.75	0.87	4.27
Undefined Visual Impairment	4	1233	1264	1244.3	13.67	NA	NA
Sensory Stimuli Response	120	1200	1280	1233.2	12.29	0.78	4.86
Follow Directions	1,325	1200	1290	1243.1	12.56	0.87	4.24
Special School	54	1200	1253	1236.4	8.52	NA	NA
Regular School Self-contained	973	1200	1290	1241.8	12.97	0.87	4.32
Regular School Primarily Self-contained	248	1200	1280	1243.5	13.45	0.87	4.36
Regular School Resource Room	115	1222	1290	1245.9	11.28	0.85	4.11
Regular School General Education	55	1225	1274	1244.6	11.12	NA	NA
Communicates Primarily Through Cries	87	1206	1267	1233.2	10.38	NA	NA
Uses Intentional Communication	338	1200	1290	1237.6	12.59	0.85	4.43
Uses Symbolic Language	1,020	1200	1290	1244.6	12.32	0.86	4.24

Table O-9. IRT Subgroup Reliability: Mathematics Grade 4

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,580	1200	1290	1239.8	11.12	0.80	3.93
Female	488	1200	1290	1239.5	10.11	0.81	3.75
Male	1,004	1200	1290	1239.8	11.34	0.80	3.99
Gender Undefined	88	1200	1290	1241.6	13.64	NA	NA
Hispanic or Latino	400	1200	1290	1239.1	9.49	0.79	3.70
American Indian or Alaska Native	53	1222	1265	1241.5	7.94	NA	NA
Asian	33	1200	1259	1233.6	11.02	NA	NA
Black or African American	270	1200	1290	1242.0	15.04	0.84	4.55
Native Hawaiian or Pacific Islander	18	1232	1257	1239.6	6.23	NA	NA
White (non-Hispanic)	633	1200	1279	1239.1	9.60	0.77	3.77
Two or More Races (non-Hispanic)	55	1200	1279	1240.1	12.08	NA	NA
No Primary race/Ethnicity Undefined	118	1200	1290	1242.0	13.27	0.84	4.16
Currently receiving LEP services	42	1222	1255	1237.8	6.98	NA	NA
Not receiving LEP services	795	1200	1290	1240.3	12.05	0.80	4.11
LEP: All Other Students	743	1200	1290	1239.4	10.22	0.81	3.77
Economically Disadvantaged Students	321	1200	1290	1243.0	14.01	0.84	4.33
Non-economically Disadvantaged Students	515	1200	1290	1238.5	9.92	0.74	3.91
SES: All Other Students	744	1200	1290	1239.4	10.22	0.81	3.77
Non-migrant	832	1200	1290	1240.2	11.88	0.80	4.08
Undefined Migrant Status	747	1200	1290	1239.4	10.20	0.81	3.77
Augmentative Communication	259	1200	1290	1235.0	9.81	0.79	3.91
No Augmentative Communication	1,308	1200	1290	1240.8	11.14	0.80	3.94
Undefined Augmentative Communications	13	1233	1268	1243.4	8.83	NA	NA
Hearing Loss	43	1200	1257	1233.2	11.08	NA	NA
Within Normal Limits	1,534	1200	1290	1240.0	11.07	0.80	3.92
Visual Impairment	44	1200	1255	1236.0	11.26	NA	NA
Within Normal Limits	1,526	1200	1290	1239.9	11.05	0.80	3.91
Undefined Visual Impairment	10	1225	1279	1243.0	18.14	NA	NA
Sensory Stimuli Response	121	1200	1279	1229.7	14.04	0.50	6.42
Follow Directions	1,459	1200	1290	1240.7	10.41	0.83	3.72
Special School	74	1200	1251	1231.5	12.18	NA	NA
Regular School Self-contained	1,074	1200	1290	1239.5	11.42	0.81	3.98
Regular School Primarily Self-contained	245	1216	1290	1241.4	9.09	0.84	3.52
Regular School Resource Room	137	1225	1273	1242.0	8.44	0.83	3.46
Regular School General Education	50	1222	1279	1245.9	11.38	NA	NA
Communicates Primarily Through Cries	105	1200	1268	1230.0	12.48	0.44	5.98
Uses Intentional Communication	345	1200	1290	1236.6	10.86	0.76	4.10
Uses Symbolic Language	1,130	1200	1290	1241.7	10.33	0.84	3.69

Table O-10. IRT Subgroup Reliability: Mathematics Grade 5

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,641	1200	1290	1240.6	11.56	0.84	4.41
Female	584	1200	1290	1239.9	11.34	0.84	4.37
Male	969	1200	1290	1241.2	11.89	0.84	4.45
Gender Undefined	88	1222	1268	1239.3	8.73	NA	NA
Hispanic or Latino	402	1200	1280	1239.6	9.57	0.79	4.24
American Indian or Alaska Native	33	1200	1286	1242.3	14.45	NA	NA
Asian	38	1213	1268	1238.6	10.88	NA	NA
Black or African American	272	1203	1290	1244.2	13.61	0.88	4.55
Native Hawaiian or Pacific Islander	17	1227	1254	1240.1	7.30	NA	NA
White (non-Hispanic)	691	1200	1290	1240.3	11.69	0.83	4.45
Two or More Races (non-Hispanic)	71	1200	1280	1238.8	12.90	NA	NA
No Primary race/Ethnicity Undefined	117	1217	1271	1239.0	9.18	0.79	4.18
Currently receiving LEP services	45	1222	1271	1238.8	9.49	NA	NA
Not receiving LEP services	872	1200	1290	1241.9	12.31	0.85	4.45
LEP: All Other Students	724	1200	1290	1239.2	10.55	0.80	4.37
Economically Disadvantaged Students	354	1209	1290	1243.5	13.04	0.88	4.44
Non-economically Disadvantaged Students	560	1200	1290	1240.6	11.46	0.82	4.43
SES: All Other Students	727	1200	1290	1239.2	10.60	0.81	4.37
Non-migrant	910	1200	1290	1241.8	12.19	0.85	4.44
Undefined Migrant Status	731	1200	1290	1239.2	10.57	0.81	4.37
Augmentative Communication	236	1200	1266	1234.5	9.71	0.75	4.43
No Augmentative Communication	1,395	1200	1290	1241.6	11.56	0.84	4.40
Undefined Augmentative Communications	10	1227	1257	1239.8	9.09	NA	NA
Hearing Loss	29	1222	1271	1238.4	10.73	NA	NA
Within Normal Limits	1,604	1200	1290	1240.7	11.59	0.84	4.41
Undefined Hearing Loss	8	1222	1243	1236.3	6.84	NA	NA
Visual Impairment	55	1200	1254	1234.1	10.00	NA	NA
Within Normal Limits	1,576	1200	1290	1240.9	11.53	0.84	4.40
Undefined Visual Impairment	10	1213	1259	1236.8	14.57	NA	NA
Sensory Stimuli Response	89	1200	1290	1233.0	13.41	NA	NA
Follow Directions	1,552	1200	1290	1241.0	11.30	0.83	4.37
Special School	72	1200	1263	1234.0	12.85	NA	NA
Regular School Self-contained	1,063	1200	1290	1240.0	11.32	0.84	4.36
Regular School Primarily Self-contained	303	1217	1290	1242.0	10.85	0.84	4.29
Regular School Resource Room	135	1209	1286	1243.5	11.39	0.85	4.36
Regular School General Education	68	1200	1290	1244.8	13.37	NA	NA
Communicates Primarily Through Cries	76	1200	1266	1231.1	13.05	NA	NA
Uses Intentional Communication	323	1200	1290	1236.6	12.64	0.82	4.70
Uses Symbolic Language	1,242	1209	1290	1242.2	10.61	0.83	4.27

Table O-11. IRT Subgroup Reliability: Mathematics Grade 6

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,742	1200	1290	1241.5	11.55	0.84	3.74
Female	603	1200	1290	1240.7	11.40	0.84	3.71
Male	1,040	1200	1290	1241.9	11.71	0.84	3.77
Gender Undefined	99	1200	1277	1241.7	10.54	NA	NA
Hispanic or Latino	381	1200	1290	1240.5	11.64	0.85	3.71
American Indian or Alaska Native	35	1228	1262	1240.1	9.52	NA	NA
Asian	31	1218	1277	1243.2	11.52	NA	NA
Black or African American	308	1200	1290	1242.2	11.42	0.83	3.79
Native Hawaiian or Pacific Islander	17	1200	1250	1234.2	10.52	NA	NA
White (non-Hispanic)	798	1200	1290	1241.8	11.83	0.84	3.78
Two or More Races (non-Hispanic)	52	1204	1270	1241.0	11.32	NA	NA
No Primary race/Ethnicity Undefined	120	1200	1277	1241.6	10.03	0.82	3.60
Currently receiving LEP services	38	1224	1290	1242.8	15.85	NA	NA
Not receiving LEP services	929	1200	1290	1242.2	11.67	0.84	3.79
LEP: All Other Students	775	1200	1290	1240.6	11.10	0.84	3.65
Economically Disadvantaged Students	372	1200	1290	1243.9	11.91	0.85	3.83
Non-economically Disadvantaged Students	597	1200	1290	1241.2	11.65	0.83	3.80
SES: All Other Students	773	1200	1290	1240.5	11.15	0.85	3.66
Non-migrant	962	1200	1290	1242.3	11.85	0.84	3.82
Undefined Migrant Status	779	1200	1290	1240.5	11.11	0.84	3.65
Augmentative Communication	231	1200	1277	1234.4	8.89	0.73	3.59
No Augmentative Communication	1,500	1200	1290	1242.6	11.55	0.84	3.77
Undefined Augmentative Communications	11	1224	1255	1240.3	8.92	NA	NA
Hearing Loss	35	1200	1253	1235.7	10.51	NA	NA
Within Normal Limits	1,700	1200	1290	1241.6	11.56	0.84	3.74
Undefined Hearing Loss	7	1228	1253	1241.3	8.36	NA	NA
Visual Impairment	58	1200	1255	1233.8	10.61	NA	NA
Within Normal Limits	1,676	1200	1290	1241.8	11.51	0.84	3.73
Undefined Visual Impairment	8	1232	1242	1237.8	3.62	NA	NA
Sensory Stimuli Response	100	1200	1250	1229.8	11.24	0.45	5.22
Follow Directions	1,642	1200	1290	1242.2	11.18	0.85	3.65
Special School	107	1200	1290	1236.5	12.11	0.75	4.17
Regular School Self-contained	1,163	1200	1290	1240.6	11.04	0.84	3.65
Regular School Primarily Self-contained	285	1200	1290	1244.1	11.83	0.85	3.83
Regular School Resource Room	130	1218	1277	1245.8	10.43	0.86	3.66
Regular School General Education	57	1200	1290	1246.7	14.40	NA	NA
Communicates Primarily Through Cries	80	1200	1252	1229.8	10.38	NA	NA
Uses Intentional Communication	313	1200	1277	1235.9	9.95	0.77	3.67
Uses Symbolic Language	1,349	1200	1290	1243.5	11.12	0.85	3.68

Table O-12. IRT Subgroup Reliability: Mathematics Grade 7

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,769	1200	1290	1241.5	13.23	0.87	4.43
Female	613	1200	1290	1240.6	12.31	0.86	4.35
Male	1,071	1200	1290	1242.1	13.89	0.88	4.51
Gender Undefined	85	1219	1266	1241.3	10.75	NA	NA
Hispanic or Latino	420	1200	1290	1240.2	12.55	0.86	4.37
American Indian or Alaska Native	53	1223	1277	1240.1	10.30	NA	NA
Asian	40	1223	1261	1237.9	10.31	NA	NA
Black or African American	300	1209	1290	1243.1	13.49	0.88	4.45
Native Hawaiian or Pacific Islander	6	1232	1249	1241.0	8.10	NA	NA
White (non-Hispanic)	788	1200	1290	1241.8	14.03	0.87	4.55
Two or More Races (non-Hispanic)	61	1200	1266	1242.9	12.76	NA	NA
No Primary race/Ethnicity Undefined	101	1216	1266	1241.6	11.09	0.86	4.14
Currently receiving LEP services	56	1213	1284	1240.5	14.12	NA	NA
Not receiving LEP services	950	1200	1290	1242.2	14.02	0.87	4.53
LEP: All Other Students	763	1200	1290	1240.7	12.07	0.86	4.32
Economically Disadvantaged Students	361	1213	1290	1244.6	15.32	0.88	4.71
Non-economically Disadvantaged Students	640	1200	1290	1240.8	13.07	0.87	4.42
SES: All Other Students	768	1200	1290	1240.6	12.06	0.86	4.32
Non-migrant	1,000	1200	1290	1242.2	14.04	0.88	4.53
Undefined Migrant Status	769	1200	1290	1240.6	12.05	0.86	4.32
Augmentative Communication	229	1200	1284	1233.4	10.07	0.76	4.39
No Augmentative Communication	1,531	1200	1290	1242.7	13.19	0.87	4.44
Undefined Augmentative Communications	9	1223	1290	1242.2	19.78	NA	NA
Hearing Loss	39	1200	1259	1232.4	12.10	NA	NA
Within Normal Limits	1,725	1200	1290	1241.7	13.17	0.87	4.42
Undefined Hearing Loss	5	1235	1269	1257.0	12.88	NA	NA
Visual Impairment	63	1200	1257	1235.0	11.17	NA	NA
Within Normal Limits	1,693	1200	1290	1241.8	13.27	0.87	4.44
Undefined Visual Impairment	13	1227	1259	1238.1	9.21	NA	NA
Sensory Stimuli Response	101	1200	1257	1230.1	10.34	0.69	4.83
Follow Directions	1,668	1200	1290	1242.2	13.07	0.87	4.41
Special School	109	1200	1273	1235.0	10.75	0.81	4.34
Regular School Self-contained	1,216	1200	1290	1240.9	13.04	0.86	4.43
Regular School Primarily Self-contained	275	1200	1290	1245.0	14.50	0.89	4.58
Regular School Resource Room	128	1200	1284	1243.8	11.49	0.85	4.29
Regular School General Education	41	1227	1290	1246.5	12.27	NA	NA
Communicates Primarily Through Cries	79	1200	1269	1228.9	10.82	NA	NA
Uses Intentional Communication	310	1200	1290	1236.3	11.80	0.85	4.32
Uses Symbolic Language	1,380	1200	1290	1243.4	12.96	0.87	4.43

Table O-13. IRT Subgroup Reliability: Mathematics Grade 8

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,865	1200	1290	1242.1	11.86	0.86	3.99
Female	616	1200	1290	1241.9	11.60	0.86	3.98
Male	1,155	1200	1290	1242.4	12.06	0.87	4.01
Gender Undefined	94	1219	1288	1240.0	10.89	NA	NA
Hispanic or Latino	449	1200	1278	1241.1	10.38	0.84	3.85
American Indian or Alaska Native	43	1216	1268	1241.8	9.87	NA	NA
Asian	34	1221	1288	1241.1	11.44	NA	NA
Black or African American	322	1200	1278	1241.6	11.03	0.86	3.88
Native Hawaiian or Pacific Islander	13	1234	1288	1248.6	18.91	NA	NA
White (non-Hispanic)	833	1200	1290	1243.1	12.61	0.87	4.08
Two or More Races (non-Hispanic)	53	1200	1278	1240.0	13.62	NA	NA
No Primary race/Ethnicity Undefined	118	1219	1290	1241.0	12.39	0.87	4.03
Currently receiving LEP services	53	1224	1288	1241.6	10.95	NA	NA
Not receiving LEP services	1,013	1200	1290	1242.9	12.33	0.87	4.04
LEP: All Other Students	799	1200	1290	1241.2	11.23	0.85	3.93
Economically Disadvantaged Students	349	1200	1290	1243.8	12.45	0.87	4.08
Non-economically Disadvantaged Students	712	1200	1290	1242.5	12.19	0.87	4.01
SES: All Other Students	804	1200	1290	1241.1	11.20	0.85	3.93
Non-migrant	1,058	1200	1290	1242.9	12.30	0.87	4.04
Undefined Migrant Status	807	1200	1290	1241.2	11.19	0.85	3.93
Augmentative Communication	218	1200	1288	1235.6	11.15	0.80	4.16
No Augmentative Communication	1,629	1200	1290	1243.0	11.68	0.86	3.97
Undefined Augmentative Communications	18	1229	1278	1244.3	12.21	NA	NA
Hearing Loss	46	1224	1288	1239.8	11.88	NA	NA
Within Normal Limits	1,813	1200	1290	1242.2	11.87	0.86	3.99
Undefined Hearing Loss	6	1232	1254	1240.8	9.47	NA	NA
Visual Impairment	56	1200	1265	1238.5	10.68	NA	NA
Within Normal Limits	1,803	1200	1290	1242.2	11.84	0.87	3.97
Sensory Stimuli Response	84	1200	1254	1232.3	10.49	NA	NA
Follow Directions	1,781	1200	1290	1242.6	11.72	0.86	3.97
Special School	94	1200	1268	1236.8	10.31	NA	NA
Regular School Self-contained	1,234	1200	1290	1241.1	11.30	0.86	3.92
Regular School Primarily Self-contained	355	1200	1290	1245.4	13.06	0.87	4.21
Regular School Resource Room	132	1221	1288	1243.8	10.37	0.85	3.84
Regular School General Education	50	1225	1288	1249.1	14.22	NA	NA
Communicates Primarily Through Cries	67	1200	1254	1231.8	11.36	NA	NA
Uses Intentional Communication	287	1200	1290	1236.6	10.20	0.81	3.94
Uses Symbolic Language	1,511	1200	1290	1243.6	11.65	0.86	3.97

Table O-14. IRT Subgroup Reliability: Mathematics Grade 11

Description	Number of Students	Scale Score			Standard Deviation	IRT Marginal Reliability	Standard Error
		Minimum	Maximum	Mean			
All	1,705	1200	1290	1241.5	10.27	0.77	3.64
Female	587	1200	1281	1240.3	10.43	0.72	3.83
Male	982	1200	1290	1242.1	10.50	0.80	3.61
Gender Undefined	136	1226	1267	1242.5	6.83	0.79	3.09
Hispanic or Latino	335	1200	1290	1240.9	9.75	0.76	3.59
American Indian or Alaska Native	47	1200	1261	1239.9	10.91	NA	NA
Asian	30	1228	1267	1241.3	8.88	NA	NA
Black or African American	274	1200	1290	1242.3	9.99	0.81	3.51
Native Hawaiian or Pacific Islander	11	1228	1249	1238.3	5.97	NA	NA
White (non-Hispanic)	752	1200	1290	1241.8	10.97	0.77	3.79
Two or More Races (non-Hispanic)	42	1231	1259	1240.2	6.97	NA	NA
No Primary race/Ethnicity Undefined	214	1200	1281	1241.5	9.53	0.76	3.55
Currently receiving LEP services	29	1213	1267	1243.6	10.40	NA	NA
Not receiving LEP services	891	1200	1290	1242.4	10.60	0.79	3.66
LEP: All Other Students	785	1200	1290	1240.5	9.78	0.74	3.64
Economically Disadvantaged Students	263	1200	1290	1244.4	11.18	0.84	3.64
Non-economically Disadvantaged Students	661	1200	1281	1241.6	10.23	0.77	3.65
SES: All Other Students	781	1200	1290	1240.5	9.79	0.74	3.64
Non-migrant	920	1200	1290	1242.4	10.59	0.79	3.65
Undefined Migrant Status	785	1200	1290	1240.5	9.78	0.74	3.64
Augmentative Communication	154	1200	1259	1233.9	11.83	0.52	5.05
No Augmentative Communication	1,545	1200	1290	1242.3	9.79	0.80	3.51
Undefined Augmentative Communications	6	1227	1257	1243.0	9.98	NA	NA
Hearing Loss	35	1200	1272	1236.7	15.92	NA	NA
Within Normal Limits	1,669	1200	1290	1241.6	10.10	0.78	3.59
Visual Impairment	59	1200	1272	1235.3	12.86	NA	NA
Within Normal Limits	1,634	1200	1290	1241.7	10.10	0.78	3.60
Undefined Visual Impairment	12	1232	1264	1244.3	8.42	NA	NA
Sensory Stimuli Response	70	1200	1247	1229.6	14.98	NA	NA
Follow Directions	1,635	1200	1290	1242.0	9.70	0.80	3.48
Special School	114	1200	1281	1236.2	13.62	0.64	5.11
Regular School Self-contained	1,117	1200	1290	1241.0	10.05	0.77	3.62
Regular School Primarily Self-contained	325	1228	1290	1243.7	8.51	0.83	3.24
Regular School Resource Room	113	1200	1290	1245.0	10.63	0.78	3.69
Regular School General Education	36	1235	1281	1245.2	9.18	NA	NA
Communicates Primarily Through Cries	69	1200	1259	1228.3	15.95	NA	NA
Uses Intentional Communication	208	1200	1267	1237.1	9.96	0.67	3.93
Uses Symbolic Language	1,428	1200	1290	1242.8	9.29	0.82	3.37

APPENDIX P
DECISION ACCURACY AND CONSISTENCY RESULTS

Table P-1. Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Overall and Conditional on Performance Level

Content Area	Grade	Overall	Kappa	Conditional on Level			
				Level 1	Level 2	Level 3	Level 4
ELA	3	0.80 (0.73)	0.63	0.91 (0.84)	0.59 (0.49)	0.80 (0.73)	0.87 (0.79)
	4	0.82 (0.75)	0.64	0.90 (0.86)	0.59 (0.45)	0.83 (0.78)	0.82 (0.71)
	5	0.80 (0.72)	0.61	0.88 (0.79)	0.71 (0.62)	0.82 (0.73)	0.82 (0.74)
	6	0.80 (0.73)	0.62	0.87 (0.83)	0.64 (0.52)	0.83 (0.76)	0.82 (0.72)
	7	0.80 (0.73)	0.63	0.89 (0.86)	0.56 (0.43)	0.80 (0.71)	0.81 (0.76)
	8	0.78 (0.69)	0.58	0.84 (0.76)	0.72 (0.60)	0.74 (0.68)	0.87 (0.78)
	11	0.79 (0.72)	0.60	0.84 (0.76)	0.56 (0.45)	0.85 (0.79)	0.86 (0.76)
Mathematics	3	0.74 (0.65)	0.53	0.82 (0.73)	0.58 (0.48)	0.76 (0.66)	0.85 (0.77)
	4	0.76 (0.67)	0.52	0.83 (0.69)	0.60 (0.51)	0.83 (0.74)	0.84 (0.76)
	5	0.72 (0.62)	0.48	0.79 (0.65)	0.63 (0.54)	0.75 (0.64)	0.86 (0.74)
	6	0.75 (0.67)	0.54	0.81 (0.69)	0.59 (0.50)	0.79 (0.71)	0.88 (0.77)
	7	0.74 (0.65)	0.52	0.82 (0.72)	0.54 (0.44)	0.74 (0.66)	0.87 (0.79)
	8	0.74 (0.65)	0.52	0.81 (0.71)	0.54 (0.43)	0.76 (0.65)	0.87 (0.79)
	11	0.73 (0.64)	0.50	0.80 (0.65)	0.53 (0.43)	0.77 (0.70)	0.86 (0.77)

Table P-2. Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Conditional on Cutpoint

Content Area	Grade	Level 1/Level 2				Level 2/Level 3				Level 3/Level 4			
		Accuracy	Consistency	False		Accuracy	Consistency	False		Accuracy	Consistency	False	
				Positive	Negative			Positive	Negative			Positive	Negative
ELA	3	0.92	0.89	0.03	0.05	0.93	0.90	0.04	0.03	0.95	0.93	0.03	0.02
	4	0.93	0.90	0.04	0.03	0.93	0.90	0.03	0.04	0.96	0.94	0.03	0.02
	5	0.92	0.89	0.03	0.05	0.92	0.89	0.05	0.03	0.96	0.94	0.02	0.02
	6	0.93	0.90	0.04	0.03	0.93	0.90	0.04	0.04	0.94	0.92	0.03	0.02
	7	0.93	0.90	0.04	0.03	0.93	0.91	0.03	0.03	0.93	0.91	0.03	0.04
	8	0.92	0.89	0.04	0.04	0.92	0.88	0.03	0.05	0.94	0.92	0.04	0.02
	11	0.92	0.89	0.04	0.04	0.92	0.89	0.04	0.04	0.95	0.92	0.03	0.02
Mathematics	3	0.89	0.85	0.05	0.06	0.90	0.86	0.05	0.05	0.95	0.92	0.03	0.02
	4	0.92	0.89	0.02	0.05	0.87	0.82	0.08	0.05	0.96	0.95	0.02	0.02
	5	0.90	0.86	0.04	0.06	0.87	0.82	0.07	0.05	0.95	0.93	0.03	0.02
	6	0.91	0.88	0.03	0.06	0.90	0.85	0.06	0.04	0.94	0.92	0.04	0.02
	7	0.89	0.84	0.05	0.06	0.89	0.84	0.05	0.06	0.95	0.93	0.03	0.02
	8	0.90	0.86	0.04	0.05	0.89	0.84	0.06	0.05	0.94	0.92	0.03	0.03
	11	0.90	0.86	0.03	0.07	0.88	0.83	0.06	0.07	0.95	0.92	0.03	0.02

Note: Due to the small sample size, students in Levels 3 and 4 were collapsed for purposes of the decision accuracy and consistency analysis.

APPENDIX Q
LIST OF ACRONYMS

TERMS AND ACRONYMS USED IN THE 2021 MSAA TECHNICAL REPORT	
2PL	two-parameter logistic
AA-AAS	Alternate Assessment Aligned with Alternate Achievement Standards (utilized under ESEA until 2015)
AA-AAAS	Alternate Assessment Aligned with Alternate Academic Achievement Standards (current use under ESSA)
AAC	augmentative and alternative communication
AERA	American Educational Research Association
ANOVA	analysis of variance
APA	American Psychological Association
APIP	Accessible Portable Item Protocol
BIE	Bureau of Indian Education
CBT	Computer-based test
CCC	Core Content Connector
CCSS	Common Core State Standards
CSEM	conditional standard error of measurement
CTT	Classical Test Theory
DAC	decision accuracy and consistency
DETECT	Dimensionality Evaluation to Enumerate Contributing Traits
DIF	differential Item functioning
DIMTEST	computer program used by Cognia
DNU	do not use
DTA	Directions for Test Administration
ELA	English language arts
EOTS	end-of-test survey
ESEA	Elementary and Secondary Education Act
ESR	early stopping rule
ESSA	Every Student Succeeds Act
EU	essential understanding
FKSA	focal knowledge, skills, and ability
GM	geometry (in standards)
GRM	graded-response model
HOSS	highest obtainable scale score
ICC	item characteristic curve
ICCC	item category characteristic curve
ICTC	item category threshold curve
IEP	individualized education program
IIF	Item information function
IRC	Item Review Committee (includes Content Review Committee and Bias-Sensitivity Review Committee)
IRT	Item Response Theory
IT	information technology
KSA	knowledge, skills, and ability
LEP	limited English proficiency
LOSS	lowest obtainable scale score

continued

TERMS AND ACRONYMS USED IN THE 2021 MSAA TECHNICAL REPORT	
LPF	Learning Progression Framework
MSAA	Multi-State Alternate Assessment
NCME	National Council on Measurement in Education
PARSCALE	Item response theory (IRT) software program that can perform item analysis and test scoring for dichotomous and polytomous IRT models
PBT	Paper-based test
PLAAFP	present level of academic achievement and functional performance?
PLD	performance level descriptor
R9-stringer	student who responds to nine (or more) consecutive multiple-choice items with the exact same option
SD	standard deviation
SEM	standard error of measurement
SIU	score interpretations and uses
SQA	Software Quality Assurance
SRC	student response check
STL	scoring team leader
TA	test administrators
TAC	Technical Advisory Committee
TAM	Test Administration Manual
TC	test coordinators
TCC	test characteristic curve
TIF	test information function
UWC	use with caution
WRCC	Writing Common—a code within iScore that is used to identify items for scoring
NCSC	National Center and State Collaborative