



RIDE Rhode Island
Department
of Education

2018 RICAS Technical Report

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CHAPTER 1 OVERVIEW

1.1 PURPOSE OF THIS REPORT

The purpose of this 2018 Rhode Island Comprehensive Assessment System (RICAS) Technical Report is to document the technical quality and characteristics of the 2018 RICAS ELA and Mathematics tests in grades 3–8, in order to present evidence of the validity, reliability, and fairness of the use of the tests as part of the Rhode Island state assessment program.

Because the tests administered in RICAS are the MCAS English Language Arts and Mathematics tests, most of the information related to their technical quality is provided in the MCAS Technical Reports produced by the Massachusetts Department of Elementary and Secondary Education (MA DESE). MCAS Technical Reports are available on the MA DESE website: doe.mass.edu/mcas/tech/?section=techreports.

This report contains information specific to the administration of the tests in Rhode Island. It is intended to accompany the information contained in the MCAS Technical Report, document any differences in the assessment policies and procedures between Rhode Island and Massachusetts, and provide additional background information about the RICAS program.

The information contained in this report, in conjunction with the technical documentation prepared by Massachusetts, demonstrates that the grade 3-8 MCAS English Language Arts and Mathematics tests are technically sound, function well for students in Rhode Island, and are appropriate instruments to assess the performance of Rhode Island students on the state’s content standards.

This report is primarily intended for experts in psychometrics and educational measurement. It assumes a working knowledge of measurement concepts, such as reliability and validity, as well as statistical concepts of correlation and central tendency. For some sections, the reader is presumed to have basic familiarity with advanced topics in measurement and statistics, such as item response theory (IRT) and factor analysis.

1.2 THE RHODE ISLAND COMPREHENSIVE ASSESSMENT SYSTEM

The Rhode Island Comprehensive Assessment System (RICAS) is Rhode Island’s state assessment program in English language arts and mathematics at grades 3–8, designed to meet the federal requirements of the Every Student Succeeds Act (ESSA). In addition to fulfilling ESSA assessment requirements, the specific purposes of the RICAS tests are (1) to provide information to parents/guardians and students on Rhode Island student achievement on the state’s English language arts and mathematics content standards, (2) to provide information to support program evaluation and improvement at the school and district level, and (3) to provide academic achievement and growth information used as part of the state’s school accountability program to inform parents/guardians and the public about the performance of Rhode Island schools.

Beginning in the 2017–2018 school year, the Rhode Island Department of Education (RIDE) adopted the MCAS English Language Arts and Mathematics tests as its state assessments in English language arts and mathematics at grades 3–8. The tests are administered in Rhode Island under a licensing agreement with MA DESE and labeled RICAS for their use in Rhode Island. The use of the MCAS tests at grades 3–8 is

part of Rhode Island’s transition from the use of the PARCC tests at grades 3–8 and high school as its state assessments. In high school, the PARCC tests have been replaced by the SAT.

The adoption of the MCAS tests reflects a continuation of Rhode Island’s policy to partner with other states to offer a high-quality state assessment. With the increased assessment requirements of the No Child Left Behind Act in 2001, RIDE determined that it would not be feasible to develop and sustain a high-quality assessment program on its own. From 2003–2014, Rhode Island partnered with New Hampshire, Vermont, and Maine in the New England Common Assessment Program (NECAP). With the adoption of the Common Core State Standards (CCSS) and the creation of national assessment consortia, Rhode Island joined the Partnership for the Assessment of Readiness for College and Careers (PARCC), administering the PARCC tests from 2015–2017.

As Massachusetts and other states left the PARCC consortium, it was no longer clear that PARCC would be able to offer long-term stability in assessment to support the state’s improvement efforts. MCAS, in contrast, has been regarded as a model for high-quality and stable state assessment since its inception in 1998. In 2017, Massachusetts developed MCAS tests to fully align with college- and career-ready content standards and established rigorous performance standards consistent with those established by PARCC. With the updated tests and performance standards in place, Rhode Island began administration of the Massachusetts tests in spring 2018.

1.3 APPROPRIATENESS OF USING MASSACHUSETTS STANDARDS

Before adopting the MCAS tests as its state assessment, it was necessary to determine the appropriateness of the Massachusetts content and performance standards for use in Rhode Island. To meet ESSA requirements and provide valid and useful information to Rhode Island parents/guardians, students, and schools, the state assessments must be aligned to the state’s content standards. In addition, to support the state’s commitment to ensure that Rhode Island’s educational system holds high expectations for all students and that Rhode Island graduates are well prepared for postsecondary education, work, and life, the state must establish rigorous performance standards that signal whether students are on track for success in high school and college and career readiness as they progress through elementary and middle school.

1.3.1 Content Standards

In 2010, Rhode Island adopted the Common Core State Standards (CCSS) as its state content standards in English language arts and mathematics. In July 2010, the Massachusetts Board of Elementary and Secondary Education also adopted the CCSS in English language arts and mathematics as the core of its PK–12 content standards.

In March 2011, Massachusetts adopted revised *Curriculum Frameworks* in English language arts and mathematics, which are the state’s academic content standards. As described at the time by Mitchell Chester, Massachusetts Commissioner of Elementary and Secondary Education, the 2011 *Curriculum Frameworks* “merges the *Common Core State Standards for Mathematics* with additional Massachusetts standards and other features. In English language arts, the elements unique to Massachusetts were described as including standards for pre-kindergartners, expansions of the *Common Core’s* glossary and bibliography, and two sections that suggest appropriate classic and contemporary authors for different grade-level ranges. In mathematics, the elements unique to Massachusetts were described as including standards for pre-kindergartners, Guiding Principles for mathematics programs, expansions of the *Common Core’s* glossary and bibliography, and an adaptation of the CCSS high school model courses.

The CCSS remain the core to which the MCAS is aligned. This is particularly true at grades 3–8, in which the MCAS tests are administered in Rhode Island. To support Rhode Island teachers understanding of the correspondence between the CCSS and the Massachusetts *Curriculum Frameworks*, RIDE has produced grade-by-grade guides for teachers that articulate the alignment between the CCSS standards and the RICAS tests, documenting any differences between individual CCSS standards and the standards to which the assessments are aligned.

- In English Language Arts, these Assessment Tables are available on the RIDE website at <http://ride.ri.gov/InstructionAssessment/Assessment/RICASAssessments.aspx#39551541-test-design-english-language-arts-information>.
- In Mathematics, those guides are presented as Assessment Tables and Achievement Level Descriptors and are available on the RIDE website at <http://www.ride.ri.gov/InstructionAssessment/Assessment/RICASAssessments.aspx#39551515-test-design-mathematics-information>.

1.3.2 Performance Standards

In addition to the alignment of the tests to Rhode Island’s academic content standards, for the MCAS tests to be appropriate for Rhode Island it was essential that the performance standards established for those tests were consistent with the rigorous performance standards that Rhode Island adopted when it began administering the PARCC tests in 2015.

Massachusetts conducted standard setting activities in August 2017 to establish achievement level cut scores on the new MCAS tests. RIDE staff and technical advisors observed those standard setting procedures and analyzed the results of the standard setting process. Although results of the new tests are reported in terms of four achievement levels rather than the five levels used to report PARCC results, analyses indicate that the MCAS performance standards are consistent with and as rigorous as the PARCC performance standards previously used in Rhode Island.

Across all grade levels 3–8, results from Rhode Island and Massachusetts suggest that performance at the Meeting Expectations level on the MCAS tests (level 3) is roughly equivalent to performance at the Met Expectations level on the PARCC tests (level 4).

1.4 ORGANIZATION OF THIS REPORT

This report provides information regarding the spring 2018 administration of the 2018 RICAS tests in English language arts and mathematics, including a description and results of analyses conducted to provide evidence of the technical quality and characteristics of those tests.

The RICAS tests were administered, scored, and processed by Measured Progress, the state’s assessment contractor for the RICAS tests. Measured Progress is also the Massachusetts assessment contractor for the MCAS tests. Unless noted in this report, all processes and procedures used in administering, processing, scoring, and reporting of the results of the spring 2018 RICAS tests were identical to the corresponding procedures used by Measured Progress for the MCAS tests. Table 1-1 provides a summary of the relationship between key aspects of the RICAS and MCAS testing programs.

**Table 1-1. 2018 RICAS: Relationship between 2018 RICAS
and MCAS Tests on Critical Test Components**

<i>Test Component</i>	<i>RICAS and MCAS</i>
Test Content	<i>Identical</i>
Test Design	<i>Identical</i>
Test Administration <input type="checkbox"/> Administration Procedures <input type="checkbox"/> Mode of Administration <input type="checkbox"/> Administration Platform	<i>Identical</i> <i>RI – Computer-based at all grades; MA – allows Paper-based Testing at grades 3 and 6</i> <i>RI offers Spanish language form in mathematics</i> <i>Identical</i>
Scoring <input type="checkbox"/> Machine-scored items <input type="checkbox"/> Hand-scored items	<i>Identical</i> <i>Identical</i>
Psychometric Quality	<i>Identical</i>
Reporting <input type="checkbox"/> Scale Scores <input type="checkbox"/> Achievement Levels	<i>Identical</i> <i>Identical</i>

Measured Progress conducted all the analyses described in this report. The analyses described and presented here are consistent with the types of analyses conducted for the MCAS tests. All analyses are based only on Rhode Island students.

The specific analyses included in this report were identified by the Rhode Island Technical Advisory Committee as necessary and useful to provide evidence of the validity, reliability, and fairness of the use of the MCAS tests as the Rhode Island state assessments in English language arts and mathematics in grades 3–8.

This information includes the following:

- Chapter 2: Test Administration – information related to test administration policies and procedures, including protocols to monitor test security
- Chapter 3: Scoring – information on hand scoring procedures for short-answer, constructed-response, and essay items, including information on the level of inter-rater agreement among raters
- Chapter 4: Reporting – detailed information on the type of student-level test scores reported to parents/guardians and a description of the quality assurance procedures used to ensure the accuracy of the reporting of those results
- Chapter 5: Psychometric Quality – a description of and summary results from the set of analyses conducted with Rhode Island students to demonstrate the technical quality and

characteristics of the tests (Statistics provided include Classical Item Statistics; Differential Item Functioning; Reliability, including subgroup reliability; and Decision Consistency/Accuracy.)

Additionally, a set of Appendices is provided, containing the following information:

- Appendix A – Participation Rates
- Appendix B –Accommodations
- Appendix C – Achievement Level Distributions
- Appendix D – Item-Level Classical Statistics
- Appendix E – Score Distributions
- Appendix F – Differential Item Functioning Results
- Appendix G – Reliability

CHAPTER 2 TEST ADMINISTRATION

2.1 TEST ADMINISTRATION SCHEDULE

The standard grades 3–8 RICAS tests were administered during two overlapping periods in spring 2018, as shown in Table 2-1 below:

Table 2-1. 2018 RICAS: Grades 3–8 ELA and Mathematics Test Administration Schedule

<i>Content Area</i>	<i>Complete the Student Registration/ Personal Needs Profile (SR/PNP) Process</i>	<i>Receive Test Administration Materials</i>	<i>Test Administration Windows</i>	<i>Deadline for Return of Materials to Contractor (for PBT Only)</i>
ELA and Mathematics	January 22 – February 2, 2018	March 21, 2018	April 2 – May 4, 2018	May 7, 2018 for ELA May 29, 2018 for Mathematics

2.2 SECURITY REQUIREMENTS

Principals were responsible for ensuring that all test administrators complied with the requirements and instructions contained in the *Test Coordinator’s Manual* and *Test Administrator’s Manuals*. In addition, other administrators, educators, and staff within the school were responsible for complying with the same requirements. Schools and school staff who violated the test security requirements were subject to numerous possible sanctions and penalties, including employment consequences, delays in reporting of test results, the invalidation of test results, the removal of school personnel from future RICAS administrations, and possible licensure consequences for licensed educators.

If test content is breached, quick identification and resolution of the breach are critical to the integrity of a testing program. In addition to reports of breaches in the field, the RICAS program used the services of Caveon Test Security, a nationally recognized test security organization, to perform web monitoring. Caveon Web Patrol leverages technology tools and human expertise to identify, prioritize, and monitor sites where sensitive test information may be disclosed. Caveon used the following strategies:

- systematically patrolled the Internet, websites, blogs, discussion forums, video archives, social media, document archives, brain dumps, auction sites, and media outlets
- identified and verified threats to RICAS test security and notified Pearson (who notified RIDE and Measured Progress, as required)
- worked systematically through the steps necessary to have infringing content removed, if a threat was verified
- provided summary reporting that included overall and specific threat analysis

Full security requirements, including details about responsibilities of principals and test administrators, examples of testing irregularities, guidance for establishing and following a document tracking system, and lists of approved and unapproved resource materials, can be found in the *Spring 2018 Test Coordinator's Manual, Grades 3–8* (TCM) and the *2018 Test Administrator's Manuals* (TAMs). In spring 2018, there was one TAM for grades 3–8 computer-based tests, and two TAMs for paper-based tests (one for grade 3, and one for grades 4–8).

2.3 PARTICIPATION REQUIREMENTS

Students in grades 3–8 are expected to participate in RICAS tests for the grade in which they are enrolled and reported to RIDE through the enrollment census.

Participation requirements and guidelines for EL students and students with significant disabilities are provided in the sections that follow.

See Part III of the *Test Coordinator's Manual* for information about scheduling test administration, including make-up sessions for students who are absent on the day of testing.

2.4 STUDENTS NOT TESTED ON STANDARD TESTS

A very small number of students educated with Rhode Island public funds were not required to take the standard RICAS tests. These students were strictly limited to the following categories:

- First-year EL students who enrolled in U.S. schools after April 1, 2017 for whom ELA testing is not required. (First-year EL students must participate in RICAS or DLM Mathematics tests.) See the RICAS Accessibility and Accommodations Manual, 2018 for details on how EL students participate in spring 2018 RICAS.
- Students with significant cognitive disabilities who are eligible for the alternate assessment, The Dynamic Learning Maps Assessment. For more information, refer to the Dynamic Learning Maps (DLM) Assessment page of the RIDE website (www.ride.ri.gov/dlm).
- Rare and unique situations in which a student is unable to participate in statewide assessments due to a documented, significant, and incapacitating emergency that extends across the entire (or remaining) test window.

More details about test administration policies and participation requirements for non-disabled students, for students with disabilities, for EL students, and for students educated in alternate settings can be found in the *Test Coordinator's Manual*.

2.4.1 Special Edition Test Forms

Spanish-Speaking Students

Spanish editions of the spring grades 3-8 mathematics test were available to any EL student with a low level of English proficiency who was receiving or had received mathematics instruction in Spanish. The

Spanish edition of the grades 3-8 mathematics test contained all common and matrix items found in Form 1 of the operational test.

Measured Progress employed two independent translators to complete the translation of the grades 3-8 mathematics test to Spanish. The translation process was as follows:

- A set of translation rules or parameters is generated taking the following into consideration: vocabulary, usage, and consistency over the years. These rules are provided to both translators.
- The first translator translates from English to Spanish. The second translator proofs the work of the first translator. Discrepancies between the two translations are resolved by the first translator.
- The Publishing Department reviews the graphics in Spanish.
- The script that the teacher reads when administering the test is also translated into Spanish and is included in the *Test Administrator's Manual* as Appendix A.

The Spanish editions of the grades 3-8 mathematics test were available in both paper and online formats. Human Read Aloud in Spanish was also available to students.

2.5 ADMINISTRATION PROCEDURES

It is the test coordinator's responsibility to coordinate the school's RICAS test administration. This coordination responsibility includes the following:

- understanding and enforcing the test security requirements and test administration protocols
- ensuring that students participate in testing according to the requirements in Part II of this manual
- coordinating the school's test administration schedule and ensuring that tests are scheduled during the prescribed testing window, and in the prescribed order
- ensuring that accommodations are properly administered and that transcriptions, if required for any accommodation, are properly completed
- completing the Principal's Certification of Proper Test Administration (PCPA) and ensuring the accuracy of information provided on the form
- providing RIDE with the school's correct contact information

More details about test administration procedures, including ordering test materials, scheduling test administration, designating and training qualified test administrators, identifying testing spaces, meeting with students, providing accurate student information, and accounting for and returning test materials, can be found in the *Test Coordinator's Manual*.

The RICAS program is supported by the RICAS Service Center, which includes a toll-free telephone line and email answered by staff members who provide support to schools and districts. The RICAS Service Center operates weekdays from 7:00 a.m. to 5:00 p.m. (Eastern Time), Monday through Friday.

CHAPTER 3 SCORING

3.1 INTERRATER CONSISTENCY

Interrater consistency statistics are the result of the processes implemented to ensure valid and reliable hand-scoring of items and, as such, provide evidence of scoring stability. Double-blind scoring was one of the processes used to monitor the quality of the hand-scoring of student responses for constructed-response items. For student constructed-response questions in grades 3–8, 10% were randomly selected and scored independently by two different scorers. Results of the double-blind scoring were used during the scoring process to identify scorers who required retraining or other intervention, and they are presented here as evidence of scoring consistency on the RICAS tests.

Summaries of the interrater consistency results are presented in Tables 3-1 for ELA and 3-2 for mathematics by grade. The tables show the number of score categories, the number of included scores, the percent exact agreement, the percent adjacent agreement, the correlation between the first two sets of scores, and the percent of responses that required a third score.

**Table 3-1. 2018 RICAS: Summary of Interrater Consistency Statistics
Organized across Items by Content Area and Grade—ELA**

Content Area	Grade	Number of		Percent*		Correlation	Kappa
		Score Categories	Included Scores	Exact	Adjacent		
ELA	3	4	2,864	72.94	26.22	0.77	0.630
		5	1,875	82.24	16.85	0.86	0.731
	4	4	3,096	75.71	23.13	0.81	0.696
		5	2,050	72.83	26.73	0.85	0.717
	5	4	3,108	75.26	24.68	0.83	0.679
		5	3,108	78.19	21.72	0.87	0.702
	6	4	2,987	68.36	30.36	0.81	0.685
		6	2,987	70.97	27.15	0.83	0.695
	7	4	2,973	71.24	28.32	0.85	0.739
		6	2,973	69.36	29.53	0.86	0.730
	8	4	2,971	72.50	26.99	0.86	0.763
		6	2,971	70.65	27.97	0.88	0.743

*Values may not total 100% due to rounding.

**Table 3-2. 2018 RICAS: Summary of Interrater Consistency Statistics
Organized across Items by Content Area and Grade—Mathematics**

Content Area	Grade	Number of		Percent*		Correlation	Kappa
		Score Categories	Included Scores	Exact	Adjacent		
Mathematics	3	4	1991	86.69	13.01	0.93	0.867
	4	5	4218	88.26	9.86	0.96	0.909
	5	5	4186	90.61	8.72	0.97	0.910
	6	5	4169	88.22	10.84	0.96	0.896
	7	5	4008	87.35	11.65	0.95	0.891
	8	5	3858	84.19	14.49	0.94	0.868

*Values may not total 100% due to rounding.

CHAPTER 4 REPORTING

4.1 REPORTING OF RESULTS

Results on the RICAS were reported in terms of achievement levels that describe student achievement in relation to established state standards. There are four achievement levels for ELA and mathematics for students in grades 3–8: *Not Meeting Expectations*, *Partially Meeting Expectations*, *Meeting Expectations*, and *Exceeding Expectations*. Students were given a separate achievement-level classification in each content area. Reports are generated at the student level. The achievement level distributions are provided in Appendix C.

Parent/Guardian Reports and student results labels are the only printed reports; they were mailed to districts for distribution to parents/guardians and schools.

4.2 PARENT/GUARDIAN REPORT

The *Parent/Guardian Report* was generated for each student eligible to take the RICAS tests. The report is a stand-alone single page (11" x 17") color report that is folded. Two full-color copies of each student's report were printed: one for the parent/guardian and one for the school's records. The report is designed to present parents/guardians with a detailed summary of their child's RICAS performance and to enable comparisons with other students at the school, district, and state levels.

The front cover of the *Parent/Guardian Report* provides student identification information, including student name, grade, date of birth, ID (SASID), school name, and district name. The cover also presents general information about the test, website information for parent/guardian resources, and a summary of the student's results for each content area. This summary provides important information for each content area at a glance, including the student's achievement level, scaled score, range of scores, and growth percentile.

The inside portion of the report contains the achievement level, scaled score, and standard error of the scaled score for each content area tested. If the student does not receive a scaled score, the reason is displayed after "Your Child's Achievement Level." Each achievement level has its own distinct color, and that color is used throughout the report to highlight important report elements based on the student's achievement level and score. These report elements include the student's earned achievement level, scaled score, the visual scale's achievement-level title and achievement-level cut scores, and the comparison of the student's scaled score to the average scaled score at the student's school, district, and the state levels.

A student growth percentile (SGP) for each content area tested is displayed with a comparison to the average SGP for the student's school and district. An SGP describes the student's learning over time compared to his or her academic peers (peers are other students with similar scores on previous state tests).

For ELA and mathematics, the student's scaled score is compared to the average scaled score earned by all students at the school, district, and state levels. These scaled score values are color-coded based on the corresponding achievement levels. The student's performance in each content area's reporting categories is also displayed using pictographs and text that indicates the points earned by the student versus the total

points possible in that reporting category. For each reporting category, the average number of points earned by students scoring close to 500 is also displayed for comparison purposes. The student's performance on individual test questions is reported at the bottom of the results page in a simplified item response grid. The grid indicates the points earned and points possible for each test question. A link to an external resource is also provided for parents/guardians who wish to review test question descriptions on the department's website.

4.3 DECISION RULES

To ensure that RICAS results are processed and reported accurately, a document delineating decision rules is prepared before reporting results. The decision rules are observed in the analyses of the RICAS test data and in reporting results. These rules also guide data analysts in identifying any student data that need to be excluded from school-, district-, and state-level summary computations.

4.4 QUALITY ASSURANCE

Quality assurance measures are implemented throughout the process of analysis and reporting at Measured Progress. The data processors and data analysts perform routine quality-control checks of their computer programs. When data are handed off to different units within the data team, the sending unit verifies that the data are accurate before handoff. Additionally, when a unit receives a data set, the first step is to verify the accuracy of the data. Once new report designs were approved by RIDE, reports were run using demonstration data to test the application of the decision rules. The populated reports were then approved by RIDE.

Another type of quality assurance measure used at Measured Progress is parallel processing. One data analyst is responsible for writing all programs required to populate the student-level and aggregate reporting tables for the administration. Each reporting table is assigned to a second data analyst who uses the decision rules to independently program the reporting table. The production and quality-assurance tables are compared; when there is 100% agreement, the tables are released for report generation.

The third aspect of quality control involves procedures to check the accuracy of reported data. Using a sample of schools and districts, the quality assurance group verifies that the reported information is correct. The selection of sample schools and districts for this purpose is very specific because it can affect the success of the quality-control efforts. There are two sets of samples selected that may not be mutually exclusive. The first set includes samples that satisfy all the following criteria:

- one-school district
- two-school district
- multi-school district
- private school
- special school (e.g., a charter school)
- small school that does not have enough students to report aggregations
- school with excluded (not tested) students

The second set of samples includes districts or schools that have unique reporting situations that require the implementation of a decision rule. This set is necessary to ensure that each rule is applied correctly.

The quality-assurance group uses a checklist to implement its procedures. Once the checklist is completed, sample reports are circulated for review by psychometric and program management staff. The appropriate sample reports are then sent to RIDE for review and signoff.

CHAPTER 5 PSYCHOMETRIC QUALITY

5.1 CLASSICAL ITEM ANALYSES

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 the *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) include standards for identifying quality items. Items should predominantly assess the knowledge and 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—in particular, racial, ethnic, or gender groups.

Both qualitative and quantitative analyses have been conducted to ensure that 2018 RICAS items meet these standards. For details on the qualitative analyses, please see the *2018 Next-Generation MCAS Technical Report*. This chapter presents statistical evaluations in four parts: (1) difficulty indices, (2) item-test correlations, (3) DIF statistics, and (4) dimensionality analyses. The item analyses presented here are based on the statewide administration of the RICAS assessments in spring 2018. Note that the information presented in this section is based only on the operational items, since those are the items on which student scores are calculated.

5.1.1 Classical Difficulty and Discrimination Indices

All selected-response and constructed-response items are evaluated in terms of item difficulty according to standard classical test theory practices. Difficulty is defined as the average proportion of points achieved on an item and is measured by obtaining the average score on an item and dividing it by the maximum possible score for the item. Selected-response items are scored dichotomously (correct vs. incorrect), so, for these items, the difficulty index is simply the proportion of students who correctly answered the item. Constructed-response items and essay items are scored polytomously, meaning that a student can achieve scores other than just 0 or 1 (e.g., 0, 1, 2, 3, or 4 for a 4-point constructed-response item). By computing the difficulty index as the average proportion of points achieved, the indices for the different item types are placed on a similar scale, ranging from 0.0 to 1.0 regardless of the item type. Although this index is traditionally described as a measure of difficulty, it is properly interpreted as an easiness index, because larger values indicate easier items. An index of 0.0 indicates that all students earned 0% of the item points, and an index of 1.0 indicates that all students received full credit for the item (i.e., all the item points). For addition details, please see the *2018 MCAS Next-Generation Technical Report*.

A summary of the item difficulty and item discrimination statistics for each grade and content area combination is presented in Table 5-1. Note that the statistics are presented for all items as well as separately by item type: selected response (SR), constructed response (CR), and essay (ES). The mean difficulty (p -value) and discrimination values shown in the table are within generally acceptable and expected ranges.

Table 5-1. 2018 RICAS: Summary of Item Difficulty and Discrimination Statistics by Content Area and Grade

Content Area	Grade	Item Type	Number of Items	Difficulty		Discrimination		
				Mean	Standard Deviation	Mean	Standard Deviation	
ELA	3	ALL	26	0.62	0.21	0.46	0.11	
		SR	15	0.75	0.08	0.43	0.08	
		CR	7	0.57	0.13	0.45	0.13	
		ES	4	0.22	0.06	0.61	0.03	
	4	ALL	26	0.63	0.16	0.45	0.12	
		SR	15	0.69	0.12	0.40	0.07	
		CR	7	0.63	0.16	0.45	0.10	
		ES	4	0.38	0.08	0.66	0.04	
	5	ALL	27	0.60	0.17	0.50	0.14	
		SR	15	0.67	0.13	0.42	0.10	
		CR	6	0.64	0.11	0.50	0.09	
		ES	6	0.37	0.08	0.69	0.05	
	6	ALL	27	0.55	0.17	0.50	0.15	
		SR	15	0.63	0.11	0.41	0.08	
		CR	6	0.59	0.09	0.50	0.06	
		ES	6	0.30	0.08	0.74	0.02	
	7	ALL	27	0.58	0.16	0.52	0.15	
		SR	15	0.62	0.11	0.43	0.08	
		CR	6	0.70	0.08	0.50	0.05	
		ES	6	0.36	0.12	0.76	0.02	
	8	ALL	27	0.54	0.16	0.48	0.17	
		SR	15	0.60	0.13	0.37	0.07	
		CR	6	0.56	0.16	0.45	0.09	
		ES	6	0.38	0.11	0.77	0.02	
	Mathematics	3	ALL	40	0.50	0.17	0.46	0.13
			SR	21	0.52	0.17	0.42	0.14
			CR	19	0.48	0.17	0.50	0.11
		4	ALL	40	0.48	0.18	0.48	0.11
SR			17	0.52	0.18	0.40	0.08	
CR			23	0.44	0.18	0.54	0.10	
5		ALL	40	0.46	0.18	0.46	0.13	
		SR	21	0.51	0.19	0.40	0.13	
		CR	19	0.40	0.15	0.53	0.08	
6		ALL	40	0.44	0.21	0.47	0.15	
		SR	13	0.47	0.25	0.35	0.16	
		CR	27	0.42	0.20	0.53	0.10	
7		ALL	40	0.35	0.15	0.45	0.17	
		SR	20	0.37	0.13	0.35	0.15	
		CR	20	0.34	0.18	0.55	0.14	
8		ALL	40	0.44	0.18	0.40	0.16	
		SR	23	0.48	0.17	0.31	0.12	
		CR	17	0.38	0.17	0.52	0.14	

Caution should be exercised when comparing indices across grade levels. Differences may be due not only to differences in the item statistics on the test but may also be affected by differences in student abilities and/or differences in the standards and/or curricula taught in each grade.

Difficulty indices for selected-response items tend to be higher (indicating that students performed better on these items) than the difficulty indices for constructed-response items because selected-response items can be answered correctly by simply identifying rather than providing the correct answer, or by guessing. Similarly, discrimination indices for those constructed-response items with more than two points tend to be larger than those for dichotomous items because of the greater variability of the former (i.e., the partial credit these items allow). The restriction of range (i.e., only two score categories) in dichotomous items tends to make the discrimination indices lower. Note that these patterns are more consistent within item type, so when interpreting classical item statistics, comparisons should be emphasized among items of the same type.

In addition to the item difficulty and discrimination summaries presented above, item-level classical test theory statistics are provided in Appendix D. On RICAS items, the item difficulty and discrimination indices are within generally acceptable and expected ranges. Very few items were answered correctly at near-chance or near-perfect rates. Similarly, the positive discrimination indices indicate that students who performed well on individual items tended to perform well overall. There are a small number of items with discrimination indices below 0.20, but none were negative. While it is acceptable to include items with low discrimination values or with very high or very low item difficulty values when their content is needed to ensure that the content specifications are appropriately covered, there were very few such cases on the 2018 RICAS. Item-level score point distributions are provided for constructed-response items in Appendix E; for each item, the percentage of students who received each score point is presented.

5.1.2 Differential Item Functioning

For the RICAS spring 2018 administration, Differential Item Functioning (DIF) analyses were conducted for all subgroups (as defined in the No Child Left Behind Act) for which the sample size was adequate. Six subgroup comparisons were evaluated for DIF:

- male compared with female
- not ELL compared with ELL¹
- not economically disadvantaged compared with economically disadvantaged
- white compared with African American or Black
- white compared with Hispanic or Latino
- students with disabilities compared with students without disabilities

The tables in Appendix F present the number of items classified as either “low” or “high” DIF, in total and by group favored. The moderate number of items that exhibited low DIF and several that exhibited high DIF were reviewed by content and educational experts to rule out a source of bias prior to being

¹ ELL = English language learner.

included on the operational tests. For detailed information about how the DIF procedure was employed, please see the *2018 MCAS Next-Generation Technical Report*.

5.1.3 Dimensionality Analysis

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.

The nonparametric IRT-based methods DIMTEST (Stout, 1987; Stout, Froelich, & Gao, 2001) and DETECT (Zhang & Stout, 1999) were applied to operational items for RICAS online test forms² administered during the spring 2018 administrations. A total of 12 test forms were analyzed. The data for each grade were split into a training sample and a cross-validation sample. For all grades, there were over 10,240 student examinees per test form in both ELA and mathematics, so every training sample and cross-validation sample had at least 5,120 students. After randomly splitting the data into training and cross-validation samples, DIMTEST was applied to each data set to see if the null hypothesis of unidimensionality would be rejected. DETECT was then applied to each data set for which the DIMTEST null hypothesis was rejected in order to estimate the effect size of the multidimensionality. 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).

The results of the DIMTEST analyses indicated that the null hypothesis was rejected at a significance level of 0.01 for every data set. Because strict unidimensionality is an idealization that almost never holds exactly for a given data set, the statistical rejections in the DIMTEST results were not surprising. Indeed, because of the large sample sizes involved in the data sets, DIMTEST would be expected to be sensitive to even quite small violations of unidimensionality.

DETECT was then used to estimate the effect size for the violations of local independence for all the tests. Table 5-2 below displays the multidimensionality effect-size estimates from DETECT.

Table 5-2. 2018 RICAS: Multidimensionality Effect Sizes by Grade and Content Area

Content Area	Grade	Multidimensionality Effect Size
ELA	3	0.16
	4	0.32
	5	0.26
	6	0.21
	7	0.24
	8	0.32
	Average	0.25

continued

² There are two testing modes in RICAS 2018 assessments: online and paper. Although the two test modes share many items in common, there are some unique items in each mode. More than 99% students took the online test forms, so dimensionality was only conducted on the online forms.

Content Area	Grade	Multidimensionality Effect Size
Mathematics	3	0.17
	4	0.23
	5	0.13
	6	0.12
	7	0.13
	8	0.20
	Average	0.16

The DETECT values indicate weak or very weak multidimensionality for all the 2018 RICAS mathematics test forms. All the 2018 RICAS ELA test forms show weak to moderate multidimensionality, except for ELA Grade 3, which shows very weak multidimensionality.

The way in which DETECT divided the tests into clusters was also investigated to determine whether there were any discernable patterns with respect to the selected-response and constructed-response item types. Inspection of the DETECT clusters indicated that selected-response/constructed-response separation generally occurred much more strongly with ELA than with mathematics. Specifically, for the ELA test forms, every grade had one set of clusters dominated by selected-response items and another set of clusters dominated by constructed-response items. On the mathematics test forms, there was less clear evidence of consistent separation of selected-response and constructed-response items.

In summary, for the 2018 dimensionality analyses, the violations of local independence, as evidenced by the DETECT effect sizes, were either very weak or weak in mathematics test forms, and were very weak or weak-to-moderate in ELA test forms. The patterns with respect to the selected-response and constructed-response items suggested that ELA tended to display more separation than mathematics.

5.2 RICAS RELIABILITY

5.2.1 Reliability and Standard Errors of Measurement

The approach that was implemented to assess the reliability of the 2018 RICAS tests was the α coefficient of Cronbach (1951). For details on the calculation of Cronbach's α coefficient, please see the *2018 MCAS Next-Generation Technical Report*. Table 5-3 presents descriptive statistics, Cronbach's α coefficient, and the raw score standard error of measurement (SEM) for each content area and grade. Statistics are based on operational items from online test forms, which were taken by most of the student examinee population. The reliability estimates range from 0.88 to 0.92, which are in generally acceptable ranges.

**Table 5-3. 2018 RICAS: Raw Score Descriptive Statistics
Cronbach’s Alpha, and SEMs by Content Area and Grade**

Content Area	Grade	Number of Students	Raw Score			Alpha (α)	SEM
			Maximum	Mean	Standard Deviation		
ELA	3	10,201	44	22.62	8.00	0.89	2.69
	4	10,578	44	24.84	8.48	0.88	2.92
	5	10,729	48	25.26	9.71	0.91	2.95
	6	10,458	51	23.28	10.39	0.91	3.06
	7	10,427	51	25.69	10.76	0.92	3.07
	8	10,604	51	24.18	10.68	0.91	3.29
Mathematics	3	10,346	48	23.44	10.55	0.92	2.98
	4	10,670	54	25.67	12.66	0.92	3.56
	5	10,861	54	22.80	11.73	0.92	3.36
	6	10,614	54	21.59	11.65	0.92	3.21
	7	10,573	54	18.32	11.55	0.92	3.34
	8	10,731	54	22.49	10.84	0.90	3.51

Because of the dependency of the α coefficients on the test-taking population and the test characteristics, precautions need be taken when making inferences about the quality of one test by comparing its reliability to that of another test from a different grade or content area. To elaborate, reliability coefficients are highly influenced by test-taking population characteristics such as the range of individual differences in the group (i.e., variability within the population), average ability level of the population that took the exams, test designs, test difficulty, test length, ceiling or floor effect, and influence of guessing. Hence, “the reported reliability coefficient is only applicable to samples similar to that on which it was computed” (Anastasi & Urbina, 1997, p.107).

5.2.2 Reporting Subcategory Reliability

Reliabilities were calculated for the reporting subcategories within the 2018 RICAS content areas. Results and reporting category descriptions are presented in Appendix G. The reliability coefficients for the reporting subcategories range from 0.29 to 0.84, with a median of 0.72 and a standard deviation of 0.13. Lower reliabilities on subcategory scores are associated with very low numbers of items. Because they are based on a subset of items rather than the full test, subcategory reliabilities were typically lower than were overall test score reliabilities, approximately to the degree expected based on the classical test theory (Haertel, 2006), and interpretations should take this into account. Qualitative differences among grades and content areas once again preclude valid inferences about the reliability of the full test score based on statistical comparisons among subtests.

5.2.3 Subgroup Reliability

The reliability coefficients discussed in the previous section were based on the overall population of students who took the 2018 RICAS online forms. Appendix G presents reliabilities for various subgroups of interest for ELA and mathematics, respectively. Cronbach’s α coefficients were calculated based only on the members of the subgroup in question in the computations; values are calculated only for subgroups with 10 or more students. The reliability coefficients for subgroups range from 0.73 to 0.95 across the tests, with a median of 0.90 and a standard deviation of 0.034, indicating that reliabilities are generally within a reasonable range.

For several reasons, the subgroup reliability results should be interpreted with caution. Reliabilities are dependent not only on the measurement properties of a test but also on the statistical distribution of the studied subgroup. For example, subgroup sizes may vary considerably, which results in natural variation in reliability coefficients. Alternatively, α , which is a type of correlation coefficient, may be artificially depressed for subgroups with little variability (Draper & Smith, 1998). More, there is no industry standard to interpret the strength of a reliability coefficient when the population of interest is a single subgroup.

5.2.4 Decision Accuracy and Consistency Results

DAC analyses were conducted for online test forms at each performance achievement level. Results of the DAC analyses are provided in Tables 5-4 and 5-5 for the 2018 RICAS tests.

Table 5-4 includes overall accuracy indices with consistency indices displayed in parentheses next to the accuracy values, as well as overall kappa values. Overall ranges for accuracy (0.80–0.86), consistency (0.72–0.80), and kappa (0.55–0.67) indicate that most students were classified accurately and consistently with respect to measurement error and chance. Accuracy and consistency values conditional on achievement level are also given. For these calculations, the denominator is the proportion of students associated with a given achievement level. For example, the conditional accuracy value is 0.82 for *Not Meeting Expectations* for the grade 3 ELA test. This figure indicates that among the students whose true scores placed them in this classification, 82% would be expected to be in this classification when categorized according to their observed scores. Similarly, a consistency value of 0.69 indicates that 69% of students with observed scores in the *Not Meeting Expectations* level would be expected to score in this classification again if a second, parallel test form was taken.

For some testing situations, the greatest concern may be decisions around achievement level thresholds. In this case, accuracy at the *Partially Meeting Expectations/Meeting Expectations* threshold is critically important, which summarizes the percentage of students who are correctly classified either above or below the particular cutpoint. Table 5-4 provides the accuracy and consistency estimates and false positive and false negative decision rates at each cutpoint for the 2018 RICAS online tests. A false positive is the proportion of students whose observed scores were above the cut and whose true scores were below the cut. A false negative is the proportion of students whose observed scores were below the cut and whose true scores were above the cut.

In Table 5-5, the accuracy and consistency indices at the *Partially Meeting Expectations/Meeting Expectations* threshold range from 0.89 – 0.94 and 0.85 – 0.91, respectively. The false positive and false negative decision rates at the *Partially Meeting Expectations/Meeting Expectations* threshold both range from 3%–5%. These results indicate that nearly all students were correctly classified with respect to being above or below the *Partially Meeting Expectations/Meeting Expectations* cutpoint.

Table 5-4. 2018 RICAS: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Overall and Conditional on Achievement Level

Content Area	Grade	Overall	Kappa	Conditional on Achievement Level			
				<i>Not Meeting Expectations</i>	<i>Partially Meeting Expectations</i>	<i>Meeting Expectations</i>	<i>Exceeding Expectations</i>
ELA	3	0.81 (0.74)	0.57	0.82 (0.69)	0.85 (0.80)	0.77 (0.70)	0.69 (0.48)
	4	0.80 (0.72)	0.55	0.84 (0.72)	0.82 (0.76)	0.76 (0.70)	0.54 (0.28)
	5	0.84 (0.78)	0.63	0.83 (0.70)	0.86 (0.82)	0.82 (0.75)	0.78 (0.59)
	6	0.82 (0.75)	0.62	0.85 (0.76)	0.84 (0.79)	0.79 (0.73)	0.65 (0.43)
	7	0.84 (0.77)	0.65	0.89 (0.83)	0.84 (0.79)	0.78 (0.71)	0.56 (0.28)
	8	0.82 (0.74)	0.62	0.88 (0.82)	0.80 (0.73)	0.78 (0.70)	0.62 (0.37)
Mathematics	3	0.83 (0.76)	0.63	0.86 (0.77)	0.84 (0.79)	0.81 (0.75)	0.67 (0.46)
	4	0.84 (0.78)	0.65	0.86 (0.78)	0.85 (0.80)	0.83 (0.76)	0.72 (0.48)
	5	0.85 (0.78)	0.65	0.82 (0.73)	0.85 (0.81)	0.85 (0.79)	0.73 (0.49)
	6	0.86 (0.80)	0.67	0.86 (0.77)	0.86 (0.82)	0.86 (0.79)	0.76 (0.50)
	7	0.83 (0.76)	0.63	0.82 (0.73)	0.83 (0.77)	0.85 (0.79)	0.70 (0.47)
	8	0.84 (0.77)	0.63	0.85 (0.76)	0.83 (0.79)	0.84 (0.76)	0.73 (0.42)

**Table 5-5. 2018 RICAS: Summary of Decision Accuracy (and Consistency) Results
by Content Area and Grade—Conditional on Cutpoint**

Content Area	Grade	Not Meeting Expectations / Partially Meeting Expectations			Partially Meeting Expectations / Meeting Expectations			Meeting Expectations / Exceeding Expectations		
		Accuracy (consistency)	False		Accuracy (consistency)	False		Accuracy (consistency)	False	
			Positive	Negative		Positive	Negative		Positive	Negative
ELA	3	0.96 (0.94)	0.02	0.03	0.90 (0.86)	0.05	0.05	0.96 (0.94)	0.03	0.01
	4	0.95 (0.92)	0.02	0.03	0.89 (0.85)	0.05	0.05	0.96 (0.94)	0.04	0.00
	5	0.95 (0.93)	0.02	0.03	0.91 (0.88)	0.05	0.04	0.98 (0.97)	0.02	0.01
	6	0.94 (0.91)	0.03	0.04	0.92 (0.88)	0.04	0.04	0.97 (0.95)	0.02	0.01
	7	0.93 (0.90)	0.03	0.04	0.93 (0.90)	0.04	0.03	0.98 (0.97)	0.02	0.00
	8	0.92 (0.89)	0.03	0.04	0.92 (0.89)	0.04	0.04	0.97 (0.96)	0.02	0.01
Mathematics	3	0.94 (0.92)	0.03	0.03	0.92 (0.89)	0.04	0.04	0.97 (0.95)	0.02	0.01
	4	0.93 (0.90)	0.03	0.04	0.93 (0.90)	0.04	0.03	0.98 (0.98)	0.01	0.00
	5	0.92 (0.89)	0.03	0.04	0.93 (0.91)	0.04	0.03	0.99 (0.99)	0.01	0.00
	6	0.93 (0.91)	0.03	0.04	0.93 (0.90)	0.04	0.03	0.99 (0.99)	0.00	0.00
	7	0.91 (0.87)	0.04	0.05	0.94 (0.91)	0.03	0.03	0.99 (0.98)	0.01	0.00
	8	0.92 (0.89)	0.03	0.05	0.92 (0.89)	0.04	0.03	1.00 (0.99)	0.00	0.00

The indices above are derived from Livingston and Lewis's (1995) method of estimating DAC. Livingston and Lewis discuss two versions of the accuracy and consistency tables. A standard version performs calculations for forms parallel to the form taken. An "adjusted" version adjusts the results of one form to match the observed score distribution obtained in the data. The tables use the standard version for two reasons: (1) This "unadjusted" version can be considered a smoothing of the data, thereby decreasing the variability of the results; and (2) for results dealing with the consistency of two parallel forms, the unadjusted tables are symmetrical, indicating that the two parallel forms have the same statistical properties. This second reason is consistent with the notion of forms that are parallel (i.e., it is more intuitive and interpretable for two parallel forms to have the same statistical distribution).

As with other methods of evaluating reliability, DAC statistics that are calculated based on small groups can be expected to be lower than those calculated based on larger groups. For this reason, the values presented in Tables 5-4 through 5-5 should be interpreted with caution. In addition, it is important to remember that it might be inappropriate to compare DAC statistics across grades and content areas.

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APPENDICES

APPENDIX A

PARTICIPATION RATES

Table A-1. 2018 RICAS Technical Report: Summary of Participation by Student Subgroup –English Language Arts, Grades 3–8

Description	Number Tested
All Students	63,735
Economically Disadvantaged	31,205
African American	5,410
Asian	2,056
Hispanic	16,402
Multi-race	2,843
Pacific Islander/Hawaiian	108
White	36,393
Female	31,106
Male	32,563
ELL	5,321
Special Education	9,312

Table A-2. 2018 RICAS Technical Report: Summary of Participation by Student Subgroup – Mathematics, Grades 3–8

Description	Number Tested
All Students	64,538
Economically Disadvantaged	31,780
African American	5,517
Asian	2,094
Hispanic	16,896
Multi-race	2,862
Pacific Islander/Hawaiian	112
White	36,530
Female	31,483
Male	32,990
ELL	6,024
Special Education	9,383

APPENDIX B

ACCOMMODATIONS

Table B-1. 2018 RICAS Technical Report: Numbers of Students Tested with and Without Accommodations by Content Area and Grade

Content Area	Grade	Number of Students Tested	
		<i>With Accommodations</i>	<i>Without Accommodations</i>
ELA	3	738	9,578
	4	767	9,936
	5	900	9,957
	6	709	9,877
	7	711	9,842
	8	675	10,045
Mathematics	3	1,947	8,515
	4	1,952	8,872
	5	1,907	9,087
	6	1,302	9,418
	7	1,157	9,528
	8	1,167	9,686

Table B-2. 2018 RICAS Technical Report: Numbers of Students Tested with Accommodations by Accommodation Type and Grade – ELA

Description	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Color Contrast	12	20	26	11	7	4
Black on Cream	6	19	23	0	2	1
Black on Light Blue	5	1	0	1	0	1
Black on Light Magenta	0	0	0	9	5	1
White on Black	0	0	2	0	0	1
Yellow on Blue	1	0	1	1	0	0
Dark Gray on Pale Green	0	0	0	0	0	0
Answer Masking	35	81	66	50	35	27
Large Print Test Edition	2	2	2	0	2	1
Screen Reader Edition	0	0	0	0	0	0
Assistive Technology	4	5	4	0	1	1
Braille Test Edition	1	1	0	1	0	35
Human Read Aloud as a Non-	23	16	36	15	16	30
Human Signer as a Standard	0	0	0	2	2	0
Human Signer as a Non-Standard	2	2	3	1	0	1
Text-to-Speech	69	69	87	97	92	80
Human Scribe as a Non-Standard	33	32	33	27	10	12
Speech-to-Text as a Non-Standard	24	33	31	30	10	4
Typed Responses	0	0	0	1	0	1
Spell-checker	56	39	36	20	14	12
Word Prediction	13	9	26	7	8	4
Graphic Organizer/Reference Sheet	431	465	549	444	458	421
Any Other Accommodation	235	230	280	184	151	172
Bilingual Dictionary and Glossary	13	4	11	4	53	3

Table B-3. 2018 RICAS Technical Report: Numbers of Students Tested with Accommodations by Accommodation Type and Grade – Mathematics

Description	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Color Contrast	12	29	25	10	7	4
Black on Cream	6	19	22	0	2	1
Black on Light Blue	5	10	0	1	0	1
Black on Light Magenta	0	0	0	9	5	1
White on Black	0	0	2	0	0	1
Yellow on Blue	1	0	1	0	0	0
Dark Gray on Pale Green	0	0	0	0	0	0
Answer Masking	32	84	65	31	34	27
Large Print Test Edition	1	2	1	2	1	0
Screen Reader Edition	0	0	0	0	0	0
Assistive Technology	0	0	1	0	1	1
Braille Test Edition	0	0	0	1	0	0
Human Read Aloud as a Standard	86	39	51	17	19	20
Human Read Aloud as a Non-Standard	0	0	0	0	0	0
Human Signer as a Standard	3	3	3	4	1	6
Human Signer as a Non-Standard	0	0	0	0	0	0
Text-to-Speech	1602	1556	1447	831	670	573
Human Scribe as a Standard	35	29	25	21	13	13
Speech-to-Text as a Standard	27	37	30	23	18	3
Typed Responses	0	0	0	0	0	0
Calculation Device	124	144	166	202	239	243
Graphic Organizer/Reference Sheet	471	516	620	461	419	409
Any Other Accommodation	253	227	280	181	148	165
Spanish	71	95	92	75	73	92
Bilingual Dictionary and Glossary	142	136	97	133	135	143

APPENDIX C

ACHIEVEMENT LEVEL DISTRIBUTIONS

**Table C-1. 2018 RICAS: Cut Scores on the Theta Metric and Reporting Scale
by Content Area and Grade**

Content Area	Grade	Theta			Scaled Score				
		<i>Cut 1</i>	<i>Cut 2</i>	<i>Cut 3</i>	<i>Min</i>	<i>Cut 1</i>	<i>Cut 2</i>	<i>Cut 3</i>	<i>Max</i>
ELA	3	-1.581	0.011	1.604	440	470	500	530	560
	4	-1.561	0.031	1.623	440	470	500	530	560
	5	-1.659	0.038	1.734	440	470	500	530	560
	6	-1.591	-0.011	1.570	440	470	500	530	560
	7	-1.560	0.011	1.582	440	470	500	530	560
	8	-1.456	0.051	1.559	440	470	500	530	560
Mathematics	3	-1.377	0.027	1.432	440	470	500	530	560
	4	-1.379	0.054	1.487	440	470	500	530	560
	5	-1.551	0.025	1.601	440	470	500	530	560
	6	-1.518	-0.008	1.502	440	470	500	530	560
	7	-1.414	0.031	1.476	440	470	500	530	560
	8	-1.496	-0.008	1.479	440	470	500	530	560

**Table C-2. 2018 RICAS Technical Report:
Achievement-Level Distributions by Grade–ELA**

Grade	Achievement Level	Percent in Level
3	Not Meeting Expectations	11.12
	Partially Meeting Expectations	48.62
	Meeting Expectations	34.89
	Exceeding Expectations	5.37
4	Not Meeting Expectations	14.82
	Partially Meeting Expectations	47.04
	Meeting Expectations	34.07
	Exceeding Expectations	4.07
5	Not Meeting Expectations	13.70
	Partially Meeting Expectations	48.85
	Meeting Expectations	35.16
	Exceeding Expectations	2.29
6	Not Meeting Expectations	19.80
	Partially Meeting Expectations	45.82
	Meeting Expectations	30.54
	Exceeding Expectations	3.84
7	Not Meeting Expectations	28.66
	Partially Meeting Expectations	47.44
	Meeting Expectations	21.67
	Exceeding Expectations	2.23
8	Not Meeting Expectations	30.30
	Partially Meeting Expectations	41.53
	Meeting Expectations	25.11
	Exceeding Expectations	3.06

**Table C-3. 2018 RICAS Technical Report:
Achievement-Level Distributions by Grade – Mathematics**

Grade	Achievement Level	Percent in Level
3	Not Meeting Expectations	19.72
	Partially Meeting Expectations	44.89
	Meeting Expectations	31.15
	Exceeding Expectations	4.24
4	Not Meeting Expectations	23.48
	Partially Meeting Expectations	49.69
	Meeting Expectations	24.62
	Exceeding Expectations	2.21
5	Not Meeting Expectations	20.76
	Partially Meeting Expectations	52.45
	Meeting Expectations	25.46
	Exceeding Expectations	1.34
6	Not Meeting Expectations	20.56
	Partially Meeting Expectations	54.19
	Meeting Expectations	24.09
	Exceeding Expectations	1.17
7	Not Meeting Expectations	25.65
	Partially Meeting Expectations	47.38
	Meeting Expectations	25.16
	Exceeding Expectations	1.81
8	Not Meeting Expectations	23.86
	Partially Meeting Expectations	53.22
	Meeting Expectations	21.50
	Exceeding Expectations	1.42

APPENDIX D

ITEM-LEVEL CLASSICAL STATISTICS

**Table D-1. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – ELA Grade 3**

Item <i>Number</i>	<i>Type</i>	Difficulty	Discrimination	Percent Omitted (%)
EL298283	OR	0.54	0.57	0
EL298286	MC	0.71	0.39	0
EL298292	MC	0.88	0.41	0
EL298296	MC	0.79	0.37	0
EL298297	OR	0.60	0.34	0
EL298299	MC	0.69	0.36	0
EL298310	MC	0.77	0.56	0
EL313844	MC	0.72	0.50	0
EL313846	MC	0.70	0.31	0
EL313847	MC	0.70	0.47	0
EL313848	MC	0.75	0.51	0
EL313855	OR	0.52	0.43	0
EL313858	MC	0.87	0.45	0
EL313860	OR	0.64	0.34	0
EL313868#SCORE_TRAIT_Conv	WP	0.29	0.63	1
EL313868#SCORE_TRAIT_Ideadev	WP	0.25	0.62	1
EL627935375#SCORE_TRAIT_Conv	WP	0.21	0.60	1
EL627935375#SCORE_TRAIT_Ideadev	WP	0.14	0.57	1
EL625955796	MC	0.66	0.39	0
EL625956672	MC	0.61	0.48	0
EL625957585	MC	0.83	0.53	0
EL625959562	MC	0.82	0.44	0
EL625959734	MC	0.70	0.26	0
EL625959920	OR	0.63	0.62	0
EL625961096	OR	0.76	0.29	0
EL625963791	OR	0.33	0.53	1

**Table D-2. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – ELA Grade 4**

Item		Difficulty	Discrimination	Percent Omitted (%)
<i>Number</i>	<i>Type</i>			
EL302966	MC	0.81	0.35	0
EL302970	OR	0.82	0.52	0
EL302972	MC	0.68	0.40	0
EL302973	OR	0.58	0.49	0
EL302974	MC	0.77	0.51	0
EL302980	MC	0.73	0.48	0
EL302988	MC	0.56	0.37	0
EL302989#SCORE_TRAIT_Conv	WP	0.43	0.68	1
EL302989#SCORE_TRAIT_Ideadev	WP	0.37	0.67	1
EL628640246	MC	0.56	0.34	0
EL628643061	MC	0.81	0.33	0
EL628643362	MC	0.59	0.31	0
EL628645147	MC	0.53	0.34	0
EL628645478	OR	0.55	0.40	0
EL628647312	MC	0.67	0.35	0
EL628657932	OR	0.80	0.41	0
EL629542750#SCORE_TRAIT_Conv	WP	0.45	0.68	1
EL629542750#SCORE_TRAIT_Ideadev	WP	0.27	0.60	1
EL624332338	MC	0.81	0.44	0
EL624359745	OR	0.74	0.52	0
EL624360481	MC	0.78	0.42	0
EL624360683	OR	0.40	0.26	0
EL624361062	MC	0.67	0.48	0
EL624361333	MC	0.53	0.34	0
EL624361561	MC	0.87	0.47	0
EL624446590	OR	0.49	0.53	0

**Table D-3. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – ELA Grade 5**

Item <i>Number</i>	<i>Type</i>	Difficulty	Discrimination	Percent Omitted (%)
EL284424	MC	0.74	0.45	0
EL284427	MC	0.89	0.43	0
EL284484	MC	0.64	0.41	0
EL284490	MC	0.32	0.19	0
EL284523	MC	0.67	0.31	0
EL284530#SCORE_TRAIT_Conv	WP	0.44	0.70	1
EL284530#SCORE_TRAIT_Ideadev	WP	0.25	0.60	1
EL626255432	MC	0.72	0.50	0
EL626255823	MC	0.64	0.53	0
EL626260085	MC	0.61	0.44	0
EL626262358	MC	0.54	0.29	0
EL626264759	OR	0.58	0.62	0
EL626265443	MC	0.79	0.54	0
EL626266147#SCORE_TRAIT_Conv	WP	0.45	0.69	1
EL626266147#SCORE_TRAIT_Ideadev	WP	0.38	0.67	1
EL626266888	OR	0.81	0.55	0
EL626533969	OR	0.50	0.45	0
EL626540234	OR	0.61	0.40	0
EL626169480	MC	0.59	0.30	0
EL626170371	MC	0.78	0.55	0
EL626170867	MC	0.71	0.43	0
EL626171344	MC	0.74	0.49	0
EL626172796	OR	0.62	0.41	0
EL626173072	MC	0.62	0.39	0
EL626173921#SCORE_TRAIT_Conv	WP	0.39	0.74	1
EL626173921#SCORE_TRAIT_Ideadev	WP	0.30	0.74	1
EL626175705	OR	0.74	0.56	0

**Table D-4. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – ELA Grade 6**

Item <i>Number</i>	<i>Type</i>	Difficulty	Discrimination	Percent Omitted (%)
EL627062789	MC	0.61	0.21	0
EL627063711	MC	0.58	0.39	0
EL627064469	MC	0.64	0.52	0
EL627064661	MC	0.70	0.47	0
EL627065081	MC	0.46	0.33	0
EL627065455	OR	0.68	0.49	0
EL627066612	OR	0.53	0.41	0
EL627067637#SCORE_TRAIT_Conv	WP	0.38	0.74	1
EL627067637#SCORE_TRAIT_Ideadev	WP	0.24	0.74	1
EL627253389	MC	0.69	0.41	0
EL627254165	MC	0.76	0.33	0
EL627255060	MC	0.75	0.44	0
EL627255182	OR	0.73	0.54	0
EL627255694	MC	0.79	0.49	0
EL627256179	OR	0.56	0.44	0
EL627257199#SCORE_TRAIT_Conv	WP	0.41	0.75	1
EL627257199#SCORE_TRAIT_Ideadev	WP	0.23	0.71	1
EL628764654	MC	0.50	0.30	0
EL628765334	MC	0.60	0.43	0
EL628766126	MC	0.65	0.48	0
EL628766509	MC	0.47	0.39	0
EL628767305	MC	0.74	0.47	0
EL628768042	OR	0.51	0.55	0
EL628771242	OR	0.51	0.55	0
EL628771852#SCORE_TRAIT_Conv	WP	0.32	0.74	1
EL628771852#SCORE_TRAIT_Ideadev	WP	0.21	0.76	1
EL629775412	MC	0.55	0.44	0

**Table D-5. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – ELA Grade 7**

Item <i>Number</i>	<i>Type</i>	Difficulty	Discrimination	Percent Omitted (%)
EL627050085#SCORE_TRAIT_Conv	WP	0.53	0.77	1
EL627050085#SCORE_TRAIT_Ideadev	WP	0.33	0.75	1
EL627259020	OR	0.76	0.42	0
EL627259700	MC	0.63	0.39	0
EL627331625	MC	0.72	0.37	0
EL627332007	OR	0.59	0.46	0
EL627332351	MC	0.64	0.41	0
EL627332976	MC	0.57	0.45	0
EL627333908#SCORE_TRAIT_Conv	WP	0.45	0.77	1
EL627333908#SCORE_TRAIT_Ideadev	WP	0.25	0.73	1
EL631647980	MC	0.73	0.34	0
EL631649042	MC	0.71	0.51	0
EL623855429	MC	0.73	0.46	0
EL623855849	MC	0.39	0.21	0
EL623855990	MC	0.56	0.41	0
EL623856213	MC	0.64	0.55	0
EL623856592	MC	0.68	0.52	0
EL623857019	MC	0.72	0.47	0
EL623857453	OR	0.69	0.51	0
EL623857917	OR	0.82	0.56	0
EL623858620#SCORE_TRAIT_Conv	WP	0.36	0.78	1
EL623858620#SCORE_TRAIT_Ideadev	WP	0.21	0.75	1

**Table D-6. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – ELA Grade 8**

Item <i>Number</i>	<i>Type</i>	Difficulty	Discrimination	Percent Omitted (%)
EL627138987	MC	0.38	0.29	0
EL627139321	OR	0.81	0.51	0
EL627141054	MC	0.57	0.33	0
EL627141423	MC	0.45	0.26	0
EL627145619	MC	0.73	0.41	0
EL627146543	MC	0.64	0.35	0
EL627147516	MC	0.52	0.44	0
EL627148893	MC	0.71	0.40	0
EL627149771	MC	0.69	0.40	0
EL627150027	MC	0.68	0.30	0
EL627151299	MC	0.57	0.30	0
EL627151569#SCORE_TRAIT_Conv	WP	0.49	0.77	1
EL627151569#SCORE_TRAIT_Ideadev	WP	0.31	0.75	1
EL627151948	OR	0.34	0.29	0
EL627159751	OR	0.46	0.51	0
EL627160756#SCORE_TRAIT_Conv	WP	0.51	0.79	2
EL627160756#SCORE_TRAIT_Ideadev	WP	0.28	0.77	2
EL627162870	OR	0.56	0.45	0
EL312918	MC	0.80	0.44	0
EL312926	MC	0.34	0.30	0
EL312932	MC	0.64	0.40	0
EL312938	MC	0.56	0.47	0
EL312939	MC	0.68	0.43	0
EL312941#SCORE_TRAIT_Conv	WP	0.43	0.76	2
EL312941#SCORE_TRAIT_Ideadev	WP	0.27	0.75	2
EL630547677	OR	0.52	0.42	0
EL632604902	OR	0.64	0.54	0

**Table D-7. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – Mathematics Grade 3**

Item		Difficulty	Discrimination	Percent Omitted (%)
Number	Type			
MA293499	MC	0.57	0.54	0
MA297413	OR	0.40	0.48	0
MA297496	MC	0.37	0.47	0
MA299999	MC	0.74	0.54	0
MA310879	MC	0.14	0.12	0
MA310888	OR	0.69	0.55	0
MA310893	OR	0.16	0.36	0
MA623068649	OR	0.30	0.33	2
M00028	OR	0.63	0.42	0
M03512	OR	0.50	0.53	0
MA227232	MC	0.61	0.51	0
MA287143	MC	0.43	0.47	0
MA293452	MC	0.68	0.50	0
MA293503A	OR	0.37	0.68	1
MA300728	MC	0.47	0.15	0
MA303411	MC	0.34	0.32	0
MA306309	MC	0.77	0.53	0
MA306369	MC	0.33	0.33	0
MA310835	MC	0.58	0.61	0
VH171898	OR	0.38	0.60	1
MA306315	MC	0.74	0.38	0
MA306337	MC	0.42	0.32	0
MA310885	OR	0.42	0.32	0
MA310886	OR	0.56	0.52	0
MA310892	OR	0.33	0.55	0
MA623045409	OR	0.26	0.58	0
MA623070758	OR	0.78	0.38	0
1749-M23082	OR	0.47	0.45	0
M00359	OR	0.80	0.43	0
M03644	OR	0.49	0.58	0
MA202992	MC	0.69	0.59	0
MA207015	MC	0.62	0.50	0
MA225833	MC	0.42	0.37	0
MA263115	MC	0.50	0.44	0
MA300045	MC	0.61	0.44	0
MA300727	MC	0.66	0.45	0
MA306343A	OR	0.43	0.69	1
MA306385	OR	0.67	0.45	0
MA310884	OR	0.56	0.57	0
MA314785	MC	0.29	0.22	0

**Table D-8. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – Mathematics Grade 4**

Item		Difficulty	Discrimination	Percent Omitted (%)
Number	Type			
MA297975	MC	0.54	0.39	0
MA302483	OR	0.27	0.49	0
MA311544	MC	0.43	0.42	0
MA623833763	OR	0.52	0.55	0
MA623834761	OR	0.33	0.62	0
MA623835665	OR	0.27	0.52	0
0491-M02309	OR	0.61	0.55	0
M01841	OR	0.42	0.53	1
M03733	OR	0.76	0.46	1
MA221898	OR	0.54	0.49	0
MA227481	MC	0.86	0.32	0
MA247705	MC	0.31	0.34	0
MA258228	OR	0.72	0.43	0
MA281504	MC	0.63	0.49	0
MA286769	MC	0.71	0.47	0
MA297972	OR	0.49	0.71	0
MA297979	MC	0.35	0.56	0
MA299678	MC	0.57	0.40	0
MA311580	OR	0.42	0.67	0
VH055056	OR	0.43	0.59	0
MA253717	OR	0.58	0.59	0
MA293701	MC	0.40	0.34	0
MA311524	MC	0.27	0.36	0
MA311525	MC	0.63	0.41	0
MA311563	OR	0.24	0.55	0
MA311578	OR	0.35	0.68	0
MA623831598	OR	0.60	0.48	0
MA623851888	OR	0.12	0.36	0
0494-M02316	OR	0.50	0.69	0
M03207	OR	0.77	0.49	0
MA293686	MC	0.52	0.49	0
MA294563	MC	0.31	0.41	0
MA298081	MC	0.35	0.35	0
MA301814	MC	0.81	0.21	0
MA307023	MC	0.49	0.49	0
MA307077	MC	0.62	0.42	0
MA307321	OR	0.42	0.41	0
MA311566	OR	0.31	0.57	0
MA311569	OR	0.21	0.37	0
MA311570	OR	0.34	0.55	0

**Table D-9. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – Mathematics Grade 5**

Item		Difficulty	Discrimination	Percent Omitted (%)
Number	Type			
MA298017	MC	0.45	0.54	0
MA301185	OR	0.43	0.59	0
MA624346092	OR	0.35	0.55	0
MA624346744	OR	0.37	0.60	0
MA624348324	OR	0.21	0.56	0
4510-M02866P	OR	0.50	0.58	0
M02482	OR	0.57	0.44	1
MA204722	MC	0.57	0.62	0
MA206953	MC	0.61	0.42	0
MA248875	MC	0.73	0.49	0
MA280474	MC	0.77	0.31	0
MA287189	MC	0.79	0.46	0
MA287413	MC	0.21	0.18	0
MA298005	OR	0.49	0.63	1
MA298107	OR	0.24	0.47	0
MA301160	MC	0.28	0.30	0
MA306414	MC	0.53	0.27	0
MA306431	MC	0.74	0.46	0
MA309659	OR	0.18	0.59	2
VF645556	OR	0.46	0.42	0
MA301175	OR	0.67	0.50	0
MA311282	MC	0.21	0.23	0
MA311284	MC	0.46	0.22	0
MA311306	MC	0.42	0.39	0
MA311361	OR	0.23	0.68	1
MA624345222	OR	0.37	0.54	0
MA624350711	OR	0.67	0.37	0
0393-M01852	OR	0.47	0.60	0
M00674	OR	0.57	0.55	0
M500039	OR	0.36	0.40	0
MA217317	MC	0.63	0.47	0
MA238613	OR	0.23	0.51	0
MA262140	MC	0.71	0.41	0
MA272886	MC	0.32	0.20	0
MA303315	MC	0.60	0.49	0
MA303746	MC	0.50	0.56	0
MA306408	MC	0.30	0.27	0
MA306447	MC	0.63	0.55	0
MA306458	MC	0.34	0.46	0
MA311352	OR	0.24	0.58	1

**Table D-10. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – Mathematics Grade 6**

Item		Difficulty	Discrimination	Percent Omitted (%)
Number	Type			
MA296350	MC	0.28	0.43	0
MA298170	MC	0.17	0.29	0
MA307266	OR	0.21	0.55	1
MA307362	OR	0.57	0.61	0
MA307396	OR	0.21	0.71	1
MA624245199	OR	0.76	0.42	0
MA624247631	OR	0.40	0.57	0
MA624248796	OR	0.44	0.44	1
M20028	OR	0.63	0.49	0
MA226187	MC	0.76	0.50	0
MA251350	OR	0.31	0.73	1
MA272301	MC	0.31	0.21	0
MA282134	MC	0.39	0.33	0
MA298138	OR	0.25	0.52	1
MA307219	OR	0.70	0.55	0
MA307348	MC	0.46	0.36	0
MA308013	MC	0.62	0.46	0
MA309781	OR	0.08	0.35	0
VH009541	OR	0.38	0.68	0
VH150831	OR	0.64	0.37	0
MA249009	OR	0.48	0.73	1
MA301238	OR	0.46	0.54	0
MA307215	MC	0.89	0.35	0
MA307223	OR	0.57	0.57	0
MA307268	MC	0.73	0.46	0
MA311677	MC	0.65	0.47	0
MA624245446	OR	0.45	0.53	0
MA624247103	OR	0.41	0.50	0
MA624248238	OR	0.17	0.46	2
M22618	OR	0.74	0.49	0
M25890	OR	0.74	0.35	0
MA272300	MC	0.47	0.58	0
MA294266	OR	0.32	0.63	0
MA301235	OR	0.50	0.51	0
MA307332	OR	0.20	0.56	0
MA307341	MC	0.19	0.09	0
MA309780	MC	0.15	0.04	0
MA309782	OR	0.09	0.56	2
MA311689	OR	0.35	0.51	1
VH016546	OR	0.40	0.49	0
EL627034566	MC	0.54	0.50	0
EL627034918	OR	0.66	0.54	0
EL627035252	MC	0.41	0.39	0
EL627035505	MC	0.67	0.41	0
EL627048910	OR	0.68	0.48	0

**Table D-11. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – Mathematics Grade 7**

Item		Difficulty	Discrimination	Percent Omitted (%)
<i>Number</i>	<i>Type</i>			
MA295749	MC	0.34	0.41	0
MA306633	MC	0.44	0.34	0
MA623964597	OR	0.46	0.56	1
MA624051323	OR	0.36	0.56	1
1180-M21034P	OR	0.31	0.63	0
M21537	OR	0.66	0.54	0
M25176	OR	0.55	0.63	0
M25897	OR	0.62	0.51	1
MA219417	MC	0.33	0.48	0
MA272158	OR	0.41	0.72	1
MA281465	MC	0.34	0.41	0
MA281676	MC	0.42	0.35	0
MA282222	MC	0.58	0.44	0
MA301866	OR	0.19	0.62	4
MA304468	MC	0.50	0.39	0
MA306590	MC	0.54	0.47	0
MA306610	OR	0.33	0.54	0
MA306617	MC	0.23	0.31	0
MA311074	MC	0.33	0.29	0
MA311075	OR	0.42	0.67	0
MA302323	MC	0.23	0.34	0
MA306484	MC	0.31	0.01	0
MA306626	MC	0.47	0.18	0
MA311101	OR	0.03	0.29	1
MA311121	MC	0.27	0.08	0
MA623961417	OR	0.21	0.46	0
MA623969728	OR	0.13	0.29	1
MA624050189	OR	0.14	0.42	2
1047-M20363P	OR	0.38	0.61	0
M21647	OR	0.47	0.53	0
MA205493	MC	0.60	0.54	0
MA261072	MC	0.25	0.16	0
MA272156	OR	0.31	0.74	2
MA296356	MC	0.19	0.34	0
MA303701	OR	0.49	0.59	1
MA306639	MC	0.37	0.59	0
MA306640	OR	0.26	0.72	3
MA306644	MC	0.44	0.53	0
MA311088	OR	0.06	0.31	1
MA314788	MC	0.19	0.34	0

**Table D-12. 2018 RICAS Technical Report:
Item-Level Classical Test Theory Statistics – Mathematics Grade 8**

Item		Difficulty	Discrimination	Percent Omitted (%)
<i>Number</i>	<i>Type</i>			
MA624167782	OR	0.26	0.51	1
MA624237104	OR	0.42	0.57	1
1239-M21249P	OR	0.43	0.31	0
M25803	OR	0.54	0.47	0
MA228171	OR	0.21	0.29	0
MA260361	MC	0.75	0.29	0
MA283266	MC	0.40	0.41	0
MA287508	MC	0.46	0.39	0
MA287544	OR	0.47	0.70	1
MA297512	MC	0.31	0.20	0
MA297519	MC	0.48	0.45	0
MA297523	MC	0.34	0.27	0
MA299575	MC	0.34	0.48	0
MA301468	MC	0.26	0.16	0
MA303770	MC	0.32	0.12	0
MA303790	OR	0.10	0.43	1
MA311379	OR	0.32	0.73	2
MA311404	MC	0.33	0.31	0
MA311426	MC	0.32	0.10	0
VH311635	OR	0.49	0.62	0
MA624240477	OR	0.15	0.41	0
1603-M20438P	OR	0.45	0.50	0
M25373	OR	0.60	0.51	1
MA219677	MC	0.58	0.36	0
MA228148	MC	0.68	0.12	0
MA228313	MC	0.69	0.48	0
MA264725	MC	0.50	0.39	0
MA264788	MC	0.87	0.24	0
MA284198	MC	0.60	0.35	0
MA284880	MC	0.47	0.33	0
MA287762	MC	0.27	0.22	0
MA296753	OR	0.57	0.47	0
MA301689	MC	0.34	0.30	0
MA307585	MC	0.73	0.39	0
MA307594	MC	0.49	0.23	0
MA307608	OR	0.28	0.76	3
MA309741	OR	0.25	0.41	1
MA311428	MC	0.42	0.43	0
MA311437	OR	0.30	0.63	3
VH195056	OR	0.70	0.50	1

APPENDIX E

SCORE DISTRIBUTIONS

**Table E-1. 2018 RICAS Technical Report:
Item-Level Score Distributions for SR and OR Items and WPs –ELA**

Grade	Item Number	Total Possible Points	Percent of Students at Score Point					
			0	1	2	3	4	5
3	EL298283	2	30.82	30.93	38.16	0.00	0.00	0.00
	EL298297	2	18.30	42.80	38.85	0.00	0.00	0.00
	EL313855	2	29.90	35.78	34.27	0.00	0.00	0.00
	EL313860	2	7.95	54.62	37.18	0.00	0.00	0.00
	EL313868#SCORE_TRAIT_Conv	3	40.42	36.62	14.97	6.94	0.00	0.00
	EL313868#SCORE_TRAIT_Ideadev	4	28.66	50.02	12.78	5.60	1.88	0.00
	EL627935375#SCORE_TRAIT_Conv	3	51.18	35.38	10.00	2.22	0.00	0.00
	EL627935375#SCORE_TRAIT_Ideadev	4	57.02	29.88	9.81	1.81	0.25	0.00
	EL625959920	2	31.92	10.19	57.84	0.00	0.00	0.00
	EL625961096	2	4.28	38.41	57.13	0.00	0.00	0.00
	EL625963791	3	21.43	60.33	14.47	2.95	0.00	0.00
4	EL302970	2	4.01	27.06	68.87	0.00	0.00	0.00
	EL302973	2	34.85	14.22	50.89	0.00	0.00	0.00
	EL302989#SCORE_TRAIT_Conv	3	24.53	30.30	35.33	9.31	0.00	0.00
	EL302989#SCORE_TRAIT_Ideadev	4	8.68	43.60	36.72	8.96	0.00	0.00
	EL628645478	2	39.11	12.41	48.45	0.00	0.00	0.00
	EL628657932	2	12.22	15.52	72.18	0.00	0.00	0.00
	EL629542750#SCORE_TRAIT_Conv	3	15.31	44.15	28.72	11.22	0.00	0.00
	EL629542750#SCORE_TRAIT_Ideadev	4	44.63	15.21	28.89	9.41	0.00	0.00
	EL624359745	2	23.36	5.01	71.61	0.00	0.00	0.00
	EL624360683	2	40.12	39.08	20.73	0.00	0.00	0.00
EL624446590	3	11.14	33.97	49.76	4.71	0.00	0.00	
5	EL284530#SCORE_TRAIT_Conv	3	13.17	50.17	26.57	9.22	0.00	0.00
	EL284530#SCORE_TRAIT_Ideadev	4	50.49	10.97	26.97	9.71	0.99	0.00
	EL626264759	2	32.30	18.52	49.16	0.00	0.00	0.00
	EL626266147#SCORE_TRAIT_Conv	3	19.34	37.21	30.24	12.54	0.00	0.00
	EL626266147#SCORE_TRAIT_Ideadev	4	8.06	46.34	31.71	12.55	0.65	0.00
	EL626266888	2	7.55	23.73	68.69	0.00	0.00	0.00
	EL626533969	2	36.35	27.20	36.45	0.00	0.00	0.00
	EL626540234	2	32.52	12.30	55.16	0.00	0.00	0.00
	EL626172796	2	19.31	37.44	43.24	0.00	0.00	0.00
	EL626173921#SCORE_TRAIT_Conv	3	21.02	43.14	30.37	4.87	0.00	0.00
	EL626173921#SCORE_TRAIT_Ideadev	4	19.36	43.69	31.55	4.65	0.14	0.00
EL626175705	2	18.89	15.05	65.99	0.00	0.00	0.00	
6	EL627065455	2	26.80	9.50	63.68	0.00	0.00	0.00
	EL627066612	2	20.21	52.98	26.75	0.00	0.00	0.00
	EL627067637#SCORE_TRAIT_Conv	3	28.26	37.15	24.69	8.99	0.00	0.00
	EL627067637#SCORE_TRAIT_Ideadev	5	22.90	44.87	22.37	7.13	1.57	0.25
	EL627255182	2	24.23	5.69	70.06	0.00	0.00	0.00
	EL627256179	2	23.78	40.72	35.43	0.00	0.00	0.00
	EL627257199#SCORE_TRAIT_Conv	3	27.18	35.70	21.41	14.67	0.00	0.00
	EL627257199#SCORE_TRAIT_Ideadev	5	38.18	23.56	24.13	9.90	2.51	0.68
	EL628768042	2	43.75	10.54	45.70	0.00	0.00	0.00
	EL628771242	2	25.95	45.76	28.24	0.00	0.00	0.00
	EL628771852#SCORE_TRAIT_Conv	3	32.72	40.45	20.72	5.20	0.00	0.00
EL628771852#SCORE_TRAIT_Ideadev	5	28.78	39.42	25.91	4.27	0.54	0.16	

continued

Grade	Item Number	Total Possible Points	Percent of Students at Score Point					
			0	1	2	3	4	5
7	EL627034918	2	28.19	11.86	59.91	0.00	0.00	0.00
	EL627048910	2	26.68	11.31	61.97	0.00	0.00	0.00
	EL627050085#SCORE_TRAIT_Conv	3	10.58	36.89	31.51	19.65	0.00	0.00
	EL627050085#SCORE_TRAIT_Ideadev	5	8.85	38.75	31.55	15.15	3.36	0.98
	EL627259020	2	5.79	36.22	57.75	0.00	0.00	0.00
	EL627332007	2	31.67	18.34	49.97	0.00	0.00	0.00
	EL627333908#SCORE_TRAIT_Conv	3	23.72	33.19	24.53	17.18	0.00	0.00
	EL627333908#SCORE_TRAIT_Ideadev	5	34.12	23.16	25.18	13.21	2.46	0.49
	EL623857453	2	12.93	36.04	50.96	0.00	0.00	0.00
	EL623857917	2	5.99	24.31	69.48	0.00	0.00	0.00
	EL623858620#SCORE_TRAIT_Conv	3	30.32	38.00	19.92	10.47	0.00	0.00
	EL623858620#SCORE_TRAIT_Ideadev	5	38.77	29.49	20.01	8.38	1.52	0.53
8	EL627139321	2	5.56	27.14	67.02	0.00	0.00	0.00
	EL627151569#SCORE_TRAIT_Conv	3	20.61	31.09	26.67	20.45	0.00	0.00
	EL627151569#SCORE_TRAIT_Ideadev	5	21.64	26.73	29.45	15.97	4.45	0.58
	EL627151948	2	54.06	23.87	22.06	0.00	0.00	0.00
	EL627159751	2	29.59	48.53	21.73	0.00	0.00	0.00
	EL627160756#SCORE_TRAIT_Conv	3	20.08	29.85	21.70	26.16	0.00	0.00
	EL627160756#SCORE_TRAIT_Ideadev	5	37.14	12.85	22.51	19.08	4.54	1.67
	EL627162870	2	34.98	17.95	47.04	0.00	0.00	0.00
	EL312941#SCORE_TRAIT_Conv	3	22.97	35.57	26.57	13.25	0.00	0.00
	EL312941#SCORE_TRAIT_Ideadev	5	21.32	36.98	26.53	10.42	2.36	0.75
	EL630547677	2	38.95	17.36	43.64	0.00	0.00	0.00
EL632604902	2	13.56	43.68	42.59	0.00	0.00	0.00	

**Table E-2 2018 RICAS Technical Report:
Item-Level Score Distributions for SR and OR Items –Mathematics**

Grade	Item Number	Total Possible Points	Percent of Students at Score Point					
			0	1	2	3	4	5
3	MA297413	1	59.30	40.27	0.00	0.00	0.00	0.00
	MA310888	1	31.04	68.85	0.00	0.00	0.00	0.00
	MA310893	1	84.03	15.73	0.00	0.00	0.00	0.00
	MA623068649	1	68.04	29.56	0.00	0.00	0.00	0.00
	M00028	1	37.00	62.80	0.00	0.00	0.00	0.00
	M03512	1	50.15	49.64	0.00	0.00	0.00	0.00
	MA293503A	3	32.07	35.97	19.16	11.91	0.00	0.00
	VH171898	3	35.51	18.45	40.37	4.89	0.00	0.00
	MA310885	1	57.70	42.08	0.00	0.00	0.00	0.00
	MA310886	1	44.27	55.62	0.00	0.00	0.00	0.00
	MA310892	1	67.19	32.58	0.00	0.00	0.00	0.00
	MA623045409	1	73.85	25.78	0.00	0.00	0.00	0.00
	MA623070758	1	21.54	78.29	0.00	0.00	0.00	0.00
	1749-M23082	3	10.06	40.67	45.34	3.48	0.00	0.00
	M00359	1	20.09	79.54	0.00	0.00	0.00	0.00
	M03644	1	51.11	48.65	0.00	0.00	0.00	0.00
	MA306343A	3	28.06	31.24	22.66	17.39	0.00	0.00
	MA306385	1	32.55	67.32	0.00	0.00	0.00	0.00
	MA310884	1	44.04	55.84	0.00	0.00	0.00	0.00
	4	MA302483	1	72.52	27.27	0.00	0.00	0.00
MA623833763		1	47.44	52.31	0.00	0.00	0.00	0.00
MA623834761		1	66.77	33.14	0.00	0.00	0.00	0.00
MA623835665		1	72.70	27.24	0.00	0.00	0.00	0.00
0491-M02309		2	20.68	35.89	43.32	0.00	0.00	0.00
M01841		1	57.02	42.34	0.00	0.00	0.00	0.00
M03733		1	23.41	75.75	0.00	0.00	0.00	0.00
MA221898		1	46.14	53.80	0.00	0.00	0.00	0.00
MA258228		1	27.45	72.46	0.00	0.00	0.00	0.00
MA297972		4	20.70	24.38	15.77	16.05	22.74	0.00
MA311580		4	21.01	23.28	27.76	20.50	7.24	0.00
VH055056		1	56.89	43.06	0.00	0.00	0.00	0.00
MA253717		4	20.15	7.82	28.80	4.69	38.42	0.00
MA311563		1	75.47	24.44	0.00	0.00	0.00	0.00
MA311578		4	31.91	28.41	16.94	12.18	10.31	0.00
MA623831598		1	39.88	59.85	0.00	0.00	0.00	0.00
MA623851888		1	87.84	12.01	0.00	0.00	0.00	0.00
0494-M02316		2	37.16	26.25	36.55	0.00	0.00	0.00
M03207		1	23.16	76.74	0.00	0.00	0.00	0.00
MA307321		1	57.32	42.45	0.00	0.00	0.00	0.00
MA311566	1	69.12	30.75	0.00	0.00	0.00	0.00	
MA311569	1	78.68	21.24	0.00	0.00	0.00	0.00	
MA311570	1	65.48	34.40	0.00	0.00	0.00	0.00	

continued

Grade	Item Number	Total Possible Points	Percent of Students at Score Point					
			0	1	2	3	4	5
5	MA301185	1	57.14	42.62	0.00	0.00	0.00	0.00
	MA624346092	1	64.87	35.01	0.00	0.00	0.00	0.00
	MA624346744	1	63.28	36.63	0.00	0.00	0.00	0.00
	MA624348324	1	78.62	21.10	0.00	0.00	0.00	0.00
	4510-M02866P	2	33.80	33.05	33.06	0.00	0.00	0.00
	M02482	1	42.19	57.20	0.00	0.00	0.00	0.00
	MA298005	4	17.66	9.28	43.65	13.65	14.88	0.00
	MA298107	1	75.71	24.17	0.00	0.00	0.00	0.00
	MA309659	4	60.21	22.38	4.13	4.50	6.93	0.00
	VF645556	1	54.14	45.61	0.00	0.00	0.00	0.00
	MA301175	1	32.80	67.11	0.00	0.00	0.00	0.00
	MA311361	4	46.75	27.44	13.94	8.40	2.96	0.00
	MA624345222	1	63.01	36.94	0.00	0.00	0.00	0.00
	MA624350711	1	32.92	67.07	0.00	0.00	0.00	0.00
	0393-M01852	2	38.03	29.78	32.11	0.00	0.00	0.00
	M00674	1	43.11	56.73	0.00	0.00	0.00	0.00
	M500039	1	63.41	36.26	0.00	0.00	0.00	0.00
	MA238613	1	76.48	23.10	0.00	0.00	0.00	0.00
	MA311352	4	52.53	16.39	19.00	5.42	6.06	0.00
	6	MA307266	1	78.79	20.71	0.00	0.00	0.00
MA307362		1	42.61	57.27	0.00	0.00	0.00	0.00
MA307396		4	47.02	34.51	8.22	4.86	4.24	0.00
MA624245199		1	24.14	75.79	0.00	0.00	0.00	0.00
MA624247631		1	59.40	40.42	0.00	0.00	0.00	0.00
MA624248796		1	55.00	44.08	0.00	0.00	0.00	0.00
M20028		1	36.74	63.23	0.00	0.00	0.00	0.00
MA251350		4	37.64	30.13	8.77	13.29	9.53	0.00
MA298138		1	74.40	25.02	0.00	0.00	0.00	0.00
MA307219		1	29.69	70.18	0.00	0.00	0.00	0.00
MA309781		1	91.72	8.01	0.00	0.00	0.00	0.00
VH009541		2	50.00	24.72	25.21	0.00	0.00	0.00
VH150831		1	35.77	64.16	0.00	0.00	0.00	0.00
MA249009		4	23.95	13.27	24.26	22.70	15.23	0.00
MA301238		1	53.54	46.34	0.00	0.00	0.00	0.00
MA307223		1	42.47	57.43	0.00	0.00	0.00	0.00
MA624245446		1	54.60	45.33	0.00	0.00	0.00	0.00
MA624247103		1	58.40	41.47	0.00	0.00	0.00	0.00
MA624248238		1	80.90	17.12	0.00	0.00	0.00	0.00
M22618		1	25.48	74.13	0.00	0.00	0.00	0.00
M25890		1	25.95	73.84	0.00	0.00	0.00	0.00
MA294266		1	67.73	32.12	0.00	0.00	0.00	0.00
MA301235		1	49.51	50.31	0.00	0.00	0.00	0.00
MA307332		1	79.75	19.89	0.00	0.00	0.00	0.00
MA309782		4	77.72	9.12	7.81	1.84	1.40	0.00
MA311689		1	63.64	35.38	0.00	0.00	0.00	0.00
VH016546	2	28.05	63.07	8.83	0.00	0.00	0.00	

continued

Grade	Item Number	Total Possible Points	Percent of Students at Score Point					
			0	1	2	3	4	5
7	MA623964597	1	52.28	46.45	0.00	0.00	0.00	0.00
	MA624051323	1	63.93	35.51	0.00	0.00	0.00	0.00
	1180-M21034P	2	49.59	38.60	11.57	0.00	0.00	0.00
	M21537	1	34.15	65.64	0.00	0.00	0.00	0.00
	M25176	1	44.79	54.88	0.00	0.00	0.00	0.00
	M25897	1	37.61	61.66	0.00	0.00	0.00	0.00
	MA272158	4	14.42	39.60	21.63	14.29	9.35	0.00
	MA301866	4	60.09	13.19	9.38	9.03	4.65	0.00
	MA306610	1	66.79	32.89	0.00	0.00	0.00	0.00
	MA311075	1	58.05	41.72	0.00	0.00	0.00	0.00
	MA311101	1	96.24	3.25	0.00	0.00	0.00	0.00
	MA623961417	1	78.30	21.37	0.00	0.00	0.00	0.00
	MA623969728	1	86.81	12.64	0.00	0.00	0.00	0.00
	MA624050189	1	84.68	13.58	0.00	0.00	0.00	0.00
	1047-M20363P	2	44.45	35.42	20.00	0.00	0.00	0.00
	M21647	1	52.71	47.18	0.00	0.00	0.00	0.00
	MA272156	4	38.96	15.94	30.06	5.51	7.95	0.00
	MA303701	1	50.33	49.14	0.00	0.00	0.00	0.00
	MA306640	4	49.95	19.00	8.23	12.78	7.24	0.00
	MA311088	1	93.27	5.74	0.00	0.00	0.00	0.00
8	MA624167782	1	73.09	26.38	0.00	0.00	0.00	0.00
	MA624237104	1	56.91	42.15	0.00	0.00	0.00	0.00
	1239-M21249P	2	32.45	49.38	0.00	0.00	0.00	0.00
	M25803	1	45.95	53.97	0.00	0.00	0.00	0.00
	MA228171	1	78.56	21.20	0.00	0.00	0.00	0.00
	MA287544	4	12.45	32.66	22.34	16.22	15.16	0.00
	MA303790	1	89.05	10.36	0.00	0.00	0.00	0.00
	MA311379	4	32.53	25.21	23.56	10.98	5.37	0.00
	VH311635	1	51.10	48.74	0.00	0.00	0.00	0.00
	MA624240477	1	84.36	15.45	0.00	0.00	0.00	0.00
	1603-M20438P	2	35.05	38.92	25.89	0.00	0.00	0.00
	M25373	1	38.92	60.21	0.00	0.00	0.00	0.00
	MA296753	1	42.61	57.12	0.00	0.00	0.00	0.00
	MA307608	4	49.81	15.40	9.87	10.43	11.25	0.00
	MA309741	1	74.46	24.85	0.00	0.00	0.00	0.00
	MA311437	4	34.13	26.55	19.41	12.41	4.79	0.00
	VH195056	1	28.61	70.23	0.00	0.00	0.00	0.00

APPENDIX F

DIFFERENTIAL ITEM FUNCTIONING RESULTS

**Table F-1. 2018 Next-Generation MCAS and MCAS-Alt Technical Report:
Number of Items Classified as “Low” or “High” DIF, Overall and by Group Favored – ELA**

Grade	Group		Item Type	Number of Items	Number “Low”			Number “High”			
	Reference	Focal			Total	Favoring		Total	Favoring		
						Reference	Focal		Reference	Focal	
3	Male	Female	MC	15	0	0	0	0	0	0	
			OR	7	0	0	0	0	0	0	
			WP	4	0	0	0	0	0	0	
	Not ELL	ELL	MC	15	4	4	0	1	1	0	
			OR	7	1	1	0	0	0	0	
			WP	4	0	0	0	0	0	0	
	Not Economically Disadvantaged	Economically Disadvantaged	MC	15	0	0	0	0	0	0	
			OR	7	0	0	0	0	0	0	
			WP	4	0	0	0	0	0	0	
	White	African American	MC	15	2	2	0	0	0	0	
			OR	7	0	0	0	0	0	0	
			WP	4	0	0	0	0	0	0	
		Hispanic / Latino	MC	15	2	2	0	0	0	0	
			OR	7	0	0	0	0	0	0	
			WP	4	0	0	0	0	0	0	
	Student Without Disabilities	Students with Disabilities	MC	15	0	0	0	0	0	0	
			OR	7	0	0	0	0	0	0	
			WP	4	0	0	0	0	0	0	
	4	Male	Female	MC	15	1	1	0	0	0	0
				OR	7	0	0	0	0	0	0
				WP	4	0	0	0	0	0	0
		Not ELL	ELL	MC	15	7	7	0	1	1	0
				OR	7	2	2	0	0	0	0
				WP	4	0	0	0	0	0	0
Not Economically Disadvantaged		Economically Disadvantaged	MC	15	1	1	0	0	0	0	
			OR	7	0	0	0	0	0	0	
			WP	4	0	0	0	0	0	0	
White		African American	MC	15	2	2	0	0	0	0	
			OR	7	0	0	0	0	0	0	
			WP	4	0	0	0	0	0	0	

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
4	White	Hispanic / Latino	MC	15	4	4	0	0	0	0
			OR	7	0	0	0	0	0	0
			WP	4	0	0	0	0	0	0
	Student Without Disabilities	Students with Disabilities	MC	15	4	4	0	0	0	0
			OR	7	1	1	0	0	0	0
			WP	4	1	1	0	0	0	0
5	Male	Female	MC	15	2	2	0	0	0	0
			OR	6	0	0	0	0	0	0
			WP	6	0	0	0	0	0	0
	Not ELL	ELL	MC	15	3	3	0	2	2	0
			OR	6	3	3	0	2	2	0
			WP	6	2	0	2	0	0	0
5	Not Economically Disadvantaged	Economically Disadvantaged	MC	15	0	0	0	0	0	0
			OR	6	1	1	0	0	0	0
			WP	6	0	0	0	0	0	0
	White	African American	MC	15	3	3	0	0	0	0
			OR	6	3	3	0	0	0	0
			WP	6	0	0	0	0	0	0
Student Without Disabilities	Students with Disabilities	MC	15	2	2	0	0	0	0	
		OR	6	1	1	0	0	0	0	
		WP	6	0	0	0	0	0	0	
6	Male	Female	MC	15	3	3	0	0	0	0
			OR	6	1	0	1	0	0	0
			WP	6	1	0	1	0	0	0
	Not ELL	ELL	MC	15	4	3	1	4	3	1
			OR	6	2	2	0	0	0	0
			WP	6	1	1	0	0	0	0
Not Economically Disadvantaged	Economically Disadvantaged	MC	15	1	1	0	0	0	0	
		OR	6	0	0	0	0	0	0	

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
6	Not Economically Disadvantaged	Economically Disadvantaged	WP	6	0	0	0	0	0	0
			MC	15	4	3	1	1	1	0
	White	African American	OR	6	0	0	0	0	0	0
			WP	6	0	0	0	0	0	0
			MC	15	3	3	0	1	1	0
			OR	6	0	0	0	0	0	0
			WP	6	0	0	0	0	0	0
			MC	15	0	0	0	0	0	0
	Student Without Disabilities	Students with Disabilities	OR	6	0	0	0	0	0	0
			WP	6	3	3	0	0	0	0
			MC	15	1	1	0	0	0	0
	Male	Female	OR	6	1	1	0	0	0	0
			WP	6	1	0	1	0	0	0
			MC	15	5	5	0	6	6	0
	Not ELL	ELL	OR	6	5	5	0	1	1	0
WP			6	0	0	0	0	0	0	
MC			15	2	2	0	0	0	0	
7	Not Economically Disadvantaged	Economically Disadvantaged	OR	6	0	0	0	0	0	0
			WP	6	0	0	0	0	0	0
			MC	15	2	2	0	0	0	0
	White	African American	OR	6	0	0	0	0	0	0
			WP	6	0	0	0	0	0	0
			MC	15	1	1	0	0	0	0
			OR	6	0	0	0	0	0	0
			WP	6	0	0	0	0	0	0
			MC	15	5	5	0	0	0	0
Student Without Disabilities	Students with Disabilities	OR	6	0	0	0	0	0	0	
		WP	6	0	0	0	0	0	0	
		MC	15	2	2	0	2	2	0	
Male	Female	OR	6	1	1	0	0	0	0	
		WP	6	2	0	2	0	0	0	
		MC	15	3	3	0	1	1	0	
Not ELL	ELL	OR	6	1	1	0	1	1	0	
		MC	15	3	3	0	1	1	0	

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"			
	Reference	Focal			Total	Favoring		Total	Favoring		
						Reference	Focal		Reference	Focal	
8	Not ELL	ELL	WP	6	1	1	0	0	0	0	
			MC	15	1	1	0	0	0	0	
	Not Economically Disadvantaged	Economically Disadvantaged	OR	6	0	0	0	0	0	0	
			WP	6	0	0	0	0	0	0	
	White	African American	MC	15	3	3	0	0	0	0	
			OR	6	0	0	0	0	0	0	
			WP	6	0	0	0	0	0	0	
		Hispanic	MC	15	1	1	0	1	1	0	
			OR	6	0	0	0	0	0	0	
			WP	6	0	0	0	0	0	0	
	Student Without Disabilities	Students with Disabilities	MC	15	1	1	0	0	0	0	
			OR	6	0	0	0	0	0	0	
				WP	6	1	1	0	0	0	0

**Table F-2. 2018 Next-Generation MCAS and MCAS-Alt Technical Report:
Number of Items Classified as “Low” or “High” DIF, Overall and by Group Favored – Mathematics**

Grade	Group		Item Type	Number of Items	Number “Low”			Number “High”		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
3	Male	Female	MC	21	3	2	1	0	0	0
			OR	19	1	1	0	0	0	0
	Not ELL	ELL	MC	21	1	1	0	1	1	0
			OR	19	2	2	0	2	1	1
	Not Economically Disadvantaged	Economically Disadvantaged	MC	21	0	0	0	0	0	0
			OR	19	2	2	0	0	0	0
	White	African American	MC	21	3	3	0	0	0	0
			OR	19	4	2	2	1	1	0
		Hispanic	MC	21	3	3	0	0	0	0
			OR	19	3	2	1	0	0	0
	Student Without Disabilities	Students with Disabilities	MC	21	0	0	0	0	0	0
			OR	19	0	0	0	0	0	0
4	Male	Female	MC	17	2	2	0	0	0	0
			OR	23	2	1	1	0	0	0
	Not ELL	ELL	MC	17	2	1	1	0	0	0
			OR	23	0	0	0	0	0	0
	Not Economically Disadvantaged	Economically Disadvantaged	MC	17	1	1	0	0	0	0
			OR	23	0	0	0	0	0	0
	White	African American	MC	17	5	2	3	0	0	0
			OR	23	2	1	1	0	0	0
		Hispanic	MC	17	2	1	1	0	0	0
			OR	23	2	2	0	0	0	0
	Student Without Disabilities	Students with Disabilities	MC	17	2	1	1	0	0	0
			OR	23	3	2	1	0	0	0
5	Male	Female	MC	21	2	1	1	0	0	0
			OR	19	3	1	2	0	0	0
	Not ELL	ELL	MC	21	3	2	1	0	0	0
			OR	19	4	2	2	1	1	0
	Not Economically Disadvantaged	Economically Disadvantaged	MC	21	0	0	0	0	0	0
			OR	19	0	0	0	0	0	0
	White	African American	MC	21	1	1	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
5	White	African American	OR	19	2	2	0	0	0	0
		Hispanic	MC	21	0	0	0	0	0	0
	Student Without Disabilities	Students with Disabilities	OR	19	0	0	0	0	0	0
			MC	21	6	6	0	0	0	0
	Male	Female	OR	19	2	2	0	0	0	0
			MC	21	0	0	0	1	0	1
6	Not ELL	ELL	OR	27	4	2	2	0	0	0
			MC	13	0	0	0	0	0	0
	Not Economically Disadvantaged	Economically Disadvantaged	OR	27	6	6	0	1	1	0
			MC	13	0	0	0	0	0	0
	White	African American	OR	27	0	0	0	0	0	0
			MC	13	4	2	2	0	0	0
Student Without Disabilities	Students with Disabilities	OR	27	6	4	2	0	0	0	
		MC	13	0	0	0	0	0	0	
7	Male	Female	OR	27	3	3	0	0	0	0
			MC	13	2	2	0	0	0	0
	Not ELL	ELL	OR	27	3	3	0	0	0	0
			MC	13	4	2	2	0	0	0
	Not Economically Disadvantaged	Economically Disadvantaged	OR	27	4	2	2	2	2	0
			MC	13	0	0	0	0	0	0
White	African American	OR	27	2	2	0	0	0	0	
		MC	13	0	0	0	0	0	0	
8	Student Without Disabilities	Students with Disabilities	OR	27	3	3	0	0	0	0
			MC	13	2	2	0	0	0	
	Male	Female	OR	27	3	2	1	0	0	0
			MC	20	4	2	3	2	2	0
	Not ELL	ELL	OR	20	4	4	0	2	2	0
			MC	20	5	2	3	2	2	0
Not Economically Disadvantaged	Economically Disadvantaged	OR	20	2	2	0	0	0	0	
		MC	20	0	0	0	0	0	0	
White	African American	OR	20	6	6	0	0	0	0	
		MC	20	3	2	1	0	0	0	
Student Without Disabilities	Students with Disabilities	OR	20	4	4	0	0	0	0	
		MC	20	3	2	1	0	0	0	

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
8	Not ELL	ELL	MC	23	8	7	1	2	1	1
			OR	17	7	6	1	1	1	0
	Not Economically Disadvantaged	Economically Disadvantaged	MC	23	1	1	0	0	0	0
			OR	17	1	1	0	0	0	0
	White	African American	MC	23	4	2	2	0	0	0
			OR	17	5	5	0	0	0	0
		Hispanic	MC	23	2	2	0	0	0	0
			OR	17	2	2	0	0	0	0
	Student Without Disabilities	Students with Disabilities	MC	23	7	3	4	0	0	0
			OR	17	7	6	1	0	0	0

APPENDIX G

RELIABILITY

**Table G-1: 2018 RICAS Technical Report:
Subgroup Reliabilities—ELA**

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			<i>Maximum</i>	<i>Mean</i>	<i>Standard</i>		
3	All Students	10,201	44	22.62	8.00	0.89	2.69
	Economically Disadvantaged	5,245	44	19.85	7.77	0.88	2.70
	African American	900	44	20.09	7.83	0.88	2.73
	Asian	375	44	23.29	8.02	0.89	2.71
	Hispanic	2,642	44	19.59	7.93	0.88	2.72
	Multi-Race	517	44	21.28	7.64	0.88	2.69
	Native American	0					
	Pacific Islander/Hawaiian	15	44	20.60	6.98	0.86	2.65
	White	5,669	44	24.56	7.50	0.87	2.66
	Female	4,994	44	23.45	8.04	0.89	2.72
	Male	5,198	44	21.81	7.89	0.89	2.66
	ELL	1,274	44	16.38	7.25	0.86	2.71
	Special Education	1,502	44	15.00	7.03	0.86	2.62
4	All Students	10,578	44	24.84	8.48	0.88	2.92
	Economically Disadvantaged	5,363	44	21.60	8.23	0.87	2.97
	African American	898	44	21.33	8.34	0.87	2.95
	Asian	383	44	26.66	7.91	0.87	2.90
	Hispanic	2,857	44	21.44	8.51	0.88	2.98
	Multi-Race	500	44	24.22	8.31	0.87	2.94
	Native American	0					
	Pacific Islander/Hawaiian	11	44	21.91	7.60	0.84	3.03
	White	5,841	44	27.04	7.74	0.86	2.87
	Female	5,269	44	25.72	8.40	0.88	2.93
	Male	5,295	44	23.95	8.46	0.88	2.90
	ELL	1,241	44	17.45	7.64	0.85	2.98
	Special Education	1,312	44	15.28	7.23	0.85	2.84
5	All Students	10,729	48	25.26	9.71	0.91	2.95
	Economically Disadvantaged	5,382	48	21.49	9.36	0.90	2.98
	African American	950	48	21.10	9.43	0.90	3.01
	Asian	333	48	28.59	8.93	0.90	2.89
	Hispanic	2,782	48	21.46	9.61	0.90	2.99
	Multi-Race	526	48	24.19	9.98	0.91	2.98
	Native American	0					
	Pacific Islander/Hawaiian	24	48	24.42	9.33	0.90	2.96
	White	6,043	48	27.67	8.94	0.89	2.91
	Female	5,251	48	26.71	9.55	0.90	2.96
	Male	5,477	48	23.87	9.67	0.91	2.92
	ELL	836	48	13.81	7.03	0.84	2.84
	Special Education	1,492	48	14.47	7.51	0.86	2.81

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard		
6	All Students	10,458	51	23.28	10.39	0.91	3.06
	Economically Disadvantaged	5,039	51	18.80	9.50	0.90	3.02
	African American	844	51	18.63	9.35	0.90	2.99
	Asian	328	51	26.56	10.75	0.92	3.03
	Hispanic	2,728	51	18.25	9.56	0.90	3.01
	Multi-Race	428	51	21.94	10.41	0.91	3.05
	Native American	0					
	Pacific Islander/Hawaiian	16	51	21.63	12.59	0.95	2.89
	White	6,046	51	26.17	9.69	0.90	3.04
	Female	5,046	51	25.55	10.30	0.91	3.09
	Male	5,410	51	21.15	10.01	0.91	2.97
	ELL	633	51	9.89	5.41	0.77	2.60
	Special Education	1,428	51	12.63	6.94	0.84	2.76
	7	All Students	10,427	51	25.69	10.76	0.92
Economically Disadvantaged		4,873	51	20.84	9.84	0.91	3.02
African American		872	51	20.55	9.83	0.91	3.00
Asian		295	51	28.56	10.80	0.92	3.07
Hispanic		2,584	51	20.26	9.98	0.91	2.99
Multi-Race		437	51	23.86	10.74	0.92	3.02
Native American		0					
Pacific Islander/Hawaiian		16	51	19.81	7.70	0.86	2.92
White		6,133	51	28.79	9.93	0.91	3.05
Female		5,126	51	28.11	10.44	0.91	3.07
Male		5,288	51	23.33	10.54	0.92	3.01
ELL		590	51	11.53	6.49	0.83	2.71
Special Education		1,458	51	14.89	7.71	0.86	2.84
8		All Students	10,604	51	24.18	10.68	0.91
	Economically Disadvantaged	4,860	51	19.38	9.63	0.89	3.16
	African American	882	51	18.62	9.28	0.89	3.11
	Asian	334	51	26.60	10.52	0.90	3.27
	Hispanic	2,583	51	18.70	9.83	0.90	3.14
	Multi-Race	397	51	23.14	10.44	0.90	3.26
	Native American	0					
	Pacific Islander/Hawaiian	25	51	19.72	9.99	0.90	3.21
	White	6,274	51	27.26	9.94	0.89	3.29
	Female	5,150	51	26.10	10.55	0.90	3.33
	Male	5,429	51	22.36	10.48	0.91	3.18
	ELL	621	51	10.33	5.79	0.79	2.66
	Special Education	1,467	51	14.01	7.73	0.86	2.93

**Table G-2. 2018 RICAS Technical Report:
Subgroup Reliabilities—Mathematics**

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			<i>Maximum</i>	<i>Mean</i>	<i>Standard</i>		
3	All Students	10,346	48	23.44	10.55	0.92	2.98
	Economically Disadvantaged	5,330	48	19.80	9.90	0.91	2.96
	African American	912	48	19.49	10.04	0.91	2.93
	Asian	390	48	26.47	10.96	0.93	2.95
	Hispanic	2,683	48	19.81	10.00	0.91	2.95
	Multi-Race	522	48	21.42	10.09	0.91	2.99
	Native American	0					
	Pacific Islander/Hawaiian	16	48	19.44	6.99	0.79	3.21
	White	5,740	48	25.83	10.16	0.91	2.98
	Female	5,051	48	23.14	10.33	0.92	3.01
	Male	5,285	48	23.73	10.75	0.92	2.96
	ELL	1,336	48	17.11	9.30	0.90	2.89
	Special Education	1,575	48	14.12	9.10	0.91	2.79
	4	All Students	10,670	54	25.67	12.66	0.92
Economically Disadvantaged		5,418	54	21.01	11.45	0.91	3.47
African American		916	54	20.34	11.32	0.91	3.45
Asian		391	54	30.52	12.19	0.92	3.53
Hispanic		2,854	54	21.28	11.81	0.91	3.47
Multi-Race		506	54	24.49	12.17	0.92	3.54
Native American		0					
Pacific Islander/Hawaiian		13	54	16.38	9.36	0.86	3.45
White		5,903	54	28.51	12.39	0.92	3.56
Female		5,297	54	25.28	12.12	0.91	3.55
Male		5,359	54	26.06	13.17	0.93	3.56
ELL		1,270	54	17.22	10.59	0.90	3.29
Special Education		1,383	54	13.34	9.48	0.89	3.08
5		All Students	10,861	54	22.80	11.73	0.92
	Economically Disadvantaged	5,471	54	18.45	10.25	0.90	3.20
	African American	983	54	17.82	10.29	0.91	3.15
	Asian	339	54	28.39	12.26	0.92	3.46
	Hispanic	2,820	54	18.55	10.37	0.90	3.22
	Multi-race	533	54	22.00	12.19	0.92	3.38
	Native American	0					
	Pacific Islander/Hawaiian	25	54	21.12	10.13	0.90	3.16
	White	6,089	54	25.45	11.56	0.91	3.42
	Female	5,299	54	23.03	11.31	0.91	3.35
	Male	5,562	54	22.57	12.11	0.92	3.36
	ELL	894	54	11.88	7.01	0.84	2.83
	Special Education	1,585	54	11.63	7.17	0.84	2.83

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard		
6	All Students	10,614	54	21.59	11.65	0.92	3.21
	Economically Disadvantaged	5,132	54	16.66	9.82	0.91	3.00
	African American	864	54	16.29	9.87	0.91	2.97
	Asian	334	54	27.26	12.55	0.93	3.39
	Hispanic	2,770	54	16.31	9.94	0.91	3.00
	Multi-Race	438	54	20.02	11.59	0.93	3.15
	Native American	0					
	Pacific Islander/Hawaiian	15	54	21.27	11.82	0.92	3.24
	White	6,128	54	24.60	11.37	0.92	3.26
	Female	5,128	54	22.20	11.34	0.92	3.22
	Male	5,484	54	21.02	11.91	0.93	3.19
	ELL	688	54	8.99	6.56	0.86	2.46
	Special Education	1,512	54	10.30	7.07	0.87	2.58
	7	All Students	10,573	54	18.32	11.55	0.92
Economically Disadvantaged		4,970	54	13.22	9.04	0.89	3.03
African American		898	54	12.42	8.90	0.89	2.97
Asian		302	54	22.19	13.12	0.93	3.45
Hispanic		2,641	54	12.85	9.22	0.89	3.00
Multi-Race		444	54	16.31	10.90	0.91	3.26
Native American		0					
Pacific Islander/Hawaiian		16	54	14.94	11.04	0.93	2.91
White		6,181	54	21.56	11.49	0.91	3.46
Female		5,193	54	18.36	11.37	0.91	3.36
Male		5,368	54	18.28	11.73	0.92	3.32
ELL		653	54	7.32	5.83	0.83	2.40
Special Education		1,539	54	8.45	6.16	0.83	2.53
8		All Students	10,731	54	22.49	10.84	0.90
	Economically Disadvantaged	4,937	54	17.69	8.66	0.85	3.31
	African American	911	54	17.03	8.65	0.86	3.25
	Asian	336	54	26.41	11.74	0.91	3.56
	Hispanic	2,607	54	17.28	8.80	0.86	3.29
	Multi-Race	401	54	20.90	10.34	0.89	3.47
	Native American	0					
	Pacific Islander/Hawaiian	25	54	20.36	8.17	0.82	3.51
	White	6,346	54	25.38	10.74	0.89	3.54
	Female	5,186	54	23.06	10.58	0.89	3.52
	Male	5,520	54	21.93	11.04	0.90	3.48
	ELL	656	54	11.74	5.53	0.73	2.87
	Special Education	1,551	54	13.15	6.52	0.79	2.95

**Table G-3. 2018 RICAS Technical Report: Reliabilities
by Reporting Subcategory by Grade—ELA**

Grade	Item Reporting Category	Number of Items	Raw Score			Alpha	SEM
			<i>Maximum</i>	<i>Mean</i>	<i>Standard Deviation</i>		
3	1	19	12	17.10	5.40	0.83	2.22
	2	2	12	1.56	1.42	0.62	0.88
	3	5	12	3.96	1.95	0.65	1.15
4	1	19	14	16.92	5.16	0.81	2.25
	2	2	14	2.56	1.68	0.64	1.01
	3	5	14	5.35	2.48	0.67	1.42
5	1	17	13	14.07	5.00	0.82	2.14
	2	3	13	3.69	2.30	0.75	1.15
	3	7	13	7.50	3.29	0.79	1.49
6	1	19	25	15.24	5.84	0.84	2.31
	2	3	15	3.40	2.58	0.82	1.10
	3	5	11	4.63	2.80	0.75	1.39
7	1	18	13	15.08	5.23	0.84	2.10
	2	3	13	3.94	2.86	0.84	1.13
	3	6	13	6.66	3.50	0.80	1.56
8	1	19	11	14.57	5.26	0.81	2.32
	2	3	11	4.30	3.15	0.84	1.26
	3	5	11	5.31	3.14	0.78	1.48

**Table G-4. 2018 RICAS Technical Report: Reliabilities
by Reporting Subcategory by Grade—Mathematics**

Grade	Item Reporting Category	Number of Items	Raw Score			Alpha	SEM
			<i>Maximum</i>	<i>Mean</i>	<i>Standard Deviation</i>		
3	1	4	15	1.95	0.94	0.29	0.79
	2	10	15	5.31	2.52	0.68	1.44
	3	6	15	4.39	2.45	0.74	1.24
	4	7	15	4.42	2.38	0.69	1.32
	5	13	15	7.37	3.92	0.82	1.65
4	1	5	11	1.77	1.39	0.60	0.88
	2	8	11	5.58	2.90	0.62	1.79
	3	7	11	4.43	2.67	0.71	1.45
	4	13	11	8.29	4.70	0.82	1.98
	5	7	11	5.60	2.87	0.69	1.61
5	1	5	8	2.65	1.57	0.48	1.13
	2	8	8	3.76	2.74	0.71	1.47
	3	12	8	7.40	4.12	0.80	1.82
	4	10	8	4.88	3.12	0.74	1.59
	5	5	8	4.10	1.97	0.49	1.41
6	1	12	11	4.87	3.61	0.82	1.53
	2	7	11	3.01	1.77	0.61	1.10
	3	8	11	5.17	2.98	0.72	1.57
	4	5	11	2.43	1.74	0.47	1.26
	5	8	11	6.11	3.15	0.74	1.62
7	1	9	11	4.22	3.22	0.72	1.70
	2	8	11	2.33	1.66	0.46	1.22
	3	7	11	3.80	2.73	0.71	1.48
	4	8	11	3.32	2.59	0.65	1.54
	5	8	11	4.64	3.01	0.77	1.46
8	1	18	6	8.62	4.48	0.79	2.05
	2	8	6	5.33	2.49	0.57	1.63
	3	11	6	6.18	3.30	0.67	1.88
	4	3	6	2.36	1.93	0.49	1.38

**Table G-5. 2018 RICAS Technical Report: Reporting Categories
by Content Area—Mathematics**

Grade	Item Reporting Category	Label
3	1	Geometry
	2	Measurement & Data
	3	Number & Operations in Base Ten
	4	Number & Operations-Fractions
	5	Operations & Algebraic Thinking
4	1	Geometry
	2	Measurement & Data
	3	Number & Operations in Base Ten
	4	Number & Operations-Fractions
	5	Operations & Algebraic Thinking
5	1	Geometry
	2	Measurement & Data
	3	Number & Operations in Base Ten
	4	Number & Operations-Fractions
	5	Operations & Algebraic Thinking
6	1	Expressions and Equations
	2	Geometry
	3	Ratios and Proportional Relationships
	4	Statistics and Probability
	5	The Number System
7	1	Expressions and Equations
	2	Geometry
	3	Ratios and Proportional Relationships
	4	Statistics and Probability
	5	The Number System
8	1	Number System & Expressions/Equations
	2	Functions
	3	Geometry
	4	Statistics and Probability

Table G-6. 2018 RICAS Technical Report: Reporting Categories by Content Area—ELA

Grade	Item Reporting Category	Label
3	1	Reading
	2	Writing
	3	Language
4	1	Reading
	2	Writing
	3	Language
5	1	Reading
	2	Writing
	3	Language
6	1	Reading
	2	Writing
	3	Language
7	1	Reading
	2	Writing
	3	Language
8	1	Reading
	2	Writing
	3	Language