Iowa Assessments

Mathematics and Reading Alignment Study Report

Grades 3 – 8, 10 and 11

For Release October 2013

DATA RECOGNITION

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Overview

The alignment studies for the Iowa Assessments for grades 3–8, 10 and 11 mathematics and reading were held on March 27−28, 2013, in Des Moines, Iowa. The purpose of each alignment study was to determine the degree of alignment between the Iowa Core Standards for each grade and the test items found on the corresponding grade-level Iowa Assessment. It should be noted that the Iowa Core Standards used for the alignment process were not the standards used to develop the Iowa Assessments. The Iowa Department of Education provided the Iowa Core Standards to be used for the study. Each alignment study involved a group of independent third-party reviewers whose role was to judge the depth-of-knowledge level of each standard, reach consensus, and then independently judge the depth-of-knowledge level of each test item, including identifying the primary and possibly a secondary standard to which each item was aligned.

This report consists of a description of the independent reviewers and the alignment model that was used, including the process and the four criteria used to judge the alignment between the standards and the test items found on the corresponding assessment. This report also includes summary tables showing the results from each grade-level study. According to the reviewers as well as the qualitative and quantitative data all assessments are in need of at least slight to major improvements. Overall, the alignment relationships for the mathematics and reading studies demonstrate that the Iowa Assessments are not well-aligned to the respective Iowa Core Standards.

Alignment Study Participants

Each committee had reviewers who were Iowa educators with extensive teaching experience and expertise in mathematics or reading, and reviewers who were national content experts. Each national content expert had expertise in mathematics or reading and experience in standards development, curriculum and instruction development, test development, and alignment studies. In addition to serving as a reviewer, one national content expert in each group also served as a group leader. The list of reviewers is provided on the following page, and a brief summary of each national expert's professional qualifications is provided in Appendix F.

In addition to the alignment study reviewers, a national alignment study expert, Dr. Carsten Wilmes of the World-Class Instructional Design and Assessment (WIDA) Consortium, also participated in the study. Dr. Wilmes is a well-known alignment expert who has broad experience in conducting alignment studies using the Webb model. Over the years he has worked closely with Dr. Norman Webb, who is affiliated with WIDA's host institution, the Wisconsin Center for Education Research (WCER). The national alignment study expert's role was to oversee the entire alignment process, ensuring that the process was followed correctly. The national alignment study expert also provided reviewers with alignment training. The training included information related to understanding Webb's depth-of-knowledge levels. The training also provided information designed to help reviewers understand the alignment process. Dr. Wilmes's professional qualifications are also provided in Appendix F.

List of Participants

Trainer/Facilitator
Carsten Wilmes, PhD

Mathematics—Grades 3–6

State of Iowa Reviewers
Ann Jorgensen
Bonnie Spaight
Shane Kalous

National Experts
Rachelle Rogers PhD (Group Facilitator)
Angela Hochstetter
Linda Bridges
Linda McQuillen

Mathematics—Grades 7–High School

State of Iowa Reviewers
Jennifer Stephens
Kim Jones
Kurtis Broeg
Shannon Buckley

National Experts
Leo Edwards, EdD (Group Facilitator)
Eric Jenson
John Selisky PhD
Tom Muchlinski PhD

Reading—Grades 3–6

State of Iowa Reviewers
Courtney Stephenson
Heidi Bogers
Patty Ryan

National Experts
Jacquelyn Graham PhD (Group Facilitator)
Mary Basch
Roxanne Semon
Sandy Starr

Reading—Grades 7–High School

State of Iowa Reviewers
Kathy Blazek
Laurie Kolstead

National Experts
Margaret Weldon PhD (Group Facilitator)
Bobbie Reiten
Carole Wicklander
Cindy Jacobson

Alignment Study: Approach and Process

The Iowa alignment studies were based on the work of Dr. Norman Webb, Wisconsin Center for Educational Research, University of Wisconsin–Madison. In his work, Webb states that the alignment of the standards or objectives for student learning with tests for measuring students' attainment of these expectations is an essential component for an effective standards-based education system. The Iowa alignment studies were designed to model Webb's procedures, including the use of depth-of-knowledge (DOK) levels and Webb's definition of alignment (Webb, 2002).

Webb's alignment model is based on four criteria, as follows:

- *Categorical concurrence*—a general indication of how well the test includes items that measure content from each standard.

- *Depth-of-knowledge consistency*—an indication of whether the cognitive demands required of the students on the test are consistent with what students are expected to know and do as stated in the standards.

- *Range-of-knowledge correspondence*—an indication of whether the extent of knowledge expected of students by a strand is the same as the extent of knowledge required of students to answer the test items correctly.

- *Balance of representation*—the degree to which one objective in a standard is given more emphasis on the test than another objective within the same strand. An index (Webb, 2002) is used to judge the distribution of the test items.

The Webb model provides a reliable set of procedures and criteria for conducting alignment analysis studies. The model combines qualitative expert reviewers' judgments and quantified coding and analysis of standards and test items. This final alignment study report includes a set of statistics for each standard and grade on the degree of alignment between the content embedded in the standards and objectives for a given grade and the content in the items on the corresponding assessment.

The Webb model has been used extensively in many alignment studies throughout the country and has been recommended for use by the Chief Council of State School Officers (CCSSO). The alignment criteria in the Webb model also adhere to the guidelines specified in the United States Department of Education's Standards and Tests Peer Review documents are in compliance with the requirements specified by the No Child Left Behind (NCLB) legislation. A brief description of the alignment criteria is provided below, and detailed information can be found in the section of this report titled Alignment Criteria.

Overview of the Alignment Study Process

Reviewers were asked to determine the degree of alignment between the standards (what students should know and be able to do) for each grade and the test questions found on the corresponding mathematics and reading Iowa Assessments. In order to accomplish this task, the alignment study process involved four major steps:

- Training
- Assigning DOK levels to standards
- Taking each test
- Determining what each item measures and identifying the DOK

The alignment study process also used an electronic template to collect the judgments of the reviewers. The electronic template was designed specifically to facilitate the gathering of independent reviewers' judgments. For the Iowa alignment studies, the template automated the process of aligning the content standards for a given grade and the test items on the corresponding assessment. The template made it possible to gauge in a timely manner the alignment between the standards and the test on the basis of the criteria. In addition, the template allowed reviewers to provide additional information regarding items, including comments related to source of challenge. The item-by-standard reviewer codings were then aggregated and analyzed.

The national alignment expert, Dr. Carsten Wilmes, provided training on the overall alignment process and the depth-of-knowledge levels and served as the lead facilitator. Dr. Wilmes has extensive experience training third-party independent review committee members in the use of the template. The training provided information not only on understanding the depth-of-knowledge levels but also on how to use the template when assigning a depth-of-knowledge level to each standard and item.

Steps in the Alignment Process

Step 1: Receiving training

Reviewers received training on Webb's depth-of-knowledge levels, the alignment process, and the use of the electronic template. The training was provided by the national alignment expert, Dr. Carsten Wilmes.

Step 2: Dividing into grade-level groups

Reviewers were divided into groups according to grade level (grades 3–6 and grades 7–11). Reviewers received additional training on the use of the electronic template and the depth-of-knowledge levels.

Step 3: Determining the depth-of-knowledge level of each standard

Using the electronic template, reviewers individually determined the depth of knowledge of each of the standards. A group discussion followed, and reviewers reached consensus. (See Appendix B.)

Step 4: Taking the test

Reviewers took the assessment and recorded their answers in the answer booklet. Reviewers noted any source-of-challenge comments or notes about the test items directly in the test booklet.

Step 5: Determining what each item measured and the depth-of-knowledge level of each item

Using the electronic template, reviewers independently determined what each item measured. Reviewers also entered the depth-of-knowledge level for each item. (Note: If reviewers determined that a given item aligned to more than one standard on or off grade, the electronic template provided them with the opportunity to align each test item with an on or off-grade primary standard and a secondary standard. However, the electronic template did not allow reviewers to determine more than one depth-of-knowledge level for a given item.)

Throughout the alignment process, reviewers also independently noted any source of challenge for each test item and provided written comments, as necessary.

Step 6: Answering debriefing questions

Using the electronic template, reviewers independently responded to debriefing questions.

Step 7: Participating in a group discussion

A final group discussion took place. Reviewers shared feedback about the process and/or any other information they wished to share with the group, the alignment experts, or the Iowa Department of Education (IDE).

Alignment Criteria

Reviewers assessed specific criteria related to the content agreement between the Iowa content standards and test questions. The four criteria receiving major attention were categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, and balance of representation. For each alignment criterion, an acceptable level was defined by what would be required to ensure that a student had met the standards.

Categorical Concurrence

According to Webb (2002), an important aspect of alignment between each standard and the test is whether both address the same content categories. The categorical concurrence criterion provides a general indication of alignment if the standards and the test incorporate the same content. For these alignment studies, this criterion was judged by first allowing reviewers to make a determination as to whether the test as a whole included questions measuring content from each of the standards. The reviewers used their professional opinions, as well as the Webb guiding principle, to determine that a minimum of six questions measuring content from each standard is a good indicator of categorical concurrence between the standard and the test (Webb, 2002, p. 7).

Using Webb's model, the number of questions used to determine categorical concurrence, six for this study, is based on estimating the number of questions that could produce a reasonably reliable subscale for estimating students' mastery of content on that subscale. Of course, many factors have to be considered in determining a reasonable number, including the reliability of the subscale, the mean score, and the cutoff score for determining mastery. Using a procedure developed by Subkoviak (1988), and assuming that the cutoff score is the mean and that the reliability of one item is 0.1, it was estimated that six questions would produce an agreement coefficient of at least 0.63. This indicates that about 63% of the group would be consistently classified as either masters or non-masters if two equivalent test administrations were employed. The agreement coefficient would increase if the cutoff score were increased to one standard deviation from the mean to 0.77 and, with a cutoff score of 1.5 standard deviations from the mean, to 0.88.

For the Iowa alignment studies, the criterion was judged by first allowing reviewers to align the items to the standards. Six questions were assumed as a minimum for a test measuring content knowledge related to a standard and as a basis for making some decisions about students' knowledge of that standard. If the mean for six questions is three and one standard deviation is one question, then a cutoff score set at four would produce an agreement coefficient of 0.77. Any fewer questions with a mean of one-half of the questions would require a cutoff that would allow a student to miss only one question. This would be a very stringent requirement, considering a reasonable standard error of measurement on the subscale. (See Appendix C.)

Depth-of-Knowledge Consistency

For the purpose of this study, Webb's definition of depth-of-knowledge consistency was used. According to Webb (2002), depth-of-knowledge consistency between content standards and test items indicates alignment if what is elicited from students on the test is as demanding cognitively as what students are expected to know and do as stated in the content standards. Therefore, for consistency to exist between the test items and the standards, each item should be coded the same depth-of-knowledge level as the standard or one level above the depth-of-knowledge level of the standard. According to the Webb model, as a measure of consistency, at least 50% of the items corresponding to a standard should be at or above the depth-of-knowledge level of the standard. For depth-of-knowledge consistency, this criterion was judged by first allowing reviewers to align the items to the standards. (See Appendix C.)

The Iowa definitions for the depth-of-knowledge levels, which are based on the Webb definitions, were used for this alignment study. The levels are as follows: **Level 1** (Recall and Reproduction), **Level 2** (Skills and Concepts), and **Level 3** (Strategic and Extended Thinking). Additional information concerning the levels can be found in Appendix A.

Range-of-Knowledge Correspondence

For standards and the test questions to be aligned, the breadth of knowledge required on both must be comparable. The range-of-knowledge criterion is used to judge whether the span of knowledge expected of students by a standard is the same as, or corresponds to, the span of knowledge that students need in order to correctly answer the test questions associated with that standard. For an acceptable range of knowledge, at least 50% of the standards must have at least one related test question. The range-of-knowledge correspondence criterion was judged by first allowing reviewers to align the items to the standards. (See Appendix C.)

Balance of Representation

The balance of representation is met if the emphasis of content and performance supplied by the questions (primary, secondary, or both) corresponds to the standards for the test as a whole. Reviewers determined whether the test questions were distributed among the standards that were assessed. (See Appendix C.)

The balance-of-representation criterion is used to indicate the degree to which one standard is given more emphasis on the test than another. An index is used to judge the distribution of the test questions. This index only considers the objective for a standard that has at least one related assessment item. The index in this study was computed by considering the difference in the proportion of standards and the proportion of hits (questions corresponding to eligible content) assigned to the standards. An index value of one signifies perfect balance and is obtained if the hits are equally distributed among the content standards. Index values that approach zero signify that a large proportion of the hits are on only one or two of all of the content standards. Depending on the number of content standards and the number of hits, a unimodal distribution has an index value of less than 0.5. A bimodal distribution has an index value of around 0.55 or 0.6. Index values of 0.7 or higher indicate that questions are distributed among all of the content standards, at least to some degree. Index values between 0.6 and 0.7 indicate the balance-of-representation criterion has only "moderately" been met. The balance-of-representation criterion was judged by first allowing reviewers to align the items to the standards.

A summary of Webb's alignment criteria can be found in Table 1.

Table 1: Alignment Levels for the Four Criteria

Alignment Level	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence	Balance of Representation
Yes	mean is 6 or more	50%	50%	.70
Weak	mean is 5 to 5.9	40%–49%	40%–49%	.60–.69
No	mean is less than 5	less than 40%	less than 40%	less than .60

The results for each of the four criteria discussed in this section were calculated using Webb's methodology, reviewers' averaged ratings, and reviewers' comments. The results for categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, and balance of representation are found in Appendix C.

Source of Challenge

The purpose of each alignment study was to determine the degree of alignment among the content standards for each grade and the test items found on the corresponding grade-level mathematics and reading Iowa assessments. In addition, the electronic template provided opportunities for reviewers to offer comments and/or feedback on how the test questions were written. Reviewers were also encouraged to note whether there was a source-of-challenge issue with a particular test question or questions. A source-of-challenge issue might include a reviewer's opinion that a particular question contained misleading information or that a particular question might require prior knowledge. All comments about the items and/or source-of-challenge issues were submitted to the Iowa Department of Education (IDE) for review and subsequent action, if required.

The source-of-challenge comments are not provided in this report. The final results of this alignment study reflect only the agreement between the standards and the corresponding mathematics and reading assessments. In other words, the purpose of the alignment study was not to provide an opinion or to verify the general quality of the standards and objectives or the test. Rather, the purpose of the study was to determine the degree of alignment.

Summary of Mathematics Results

Depth-of-Knowledge Consensus

After training, the first step in the mathematics alignment process was to determine the depth-of-knowledge levels of the standards. Table 2 summarizes the reviewers' consensus on the depth-of-knowledge levels of the Iowa Core Standards by grade for mathematics. Appendix B provides the depth-of-knowledge consensus values for each standard as determined by the reviewers.

Table 2: Mathematics Depth-of-Knowledge Consensus

Grade	Number of Standards per Grade	Depth-of-Knowledge Level	Number of Standards by Depth-of-Knowledge Level and Percentage	
			Number	Percentage
3	25	1 2 3	14 11 0	56 44 0
4	28	1 2 3	14 14 0	50 50 0
5	26	1 2 3	11 15 0	42 58 0
6	29	1 2 3	19 10 0	66 34 0
7	24	1 2 3	4 16 4	17 67 17
8	28	1 2 3	4 23 1	14 82 4
10	68	1 2 3	11 51 6	16 75 9
11	44	1 2 3	7 30 7	16 68 16

Mathematics Alignment Results

Using the electronic template, reviewers independently determined what each mathematics item measured. They also entered the depth-of-knowledge level for each item. The statistical data is used to determine whether each mathematics assessment as a whole at a given grade level included items measuring content from each of the standards. The tool also provided the statistical data to determine categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, and balance of representation.

A high-level summary alignment analysis for categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, and balance of representation is provided in Table 3. The results of the alignment relationship between the standards for mathematics and the corresponding mathematics assessment for grades 3-11 is noted in Table 3. Detailed information can be found in Appendix C and Appendix D.

Table 3: Summary of Mathematics Alignment

Grade	Domain	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence	Balance of Representation
3	OA	Yes	Yes	Weak	Yes
	NBT	No	Yes	No	Yes
	NF	No	Yes	Weak	Yes
	MD	Yes	Yes	Yes	Weak
	G	No	Yes	No	Yes
4	OA	Weak	Yes	Yes	Yes
	NBT	No	Yes	Weak	Yes
	NF	No	Yes	No	Yes
	MD	Yes	Yes	Weak	Yes
	G	No	Yes	Weak	Yes
5	OA	No	Yes	Yes	Yes
	NBT	No	Yes	No	Yes
	NF	No	Yes	No	Yes
	MD	No	Yes	No	Yes
	G	No	Yes	No	Yes
6	RP	No	Yes	Weak	Yes
	NS	No	Yes	Weak	Yes
	EE	Weak	Yes	No	Yes
	G	No	Yes	Yes	Yes
	SP	No	Yes	No	Yes
7	RP	Weak	Yes	Yes	Yes
	NS	Yes	Yes	Yes	Yes
	EE	No	Yes	Yes	Yes
	G	Yes	Yes	Weak	Yes
	SP	Weak	Yes	No	Yes
8	NS	No	Yes	No	Yes
	EE	Weak	Yes	No	Yes
	F	No	Yes	No	Yes
	G	No	Yes	No	Yes
	SP	No	Yes	No	Yes
10	N	Weak	Yes	No	Yes
	A	No	Yes	No	Yes
	F	No	Yes	No	Yes
	G	No	Yes	No	Yes
	S	No	Yes	No	Yes
11	N	No	Yes	No	Yes
	A	No	Yes	No	Yes
	F	No	Yes	No	Yes
	G	No	Yes	No	Yes
	S	No	Yes	No	Yes

Note: See Domain Translation Table on page 76.

Item-to-Standard Alignment Summary

The reviewers were instructed to align the mathematics items first to the on-grade mathematics standards. If they did not find an on-grade standard to align an item, they were to review the standards below and above grade level until they found a standard to align the item. When reviewers were unable to find a standard to align an item, they were to indicate NA in the template. The number and percentage of items aligned to on-and off-grade standards are summarized below in Table 4.

Table 4: Number and Percentage of Mathematics Items Aligned to Standards On and Off Grade

Mathematics	Number of Total Items	Number of Items Aligned On Grade	Percentage of Items Aligned On Grade	Number of Items Aligned Off Grade	Percentage of Items Aligned Off Grade
3	50	19	38	31	62
4	55	18	33	37	67
5	60	3	5	57	95
6	65	18	28	47	72
7	70	17	24	53	76
8	75	4	5	71	95
10	40	11	28	29	73
11	40	2	5	38	95

The number and percentage of mathematics standards to which items were and were not aligned on grade is provided in Table 5.

Table 5: Number and Percentage of Mathematics Standards to Which Items Were and Were Not Aligned On Grade

Mathematics	Total Number of Standards	Number of Standards to Which Items Were Aligned On Grade	Percentage of Standards to Which Items Were Aligned On Grade	Number of Standards to Which Items Were Not Aligned On Grade	Percentage of Standards to Which Items Were Not Aligned On Grade
3	25	20	80	5	20
4	28	21	75	7	25
5	26	15	58	11	42
6	29	27	93	2	7
7	24	23	96	1	4
8	28	19	68	9	32
10	68	31	46	37	54
11	44	17	39	27	61

The number of mathematics items not aligned to a standard is provided in Table 6.

Table 6: Number of Mathematics Items Not Aligned to a Standard

Mathematics	Grade	Item Number
	3	7
	3	26
	3	32
	4	2
	4	8
	5	31
	6	2
	6	41
	7	0
	8	0
	10	0
	11	0
Total Items		***8**

***Note: Grade 4, items 2 and 8, as well as grade 6 item 2 are duplicate items. These items were pulled forward from the previous grade. A total of 5 "unique" items were not aligned to a standard.**

Interpretation of Mathematics Alignment Results

Reviewers were asked to align the assessment items to the Iowa Common Core. As previously mentioned in the Overview, the standards of the Iowa Common Core were not the standards used to develop the test but were used in this study as requested by the Iowa Department of Education. Using standards that were not used to develop the items could affect the results of the alignment criteria. There could be variability in assigning the same standard to an item by the reviewers. This could be a result of asking the reviewers to align items to standards that the assessment was not originally intended to measure and to continue the process until the reviewers found an alignment in one or more grades below the original grade.

Categorical Concurrence: According to Webb (2002), an important aspect of alignment between each standard and the test is whether both address the same content categories. The categorical concurrence criterion provides a general indication of alignment if the standards and the test incorporate the same content when there are six items per domain. This criterion indicates whether there is a link between the standards and the assessment items on the assessment.

Categorical concurrence was infrequently met in the domains. This indicates that in most of the grades there are not enough on-grade items within the domain. IDE will discuss with the test developer to incorporate more on-grade items per domain especially in grades 5, 6, 8, 10, and 11.

Depth-of-Knowledge Consistency: As stated earlier in this report, depth-of-knowledge consistency between standards and test items indicates alignment if what is elicited from students on the test is as demanding cognitively as what students are expected to know and do as stated in the standards. Therefore, for consistency to exist between the test items and the standards, each item should be coded the same depth-of-knowledge level as the standard or one level above the depth-of-knowledge level of the standard. According to the Webb model, as a measure of consistency, at least 50% of the items must be at or above the depth-of-knowledge level of the corresponding standard. For this study, the already established depth-of-knowledge judgments from the WestEd report *Smarter Balanced Assessment Consortium Common Core State Standards Analysis: Eligible Content for the Summative Assessment* were used to determine if there was consistency between the DOK of the items and the standards. The DOK consensus of the standards derived during this study is provided in Appendix B.

As noted in Table 1, 0.5 is an acceptable value for depth-of-knowledge consistency. Since all domains are "at" or "above" 0.5 for grades 3–8 and 10 & 11, the items are at an acceptable level of depth-of-knowledge when compared to the depth-of-knowledge of the standards.

Range-of-Knowledge Correspondence: According to Webb's model, for standards and items on a given test to be aligned, the breadth of knowledge required on both should be comparable. This is called range-of-knowledge correspondence. The range-of-knowledge criterion is used to judge whether a comparable span of knowledge expected of students by a standard is the same as, or corresponds to, the span of knowledge that students need in order to correctly answer the items on the test. For an acceptable range-of-knowledge correspondence, according to Webb's model, at least 50% of standards within a given domain should have at least one item aligned to them.

The range-of-knowledge correspondence was generally not acceptable for the domains of grades 3, 4, 5, 6, 8, 10, and 11. The distribution of the on-grade items among the standards within most of the domains needs to be improved for grades 8, 10, and 11. The distribution of items among the standards for all of the domains for grades 8, 10, and 11 is well below the accepted criteria of 50%. IDE will discuss with the test developer the distribution of items among the standards within the domains, and will recommend more on-grade items be added to ensure a better distribution among the standards within a domain.

Balance of Representation: As stated earlier in this report, balance of representation is the degree to which one standard in a domain is given more emphasis on the test than another standard within the same reporting category. An index is used to judge the distribution of the test items. In addition, the debriefing comments were taken into consideration to judge whether the assessment items and the assessment as a whole is balanced.

The balance-of-representation index was above 0.7 for all grades, except grade 3 Measurement and Data, which indicates that the items are distributed well among the standards within each domain. For grade 3 Measurement and

Data standards, the balance of representation criteria was determined to be "Weak." This indicates that there are sufficient items assessing that domain but not enough to be considered "Yes."

Item-to-Standard Alignment: The item-to-standard alignment was determined by identifying the items where a majority of the reviewers selected a standard for that grade which they believed the item aligned. All grades had less than 40% of the items aligned to on-grade standards. All grades had more the 60% of the items aligned to off-grade standards. IDE will discuss with the test developer the need to increase the number of on-grade items for all grades. In addition, the number of standards that reviewers aligned items to was good for all grades except for grades 5, 8, 10 and 11. For those grades, less than 75 % of the standards had items aligned to them. Reviewers were not able to align a total of eight items, or five unique items, to a standard. IDE will discuss with the test developer the need to develop items that are aligned to more of the mathematics standards in grades 10 and 11.

Summary of Reading Results

Depth-of-Knowledge Consensus

After training, the first step in the reading alignment process was to determine the depth-of-knowledge levels of the standards. Table 7 summarizes the reviewers' consensus on the depth-of-knowledge levels of the Iowa Core Standards by grade for reading. Appendix B provides the depth-of-knowledge consensus values for each standard as determined by the reviewers.

Table 7: Reading Depth-of-Knowledge Consensus

Grade	Number of Standards per Grade	Depth-of-Knowledge Level	Number of Standards by Depth-of-Knowledge Level and Percentage	
			Number	Percentage
3	19	1	3	16
		2	11	58
		3	5	26
4	19	1	0	0
		2	12	63
		3	7	37
5	19	1	0	0
		2	13	68
		3	6	32
6	19	1	0	0
		2	16	84
		3	3	16
7	19	1	0	0
		2	11	58
		3	8	42
8	19	1	0	0
		2	10	53
		3	9	47
10	19	1	0	0
		2	9	47
		3	10	53
11	19	1	0	0
		2	7	37
		3	12	63

Reading Alignment Results

Using the electronic template, reviewers independently determined what each reading item measured. They also entered the depth-of-knowledge level for each item. The statistical data is used to determine whether each reading assessment as a whole at a given grade level included items measuring content from each of the standards. The tool also provided the statistical data to determine categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, and balance of representation.

A high-level summary alignment analysis for categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, and balance of representation is provided in Table 8. The results of the alignment relationship between the standards for reading and the corresponding reading assessment for reading grades 3-11 is noted in Table 8. Detailed information can be found in Appendix C and Appendix D.

Table 8: Summary of Reading Alignment

Grade	Domain	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence	Balance of Representation
3	RL RI	Yes Yes	Yes Yes	Yes Yes	Yes Weak
4	RL RI	Yes Yes	Yes Yes	Weak No	Yes Yes
5	RL RI	Yes Yes	Yes Yes	Yes No	Yes Yes
6	RL RI	Weak Yes	Yes Yes	No Yes	Yes Yes
7	RL RI	Yes Yes	Yes Yes	Weak Yes	Yes Weak
8	RL RI	Weak Yes	Yes Yes	No Yes	Yes Weak
10	RL RI	Yes Yes	Yes Yes	Yes Yes	Yes Yes
11	RL RI	Yes Yes	Yes Yes	Weak Yes	Yes Yes

Note: The results reflect the change of domain per the discussion with the Iowa Department of Education. See Domain Translation Table on page 93.

Item-to-Standard Reading Alignment Summary

The reviewers were instructed to align items first to the on-grade reading standards. If they did not find an on-grade standard to align an item, they were to review the standards below and above grade level until they found a standard to align the item. When reviewers were unable to find a standard to align an item, they were to indicate NA in the template. The number and percentage of items aligned to on-and off-grade standards are summarized below in Table 9.

Table 9: Number and Percentage of Reading Items Aligned to Standards On and Off Grade

Reading	Number of Total Items	Number of Items Aligned On Grade	Percentage of Items Aligned On Grade	Number of Items Aligned Off Grade	Percentage of Items Aligned Off Grade
3	41	41	100	0	0
4	42	19	45	23	55
5	43	20	47	23	53
6	44	22	50	22	50
7	45	45	100	0	0
8	46	22	48	24	52
9-10	40	38	95	2	5
11-12	40	21	53	19	48

The number and percentage of reading standards to which items were and were not aligned on grade is provided in Table 10.

Table 10: Number and Percentage of Reading Standards to Which Items Were and Were Not Aligned On Grade

Reading	Total Number of Standards	Number of Standards to Which Items Were Aligned On Grade	Percentage of Standards to Which Items Were Aligned On Grade	Number of Standards to Which Items Were Not Aligned On Grade	Percentage of Standards to Which Items Were Not Aligned On Grade
3	19	16	84	3	16
4	19	14	74	5	26
5	19	16	84	3	16
6	19	15	79	4	21
7	19	12	63	7	37
8	19	13	68	6	32
9-10	19	14	74	5	26
11-12	19	13	68	6	32

The number of reading items not aligned to a standard is provided in Table 11.

Table 11: Number of Reading Items Not Aligned to a Standard

Reading	Grades	Item Number
	3-12	0
Total Items		0

Interpretation of Reading Alignment Results

Reviewers were asked to align the assessment items to the Iowa Common Core. As previously mentioned in the Overview, the standards of the Iowa Common Core were not the standards used to develop the test but were used in this study as requested by the Iowa Department of Education. Using standards that were not used to develop the items could affect the results of the alignment criteria. There could be variability in assigning the same standard to an item by the reviewers. This could be a result of asking the reviewers to align items to standards that the assessment was not originally intended to measure and to continue the process until the reviewers found an alignment in one or more grades below the original grade.

Categorical Concurrence: According to Webb (2002), an important aspect of alignment between each standard and the test is whether both address the same content categories. The categorical concurrence criterion provides a general indication of alignment if the standards and the test incorporate the same content when there are six items per domain. This criterion indicates whether there is a link between the standards and the assessment items on the assessment.

As indicated in Table 8, Categorical Concurrence is met for all domains, in all grades, except grades 6 and 8 domain RL. It is weakly met according Webb's definition. This indicates that for all grades and domains, except grades 6 and 8 RL, there are enough items to indicate alignment for all the grades and domains and that the test incorporates the same content as the standards. IDE will discuss with the test developer to incorporate more on-grade items for grades 6 and 8 RL.

Depth-of-Knowledge Consistency: As stated earlier in this report, depth-of-knowledge consistency between standards and test items indicates alignment if what is elicited from students on the test is as demanding cognitively as what students are expected to know and do as stated in the standards. Therefore, for consistency to exist between the test items and the standards, each item should be coded the same depth-of-knowledge level as the standard or one level above the depth-of-knowledge level of the standard. According to the Webb model, as a measure of consistency, at least 50% of the items must be at or above the depth-of-knowledge level of the corresponding objective. For this study the already established depth-of-knowledge judgments from the WestEd report *Smarter Balanced Assessment Consortium Common Core State Standards Analysis: Eligible Content for the Summative Assessment* were used to determine if there was consistency between the DOK of the items and the standards. The DOK consensus of the standards derived during this study is provided in Appendix B.

As noted in Table 1, an acceptable depth-of-knowledge consistency of 0.5 is acceptable. Since all domains are "at" or "above" 0.5 for grades 3–8 and 10 & 11, the items are at an acceptable level of depth-of-knowledge when compared to the depth-of-knowledge of the standards.

Range-of-Knowledge Correspondence: According to Webb's model, for standards and items on a given test to be aligned, the breadth required on both should be comparable. This is called range-of-knowledge correspondence. The range-of-knowledge criterion is used to judge whether a comparable span of knowledge expected of students by a standard is the same as, or corresponds to, the span of knowledge that students need in order to correctly answer the items on the test. For an acceptable range-of-knowledge correspondence, according to Webb's model, at least 50% of standards within a given domain should have at least one item aligned to them.

The range-of-knowledge correspondence was met for domain RL for all grades except grades 4, 7, 11 where it was "Weak," and grades 6 and 8 where it was "No." The range-of-knowledge correspondence was met for domain RI for all grades except grades 4 and 5. The distribution of the on-grade items for domain RI needs to be improved for grades 4 and 5. IDE will discuss with the test developer the distribution of items across the standards within the domains, and will recommend more on-grade items be added to ensure a better distribution among the standards within the RL and RI domains.

Balance of Representation: As stated earlier in this report, balance of representation is the degree to which one standard in a domain is given more emphasis on the test than another standard within the same reporting category. An index is used to judge the distribution of the test items. In addition, the debriefing comments were taken into consideration to judge whether the assessment items and the assessment as a whole is balanced.

The balance-of-representation index was above 0.7 for grades 4, 5, 6, 10, and 11for both domains RL and RI. The index for grades 3, 7, and 8 domain RL was above 0.70 and therefore meets the criteria with "Yes." This indicates that the items are sufficiently distributed among the standards within the domains. For grades 3, 7 and 8 domain RI the index was below 0.70 and fell within the "Weak" range. IDE will discuss with the test developer the need for a slight improvement in the balance for grades 3, 7 and 8 domain RI.

Item-to-Standard Alignment: The item-to-standard alignment was determined by identifying the items where a majority of the reviewers selected a standard for that grade which they believed the item aligned. 50% or more of the items were aligned to on-grade standards for grades 3, 6, 7, 9-10, and 11-12. Grades 4, 5, and 8 were between 45-49%. IDE will discuss with the test developer the need to increase the number of on-grade items for all grades, but especially grades 4, 5, and 8 where less than half of the items were aligned to on-grade standards. In addition, the number of standards that reviewers aligned items to was good for all grades except grades 4, 7, 8, 9-10, and 11-12. Those grades had less than 75% of the standards with items aligned to them, and all items on the assessment were aligned to a standard whether on or off grade. IDE will discuss with the test developer the need to develop items that are aligned to more standards for those grades.

Reliability among Reviewers

The intra-class correlation is based on the mean squares from the analysis of variance of a two-way random effects model, reviewers crossed with items (Shrout and Fleiss, 1979), as described in Appendix E. The overall intra-class correlation among the reviewers' assignment of depth-of-knowledge levels to items was acceptable for mathematics and reading except reading grade 7. If there is a low variance among the reviewers' coding in assigning depth-of-knowledge levels to items, the intra-class correlation has greater error. Tables 12 and 13 provide a summary of the intra-class correlation.

Table 12: Summary of Reliability—Mathematics

Grade	Intra-Class Correlation
3	0.79
4	0.76
5	0.75
6	0.70
7	0.70
8	0.70
10	0.72
11	0.73

Table 13: Summary of Reliability—Reading

Grade	Intra-Class Correlation
3	0.76
4	0.53
5	0.55
6	0.63
7	0.45
8	0.75
9-10	0.64
11-12	0.69

* The interclass correlation for Grade 7 is lower than the other grades. This is due to little or no variability from item to item when the depth of knowledge was assigned by the reviewers.

Pairwise Agreement

Webb's methodology uses pairwise agreement to calculate the agreement of how the reviewers assigned the standard to the items. The pairwise agreement is averaged over all the assessment items to give the pairwise agreement statistic for the grade as a whole. A pairwise comparison result of 0.7 or higher reflects good agreement, a result of 0.6 or higher is considered to reflect a reasonable agreement, and a result of less than 0.5 is considered to reflect poor agreement (Webb, 2005).

The pairwise agreements for mathematics and reading are below. The reading is updated using the adjusted judgments as discussed with Iowa Department of Education.

Table 14: Summary of Pairwise—Mathematics

Grade	Number of Reviewers	Pairwise Agreement
3	7	0.457341
4	7	0.362084
5	7	0.327381
6	7	0.289683
7	8	0.252296
8	8	0.221905
10	8	0.170536
11	8	0.174107

Table 15: Summary of Pairwise—Reading

Grade	Number of Reviewers	Pairwise Agreement
3	7	0.524971
4	7	0.369615
5	7	0.297896
6	7	0.275433
7	6	0.478519
8	6	0.498551
9-10	6	0.425
11-12	6	0.380833

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Appendix A

Depth-of-Knowledge Levels

Mathematics DOK Levels

Level 1 (Recall) includes the recall of information such as a fact, definition, term, or a simple procedure, as well as performing a simple algorithm or applying a formula. That is, in mathematics, a one-step, well-defined, and straight algorithmic procedure should be included at this lowest level. Other key words that signify Level 1 include "identify," "recall," "recognize," "use," and "measure." Verbs such as "describe" and "explain" could be classified at different levels, depending on what is to be described and explained.

Level 2 (Skill/Concept) includes the engagement of some mental processing beyond an habitual response. A Level 2 assessment item requires students to make some decisions as to how to approach the problem or activity, whereas Level 1 requires students to demonstrate a rote response, perform a well-known algorithm, follow a set procedure (like a recipe), or perform a clearly defined series of steps. Keywords that generally distinguish a Level 2 item include "classify," "organize," "estimate," "make observations," "collect and display data," and "compare data." These actions imply more than one step. For example, to compare data requires first identifying characteristics of objects or phenomena and then grouping or ordering the objects. Some action verbs, such as "explain," "describe," or "interpret," could be classified at different levels depending on the object of the action. For example, interpreting information from a simple graph, or reading information from the graph, also are at Level 2. Interpreting information from a complex graph that requires some decisions on what features of the graph need to be considered and how information from the graph can be aggregated is at Level 3. Level 2 activities are not limited only to number skills, but may involve visualization skills and probability skills. Other Level 2 activities include noticing or describing non-trivial patterns, explaining the purpose and use of experimental procedures; carrying out experimental procedures; making observations and collecting data; classifying, organizing, and comparing data; and organizing and displaying data in tables, graphs, and charts.

Level 3 (Strategic Thinking) requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. In most instances, requiring students to explain their thinking is at Level 3. Activities that require students to make conjectures are also at this level. The cognitive demands at Level 3 are complex and abstract. The complexity does not result from the fact that there are multiple answers, a possibility for both Levels 1 and 2, but because the task requires more demanding reasoning. An activity, however, that has more than one possible answer and requires students to justify the response they give would most likely be at Level 3.

Other Level 3 activities include drawing conclusions from observations; citing evidence and developing a logical argument for concepts; explaining phenomena in terms of concepts; and deciding which concepts to apply in order to solve a complex problem.

Level 4 (Extended Thinking) requires complex reasoning, planning, developing, and thinking, most likely over an extended period of time. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require applying significant conceptual understanding and higher-order thinking. For example, if a student has to take the water temperature from a river each day for a month and then construct a graph, this would be classified as a Level 2. However, if the student is to conduct a river study that requires taking into consideration a number of variables, this would be a Level 4. At Level 4, the cognitive demands of the task should be high and the work should be very complex. Students should be required to make several connections—relate ideas *within* the content area or *among* content areas—and have to select one approach among many alternatives on how the situation should be solved, in order to be at this highest level. Level 4 activities include designing *and* conducting experiments and projects; developing and proving conjectures, making connections between a finding and related concepts and phenomena; combining and synthesizing ideas into new concepts; and critiquing experimental designs.

Sample Items

Level 1

Bill lives on the side of the street with even-numbered addresses. Which addresses below would be found on Bill's side of the street?

A 1020, 1022, 1024
B 2021, 2023, 2025
C 3168, 3169, 3170
D 4167, 4168, 4170

Students only need to be able to recognize even numbers.

Level 2

The class went on a field trip. The students left school at 9:00 a.m. They returned to school at 1:30 p.m. How long were they gone?

A 8 hr 30 min
B 8 hr
C 4 hr 30 min
D 4 hr

The choices offered indicate that this item is intended to identify students who would simply subtract 9 minus 1 to get an 8. More than one step is required here. The students must first recognize the difference between a.m. and p.m. and make some decisions about how to make this into a subtraction problem, and then do the subtraction.

Level 3

On his first three mathematics tests, Jesse's scores were 12, 12 and 15. After his fourth test, the median was 13. Which other measurement changed after the fourth test?

A mean
B minimum
C mode
D range

Students need to not only recognize the measures of central tendency; they must also use the concepts and make a decision based on the relationships of the concepts. The ability to generalize and understand the relationship between measures of central tendency is needed.

ELA DOK Levels

Level 1 requires students to receive or recite facts or to use simple skills or abilities. Oral reading that does not include analysis of the text, as well as basic comprehension of a text, is included. Items require only a shallow understanding of the text presented and often consist of verbatim recall from text, slight paraphrasing of specific details from the text, or simple understanding of a single word or phrase. Some examples that represent, but do not constitute all of, Level 1 performance are:

- Support ideas by reference to verbatim or only slightly paraphrased details from the text.
- Use a dictionary to find the meanings of words.
- Recognize figurative language in a reading passage.

Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response; it requires both comprehension and subsequent processing of text or portions of text. Inter-sentence analysis of inference is required. Some important concepts are covered, but not in a complex way. Standards and items at this level may include words such as summarize, interpret, infer, classify, organize, collect, display, compare, and determine whether fact or opinion. Literal main ideas are stressed. A Level 2 assessment item may require students to apply skills and concepts that are covered in Level 1. However, items require closer understanding of text, possibly through the item's paraphrasing of both the question and the answer. Some examples that represent, but do not constitute all of, Level 2 performance are:

- Use context cues to identify the meaning of unfamiliar words, phrases, and expressions that could otherwise have multiple meanings.
- Predict a logical outcome based on information in a reading selection.
- Identify and summarize the major events in a narrative.

Level 3 Deep knowledge becomes a greater focus at Level 3. Students are encouraged to go beyond the text; however, they are still required to show understanding of the ideas in the text. Students may be encouraged to explain, generalize, or connect ideas. Standards and items at Level 3 involve reasoning and planning. Students must be able to support their thinking. Items may involve abstract theme identification, inference across an entire passage, or students' application of prior knowledge. Items may also involve more superficial connections between texts. Some examples that represent, but do not constitute all of, Level 3 performance are:

- Explain or recognize how the author's purpose affects the interpretation of a reading selection.
- Summarize information from multiple sources to address a specific topic.
- Analyze and describe the characteristics of various types of literature.

Level 4 Higher-order thinking is central and knowledge is deep at Level 4. The standard or assessment item at this level will probably be an extended activity, with extended time provided for completing it. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require the application of significant conceptual understanding and higher-order thinking. Students take information from at least one passage of a text and are asked to apply this information to a new task. They may also be asked to develop hypotheses and perform complex analyses of the connections among texts. Some examples that represent, but do not constitute all of, Level 4 performance are:

- Analyze and synthesize information from multiple sources.
- Examine and explain alternative perspectives across a variety of sources.
- Describe and illustrate how common themes are found across texts from different cultures.

Sample Items

Level 1

What did Minnie do in paragraph 3?

A) fallen in the river
B) gotten lost in the forest
C) gone off to chase a deer
D) returned to the house

This item asks students to refer to a particular detail in the text.

Level 2

The main problem Cory faced was

A) convincing Elisa to keep her coat on
B) finding a good hiding place from Minnie
C) getting across the ice with Elisa before dark
D) pulling Minnie out of the icy waters

This item requires comprehension of the text in order to identify a main point.

Level 3

Which of the following statements would the author be most likely to agree with?

A) He who fears something gives it power over him.
B) Two minds are better than one.
C) Older means wiser.
D) Great minds think alike

Students must connect ideas and make an inference about the author's position.

Appendix B

Depth-of-Knowledge Consensus Values

Mathematics Grade 3 Depth of Knowledge Consensus

Grade 3 DOK Consensus	
	Consensus
Operations and Algebraic Thinking	
3.OA.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.	**1**
3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.	**1**
3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	**2**
3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = □ ÷ 3, 6 × 6 = ?.	**1**
3.OA.5 Apply properties of operations as strategies to multiply and divide. Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)	**1**
3.OA.6 Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	**1**
3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	**1**
3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	**2**
3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	**2**
Numbers and Operations in Base Ten	
3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.	**1**
3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	**1**
3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	**1**
Number and Operations—Fractions	
3.NF.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	**1**
3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	**2**

Mathematics Grade 3 Depth-of-Knowledge Consensus (Continued)

3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	**2**
Measurement and Data	
3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	**2**
3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	**1**
3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	**2**
3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.	**2**
3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.	**1**
3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	**1**
3.MD.7 Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	**2**
3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	**2**

Mathematics Grade 3 Depth-of-Knowledge Consensus (Continued)

Geometry	
3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	**2**
3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.	**1**

Mathematics Grade 4 Depth-of-Knowledge Consensus

Grade 4 DOK Consensus	
	Consensus
Operations and Algebraic Thinking	
4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	**1**
4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	**2**
4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	**2**
4.OA.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	**1**
4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	**2**
Number and Operations in Base Ten	
4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.	**1**
4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**1**
4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.	**1**
4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.	**1**
4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**2**
4.NBT.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**2**
Number and Operations—Fractions	
4.NF.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	**2**
4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	**2**

Mathematics Grade 4 Depth-of-Knowledge Consensus (Continued)

4.NF.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8. c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	**2**
4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4). b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.) c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?	**2**
4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.	**1**
4.NF.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.	**1**
4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	**2**
Measurement and Data	
4.MD.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...	**1**
4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	**2**
4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	**1**
4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.	**2**

Mathematics Grade 4 Depth-of-Knowledge Consensus (Continued)

4.MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	**1**
4.MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	**1**
4.MD.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	**1**
Geometry	
4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	**1**
4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	**2**
4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	**2**

Mathematics Grade 5 Depth-of-Knowledge Consensus

Grade 5 DOK Consensus	
	Consensus
Operations and Algebraic Thinking	
5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	**1**
5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.	**2**
5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	**2**
Number and Operations in Base Ten	
5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	**1**
5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	**2**
5.NBT.3 Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**1**
5.NBT.4 Use place value understanding to round decimals to any place.	**1**
5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm.	**1**
5.NBT.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**2**
5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	**2**
Number and Operations—Fractions	
5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)	**1**
5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.	**2**
5.NF.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?	**1**

Mathematics Grade 5 Depth-of-Knowledge Consensus (Continued)

5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.) b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	**2**
5.NF.5 Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the effect of multiplying a/b by 1.	**2**
5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	**1**
5.NF.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3. b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?	**2**
Measurement and Data	
5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	**2**
5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.	**2**
5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	**1**
5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	**1**

Mathematics Grade 5 Depth-of-Knowledge Consensus (Continued)

5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	**2**
Geometry	
5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	**1**
5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	**2**
5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	**2**
5.G.4 Classify two-dimensional figures in a hierarchy based on properties.	**2**

Mathematics Grade 6 Depth-of-Knowledge Consensus

Grade 6 DOK Consensus	
	Consensus
Ratios and Proportional Relationships	
6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."	**1**
6.RP.2 Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."	**1**
6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	**1**
The Number System	
6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?	**2**
6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.	**1**
6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	**1**
6.NS.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).	**1**
6.NS.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	**1**
6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	**1**

Mathematics Grade 6 Depth-of-Knowledge Consensus (Continued)

6.NS.7 Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3 °C > –7 °C to express the fact that –3 °C is warmer than –7 °C. c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars. d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.	**2**
6.NS.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	**1**
Expressions and Equations	
6.EE.1 Write and evaluate numerical expressions involving whole-number exponents.	**1**
6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 – y. b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.	**1**
6.EE.3 Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.	**1**
6.EE.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.	**1**
6.EE.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	**1**
6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	**1**
6.EE.7 Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.	**2**
6.EE.8 Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	**2**

Mathematics Grade 6 Depth-of-Knowledge Consensus (Continued)

6.EE.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	**2**
Geometry	
6.G.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	**2**
6.G.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	**1**
6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	**1**
6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	**2**
Statistics and Probability	
6.SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.	**2**
6.SP.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	**1**
6.SP.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	**1**
6.SP.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	**2**
6.SP.5 Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	**2**

Mathematics Grade 7 Depth-of-Knowledge Consensus

Grade 7 DOK Consensus	
	Consensus
Ratios and Proportional Relationships	
7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.	**2**
7.RP.2 Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	**2**
7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	**2**
The Number System	
7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged. b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.	**1**
7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	**2**
7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.	**2**
Expressions and Equations	
7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	**1**
7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."	**2**

Mathematics Grade 7 Depth-of-Knowledge Consensus (Continued)

7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	**2**
7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.	**2**
Geometry	
7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	**2**
7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	**2**
7.G.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	**3**
7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	**3**
7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	**2**
7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	**2**
Statistics and Probability	
7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	**1**
7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	**3**
7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variability's, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.	**2**
7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.	**2**

Mathematics Grade 7 Depth-of-Knowledge Consensus (Continued)

7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	**1**
7.SP.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.	**2**
7.SP.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?	**3**
7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?	**2**

Mathematics Grade 8 Depth-of-Knowledge Consensus

Grade 8 DOK Consensus	
	Consensus
The Number System	
8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	**1**
8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	**2**
Expressions and Equations	
8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	**1**
8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	**1**
8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.	**2**
8.EE.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	**2**
8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	**2**
8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	**2**
8.EE.7 Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	**2**
8.EE.8 Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6. c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.	**2**
Functions	
8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	**1**

Mathematics Grade 8 Depth-of-Knowledge Consensus (Continued)

8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	**2**
8.F.3 Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.	**2**
8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	**2**
8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	**2**
Geometry	
8.G.1 Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.	**2**
8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	**2**
8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	**2**
8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	**2**
8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.	**2**
8.G.6 Explain a proof of the Pythagorean Theorem and its converse.	**2**
8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	**2**
8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	**2**
8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	**2**
Statistics and Probability	
8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	**2**
8.SP.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	**2**
8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.	**2**

Mathematics Grade 8 Depth-of-Knowledge Consensus (Continued)

8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?	**3**

Mathematics Grade 10 Depth-of-Knowledge Consensus

Grade 10 DOK Consensus	
The Real Number System	
N-RN.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5(^{1/3})^3$ to hold, so $(5^{1/3})^3$ must equal 5.	**1**
N-RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.	**1**
N-RN.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	**2**
Quantities	
N-Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	**2**
N-Q.2 Define appropriate quantities for the purpose of descriptive modeling.	**1**
N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	**2**
Seeing Structure in Expressions	
A-SSE.1 Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.	**2**
A-SSE.2 Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.	**2**
A-SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	**2**
A-SSE.4 Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.	**2**
Arithmetic with Polynomials and Rational Expressions	
A-APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	**1**
A-APR.2 Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).	**2**
A-APR.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	**2**
A-APR.4 Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.	**3**
A-APR.6 Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.	**1**
Creating Equations	
A-CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	**2**

Mathematics Grade 10 Depth-of-Knowledge Consensus (Continued)

A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**2**
A-CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	**2**
A-CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	**1**
Reasoning with Equations and Inequalities	
A-REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	**2**
A-REI.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	**2**
A-REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**2**
A-REI.4 Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	**2**
A-REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	**2**
A-REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**2**
A-REI.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	**1**
A-REI.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	**2**
Interpreting Functions	
F-IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	**1**
F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	**2**
F-IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.	**1**
F-IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	**2**
F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.	**2**
F-IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	**2**

Mathematics Grade 10 Depth-of-Knowledge Consensus (Continued)

Congruence	
G-CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	**1**
G-CO.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	**2**
G-CO.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	**2**
G-CO.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	**2**
G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	**2**
G-CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	**2**
G-CO.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	**2**
G-CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	**2**
G-CO.9 Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	**2**
G-CO.10 Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	**2**
G-CO.11 Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	**2**
G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	**1**
G-CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	**2**
Similarity, Right Triangles, and Trigonometry	
G-SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	**2**
G-SRT.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	**2**
G-SRT.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	**2**
G-SRT.4 Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	**2**

Mathematics Grade 10 Depth-of-Knowledge Consensus (Continued)

G-SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	**3**
Circles	
G-C.1 Prove that all circles are similar.	**2**
G-C.2 Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.	**2**
G-C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	**3**
G-C.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	**3**
Expressing Geometric Properties with Equations	
G-GPE.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	**2**
G-GPE.2 Derive the equation of a parabola given a focus and directrix.	**2**
G-GPE.4 Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point (0, 2).	**3**
G-GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	**2**
G-GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	**2**
G-GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	**2**
Geometric Measurement and Dimension	
G-GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	**2**
G-GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	**2**
Modeling with Geometry	
G-MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	**2**
G-MG.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	**2**
Interpreting Categorical and Quantitative Data	
S-ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).	**2**
S-ID.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	**2**
S-ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	**3**

Mathematics Grade 11 Depth-of-Knowledge Consensus

Grade 11 DOK Consensus	
The Complex Number System	
N-CN.1 Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b real.	**1**
N-CN.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	**1**
N-CN.7 Solve quadratic equations with real coefficients that have complex solutions.	**1**
Reasoning with Equations and Inequalities	
A-REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.	**2**
A-REI.11 Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	**2**
Interpreting Functions	
F-IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	**2**
F-IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.	**2**
F-IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	**2**
Building Functions	
F-BF.1 Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. (+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.	**2**
F-BF.2 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	**2**

Mathematics Grade 11 Depth-of-Knowledge Consensus (Continued)

F-BF.3 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	**2**
F-BF.4 Find inverse functions. a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^3$ or f(x) = (x+1)/(x–1) for $x \neq 1$. b. (+) Verify by composition that one function is the inverse of another. c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse. d. (+) Produce an invertible function from a non-invertible function by restricting the domain.	**2**
Linear, Quadratic, and Exponential Models	
F-LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	**2**
F-LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	**2**
F-LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	**1**
F-LE.4 For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	**2**
F-LE.5 Interpret the parameters in a linear or exponential function in terms of a context.	**2**
Trigonometric Functions	
F-TF.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	**1**
F-TF.2 Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	**2**
F-TF.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	**2**
Similarity, Right Triangles, and Trigonometry	
G-SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	**2**
G-SRT.7 Explain and use the relationship between the sine and cosine of complementary angles	**2**
G-SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	**2**
Geometric Measurement and Dimension	
G-GMD.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	**2**
Modeling with Geometry	
G-MG.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	**3**
Interpreting Categorical and Quantitative Data	
S-ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	**2**

Mathematics Grade 11 Depth-of-Knowledge Consensus (Continued)

S-ID.4 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	**2**
S-ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	**3**
S-ID.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	**2**
S-ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.	**2**
S-ID.9 Distinguish between correlation and causation.	**1**
Making Inferences and Justifying Conclusions	
S-IC.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	**1**
S-IC.2 Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?	**2**
S-IC.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	**3**
S-IC.4 Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	**2**
S-IC.5 Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	**3**
S-IC.6 Evaluate reports based on data.	**3**
Conditional Probability and the Rules of Probability	
S-CP.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not")	**2**
S-CP.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	**2**
S-CP.3 Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	**2**
S-CP.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among mathematics, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.	**3**
S-CP.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.	**3**
S-CP.6 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	**2**
S-CP.7 Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.	**2**

Reading Grade 3 Depth-of-Knowledge Consensus

Grade 3 DOK Consensus	
	Consensus
Key Ideas and Details	
RL.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.	**1**
RL.3.2 Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.	**2**
RL.3.3 Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.	**2**
Craft and Structure	
RL.3.4 Determine the meaning of words and phrases as they are used in a text, distinguishing literal from nonliteral language.	**2**
RL.3.5 Refer to parts of stories, dramas, and poems when writing or speaking about a text, using terms such as chapter, scene, and stanza; describe how each successive part builds on earlier sections.	**2**
RL.3.6 Distinguish their own point of view from that of the narrator or those of the characters.	**3**
Integration of Knowledge and Ideas	
RL.3.7 Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting).	**2**
RL.3.9 Compare and contrast the themes, settings, and plots of stories written by the same author about the same or similar characters (e.g., in books from a series).	**3**
Range of Reading and Level of Text Complexity	
RL.3.10 By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 2–3 text complexity band independently and proficiently.	**2**
Key Ideas and Details	
RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.	**1**
RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.	**2**
RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.	**3**
Craft and Structure	
RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.	**2**
RI.3.5 Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.	**1**
RI.3.6 Distinguish their own point of view from that of the author of a text.	**3**
Integration of Knowledge and Ideas	
RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).	**2**
RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).	**2**
RI.3.9 Compare and contrast the most important points and key details presented in two texts on the same topic.	**3**

Reading Grade 3 Depth-of-Knowledge Consensus (Continued)

Range of Reading and Level of Text Complexity	
RI.3.10 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2–3 text complexity band independently and proficiently.	**2**

Reading Grade 4 Depth-of-Knowledge Consensus

Grade 4 DOK Consensus	
	Consensus
Key Ideas and Details	
RL.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	**2**
RL.4.2 Determine a theme of a story, drama, or poem from details in the text; summarize the text.	**2**
RL.4.3 Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text (e.g., a character's thoughts, words, or actions).	**2**
Craft and Structure	
RL.4.4 Determine the meaning of words and phrases as they are used in a text, including those that allude to significant characters found in mythology (e.g., Herculean).	**2**
RL.4.5 Explain major differences between poems, drama, and prose, and refer to the structural elements of poems (e.g., verse, rhythm, meter) and drama (e.g., casts of characters, settings, descriptions, dialogue, stage directions) when writing or speaking about a text.	**3**
RL.4.6 Compare and contrast the point of view from which different stories are narrated, including the difference between first- and third-person narrations.	**3**
Integration of Knowledge and Ideas	
RL.4.7 Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in the text.	**3**
RL.4.9 Compare and contrast the treatment of similar themes and topics (e.g., opposition of good and evil) and patterns of events (e.g., the quest) in stories, myths, and traditional literature from different cultures.	**3**
Range of Reading and Level of Text Complexity	
RL.4.10 By the end of the year, read and comprehend literature, including stories, dramas, and poetry, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.	**2**
Key Ideas and Details	
RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	**2**
RI.4.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.	**2**
RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	**3**
Craft and Structure	
RI.4.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.	**2**
RI.4.5 Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.	**2**
RI.4.6 Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided.	**3**

Reading Grade 4 Depth-of-Knowledge Consensus (Continued)

Integration of Knowledge and Ideas	
RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.	**2**
RI.4.8 Explain how an author uses reasons and evidence to support particular points in a text.	**2**
RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.	**3**
Range of Reading and Level of Text Complexity	
RI.4.10 By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.	**2**

Reading Grade 5 Depth-of-Knowledge Consensus

Grade 5 DOK Consensus	
	Consensus
Key Ideas and Details	
RL.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.	**2**
RL.5.2 Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.	**2**
RL.5.3 Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text (e.g., how characters interact).	**2**
Craft and Structure	
RL.5.4 Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes.	**2**
RL.5.5 Explain how a series of chapters, scenes, or stanzas fits together to provide the overall structure of a particular story, drama, or poem.	**2**
RL.5.6 Describe how a narrator's or speaker's point of view influences how events are described.	**3**
Integration of Knowledge and Ideas	
RL.5.7 Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).	**2**
RL.5.9 Compare and contrast stories in the same genre (e.g., mysteries and adventure stories) on their approaches to similar themes and topics.	**3**
Range of Reading and Level of Text Complexity	
RL.5.10 By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 4–5 text complexity band independently and proficiently.	**2**
Key Ideas and Details	
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.	**2**
RI.5.2 Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.	**2**
RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.	**3**
Craft and Structure	
RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.	**2**
RI.5.5 Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.	**3**
RI.5.6 Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.	**3**
Integration of Knowledge and Ideas	
RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.	**2**
RI.5.8 Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).	**2**
RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.	**3?**

Reading Grade 5 Depth-of-Knowledge Consensus (Continued)

Range of Reading and Level of Text Complexity	
RI.5.10 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4–5 text complexity band independently and proficiently	**2**

Reading Grade 6 Depth-of-Knowledge Consensus

Grade 6 DOK Consensus	
	Consensus
Key Ideas and Details	
RL.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	**2**
RL.6.2 Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.	**2**
RL.6.3 Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.	**2**
Craft and Structure	
RL.6.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone.	**2**
RL.6.5 Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.	**2**
RL.6.6 Explain how an author develops the point of view of the narrator or speaker in a text.	**2**
Integration of Knowledge and Ideas	
RL.6.7 Compare and contrast the experience of reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch.	**2**
RL.6.9 Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics.	**3**
Range of Reading and Level of Text Complexity	
RL.6.10 By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.	**2**
Key Ideas and Details	
RI.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	**2**
RI.6.2 Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.	**2**
RI.6.3 Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).	**2**
Craft and Structure	
RI.6.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.	**2**
RI.6.5 Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.	**2**
RI.6.6 Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.	**2**

Reading Grade 6 Depth-of-Knowledge Consensus (Continued)

Integration of Knowledge and Ideas	
RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.	**3**
RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.	**2**
RI.6.9 Compare and contrast one author's presentation of events with that of another (e.g., a memoir written by and a biography on the same person).	**3**
Range of Reading and Level of Text Complexity	
RI.6.10 By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.	**2**

Reading Grade 7 Depth-of-Knowledge Consensus

Grade 7 DOK Consensus	
	Consensus
Key Ideas and Details	
RL7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text	**2**
RL.7.2 Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.	**3**
RL.7.3 Analyze how particular elements of a story or drama interact (e.g., how setting shapes the characters or plot).	**2**
Craft and Structure	
RL.7.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama.	**2**
RL.7.5 Analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning.	**2**
RL.7.6 Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.	**3**
Integration of Knowledge and Ideas	
RL7.7 Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).	**3**
RL.7.9 Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.	**3**
Range of Reading and Level of Text Complexity	
RL.7.10 By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.	**2**
Key Ideas and Details	
RI.7-1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	**2**
RI.7-2 Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.	**2**
RI.7-3 Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).	**2**
Craft and Structure	
RI.7-4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.	**2**
RI.7-5 Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.	**2**
RI.7-6 Determine an author's point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others.	**3**

Reading Grade 7 Depth-of-Knowledge Consensus (Continued)

Integration of Knowledge and Ideas	
RI.7-7 Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).	**3**
RI.7-8 Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.	**3**
RI.7-9 Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.	**3**
Range of Reading and Level of Text Complexity	
RI.7-10 By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.	**2**

Reading Grade 8 Depth-of-Knowledge Consensus

Grade 8 DOK Consensus	
	Consensus
Key Ideas and Details	
RL.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	**2**
RL.8.2 Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.	**3**
RL.8.3 Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.	**2**
Craft and Structure	
RL.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	**2**
RL.8.5 Compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.	**3**
RL.8.6 Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.	**3**
Integration of Knowledge and Ideas	
RL.8.7 Analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the text or script, evaluating the choices made by the director or actors.	**3**
RL.8.9 Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new.	**3**
Range of Reading and Level of Text Complexity	
RL.8.10 By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6–8 text complexity band independently and proficiently.	**2**
Key Ideas and Details	
RI.8-1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	**2**
RI.8-2 Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.	**2**
RI.8-3 Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).	**2**
Craft and Structure	
RI.8-4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	**2**
RI.8-5 Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.	**2**
RI.8-6 Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.	**3**

Reading Grade 8 Depth-of-Knowledge Consensus (Continued)

Integration of Knowledge and Ideas	
RI.8-7 Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.	**3**
RI.8-8 Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.	**3**
RI.8-9 Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.	**3**
Range of Reading and Level of Text Complexity	
RI.8-10 By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6–8 text complexity band independently and proficiently.	**2**

Reading Grades 9-10 Depth-of-Knowledge Consensus

Grade 9-10 DOK Consensus	
	Consensus
Key Ideas and Details	
RL.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	**2**
RL.9-10.2 Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	**3**
RL.9-10.3 Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme.	**3**
Craft and Structure	
RL.9-10.4 Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone).	**2**
RL.9-10.5 Analyze how an author's choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension, or surprise.	**2**
RL.9-10.6 Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature.	**3**
Integration of Knowledge and Ideas	
RL.9-10.7 Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (e.g., Auden's "Musée des Beaux Arts" and Breughel's Landscape with the Fall of Icarus).	**3**
RL.9-10.9 Analyze how an author draws on and transforms source material in a specific work (e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare).	**3**
Range of Reading and Level of Text Complexity	
RL.9-10.10 By the end of grade 9, read and comprehend literature, including stories, dramas, and poems, in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 9–10 text complexity band independently and proficiently.	**2**
Key Ideas and Details	
RI.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	**2**
RI.9-10.2 Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	**2**
RI.9-10.3 Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.	**3**

Reading Grades 9-10 Depth-of-Knowledge Consensus (Continued)

Craft and Structure	
RI.9-10.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).	**2**
RI.9-10.5 Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).	**2**
RI.9-10.6 Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.	**3**
Integration of Knowledge and Ideas	
RI.9-10.7 Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.	**3**
RI.9-10.8 Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.	**3**
RI.9-10.9 Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.	**3**
Range of Reading and Level of Text Complexity	
RI.9-10.10 By the end of grade 9, read and comprehend literary nonfiction in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9–10 text complexity band independently and proficiently.	**2**

Reading Grades 11-12 Depth-of-Knowledge Consensus

Grade 11-12 DOK Consensus	
	Consensus
Key Ideas and Details	
RL.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	**2**
RL.11-12.2 Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.	**3**
RL.11-12.3 Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).	**3**
Craft and Structure	
RL.11-12.4 Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)	**2**
RL.11-12.5 Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.	**3**
RL.11-12.6 Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).	**3**
Integration of Knowledge and Ideas	
RL.11-12.7 Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)	**3**
RL.11-12.9 Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics.	**3**
Range of Reading and Level of Text Complexity	
RL.11-12.10 By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 11–CCR text complexity band independently and proficiently.	**2**
Key Ideas and Details	
RI.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	**2**
RI.11-12.2 Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.	**2**
RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.	**2**

Reading Grades 11-12 Depth-of-Knowledge Consensus (Continued)

Craft and Structure	
RI.11-12.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).	**3**
RI.11-12.5 Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.	**3**
RI.11-12.6 Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.	**3**
Integration of Knowledge and Ideas	
RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	**3**
RI.11-12.8 Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).	**3**
RI.11-12.9 Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.	**3**
Range of Reading and Level of Text Complexity	
RI.11-12.10 By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.	**2**

Iowa Reading Grade 3-HS Depth of Knowledge Consensus

Grade 3 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
Grade 3 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
Grade 4 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
Grade 4 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
Grade 5 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
Grade 5 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
Grade 6 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
Grade 6 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**

Iowa Reading Grade 3-HS Depth of Knowledge Consensus (Continued)

Grade 7 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**
Grade 7 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**
Grade 8 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**
Grade 8 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**
Grade 9-10 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**
Grade 9-10 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**

Iowa Reading Grade 3-HS Depth of Knowledge Consensus (Continued)

Grade 11-12 DOK Consensus (RL)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**
Grade 11-12 DOK Consensus (RI)	
	Consensus
Key Ideas and Details	
IA.1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.	**4**
IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.	**2**

Appendix C

Summary Tables

Domain Translation Table

Mathematics		
Grade(s)	**Domain Abbreviation**	**Translation**
3,4,5	OA	Operations and Algebraic Thinking
	NBT	Numbers and Operations in Base Ten
	NF	Numbers and Operations—Fractions
	MD	Measurement and Data
	G	Geometry
6,7,8	RP	Ratios and Proportional Relationships
	NS	The Number System
	EE	Expressions and Equations
	G	Geometry
	SP	Statistics and Probability
8	F	Functions
HS	**N**	**Number and Quantity**
	N-RN	The Real Number System
	N-Q	Quantities
	N-CN	The Complex Number System
	N-VM	Vector and Matrix Quantities
	A	**Algebra**
	A-SSE	Seeing Structure in Expressions
	A-APR	Arithmetic with Polynomials and Rational Expressions
	A-CED	Creating Equations
	A-REI	Reasoning with Equations and Inequalities
	F	**Functions**
	F-IF	Interpreting Functions
	F-BF	Building Functions
	F-LE	Linear, Quadratic, and Exponential Models
	F-TF	Trigonometric Functions
	G	**Geometry**
	G-CO	Congruence
	G-SRT	Similarity, Right Triangles, and Trigonometry
	G-C	Circles
	G-GPE	Expressing Geometric Properties with Equations
	G-GMD	Geometric Measurement and Dimension
	G-MG	Modeling with Geometry
	SP	**Statistics and Probability**
	S-ID	Interpreting Categorical and Quantitative Data
	S-IC	Making Inferences and Justifying Conclusions
	S-CP	Conditional Probability and the Rules of Probability
	S-MD	Using Probability to Make Decisions

Mathematics Grade 3

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
OA	9	8.29	1.25	0.00	0.00	100%	0.00	0%	0.00	Yes
NBT	3	1.43	1.13	0.00	0.00	90%	0.22	10%	0.22	Yes
NF	3	2.00	1.15	0.00	0.00	100%	0.00	0%	0.00	Yes
MD	8	8.29	1.70	0.00	0.00	100%	0.00	0%	0.00	Yes
G	2	0.29	0.49	0.00	0.00	100%	0.00	0%	0.00	Yes
Total	25	4.06	3.91	0.00	0.00	98%	0.04	2%	0.04	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
OA	9	1 2 3	6 3 0	67% 33% 0%	8.29	1.25	Yes
NBT	3	1 2 3	3 0 0	100% 0% 0%	1.43	1.13	No
NF	3	1 2 3	1 2 0	33% 67% 0%	2.00	1.15	No
MD	8	1 2 3	3 5 0	38% 63% 0%	8.29	1.70	Yes
G	2	1 2 3	1 1 0	50% 50% 0%	0.29	0.49	No
Total	25	1 2 3	14 11 0	56% 44% 0%	4.06	3.91	

Mathematics Grade 3 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
OA	9	8.29	1.25	4.43	1.13	49%	0.13	Weak	41%	1.25	0.77	0.06	Yes
NBT	3	1.43	1.13	0.71	0.49	24%	0.16	No	7%	1.13	0.90	0.22	Yes
NF	3	2.00	1.15	1.43	0.53	48%	0.18	Weak	10%	1.15	0.98	0.06	Yes
MD	8	8.29	1.70	4.57	0.98	57%	0.12	Yes	41%	1.70	0.69	0.10	Weak
G	2	0.29	0.49	0.29	0.49	14%	0.24	No	1%	0.49	1.00	0.00	Yes
Total	25	4.06	3.91	2.29	2.06	38%	0.18		20%	0.19	0.87	0.13	

Mathematics Grade 4

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
OA	5	5.00	2.16	0.00	0.00	100%	0.00	0%	0.00	Yes
NBT	6	4.00	1.15	0.00	0.00	87%	0.24	13%	0.24	Yes
NF	7	0.57	0.79	0.00	0.00	100%	0.00	0%	0.00	Yes
MD	7	6.43	1.72	0.00	0.00	75%	0.21	25%	0.21	Yes
G	3	1.29	0.49	0.00	0.00	64%	0.48	36%	0.48	Yes
Total	28	3.46	2.48	0.00	0.00	85%	0.16	15%	0.16	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
OA	5	1 2 3	2 3 0	40% 60% 0%	5.00	2.16	Weak
NBT	6	1 2 3	4 2 0	67% 33% 0%	4.00	1.15	No
NF	7	1 2 3	2 5 0	29% 71% 0%	0.57	0.79	No
MD	7	1 2 3	5 2 0	71% 29% 0%	6.43	1.72	Yes
G	3	1 2 3	1 2 0	33% 67% 0%	1.29	0.49	No
Total	28	1 2 3	14 14 0	50% 50% 0%	3.46	2.48	

Mathematics Grade 4 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
OA	5	5.00	2.16	2.57	0.98	51%	0.20	Yes	28.93%	2.16	0.80	0.16	Yes
NBT	6	4.00	1.15	2.86	0.90	48%	0.15	Weak	23.14%	1.15	0.86	0.11	Yes
NF	7	0.57	0.79	0.57	0.79	8%	0.11	No	3.31%	0.79	1.00	0.00	Yes
MD	7	6.43	1.72	2.86	0.69	41%	0.10	Weak	37.19%	1.72	0.79	0.12	Yes
G	3	1.29	0.49	1.29	0.49	43%	0.16	Weak	7.44%	0.49	1.00	0.00	Yes
Total	28	3.46	2.48	2.03	1.04	38%	0.17		20%	0.14	0.89	0.10	

Mathematics Grade 5

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	DOK Consistency
OA	3	2.29	1.60	0.00	0.00	94%	0.11	6%	0.11	Yes
NBT	7	1.86	1.07	0.00	0.00	83%	0.26	17%	0.26	Yes
NF	7	1.14	0.38	0.00	0.00	100%	0.00	0%	0.00	Yes
MD	5	0.71	0.95	0.00	0.00	100%	0.00	0%	0.00	Yes
G	4	0.71	1.11	0.00	0.00	100%	0.00	0%	0.00	Yes
Total	26	1.34	0.70	0.00	0.00	95%	0.07	5%	0.07	

Table C2: Categorical Concurrence between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
OA	3	1 2 3	1 2 0	33% 67% 0%	2.29	1.60	No
NBT	7	1 2 3	4 3 0	57% 43% 0%	1.86	1.07	No
NF	7	1 2 3	3 4 0	43% 57% 0%	1.14	0.38	No
MD	5	1 2 3	2 3 0	40% 60% 0%	0.71	0.95	No
G	4	1 2 3	1 3 0	25% 75% 0%	0.71	1.11	No
Total	26	1 2 3	11 15 0	42% 58% 0%	1.34	0.70	

Mathematics Grade 5 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
OA	3	2.29	1.60	1.57	0.98	52%	0.33	Yes	34%	1.60	0.94	0.11	Yes
NBT	7	1.86	1.07	1.57	1.27	22.5%	0.18	No	27.6%	1.07	1.00	0.00	Yes
NF	7	1.14	0.38	1.14	0.38	16.33%	0.05	No	17%	0.38	1.00	0.00	Yes
MD	5	0.71	0.95	0.43	0.53	8.5%	0.11	No	10.6%	0.95	1.00	0.00	Yes
G	4	0.71	1.11	0.57	0.79	14%	0.20	No	10.6%	1.11	0.94	0.10	Yes
Total	26	1.34	0.70	1.06	0.54	23%	0.17		20%	0.10	0.98	0.03	

Mathematics Grade 6

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RP	3	2.71	1.60	0.00	0.00	100%	0.00	0%	0.00	Yes
NS	8	4.57	1.81	0.00	0.00	82%	0.18	18%	0.18	Yes
EE	9	5.00	1.29	0.00	0.00	90%	0.13	10%	0.13	Yes
G	4	2.71	1.25	0.00	0.00	100%	0.00	0%	0.00	Yes
SP	5	3.00	3.61	0.00	0.00	98%	0.05	3%	0.05	Yes
Total	29	3.60	1.10	0.00	0.00	94%	0.08	6%	0.08	

Table C2: Categorical Concurrence between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Level	Mean	Standard Deviation	
RP	3	1 2 3	3 0 0	100% 0% 0%	2.71	1.60	No
NS	8	1 2 3	6 2 0	75% 25% 0%	4.57	1.81	No
EE	9	1 2 3	6 3 0	67% 33% 0%	5.00	1.29	Weak
G	4	1 2 3	2 2 0	50% 50% 0%	2.71	1.25	No
SP	5	1 2 3	2 3 0	40% 60% 0%	3.00	3.61	No
Total	29	1 2 3	19 10 0	66% 34% 0%	3.60	1.10	

Mathematics Grade 6 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RP	3	2.71	1.60	1.29	0.76	42.86%	0.25	Weak	15.08%	1.60	0.98	0.06	Yes
NS	8	4.57	1.81	3.57	1.62	44.64%	0.20	Weak	25.40%	1.81	0.90	0.09	Yes
EE	9	5.00	1.29	3.43	0.53	38.10%	0.06	No	27.78%	1.29	0.83	0.09	Yes
G	4	2.71	1.25	2.57	0.98	64.29%	0.24	Yes	15.08%	1.25	0.98	0.06	Yes
SP	5	3.00	3.61	1.00	1.15	20.00%	0.23	No	16.67%	3.61	0.84	0.22	Yes
Total	29	3.60	1.10	2.37	1.19	42%	0.16		20%	0.06	0.91	0.07	

Mathematics Grade 7

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RP	3	5.00	2.83	0.00	0.00	95%	0.09	5%	0.09	Yes
NS	3	7.63	9.04	0.00	0.00	98%	0.05	2%	0.05	Yes
EE	4	4.88	3.60	0.00	0.00	99%	0.03	1%	0.03	Yes
G	6	6.38	5.34	0.00	0.00	86%	0.16	14%	0.16	Yes
SP	8	5.63	2.00	0.03	0.05	94%	0.09	3%	0.07	Yes
Total	24	5.90	1.13	0.01	0.01	94%	0.05	5%	0.05	

Table C2: Categorical Concurrence between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RP	3	1 2 3	0 3 0	0% 100% 0%	5.00	2.83	Weak
NS	3	1 2 3	1 2 0	33% 67% 0%	7.63	9.04	Yes
EE	4	1 2 3	1 3 0	25% 75% 0%	4.88	3.60	No
G	6	1 2 3	0 4 2	0% 67% 33%	6.38	5.34	Yes
SP	8	1 2 3	2 4 2	25% 50% 25%	5.63	2.00	Weak
Total	24	1 2 3	4 16 4	17% 67% 17%	5.90	1.13	

Mathematics Grade 7 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RP	3	5.00	2.83	2.13	0.83	70.83%	0.28	Yes	16.95%	2.83	0.90	0.09	Yes
NS	3	7.63	9.04	1.75	1.16	58.33%	0.39	Yes	25.85%	9.04	0.86	0.15	Yes
EE	4	4.88	3.60	2.13	0.99	53.13%	0.25	Yes	16.53%	3.60	0.89	0.10	Yes
G	6	6.38	5.34	2.88	1.73	47.92%	0.29	Weak	21.61%	5.34	0.85	0.10	Yes
SP	8	5.63	2.00	2.88	1.46	35.94%	0.18	No	19.07%	2.00	0.79	0.11	Yes
Total	24	5.90	1.13	2.35	0.50	53%	0.13		20%	0.04	0.86	0.04	

Mathematics Grade 8

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
NS	2	1.13	2.42	0.00	0.00	100%	0.00	0%	0.00	Yes
EE	8	5.75	6.41	0.00	0.00	81%	0.23	19%	0.23	Yes
F	5	0.38	0.74	0.00	0.00	100%	0.00	0%	0.00	Yes
G	9	2.75	1.16	0.00	0.00	97%	0.09	3%	0.09	Yes
SP	4	0.88	2.10	0.00	0.00	100%	0.00	0%	0.00	Yes
Total	28	2.18	2.19	0.00	0.00	96%	0.08	4%	0.08	

Table C2: Categorical Concurrence between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
NS	2	1 2 3	1 1 0	50% 50% 0%	1.13	2.42	No
EE	8	1 2 3	2 6 0	25% 75% 0%	5.75	6.41	Weak
F	5	1 2 3	1 4 0	20% 80% 0%	0.38	0.74	No
G	9	1 2 3	0 9 0	0% 100% 0%	2.75	1.16	No
SP	4	1 2 3	0 3 1	0% 75% 25%	0.88	2.10	No
Total	28	1 2 3	4 23 1	14% 82% 4%	2.18	2.19	

Mathematics Grade 8 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
NS	2	1.13	2.42	0.50	0.76	25.00%	0.38	No	10.34%	2.42	0.93	0.12	Yes
EE	8	5.75	6.41	3.00	1.77	37.50%	0.22	No	52.87%	6.41	0.89	0.16	Yes
F	5	0.38	0.74	0.25	0.46	5.00%	0.09	No	3.45%	0.74	1.00	0.00	Yes
G	9	2.75	1.16	2.38	0.74	26.39%	0.08	No	25.29%	1.16	0.94	0.08	Yes
SP	4	0.88	2.10	0.38	0.74	9.38%	0.19	No	8.05%	2.10	0.83	0.24	Yes
Total	28	2.18	2.19	1.30	1.29	21%	0.13		20%	0.20	0.92	0.06	

Mathematics Grade 10

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
N	6	5.38	9.71	0%	0.00	98%	0.06	2%	0.06	Yes
A	21	4.63	3.81	0%	0.00	74%	0.35	26%	0.35	Yes
F	6	1.13	1.13	0%	0.00	100%	0.00	0%	0.00	Yes
G	32	3.00	1.60	14%	0.27	65%	0.33	22%	0.26	Yes
S	3	2.13	1.89	0%	0.00	100%	0.00	0%	0.00	Yes
Total	68	3.25	1.75	3%	0.06	87%	0.17	10%	0.13	

Table C2: Categorical Concurrence between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
N	6	1 2 3	3 3 0	50% 50% 0%	5.38	9.71	Weak
A	21	1 2 3	4 16 1	19% 76% 5%	4.63	3.81	No
F	6	1 2 3	2 4 0	33% 67% 0%	1.13	1.13	No
G	32	1 2 3	2 26 4	6% 81% 13%	3.00	1.60	No
S	3	1 2 3	0 2 1	13% 0% 67%	2.13	1.89	No
Total	68	1 2 3	11 51 6	16% 75% 9%	3.25	1.75	

Mathematics Grade 10 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
N	6	5.38	9.71	1.75	1.49	29.17%	0.25	No	33.08%	9.71	0.88	0.23	Yes
A	21	4.63	3.81	2.88	1.96	13.69%	0.09	No	28.46%	3.81	0.84	0.16	Yes
F	6	1.13	1.13	0.75	0.71	12.50%	0.12	No	6.92%	1.13	0.97	0.07	Yes
G	32	3.00	1.60	2.75	1.16	8.59%	0.04	No	18.46%	1.60	0.98	0.06	Yes
S	3	2.13	1.89	0.88	0.64	29.17%	0.21	No	13.08%	1.89	0.97	0.07	Yes
Total	68	3.25	1.75	1.80	1.00	19%	0.10		20%	0.11	0.93	0.06	

Mathematics Grade 11

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
N	3	0.13	0.35	0%	NA	0%	NA	100%	NA	Yes
A	2	0.50	0.76	0%	0.00	100%	0.00	0%	0.00	Yes
F	15	4.50	5.50	0%	0.00	100%	0.00	0%	0.00	Yes
G	5	2.50	6.28	0%	0.00	100%	0.00	0%	0.00	Yes
S	19	2.38	0.74	15%	0.27	56%	0.33	29%	0.26	Yes
Total	44	2.00	1.76	3%	0.07	71%	0.44	26%	0.43	

Table C2: Categorical Concurrence between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
N	3	1 2 3	3 0 0	100% 0% 0%	0.13	0.35	No
A	2	1 2 3	0 2 0	0% 100% 0%	0.50	0.76	No
F	15	1 2 3	2 13 0	13% 87% 0%	4.50	5.50	No
G	5	1 2 3	0 4 1	0% 80% 20%	2.50	6.28	No
S	19	1 2 3	2 11 6	11% 58% 32%	2.38	0.74	No
Total	44	1 2 3	7 30 7	16% 68% 16%	2.00	1.76	

Mathematics Grade 11 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
N	3	0.13	0.35	0.13	0.35	4.17%	0.12	No	1.25%	0.35	1.00		Yes
A	2	0.50	0.76	0.38	0.52	18.75%	0.26	No	5.00%	0.76	1.00	0.00	Yes
F	15	4.50	5.50	2.00	1.07	13.33%	0.07	No	45.00%	5.50	0.90	0.11	Yes
G	5	2.50	6.28	0.25	0.46	5.00%	0.09	No	25.00%	6.28	1.00	0.00	Yes
S	19	2.38	0.74	1.75	0.46	9.21%	0.02	No	23.75%	0.74	0.94	0.09	Yes
Total	44	2.00	1.76	0.90	0.90	10%	0.06		20%	0.18	0.97	0.05	

Domain Translation Table

Reading		
Grade(s)	**Domain Abbreviation**	**Translation**
3-8,10	RL	Reading Standards for Literature
	RI	Reading Standards for Informational Text

Reading Grade 3

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	DOK Consistency
RL	9	18.00	3.21	9%	0.08	91%	0.08	0%	0	Yes
RI	10	21.43	4.31	13%	0.06	87%	0.06	0%	0	Yes
Total	19	19.71	2.42	11%	0.02	89%	0.02	0%	0.00	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	Categorical Concurrence
RL	9	1 2 3	1 6 2	11% 67% 22%	18.00	3.21	Yes
RI	10	1 2 3	2 5 3	20% 50% 30%	21.43	4.31	Yes
Total	19	1 2 3	3 11 5	16% 58% 26%	19.71	2.42	

Reading Grade 3 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	18.00	3.21	6.29	0.76	62.86%	0.08	Yes	60.14%	3.21	0.71	0.04	Yes
RI	10	21.43	4.31	5.86	1.46	58.57%	0.15	Yes	39.86%	4.31	0.68	0.09	Weak
Total	19	19.71	2.42	6.07	0.30	61%	0.03		50%	0.14	0.70	0.02	

Reading Grade 4

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RL	9	12.71	2.81	7%	0.08	93%	0.08	0%	0	Yes
RI	10	7.86	3.58	26%	0.19	74%	0.19	0%	0	Yes
Total	19	10.29	3.43	16%	0.13	84%	0.13	0%	0.00	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RL	9	1 2 3	0 5 4	0% 56% 44%	12.71	2.81	Yes
RI	10	1 2 3	0 7 3	0% 70% 30%	7.86	3.58	Yes
Total	19	1 2 3	0 12 7	0% 63% 37%	10.29	3.43	

Reading Grade 4 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	12.71	2.81	4.00	1.15	44.44%	0.13	Weak	65.28%	2.81	0.73	0.12	Yes
RI	10	7.86	3.58	3.14	1.21	31.43%	0.12	No	34.72%	3.58	0.70	0.12	Yes
Total	19	10.29	3.43	3.57	0.61	38%	0.09		50%	0.22	0.72	0.02	

Reading Grade 5

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RL	9	10.71	6.10	33%	0.21	67%	0.22	1%	0.02	Yes
RI	10	7.43	3.60	15%	0.14	85%	0.14	0%	0.00	Yes
Total	19	9.07	2.32	24%	0.12	76%	0.13	0%	0.01	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RL	9	1 2 3	0 7 2	0% 78% 22%	10.71	6.10	Yes
RI	10	1 2 3	0 6 4	0% 60% 40%	7.43	3.60	Yes
Total	19	1 2 3	0 13 6	0% 68% 32%	9.07	2.32	

Reading Grade 5 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	10.71	6.10	4.71	2.36	52.38%	0.26	Yes	66.14%	6.10	0.80	0.13	Yes
RI	10	7.43	3.60	3.71	1.50	37.14%	0.15	No	33.86%	3.60	0.79	0.07	Yes
Total	19	9.07	2.32	4.21	0.71	44.76%	0.11		50%	0.23	0.80	0.00	

Reading Grade 6

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RL	9	5.29	0.76	40%	0.16	60%	0.16	0%	0.00	Yes
RI	10	14.57	7.59	23%	0.15	77%	0.15	0%	0.00	Yes
Total	19	9.93	6.57	32%	0.12	68%	0.12	0%	0.00	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RL	9	1 2 3	0 8 1	0% 89% 11%	5.29	0.76	Weak
RI	10	1 2 3	0 8 2	0% 80% 20%	14.57	7.59	Yes
Total	19	1 2 3	0 16 3	0% 84% 16%	9.93	6.57	

Reading Grade 6 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	5.29	0.76	3.57	0.98	39.68%	0.11	No	28.06%	0.76	0.86	0.07	Yes
RI	10	14.57	7.59	5.00	2.24	50.00%	0.22	Yes	71.94%	7.59	0.77	0.12	Yes
Total	19	9.93	6.57	4.29	1.01	45%	0.07		50%	0.31	0.81	0.06	

Reading Grade 7

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RL	9	17.33	3.27	24%	0.22	76%	0.22	0%	0.00	Yes
RI	10	27.33	3.14	26%	0.18	74%	0.18	0%	0.00	Yes
Total	19	22.33	7.07	25%	0.01	75%	0.01	0%	0.00	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RL	9	1 2 3	0 5 4	0% 56% 44%	17.33	3.27	Yes
RI	10	1 2 3	0 6 4	0% 60% 40%	27.33	3.14	Yes
Total	19	1 2 3	0 11 8	0% 58% 42%	22.33	7.07	

Reading Grade 7 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	17.33	3.27	4.17	1.72	46.30%	0.19	Weak	41.79%	3.27	0.77	0.15	Yes
RI	10	27.33	3.14	5.17	0.98	51.67%	0.10	Yes	58.21%	3.14	0.62	0.10	Weak
Total	19	22.33	7.07	4.67	0.71	49%	0.04		50%	0.12	0.70	0.10	

Reading Grade 8

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RL	9	5.33	0.82	20%	0.26	80%	0.26	0%	0.00	Yes
RI	10	19.17	2.32	21%	0.09	79%	0.09	0%	0.00	Yes
Total	19	12.25	9.78	21%	0.00	79%	0.00	0%	0.00	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RL	9	1 2 3	0 4 5	0% 44% 56%	5.33	0.82	Weak
RI	10	1 2 3	0 6 4	0% 60% 40%	19.17	2.32	Yes
Total	19	1 2 3	0 10 9	0% 53% 47%	12.25	9.78	

Reading Grade 8 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	5.33	0.82	2.83	1.17	31.48%	0.13	No	28.57%	0.82	0.85	0.07	Yes
RI	10	19.17	2.32	5.83	0.75	58.33%	0.08	Yes	71.43%	2.32	0.68	0.06	Weak
Total	19	12.25	9.78	4.33	2.12	45%	0.19		50%	0.30	0.76	0.12	

Reading Grades 9-10

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RL	9	9.83	2.23	32%	0.07	68%	0.07	0%	0.00	Yes
RI	10	32.67	5.20	29%	0.10	71%	0.10	0%	0.00	Yes
Total	19	21.25	16.15	30%	0.02	70%	0.02	0%	0.00	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RL	9	1 2 3	0 4 5	0% 44% 56%	9.83	2.23	Yes
RI	10	1 2 3	0 5 5	0% 50% 50%	32.67	5.20	Yes
Total	19	1 2 3	0 9 10	0% 47% 53%	21.25	16.15	

Reading Grades 9-10 (Continued)

Table C3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	9.83	2.23	4.50	0.55	50.00%	0.06	Yes	35.29%	2.23	0.79	0.08	Yes
RI	10	32.67	5.20	6.17	0.98	61.67%	0.10	Yes	64.71%	5.20	0.75	0.09	Yes
Total	19	21.25	16.15	5.33	1.18	56%	0.08		50%	0.21	0.77	0.03	

Reading Grades 11-12

Table C1: Depth-of-Knowledge Consistency between Standards and Test

Domain		Hits		Depth-of-Knowledge Levels						DOK Consistency
	Standards	Mean	Standard Deviation	% Under	Standard Deviation	% At	Standard Deviation	% Above	Standard Deviation	
RL	9	8.83	3.25	38%	0.38	62%	0.38	0%	0.00	Yes
RI	10	14.33	2.58	28%	0.27	72%	0.27	0%	0.00	Yes
Total	19	11.58	3.89	33%	0.08	67%	0.08	0%	0.00	

Table C2: Categorical Concurrence Between Standards and Test

Domain		Level by Standard			Hits		Categorical Concurrence
	Standards	Level	Standards by Level	Percentage by Standard	Mean	Standard Deviation	
RL	9	1 2 3	0 3 6	0% 33% 67%	8.83	3.25	Yes
RI	10	1 2 3	0 4 6	0% 40% 60%	14.33	2.58	Yes
Total	19	1 2 3	0 7 12	0% 37% 63%	11.58	3.89	

Reading Grades 11-12 (Continued)

Table R3: Range-of-Knowledge Correspondence and Balance of Representation between Standards and Test

Domain		Hits		Range of Standards				Range of Knowledge	Balance Index				Balance of Representation
				Number of Standards Hit		% of Total			Percentage of Total Hits		Index		
	Standards	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation		Mean	Standard Deviation	Mean	Standard Deviation	
RL	9	8.83	3.25	4.00	2.10	44.44%	0.23	Weak	56.83%	3.25	0.80	0.10	Yes
RI	10	14.33	2.58	5.00	1.79	50.00%	0.18	Yes	43.17%	2.58	0.73	0.09	Yes
Total	19	11.58	3.89	4.50	0.71	47%	0.04		50%	0.10	0.76	0.05	

Appendix D

Depth-of-Knowledge Levels and Standards by Item and Reviewers

Mathematics Grade 3
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6	DOK R7
1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	2	2	2	2	2	2	2
5	1	1	1	1	1	1	1
6	2	2	1	1	1	2	1
7	1	1	1	1	1	1	1
8	2	2	1	1	1	2	1
9	1	1	1	1	1	1	1
10	2	2	2	2	2	2	2
11	1	1	1	2	1	1	1
12	1	1	1	1	1	1	1
13	2	2	1	1	1	1	1
14	2	1	1	2	2	1	1
15	2	2	2	2	2	2	3
16	2	2	2	2	2	2	1
17	2	1	1	2	2	1	1
18	2	2	3	1	2	2	1
19	2	2	1	2	1	2	1
20	1	2	2	2	2	1	1
21	2	2	2	2	2	3	1
22	1	1	2	1	1	1	1
23	2	1	1	1	2	2	1
24	1	1	1	1	1	2	1
25	2	2	1	1	1	2	2
26	2	2	1	1	2	1	-
27	1	1	-	1	1	1	1
28	2	2	1	1	1	2	1
29	2	2	2	2	2	2	2
30	2	2	1	2	2	2	2
31	1	2	2	2	2	2	2
32	1	2	1	1	2	2	-
33	2	2	3	2	2	3	3
34	1	1	1	1	2	2	1
35	2	1	2	1	1	2	2
36	2	2	2	2	2	1	1
37	2	2	1	1	2	2	2
38	2	2	1	1	1	1	1
39	2	2	2	1	2	2	2
40	2	2	1	1	1	1	1
41	1	2	2	2	2	1	2
42	1	1	1	2	2	1	1
43	2	1	1	1	1	1	1
44	2	2	2	1	1	1	1
45	2	1	1	2	2	2	1
46	2	2	1	2	2	2	1
47	1	1	1	2	2	1	1
48	2	2	1	2	2	3	2

Mathematics Grade 3 (Table D1 Continued)

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6	DOK R7
49	1	1	1	1	1	1	1
50	1	1	2	2	1	3	2

Mathematics Grade 4
Table D1
DOK Levels by Item and Reviewers

Item	R1	R2	R3	R4	R5	R6	R7
1	2	2	1	1	1	2	2
2	2	2	1	1	2	1	2
3	1	1	0	1	1	1	1
4	2	2	1	1	1	2	1
5	2	2	2	2	2	2	2
6	2	2	1	2	2	2	2
7	1	2	2	2	2	2	2
8	1	2	1	1	2	2	2
9	2	2	3	2	2	3	3
10	1	1	1	1	2	2	1
11	2	1	2	1	1	2	2
12	2	2	2	2	2	1	1
13	2	2	1	1	2	2	2
14	2	2	1	1	1	1	1
15	2	2	2	1	2	2	2
16	2	2	1	1	1	1	1
17	1	2	2	2	2	1	2
18	1	1	1	2	2	1	1
19	2	1	1	1	1	1	1
20	2	2	2	1	1	1	1
21	2	1	1	2	2	2	1
22	2	2	1	2	2	2	1
23	1	1	1	2	2	1	1
24	2	2	1	2	2	3	2
25	1	1	1	1	1	1	1
26	1	1	2	2	1	3	2
27	2	1	1	2	2	1	1
28	1	1	1	1	2	2	1
29	1	1	1	1	1	1	1
30	1	2	1	1	1	1	1
31	2	1	1	2	2	1	1
32	1	1	2	2	1	2	1
33	1	2	2	2	2	2	2
34	2	2	1	2	2	2	1
35	2	2	1	2	2	1	1
36	1	1	1	1	2	1	1
37	2	1	1	1	2	1	2
38	1	1	1	1	1	1	1
39	1	1	1	1	1	1	1
40	2	2	1	2	2	2	1
41	2	2	1	1	1	1	1
42	2	2	2	2	2	2	2
43	2	2	1	1	1	2	1
44	2	2	1	1	1	2	1
45	2	2	1	2	2	2	1
46	1	1	1	1	1	1	1
47	1	1	1	2	2	1	2
48	1	1	1	2	2	2	2

Mathematics Grade 4 (Table D1 Continued)

Item	R1	R2	R3	R4	R5	R6	R7
49	1	2	2	2	2	2	2
50	1	1	1	1	1	1	1
51	2	2	2	2	2	2	2
52	1	2	1	1	1	1	1
53	1	1	1	2	1	1	1
54	1	1	1	1	1	1	1
55	1	1	1	1	1	1	1

Mathematics Grade 5
Table D1
DOK Levels by Item and Reviewers

Item	R1	R2	R3	R4	R5	R6	R7
1	2	1	2	2	2	2	2
2	1	1	1	1	2	1	1
3	1	1	1	1	1	1	1
4	1	2	1	1	1	1	1
5	2	1	1	2	2	1	1
6	1	1	2	2	1	2	1
7	1	2	2	2	2	2	2
8	2	2	1	2	2	2	1
9	2	2	1	2	2	1	1
10	1	1	1	1	2	1	1
11	2	1	1	1	2	1	2
12	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1
14	2	2	1	2	2	2	1
15	2	2	1	1	1	1	1
16	2	2	2	2	2	2	2
17	2	2	1	1	1	2	1
18	2	2	1	1	1	2	1
19	2	2	1	2	2	2	1
20	1	1	1	1	1	1	1
21	1	1	1	2	2	1	2
22	1	1	1	2	2	2	2
23	1	2	2	2	2	2	2
24	1	1	1	1	1	1	1
25	2	2	2	2	2	2	2
26	1	2	1	1	1	1	1
27	1	1	1	2	1	1	1
28	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1
31	2	2	1	1	1	1	1
32	1	1	2	2	2	2	2
33	2	2	1	2	2	2	1
34	2	2	1	1	2	1	1
35	1	1	1	1	1	1	1
36	2	1	2	1	2	1	2
37	1	1	1	1	1	1	1
38	2	2	2	2	2	2	2
39	1	2	1	2	1	1	1
40	2	2	1	2	2	1	2
41	1	2	1	1	1	1	1
42	2	2	1	1	1	2	1
43	2	2	1	2	1	1	2
44	1	1	1	1	1	2	1
45	2	1	1	2	1	1	1
46	2	2	1	1	2	1	1
47	2	2	1	1	2	1	2
48	2	2	1	1	2	1	1

Mathematics Grade 5 (Table D1 Continued)

Item	R1	R2	R3	R4	R5	R6	R7
49	1	1	1	1	2	1	1
50	2	2	1	1	1	1	1
51	1	1	1	1	1	1	1
52	1	2	1	1	1	1	1
53	1	1	1	2	2	2	2
54	1	2	1	1	2	2	1
55	1	1	1	1	1	1	1
56	1	2	1	2	2	1	2
57	1	2	1	2	2	1	2
58	1	1	1	2	2	2	1
59	1	1	1	1	1	1	1
60	2	2	2	2	2	2	2

Mathematics Grade 6
Table D1
DOK Levels by Item and Reviewers

Item	R1	R2	R3	R4	R5	R6	R7
1	1	1	1	1	1	1	1
2	2	2	1	1	1	1	1
3	1	1	2	2	2	2	2
4	2	2	1	2	2	2	1
5	2	2	1	1	2	1	1
6	1	1	1	1	1	1	1
7	2	1	2	1	2	1	2
8	1	1	1	1	1	1	1
9	2	2	2	2	2	2	2
10	1	2	1	2	1	1	1
11	2	2	1	2	2	1	2
12	1	2	1	1	1	1	1
13	2	2	1	1	1	2	1
14	2	2	1	2	1	1	2
15	1	1	1	1	1	2	1
16	2	1	1	2	1	1	1
17	2	2	1	1	2	1	1
18	2	2	1	1	2	1	2
19	2	2	1	1	2	1	1
20	1	1	1	1	2	1	1
21	2	2	1	1	1	1	1
22	1	1	1	1	1	1	1
23	1	2	1	1	1	1	1
24	1	1	1	2	2	2	2
25	1	2	1	1	2	2	1
26	1	1	1	1	1	1	1
27	1	2	1	2	2	1	2
28	1	2	1	2	2	1	2
29	1	1	1	2	2	2	1
30	1	1	1	1	1	1	1
31	2	2	2	2	2	2	2
32	1	1	1	1	1	1	1
33	2	1	1	2	2	2	2
34	2	2	1	1	1	1	1
35	1	2	1	2	1	2	1
36	2	2	2	2	2	2	1
37	1	1	1	2	1	2	1
38	1	1	1	1	1	1	1
39	2	2	1	2	2	2	2
40	2	2	1	1	1	2	1
41	2	1	1	1	2	2	2
42	2	1	1	1	2	2	2
43	1	2	2	2	2	2	1
44	1	1	1	1	1	2	1
45	2	1	2	2	2	2	2
46	1	1	1	1	1	1	2
47	1	1	2	1	1	1	2
48	2	1	1	1	2	2	2

Mathematics Grade 6 (Table D1 Continued)

Item	R1	R2	R3	R4	R5	R6	R7
49	2	2	1	2	2	2	2
50	1	1	1	1	1	1	2
51	1	2	2	2	2	2	2
52	1	2	1	1	1	2	1
53	2	2	2	1	2	2	2
54	2	2	1	1	1	1	1
55	1	1	1	1	1	1	1
56	2	2	1	2	2	2	2
57	2	1	1	2	2	2	2
58	1	2	1	2	2	2	2
59	2	2	1	2	2	1	2
60	1	1	1	1	2	1	1
61	1	1	1	2	1	1	1
62	2	2	2	1	2	2	1
63	1	1	2	2	2	2	1
64	1	1	1	1	1	1	1
65	2	2	1	2	2	1	2

Mathematics Grade 7
Table D1
DOK Levels by Item and Reviewers

Item	R1	R2	R3	R4	R5	R6	R7	R8
1	2	1	1	1	2	1	1	1
2	1	2	1	1	1	1	1	1
3	1	2	1	1	2	1	1	1
4	2	2	1	2	2	1	2	2
5	2	2	2	3	3	1	2	1
6	1	1	1	1	2	1	2	2
7	1	1	1	1	2	1	1	1
8	2	2	2	2	2	1	3	1
9	1	2	1	1	2	2	1	1
10	1	2	2	2	2	2	2	1
11	1	1	1	1	2	1	2	1
12	2	2	2	3	2	2	2	2
13	2	1	1	2	2	1	1	1
14	1	2	1	2	3	1	2	2
15	1	2	1	2	2	1	2	2
16	1	1	1	2	2	2	1	1
17	1	1	2	1	1	2	2	1
18	2	2	2	3	2	2	2	1
19	1	1	1	1	2	2	2	1
20	2	2	1	1	2	2	1	2
21	2	1	1	2	2	1	2	1
22	2	1	1	2	3	1	2	2
23	1	1	1	1	2	2	2	1
24	1	1	1	2	2	2	1	1
25	2	2	1	2	2	2	2	2
26	2	1	2	1	2	2	2	1
27	1	2	1	2	2	2	2	1
28	2	1	2	3	2	2	2	2
29	1	1	1	1	2	1	1	1
30	2	2	1	2	2	2	2	1
31	1	2	2	2	2	2	1	1
32	1	2	2	3	2	2	2	2
33	1	1	1	1	1	1	1	1
34	1	1	1	1	2	2	2	2
35	1	1	1	1	1	2	1	1
36	2	2	1	2	2	1	2	1
37	2	1	1	1	2	2	2	1
38	2	2	1	2	2	2	2	2
39	1	1	1	1	2	1	1	1
40	1	1	1	2	2	1	2	2
41	1	2	2	2	2	2	2	1
42	1	1	1	1	2	1	2	1
43	1	1	2	1	2	1	1	2
44	2	2	2	2	2	2	2	2
45	1	1	2	1	2	1	2	2
46	1	2	1	1	2	2	2	1
47	1	1	1	1	3	2	1	1
48	1	1	1	1	1	2	1	1

Mathematics Grade 7 (Table D1 Continued)

Item	R1	R2	R3	R4	R5	R6	R7	R8
49	2	2	2	2	3	1	2	2
50	1	1	1	1	2	2	1	1
51	1	1	1	1	2	1	1	1
52	1	1	1	1	2	1	1	2
53	2	2	1	2	2	2	2	2
54	2	2	1	1	2	2	2	2
55	2	2	1	3	3	2	2	2
56	2	2	1	3	3	2	2	2
57	1	1	1	2	2	2	2	1
58	1	1	1	1	2	1	1	1
59	1	1	1	1	2	1	1	1
60	1	3	1	3	3	2	2	2
61	1	1	1	1	2	1	1	2
62	1	2	1	1	3	2	2	2
63	1	2	1	2	2	2	2	2
64	1	2	1	3	3	2	2	2
65	2	2	1	2	3	2	2	2
66	1	2	1	2	2	1	2	2
67	1	2	1	1	2	1	2	2
68	2	1	1	1	2	2	1	1
69	2	2	1	2	3	2	2	2
70	1	1	1	1	2	1	1	1

Mathematics Grade 8
Table D1
DOK Levels by Item and Reviewers

Item	R1	R2	R3	R4	R5	R6	R7	R8
1	1	1	1	1	1	2	1	1
2	2	2	1	2	2	1	2	1
3	2	1	1	1	2	2	2	1
4	2	2	1	2	2	2	2	2
5	1	1	1	1	2	1	1	1
6	1	1	1	2	2	1	2	2
7	1	2	2	2	2	2	2	1
8	1	1	1	1	2	1	2	1
9	1	1	2	1	2	1	1	2
10	2	2	2	2	2	2	2	2
11	1	1	2	1	2	1	2	2
12	1	2	1	1	2	2	2	1
13	1	1	1	1	3	2	1	1
14	1	1	1	1	1	2	1	1
15	2	2	2	2	3	1	2	2
16	1	1	1	1	2	2	1	1
17	1	1	1	1	2	1	1	1
18	1	1	1	1	2	1	1	2
19	2	2	1	2	2	2	2	2
20	2	2	1	1	2	2	2	2
21	2	2	1	3	3	2	2	2
22	2	2	1	3	3	2	2	2
23	1	1	1	2	2	2	2	1
24	1	1	1	1	2	1	1	1
25	1	1	1	1	2	1	1	1
26	1	3	1	3	3	2	2	2
27	1	1	1	1	2	1	1	2
28	1	2	1	1	3	2	2	2
29	1	2	1	2	2	2	2	2
30	1	2	1	3	3	2	2	2
31	2	2	1	2	3	2	2	2
32	1	2	1	2	2	1	2	2
33	1	2	1	1	2	1	2	2
34	2	1	1	1	2	2	1	1
35	2	2	1	2	3	2	2	2
36	1	1	1	1	2	1	1	1
37	1	1	1	1	1	1	1	1
38	1	2	1	1	2	2	2	2
39	2	1	1	2	2	2	2	2
40	1	1	1	1	2	1	2	2
41	1	1	1	1	2	1	2	1
42	1	2	1	2	2	2	2	1
43	1	1	2	2	3	2	2	2
44	1	1	1	1	2	1	1	1
45	1	1	1	1	3	1	2	1
46	1	2	1	2	3	2	2	2
47	1	1	2	1	2	1	1	1
48	1	1	1	1	2	1	1	1

Mathematics Grade 8 (Table D1 Continued)

Item	R1	R2	R3	R4	R5	R6	R7	R8
49	1	2	1	3	3	2	2	2
50	2	2	1	2	2	2	2	2
51	1	1	1	1	2	2	2	2
52	1	2	1	2	2	2	2	2
53	1	2	1	2	2	1	2	1
54	2	2	1	2	2	2	2	2
55	2	2	2	2	1	2	2	1
56	2	1	2	1	2	2	1	1
57	1	1	2	1	1	1	1	1
58	2	2	2	1	3	2	2	2
59	1	1	2	1	2	2	1	1
60	1	2	2	1	2	2	2	1
61	1	1	1	2	2	2	1	1
62	1	1	1	1	2	2	2	1
63	1	1	1	2	2	1	2	2
64	1	2	1	2	2	1	2	2
65	1	1	1	1	2	1	1	1
66	1	2	1	1	2	2	1	1
67	1	1	1	1	2	1	2	1
68	1	1	1	1	2	2	2	1
69	1	1	1	1	1	1	1	1
70	1	2	1	2	2	1	2	2
71	1	1	1	1	2	2	2	2
72	1	2	2	2	2	2	2	3
73	1	2	1	2	2	1	1	1
74	1	1	1	1	2	2	2	1
75	1	2	1	2	3	2	2	2

Mathematics Grade 10
Table D1
DOK Levels by Item and Reviewers

Item	R1	R2	R3	R4	R5	R6	R7	R8
1	2	1	1	2	2	2	1	2
2	1	2	1	3	2	2	2	2
3	1	2	1	1	2	2	2	2
4	2	2	2	3	2	2	2	2
5	1	2	1	2	2	1	2	2
6	1	1	1	1	1	1	1	1
7	1	2	1	3	2	2	2	3
8	1	1	1	1	1	1	1	1
9	2	1	1	1	2	1	2	2
10	2	2	1	2	2	1	2	2
11	2	2	1	2	2	1	2	1
12	2	1	1	1	2	1	2	2
13	2	1	1	1	2	1	2	1
14	1	2	2	1	3	1	2	1
15	2	2	2	3	2	1	2	2
16	2	1	1	2	2	2	2	1
17	2	2	1	1	2	1	2	1
18	2	1	1	1	2	1	2	1
19	1	2	1	1	2	1	2	1
20	1	2	2	2	2	1	2	1
21	2	2	1	3	3	1	2	2
22	1	2	1	2	2	1	1	1
23	2	1	1	2	2	2	2	2
24	2	2	1	2	2	2	2	2
25	2	2	1	2	2	2	2	2
26	2	2	1	1	2	2	2	2
27	2	2	2	2	3	2	1	2
28	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	2
30	2	2	1	2	2	2	2	2
31	2	2	1	2	2	1	1	2
32	2	2	1	2	2	2	2	2
33	2	2	1	2	2	2	1	2
34	1	1	1	1	2	1	1	1
35	1	1	1	1	1	1	1	1
36	1	1	1	1	3	2	1	1
37	1	2	1	3	3	2	2	2
38	2	1	1	1	2	2	2	1
39	2	2	2	3	2	2	2	2
40	2	2	2	2	2	1	2	2

Mathematics Grade 11
Table D1
DOK Levels by Item and Reviewers

Item	R1	R2	R3	R4	R5	R6	R7	R8
1	2	2	1	3	3	1	2	2
2	1	2	1	2	2	1	1	1
3	2	1	1	2	2	2	2	2
4	2	2	1	2	2	2	2	2
5	2	2	1	2	2	2	2	2
6	2	2	1	1	2	2	2	2
7	2	2	2	2	3	2	1	2
8	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	2
10	2	2	1	2	2	2	2	2
11	2	2	1	2	2	1	1	2
12	2	2	1	2	2	2	2	2
13	2	2	1	2	2	2	1	2
14	1	1	1	1	2	1	1	1
15	1	1	1	1	1	1	1	1
16	1	1	1	1	3	2	1	1
17	1	2	1	3	3	2	2	2
18	2	1	1	1	2	2	2	1
19	2	2	2	3	2	2	2	2
20	2	2	2	2	2	1	2	2
21	2	2	1	2	3	1	2	2
22	2	2	2	3	1	1	1	1
23	2	2	1	2	2	1	1	2
24	1	1	1	2	3	1	2	2
25	2	2	1	3	2	1	2	2
26	2	2	2	2	3	2	2	2
27	2	2	2	2	3	2	2	2
28	1	1	1	1	2	2	1	1
29	2	2	1	2	2	2	2	2
30	2	2	2	2	3	1	2	2
31	2	1	1	2	2	2	2	2
32	1	2	1	2	2	2	2	2
33	2	2	2	3	3	2	2	2
34	1	2	1	1	2	2	2	1
35	2	2	1	2	3	2	2	2
36	2	2	1	2	2	2	2	2
37	1	3	2	3	3	2	2	2
38	2	2	1	2	2	2	2	2
39	2	2	1	2	2	1	2	2
40	2	1	2	2	2	1	2	1

Reading Grade 3
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6	DOK R7
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	1	2	1	2	2	2	2
4	1	1	1	1	1	2	1
5	1	2	1	1	1	2	1
6	2	1	2	2	1	2	1
7	1	1	2	1	1	2	1
8	2	2	2	2	2	1	1
9	2	2	3	3	3	3	3
10	2	2	2	2	2	2	2
11	2	1	2	1	1	2	1
12	1	2	2	2	1	2	1
13	2	2	3	2	2	3	1
14	2	2	2	2	2	3	2
15	1	2	1	1	1	1	1
16	2	2	1	1	1	2	2
17	2	2	1	2	2	2	2
18	1	2	3	1	2	2	3
19	2	2	2	2	2	2	2
20	1	2	1	1	2	1	2
21	2	1	3	1	1	1	2
22	1	1	2	1	1	2	1
23	2	2	3	1	2	2	2
24	2	1	2	2	2	2	2
25	2	2	2	2	2	2	1
26	2	2	2	2	2	2	2
27	1	2	1	1	2	1	1
28	2	2	2	2	2	2	1
29	2	2	3	2	2	2	1
30	2	2	2	2	2	2	2
31	2	2	1	3	2	2	1
32	1	2	1	1	1	2	1
33	2	1	2	1	2	2	2
34	2	2	2	2	2	2	1
35	2	2	2	1	1	2	1
36	2	2	3	2	2	2	2
37	2	2	2	2	2	2	2
38	2	2	2	2	2	2	3
39	2	1	2	1	2	2	2
40	2	2	2	2	2	1	1
41	1	1	1	1	2	2	1

Reading Grade 4
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6	DOK R7
1	2	1	3	1	1	1	2
2	1	1	2	1	1	2	1
3	2	2	3	1	2	2	2
4	2	1	2	2	2	2	2
5	2	2	2	2	2	2	1
6	2	2	2	2	2	2	2
7	1	2	1	1	2	1	1
8	2	2	2	2	2	2	1
9	2	2	3	2	2	2	1
10	2	2	2	2	2	2	2
11	2	2	1	3	2	2	1
12	1	2	1	1	1	2	1
13	2	1	2	1	2	2	2
14	2	2	2	2	2	2	1
15	2	2	2	1	1	2	1
16	2	2	3	2	2	2	2
17	2	2	2	2	2	2	2
18	2	2	2	2	2	2	3
19	2	1	2	1	2	2	2
20	2	2	2	2	2	1	1
21	1	1	1	1	2	2	1
22	2	2	2	2	2	2	1
23	2	2	2	2	1	2	2
24	2	2	2	2	2	2	2
25	2	2	1	2	2	2	1
26	1	2	2	2	2	2	2
27	1	2	2	1	1	2	2
28	2	2	2	2	2	1	2
29	2	2	3	2	2	2	2
30	2	2	1	2	2	3	2
31	2	2	1	2	2	2	2
32	1	2	1	2	2	2	2
33	2	2	2	2	2	1	2
34	2	2	1	1	2	2	2
35	2	2	2	2	2	2	2
36	2	2	2	2	2	3	2
37	2	2	2	3	2	2	2
38	2	2	2	2	2	2	1
39	2	2	2	1	2	3	1
40	2	1	1	1	1	2	1
41	2	2	2	1	2	2	1
42	2	2	1	2	2	2	2

Reading Grade 5
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6	DOK R7
1	2	2	2	2	2	2	1
2	2	2	2	2	1	2	2
3	2	2	2	2	2	2	2
4	2	2	1	2	2	2	1
5	1	2	2	2	2	2	2
6	1	2	2	1	1	1	2
7	2	2	2	2	2	2	2
8	**2**	2	3	2	2	3	2
9	2	2	1	2	2	3	2
10	2	2	1	2	2	2	2
11	1	2	1	2	2	2	2
12	2	2	2	2	2	1	2
13	2	2	1	1	2	2	2
14	2	2	2	2	2	2	2
15	2	2	2	2	2	3	2
16	2	2	2	3	2	2	2
17	2	2	2	2	2	2	1
18	2	2	2	1	2	3	1
19	2	1	1	1	1	2	1
20	2	2	2	1	2	2	1
21	**2**	2	1	2	2	2	2
22	2	1	1	1	2	2	1
23	2	2	2	2	2	2	2
24	2	1	2	1	2	2	2
25	2	3	2	2	2	2	2
26	2	3	3	2	2	3	3
27	2	1	2	2	2	3	2
28	2	2	1	1	2	2	2
29	2	1	2	2	2	2	2
30	2	1	2	2	2	2	3
31	2	2	2	2	2	1	2
32	2	2	3	2	2	2	3
33	2	2	2	1	2	2	2
34	**2**	2	1	1	2	1	2
35	2	2	2	1	2	2	3
36	2	2	1	2	2	1	2
37	2	2	2	2	2	2	3
38	2	1	1	1	2	2	2
39	2	2	3	1	2	3	2
40	2	1	2	2	2	2	3
41	2	2	2	2	2	2	2
42	2	2	2	2	2	2	2
43	2	3	2	2	2	2	3

Reading Grade 6
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6	DOK R7
1	2	1	1	1	2	2	1
2	2	2	2	2	2	2	2
3	2	1	2	1	2	2	2
4	2	3	2	2	2	2	2
5	2	3	3	2	2	3	3
6	2	1	2	2	2	3	2
7	2	2	1	1	2	2	2
8	2	1	2	2	2	2	2
9	2	1	2	2	2	2	3
10	2	2	2	2	2	1	2
11	2	2	3	2	2	2	3
12	2	2	2	1	2	2	2
13	2	2	1	1	2	1	2
14	2	2	2	1	2	2	3
15	2	2	1	2	2	1	2
16	2	2	2	2	2	2	3
17	2	1	1	1	2	2	2
18	2	2	3	1	0	3	2
19	2	1	2	2	2	2	3
20	2	2	2	2	2	2	2
21	2	2	2	2	2	2	2
22	2	3	2	2	2	2	3
23	2	2	2	2	2	2	3
24	2	2	2	2	2	2	2
25	1	2	1	1	1	2	2
26	2	2	2	2	2	2	2
27	2	2	1	1	2	2	2
28	2	2	2	2	2	3	3
29	2	2	2	1	2	2	2
30	2	1	2	1	1	2	2
31	2	2	2	2	2	1	2
32	2	2	2	1	2	2	2
33	2	2	2	2	2	1	2
34	2	2	2	2	2	2	2
35	2	3	2	2	2	1	2
36	1	1	1	1	1	2	2
37	2	2	2	1	1	2	2
38	2	1	3	2	2	2	2
39	2	2	2	1	2	2	3
40	2	2	3	3	3	2	3
41	2	3	3	2	3	3	3
42	2	1	3	2	2	2	2
43	2	2	2	2	2	1	2
44	2	2	2	2	2	2	3

Reading Grade 7
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6
1	2	1	2	2	2	2
2	2	1	2	2	2	1
3	2	1	2	2	1	2
4	2	1	2	1	1	2
5	2	1	2	2	1	1
6	2	2	2	2	2	2
7	2	2	2	3	2	2
8	2	1	2	2	2	2
9	2	2	2	2	1	2
10	2	1	2	3	2	2
11	2	2	2	2	1	2
12	2	2	2	2	2	2
13	2	2	2	2	2	2
14	2	1	2	2	2	1
15	2	2	2	2	1	2
16	2	2	2	3	2	1
17	2	2	2	1	2	2
18	2	2	2	2	2	2
19	2	2	2	2	2	2
20	2	1	2	2	1	1
21	2	2	2	2	1	2
22	2	2	2	2	2	2
23	2	1	2	2	1	1
24	2	1	2	2	2	2
25	2	2	2	2	2	2
26	2	2	2	2	1	2
27	2	2	2	2	2	2
28	2	1	2	2	1	2
29	2	2	2	2	2	2
30	2	2	2	3	2	2
31	2	1	2	2	2	1
32	2	1	2	2	2	2
33	2	2	2	2	2	2
34	2	2	2	2	2	2
35	2	1	2	2	2	2
36	2	2	1	2	2	1
37	2	2	1	2	2	2
38	2	1	2	2	2	2
39	2	2	3	2	3	3
40	2	2	2	2	2	2
41	2	3	2	2	2	2
42	2	2	2	2	2	2
43	2	2	3	2	2	2
44	2	2	3	2	2	2
45	2	2	2	2	2	2

Reading Grade 8
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6
1	2	1	2	2	1	1
2	2	1	2	2	2	2
3	2	2	2	2	2	2
4	2	2	2	2	1	2
5	2	2	2	2	2	2
6	2	1	2	2	1	2
7	2	2	2	2	2	2
8	2	2	2	3	2	2
9	2	1	2	2	2	1
10	2	1	2	2	2	2
11	2	2	2	2	2	2
12	2	2	2	2	2	2
13	2	1	2	2	2	2
14	2	2	1	2	2	1
15	2	2	1	2	2	2
16	2	1	2	2	2	2
17	2	2	3	2	3	3
18	2	2	2	2	2	2
19	2	3	2	2	2	2
20	2	2	2	2	2	2
21	2	2	3	2	2	2
22	2	2	3	2	2	2
23	2	2	2	2	2	2
24	2	1	2	1	1	2
25	2	2	1	2	1	2
26	2	2	2	2	1	2
27	2	2	3	3	3	2
28	2	3	2	3	3	2
29	2	3	2	2	3	3
30	2	1	2	3	3	2
31	2	2	3	2	2	2
32	2	3	3	3	3	3
33	2	3	3	2	3	2
34	3	3	3	3	3	2
35	2	2	2	2	2	2
36	2	2	2	2	2	3
37	2	1	1	2	1	1
38	2	2	1	2	2	2
39	3	2	2	3	3	2
40	2	2	2	2	3	3
41	2	2	2	2	3	3
42	2	1	2	2	1	2
43	2	2	3	2	2	3
44	2	2	2	2	2	3
45	2	2	1	2	2	1
46	2	3	2	3	3	3

Reading Grades 9-10
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6
1	2	2	2	3	3	1
2	2	2	2	3	2	2
3	2	2	3	2	3	3
4	2	2	2	2	2	3
5	2	2	2	2	2	2
6	3	2	2	2	3	3
7	3	2	2	3	2	2
8	2	3	2	3	3	1
9	2	1	2	2	1	2
10	3	2	2	2	2	3
11	2	2	2	2	2	2
12	3	2	2	3	3	2
13	2	2	2	2	2	2
14	2	2	2	3	3	2
15	2	2	2	2	3	3
16	2	2	1	3	3	2
17	2	1	1	2	1	2
18	2	2	2	2	2	2
19	2	2	2	3	2	2
20	2	2	2	2	2	3
21	2	1	2	3	3	2
22	3	1	3	2	2	2
23	3	2	3	2	2	2
24	2	2	2	2	3	2
25	3	2	2	2	3	3
26	3	2	2	2	3	3
27	2	1	1	3	1	1
28	2	1	2	2	2	2
29	3	2	2	3	2	2
30	2	1	1	3	1	1
31	3	2	2	2	2	3
32	3	3	3	3	3	3
33	3	3	3	3	3	3
34	2	2	2	2	2	2
35	3	2	2	3	2	2
36	3	2	2	2	2	2
37	2	2	2	2	2	2
38	3	1	2	2	2	2
39	3	2	2	2	2	2
40	3	2	3	3	3	3

Reading Grades 11-12
Table D1
DOK Levels by Item and Reviewers

Item	DOK R1	DOK R2	DOK R3	DOK R4	DOK R5	DOK R6
1	2	2	2	3	1	2
2	2	2	2	2	2	2
3	3	2	2	2	2	2
4	3	2	2	3	3	3
5	2	2	2	2	2	2
6	2	1	1	2	1	2
7	3	2	2	2	2	2
8	3	2	2	2	3	3
9	3	2	2	2	3	3
10	2	1	1	3	1	1
11	2	1	2	2	2	2
12	3	2	2	3	2	2
13	2	1	1	3	1	1
14	3	2	2	2	2	3
15	3	3	3	3	3	3
16	3	3	3	3	3	3
17	2	1	2	2	1	2
18	3	2	2	2	2	3
19	2	2	2	2	2	2
20	3	2	2	3	3	2
21	2	2	2	2	2	2
22	2	2	2	3	3	2
23	2	2	2	2	3	3
24	2	2	1	3	3	2
25	2	1	1	2	1	2
26	3	2	2	2	2	2
27	2	2	2	2	2	2
28	3	2	2	3	2	2
29	3	2	2	2	2	3
30	3	2	2	3	2	3
31	3	3	3	3	3	2
32	3	2	2	3	2	2
33	2	2	1	3	3	2
34	3	2	2	2	2	3
35	3	2	2	2	2	3
36	3	2	2	2	2	2
37	3	1	2	3	2	2
38	3	1	2	2	3	3
39	3	2	2	3	2	3
40	2	2	2	2	3	2

Mathematics Grade 3
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	3.NF.1	3.NF.1	3.NF.1	3.NF.1	3.NF.1	3.NF.1	3.NF.1
2	2.G.1	2.G.1	2.G.1	2.G.1	2.G.1	2.G.1	2.G.1
3	2.OA.1	2.OA.1	2.OA.1	2.OA.1	2.OA.1	2.OA.1	2.OA.1
4	4.OA.3	4.OA.3	4.OA.3	4.OA.3	4.OA.3	4.OA.3	4.OA.3
5	3.MD.1	3.MD.1	3.MD.1	3.MD.1	3.MD.1	3.MD.1	3.MD.1
6	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1
7	2.G.1	NA	NA	NA	NA	NA	NA
8	4.NF.7	4.NF.7	4.NF.7	4.NF.7	4.MD.2	3.NBT.2	4.NF.7
9	3.OA.7	3.OA.7	3.OA.6	3.OA.7	3.OA.6	3.OA.5	3.OA.5
10	3.OA.9	3.OA.9	3.OA.9	3.OA.9	3.OA.9	3.OA.9	3.OA.3
11	4.MD.1	3.MD.2	4.MD.1	4.MD.1	5.MD.1	4.MD.1	4.MD.1
12	3.MD.6	3.MD.6	3.MD.5	3.MD.6	3.MD.6	3.MD.5	3.MD.6
13	3.MD.3	3.MD.3	NA	3.MD.3	2.MD.10	2.OA.4	3.MD.3
14	3.MD.3	3.MD.3	NA	3.MD.3	3.MD.3	2.OA.1	3.MD.3
15	3.MD.3	3.MD.3	NA	3.MD.3	3.MD.3	4.MD.2	NA
16	3.OA.8	3.OA.8	3.OA.8	3.OA.8	3.OA.8	3.OA.8	3.OA.8
17	4.MD.3	3.MD.8	3.MD.8	3.MD.8	3.MD.8	3.MD.8	3.MD.8
18	5.OA.3	3.OA.8	4.OA.2	3.OA.9	5.OA.3	3.OA.4	3.OA.3
19	4.NF.4	4.NF.4	4.NF.4	3.NF.1	4.NF.4	3.OA.7	4.NF.4
20	NA	4.NF.7	2.MD.8	2.MD.8	2.MD.8	2.MD.8	2.MD.8
21	6.G.4	NA	6.G.4	6.G.4	6.G.4	6.G.4	6.NS.4
22	2.OA.1	3.NBT.2	3.NBT.2	2.OA.1	2.NBT.5	3.NBT.2	2.MD.5
23	4.MD.1	2.MD.3	2.MD.3	2.MD.3	2.MD.3	2.MD.3	2.MD.3
24	4.NF.3	4.NF.3	4.NF.3	4.NF.3	4.NF.3	3.NF.3	3.NF.3
25	3.OA.9	3.OA.9	3.OA.9	3.OA.9	4.OA.5	3.OA.9	3.OA.9
26	NA	NA	NA	3.MD.3	NA	3.MD.2	NA
27	4.G.1	4.MD.6	4.MD.7	4.MD.5	4.MD.6	4.MD.5	4.MD.6
28	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1
29	3.OA.8	4.OA.3	3.OA.8	3.OA.3	3.OA.8	3.OA.8	3.OA.8
30	4.MD.2	4.MD.2	4.NF.1	3.NF.3	3.MD.1	3.NF.3	4.MD.2
31	NA	2.NBT.1	2.NBT.1	4.NBT.2	2.NBT.5	3.NBT.2	2.NBT.1
32	NA	NA	8.G.1	NA	NA	6.NS.6	NA
33	5.MD.4	NA	5.MD.4	5.MD.4	5.MD.4	5.MD.4	5.MD.5
34	3.NBT.2	3.NBT.2	2.NBT.9	3.NBT.2	3.OA.8	6.NS.5	2.NBT.9
35	2.OA.2	3.OA.8	3.OA.8	2.OA.2	2.OA.2	3.OA.8	3.OA.8
36	4.OA.3	3.OA.8	NA	4.OA.3	3.OA.9	3.OA.3	NA
37	4.MD.2	4.MD.2	3.OA.8	4.NF.7	4.MD.2	3.OA.8	3.OA.8
38	3.MD.3	3.MD.3	3.MD.3	3.MD.3	2.MD.10	3.MD.3	2.MD.10
39	3.MD.3	3.MD.3	3.MD.3	3.MD.3	3.MD.3	3.MD.3	3.MD.3
40	3.MD.3	3.MD.3	3.MD.3	3.MD.3	2.MD.10	3.MD.3	2.MD.10

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 3 (Table D2 Continued)

Items	Standards						
	R1	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**
41	3.OA.8	3.OA.8	6.EE.2	6.EE.2	6.EE.7	2.OA.1	6.EE.3
42	2.G.1	3.G.1	7.G.1	7.G.1	7.G.1	8.G.4	NA
43	3.MD.6	3.MD.7	3.OA.1	3.OA.1	3.OA.3	3.OA.3	4.NBT.5
44	2.MD.1	2.MD.3	2.MD.3	2.MD.3	4.MD.1	4.MD.1	4.MD.1
45	2.OA.1	2.OA.1	2.OA.1	3.NBT.2	6.EE.2	6.EE.6	NA
46	3.NF.1	3.NF.1	6.SP.1	7.SP.5	7.SP.5	7.SP.6	7.SP.7
47	2.NBT.4	2.NBT.5	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.3	6.NS.7
48	3.MD.2	3.MD.2	3.OA.8	4.MD.1	4.MD.1	4.MD.1	4.MD.1
49	2.G.1	2.G.1	2.G.1	2.G.1	3.G.1	NA	NA
50	6.EE.2	6.EE.2	6.EE.2	6.EE.5	6.EE.6	7.EE.3	NA

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 4
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	3.OA.9	3.OA.9	3.OA.9	3.OA.9	4.OA.5	3.OA.9	3.OA.9
2	NA	NA	NA	3.MD.3	NA	3.MD.2	NA
3	4.G.1	4.MD.6	4.MD.7	4.MD.5	4.MD.6	4.MD.5	4.MD.6
4	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1
5	3.OA.8	4.OA.3	3.OA.8	3.OA.3	3.OA.8	3.OA.8	3.OA.8
6	4.MD.2	4.MD.2	4.NF.1	3.NF.3	3.MD.1	3.NF.3	4.MD.2
7	NA	2.NBT.1	2.NBT.1	4.NBT.2	2.NBT.5	3.NBT.2	2.NBT.1
8	NA	NA	8.G.1	NA	NA	6.NS.6	NA
9	5.MD.4	NA	5.MD.4	5.MD.4	5.MD.4	5.MD.4	5.MD.5
10	3.NBT.2	3.NBT.2	2.NBT.9	3.NBT.2	3.OA.8	6.NS.5	2.NBT.9
11	2.OA.2	3.OA.8	3.OA.8	2.OA.2	2.OA.2	3.OA.8	3.OA.8
12	4.OA.3	3.OA.8	NA	4.OA.3	3.OA.9	3.OA.3	NA
13	4.MD.2	4.MD.2	3.OA.8	4.NF.7	4.MD.2	3.OA.8	3.OA.8
14	3.MD.3	3.MD.3	3.MD.3	3.MD.3	2.MD.10	3.MD.3	2.MD.10
15	3.MD.3	3.MD.3	3.MD.3	3.MD.3	3.MD.3	3.MD.3	3.MD.3
16	3.MD.3	3.MD.3	3.MD.3	3.MD.3	2.MD.10	3.MD.3	2.MD.10
17	3.OA.8	3.OA.8	6.EE.2	6.EE.2	6.EE.7	2.OA.1	6.EE.3
18	7.G.1	NA	7.G.1	7.G.1	8.G.4	2.G.1	3.G.1
19	3.OA.3	4.NBT.5	3.OA.1	3.OA.1	3.OA.3	3.MD.7	3.MD.6
20	4.MD.1	2.MD.1	4.MD.1	2.MD.3	4.MD.1	2.MD.3	2.MD.3
21	3.NBT.2	2.OA.1	6.EE.2	2.OA.1	NA	2.OA.1	6.EE.6
22	7.SP.7	3.NF.1	7.SP.5	7.SP.6	7.SP.5	3.NF.1	6.SP.1
23	4.NBT.2	2.NBT.4	4.NBT.2	4.NBT.2	6.NS.7	2.NBT.5	4.NBT.3
24	4.MD.1	4.MD.1	4.MD.1	3.MD.2	3.MD.2	3.OA.8	4.MD.1
25	2.G.1	NA	NA	3.G.1	2.G.1	2.G.1	2.G.1
26	7.EE.3	NA	6.EE.5	6.EE.2	6.EE.2	6.EE.2	6.EE.6
27	5.NBT.3	4.NBT.1	5.NBT.3	4.NBT.2	4.NBT.1	4.NBT.2	5.NBT.1
28	3.G.1	NA	NA	NA	2.G.1	6.G.4	5.G.4
29	2.MD.1	NA	4.NF.7	2.MD.1	2.MD.1	2.MD.3	4.MD.1
30	2.OA.1	3.OA.8	4.OA.2	5.OA.2	5.OA.2	2.OA.1	6.EE.2
31	4.OA.3	4.OA.3	4.NBT.6	4.OA.3	4.OA.3	4.NBT.6	4.NF.1
32	3.MD.8	3.MD.8	3.MD.8	4.MD.3	3.MD.8	4.OA.3	4.MD.2
33	3.OA.9	4.OA.5	3.MD.1	4.MD.2	3.MD.1	4.MD.2	4.MD.2
34	4.MD.1	4.MD.1	4.MD.1	3.MD.2	4.MD.1	4.MD.2	4.MD.1
35	7.SP.5	NA	7.SP.5	7.SP.5	7.SP.7	3.NF.1	7.RP.1
36	3.NBT.3	4.OA.2	3.OA.3	4.OA.2	4.OA.1	4.OA.2	4.OA.2
37	4.G.3	4.G.3	4.G.3	4.G.3	4.G.3	4.G.3	4.G.3
38	6.RP.2	NA	5.NF.5	7.G.1	6.RP.3	6.RP.1	5.NF.5

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 4 (Table D2 Continued)

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
39	4.NBT.3	4.NBT.3	4.NBT.1	4.NBT.3	4.NBT.3	4.NBT.3	4.NBT.3
40	3.NF.2	3.NF.2	3.NF.2	3.NF.2	3.NF.2	3.NF.2	3.NF.2
41	4.OA.1	4.OA.1	5.OA.2	3.OA.3	6.RP.3	4.OA.2	3.OA.3
42	6.G.1	NA	6.G.4	6.G.4	6.G.4	6.G.4	6.G.4
43	6.SP.5	NA	6.SP.5	6.SP.4	6.SP.5	6.SP.5	6.SP.5
44	6.SP.5	NA	6.SP.4	6.SP.4	6.SP.5	6.SP.5	6.SP.5
45	6.SP.5	NA	6.SP.4	6.SP.4	6.SP.5	6.SP.5	6.SP.5
46	3.MD.1	3.MD.1	3.MD.1	3.MD.1	2.MD.7	2.MD.7	3.MD.1
47	4.OA.3	4.OA.3	3.OA.8	4.OA.3	4.OA.3	4.NBT.4	4.OA.3
48	3.MD.6	3.MD.5	3.MD.6	3.MD.5	3.MD.6	3.MD.6	3.MD.6
49	4.OA.3	4.MD.2	3.OA.8	4.OA.3	4.OA.3	4.NBT.6	6.RP.3
50	3.OA.4	3.OA.6	3.OA.4	3.OA.6	4.OA.2	4.OA.2	3.OA.4
51	4.OA.3	4.OA.3	4.OA.3	4.OA.3	4.OA.3	4.OA.3	3.OA.8
52	4.MD.1	4.MD.1	4.MD.1	5.MD.1	4.MD.1	4.MD.1	4.MD.1
53	7.EE.3	NA	3.OA.5	6.EE.7	6.EE.3	3.OA.5	5.OA.1
54	3.G.1	3.G.1	2.G.1	3.G.1	6.G.1	4.G.2	3.G.1
55	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 5
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	5.NBT.3	4.NBT.1	5.NBT.3	4.NBT.2	4.NBT.1	4.NBT.2	5.NBT.1
2	3.G.1	NA	NA	NA	2.G.1	6.G.4	5.G.4
3	2.MD.1	NA	4.NF.7	2.MD.1	2.MD.1	2.MD.3	4.MD.1
4	2.OA.1	3.OA.8	4.OA.2	5.OA.2	5.OA.2	2.OA.1	6.EE.2
5	4.OA.3	4.OA.3	4.NBT.6	4.OA.3	4.OA.3	4.NBT.6	4.NF.1
6	3.MD.8	3.MD.8	3.MD.8	4.MD.3	3.MD.8	4.OA.3	4.MD.2
7	3.OA.9	4.OA.5	3.MD.1	4.MD.2	3.MD.1	4.MD.2	4.MD.2
8	4.MD.1	4.MD.1	4.MD.1	3.MD.2	4.MD.1	4.MD.2	4.MD.1
9	7.SP.5	NA	7.SP.5	7.SP.5	7.SP.7	3.NF.1	7.RP.1
10	3.NBT.3	4.OA.2	3.OA.3	4.OA.2	4.OA.1	4.OA.2	4.OA.2
11	4.G.3	4.G.3	4.G.3	4.G.3	4.G.3	4.G.3	4.G.3
12	6.RP.2	NA	5.NF.5	7.G.1	6.RP.3	6.RP.1	5.NF.5
13	4.NBT.3	4.NBT.3	4.NBT.1	4.NBT.3	4.NBT.3	4.NBT.3	4.NBT.3
14	3.NF.2	3.NF.2	3.NF.2	3.NF.2	3.NF.2	3.NF.2	3.NF.2
15	4.OA.1	4.OA.1	5.OA.2	3.OA.3	6.RP.3	4.OA.2	3.OA.3
16	6.G.1	NA	6.G.4	6.G.4	6.G.4	6.G.4	6.G.4
17	6.SP.5	NA	6.SP.5	6.SP.4	6.SP.5	6.SP.5	6.SP.5
18	6.SP.5	NA	6.SP.4	6.SP.4	6.SP.5	6.SP.5	6.SP.5
19	6.SP.5	NA	6.SP.4	6.SP.4	6.SP.5	6.SP.5	6.SP.5
20	3.MD.1	3.MD.1	3.MD.1	3.MD.1	2.MD.7	2.MD.7	3.MD.1
21	4.OA.3	4.OA.3	3.OA.8	4.OA.3	4.OA.3	4.NBT.4	4.OA.3
22	3.MD.6	3.MD.5	3.MD.6	3.MD.5	3.MD.6	3.MD.6	3.MD.6
23	4.OA.3	4.MD.2	3.OA.8	4.OA.3	4.OA.3	4.NBT.6	6.RP.3
24	3.OA.4	3.OA.6	3.OA.4	3.OA.6	4.OA.2	4.OA.2	3.OA.4
25	4.OA.3	4.OA.3	4.OA.3	4.OA.3	4.OA.3	4.OA.3	3.OA.8
26	4.MD.1	4.MD.1	4.MD.1	5.MD.1	4.MD.1	4.MD.1	4.MD.1
27	7.EE.3	NA	3.OA.5	6.EE.7	6.EE.3	3.OA.5	5.OA.1
28	3.G.1	3.G.1	2.G.1	3.G.1	6.G.1	4.G.2	3.G.1
29	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2	4.NBT.2
30	4.NBT.2	5.NBT.1	4.NBT.2	4.NBT.2	4.NBT.2	5.NBT.1	NA
31	2.MD.1	4.MD.1	NA	NA	NA	2.MD.1	NA
32	3.OA.8	4.OA.2	NA	6.EE.2	4.OA.3	5.OA.2	NA
33	NA	NA	8.G.1	6.NS.6	8.G.3	8.G.1	4.G.3
34	4.OA.5	4.OA.5	3.OA.9	5.OA.3	4.OA.5	5.OA.3	3.NBT.2
35	4.G.1	4.MD.5	NA	4.MD.5	7.G.2	4.MD.5	4.G.1

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 5 (Table D2 Continued)

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
36	3.OA.8	NA	3.OA.8	4.OA.3	4.MD.2	4.NBT.4	4.OA.3
37	6.SP.5	NA	6.SP.5	6.SP.5	7.SP.4	6.SP.5	NA
38	G-CO.10	NA	NA	5.G.3	8.G.4	6.EE.9	4.MD.7
39	6.NS.4	4.OA.2	6.NS.4	4.OA.4	6.NS.4	4.OA.4	6.NS.4
40	5.NF.4	5.NF.3	4.NF.4	5.NF.6	5.NF.3	5.OA.2	4.OA.2
41	4.MD.6	4.MD.6	4.MD.6	4.MD.6	NA	2.MD.1	4.MD.6
42	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	3.MD.2	4.MD.1
43	4.MD.2	NA	4.MD.2	3.MD.1	3.MD.1	3.MD.1	4.MD.2
44	6.EE.1	6.EE.1	6.EE.1	6.EE.1	6.EE.1	6.EE.2	6.EE.1
45	NA	NA	3.MD.8	5.G.3	5.OA.2	5.G.3	4.MD.3
46	8.SP.1	NA	8.SP.1	8.SP.1	7.SP.4	6.SP.5	8.SP.1
47	8.SP.1	NA	8.SP.1	8.SP.1	8.SP.2	6.SP.5	8.SP.3
48	8.SP.1	NA	8.SP.1	8.SP.1	8.SP.1	6.SP.5	8.SP.1
49	NA	5.NBT.3	NA	5.NBT.3	4.NF.7	5.NBT.3	NA
50	4.MD.1	4.MD.1	4.MD.1	2.MD.1	4.MD.1	NA	4.MD.1
51	7.RP.2	6.RP.3	6.RP.3	7.RP.2	7.RP.2	5.NF.7	7.RP.2
52	4.OA.4	4.NBT.6	3.OA.7	4.OA.4	4.NBT.6	5.NF.3	NA
53	6.EE.7	4.OA.3	6.EE.2	6.EE.5	8.EE.7	6.EE.4	6.EE.2
54	NA	NA	NA	5.MD.1	4.MD.1	5.MD.1	4.MD.1
55	5.NBT.2	5.NBT.2	6.NS.3	5.NBT.2	5.NBT.6	5.MD.1	5.MD.1
56	4.OA.2	6.EE.2	6.EE.2	5.OA.2	6.EE.2	5.OA.2	6.EE.7
57	NA	NA	8.G.2	5.G.4	NA	4.G.3	4.G.3
58	5.OA.1	5.OA.1	6.EE.2	5.OA.1	6.EE.3	5.OA.1	5.OA.1
59	4.MD.3	NA	3.MD.8	4.MD.3	3.MD.8	4.MD.3	4.MD.3
60	7.SP.1	NA	7.SP.1	7.SP.1	7.SP.1	6.SP.1	NA

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 6
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	4.NBT.2	5.NBT.1	4.NBT.2	4.NBT.2	4.NBT.2	5.NBT.1	NA
2	2.MD.1	4.MD.1	NA	NA	NA	2.MD.1	NA
3	3.OA.8	4.OA.2	NA	6.EE.2	4.OA.3	5.OA.2	NA
4	NA	NA	8.G.1	6.NS.6	8.G.3	8.G.1	4.G.3
5	4.OA.5	4.OA.5	3.OA.9	5.OA.3	4.OA.5	5.OA.3	3.NBT.2
6	4.G.1	4.MD.5	NA	4.MD.5	7.G.2	4.MD.5	4.G.1
7	3.OA.8	NA	3.OA.8	4.OA.3	4.MD.2	4.NBT.4	4.OA.3
8	6.SP.5	NA	6.SP.5	6.SP.5	7.SP.4	6.SP.5	NA
9	G-CO.10	NA	NA	5.G.3	8.G.4	6.EE.9	4.MD.7
10	6.NS.4	4.OA.2	6.NS.4	4.OA.4	6.NS.4	4.OA.4	6.NS.4
11	5.NF.4	5.NF.3	4.NF.4	5.NF.6	5.NF.3	5.OA.2	4.OA.2
12	4.MD.6	4.MD.6	4.MD.6	4.MD.6	NA	2.MD.1	4.MD.6
13	4.MD.1	4.MD.1	4.MD.1	4.MD.1	4.MD.1	3.MD.2	4.MD.1
14	4.MD.2	NA	4.MD.2	3.MD.1	3.MD.1	3.MD.1	4.MD.2
15	6.EE.1	6.EE.1	6.EE.1	6.EE.1	6.EE.1	6.EE.2	6.EE.1
16	NA	NA	3.MD.8	5.G.3	5.OA.2	5.G.3	4.MD.3
17	8.SP.1	NA	8.SP.1	8.SP.1	7.SP.4	6.SP.5	8.SP.1
18	8.SP.1	NA	8.SP.1	8.SP.1	8.SP.2	6.SP.5	8.SP.3
19	8.SP.1	NA	8.SP.1	8.SP.1	8.SP.1	6.SP.5	8.SP.1
20	NA	5.NBT.3	NA	5.NBT.3	4.NF.7	5.NBT.3	NA
21	4.MD.1	4.MD.1	4.MD.1	2.MD.1	4.MD.1	NA	4.MD.1
22	7.RP.2	6.RP.3	6.RP.3	7.RP.2	7.RP.2	5.NF.7	7.RP.2
23	4.OA.4	4.NBT.6	3.OA.7	4.OA.4	4.NBT.6	5.NF.3	NA
24	6.EE.7	4.OA.3	6.EE.2	6.EE.5	8.EE.7	6.EE.4	6.EE.2
25	NA	NA	NA	5.MD.1	4.MD.1	5.MD.1	4.MD.1
26	5.NBT.2	5.NBT.2	6.NS.3	5.NBT.2	5.NBT.6	5.MD.1	5.MD.1
27	4.OA.2	6.EE.2	6.EE.2	5.OA.2	6.EE.2	5.OA.2	6.EE.7
28	NA	NA	8.G.2	5.G.4	NA	4.G.3	4.G.3
29	5.OA.1	5.OA.1	6.EE.2	5.OA.1	6.EE.3	5.OA.1	5.OA.1
30	4.MD.3	NA	3.MD.8	4.MD.3	3.MD.8	4.MD.3	4.MD.3
31	7.SP.1	NA	7.SP.1	7.SP.1	7.SP.1	6.SP.1	NA
32	4.MD.2	5.NBT.7	6.EE.1	5.OA.2	5.OA.2	5.OA.2	4.OA.2
33	7.EE.1	6.NS.5	6.NS.6	6.NS.5	6.NS.5	6.NS.5	7.EE.1
34	4.MD.1	NA	4.MD.1	2.MD.3	NA	5.MD.1	4.MD.1
35	6.SP.3	6.RP.3	6.RP.3	6.RP.3	6.RP.3	6.RP.2	5.NBT.7
36	6.G.4	6.G.4	6.G.4	6.G.4	6.G.4	6.G.4	6.G.4
37	6.NS.4	6.NS.4	6.NS.4	6.NS.4	6.NS.4	6.NS.4	6.NS.4
38	5.NBT.3	5.NBT.3	5.NBT.3	5.NBT.3	5.NBT.3	5.NBT.3	5.NBT.3

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 6 (Table D2 Continued)

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
39	3.MD.6	NA	3.MD.6	3.MD.6	3.MD.6	6.G.1	NA
40	4.OA.5	6.NS.6	7.NS.1	7.NS.1	4.OA.5	6.NS.6	6.NS.6
41	3.MD.2	NA	NA	5.MD.1	NA	6.NS.1	NA
42	4.MD.2	5.NBT.4	NA	5.NBT.4	5.NBT.7	6.NS.3	5.NBT.4
43	8.G.3	5.G.2	8.G.3	8.G.1	8.G.3	6.G.3	6.NS.8
44	6.RP.3	6.RP.3	5.NBT.7	6.NS.2	5.NBT.7	6.RP.2	5.NBT.7
45	5.MD.1	5.MD.1	5.MD.1	5.MD.1	5.MD.1	6.RP.3	5.NBT.2
46	5.MD.5	5.MD.5	6.G.2	6.G.2	6.G.2	6.G.2	6.G.2
47	NA	7.NS.2	7.NS.2	6.SP.5	7.NS.2	6.SP.5	7.NS.2
48	NA	NA	8.G.2	4.G.3	4.G.3	4.G.3	4.G.3
49	NA	6.EE.2	4.OA.5	4.OA.5	4.OA.5	5.OA.3	NA
50	4.NBT.2	NA	5.NBT.3	4.NBT.2	4.NBT.2	6.NS.3	5.OA.2
51	7.SP.1	6.SP.5	NA	7.SP.6	7.SP.7	6.SP.4	NA
52	6.SP.5	6.SP.5	NA	6.SP.5	8.SP.1	6.SP.5	NA
53	3.MD.3	6.SP.5	NA	6.SP.5	8.SP.1	6.SP.5	NA
54	4.MD.1	NA	NA	4.MD.1	NA	5.MD.1	4.MD.1
55	6.EE.5	5.NBT.7	NA	6.EE.5	6.EE.2	6.EE.2	5.NBT.7
56	7.EE.4	6.EE.9	6.EE.2	6.EE.9	5.OA.3	6.EE.2	8.EE.5
57	4.G.1	NA	4.G.2	5.G.4	NA	5.G.4	4.G.1
58	6.RP.3	7.EE.3	6.RP.3	6.RP.3	6.RP.3	6.RP.3	7.RP.3
59	7.G.1	7.G.1	7.G.1	7.G.1	7.G.1	6.RP.3	7.G.1
60	5.NBT.2	6.NS.3	6.NS.3	6.NS.3	6.NS.3	6.NS.3	5.NBT.3
61	3.MD.6	6.G.1	6.G.1	6.G.1	6.G.1	6.G.1	7.G.6
62	4.MD.1	NA	NA	4.MD.1	NA	6.SP.5	5.NBT.3
63	6.EE.5	6.EE.5	6.EE.5	6.EE.5	6.EE.8	6.NS.7	7.EE.4
64	4.OA.4	NA	NA	4.OA.4	4.OA.4	4.OA.4	NA
65	7.SP.1	6.SP.5	7.SP.5	7.SP.7	7.SP.6	6.RP.1	6.RP.1

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 7
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards							
	R1	R2	R3	R4	R5	R6	R7	R8
1	5.OA.2	6.RP.3	7.EE.3	6.NS.3	7.NS.3	7.RP.1	5.OA.2	7.RP.2
2	6.NS.5	7.NS.1	7.EE.4	7.NS.1	7.NS.1	7.RP.1	7.NS.1	7.NS.1
3	4.MD.1	4.MD.1	3.MD.1	4.MD.1	N-Q.3	7.RP.1	4.MD.1	4.MD.1
4	6.RP.3	6.RP.3	6.RP.3	6.RP.3	7.RP.1	7.RP.2	7.RP.1	6.RP.3
5	6.G.4	6.G.4	6.G.4	6.G.4	7.G.3	7.G.3	6.G.4	6.G.4
6	6.NS.4	6.NS.4	6.NS.4	6.NS.4	7.NS.2	7.NS.1	6.NS.4	6.NS.4
7	5.NBT.3	5.NBT.3	5.NBT.3	5.NBT.3	5.MD.2	7.NS.1	5.NBT.3	5.NBT.3
8	6.SP.1	7.G.6	3.MD.6	6.G.1	7.G.6	7.G.1	7.G.4	3.MD.6
9	7.NS.1	7.NS.1	4.OA.5	7.NS.3	7.RP.2	7.NS.1	4.OA.5	4.OA.5
10	4.MD.1	7.RP.3	N-Q.3	4.MD.2	N-Q.3	7.NS.2	NA	5.MD.1
11	5.NBT.7	5.NBT.7	4.NBT.4	5.NBT.7	5.NBT.4	7.NS.1	4.NF.7	5.NBT.7
12	8.G.1	8.G.3	G-CO.5	8.G.3	8.G.3	7.G.1	8.G.3	8.G.3
13	6.RP.3	6.RP.3	6.RP.2	6.RP.3	7.NS.3	7.RP.1	7.RP.1	7.RP.1
14	5.NBT.2	6.RP.3	5.MD.1	4.MD.1	7.RP.1	7.NS.3	4.MD.1	6.RP.3
15	7.G.6	7.G.6	5.MD.5	7.G.6	7.G.1	7.G.1	7.G.6	7.G.6
16	6.SP.5	6.SP.5	6.SP.5	6.SP.5	7.NS.3	7.NS.2	6.SP.5	6.SP.5
17	4.G.3	4.G.3	4.G.3	4.G.3	7.G.5	7.G.4	4.G.3	4.G.3
18	4.OA.5	7.EE.4	3.OA.9	4.OA.5	7.EE.1	7.G.6	4.OA.5	5.OA.3
19	4.NBT.1	4.NBT.2	4.NBT.1	4.NBT.2	5.NBT.1	7.EE.2	5.NBT.2	4.NBT.2
20	7.SP.8	7.SP.7	3.MD.3	7.SP.6	7.SP.6	7.SP.5	7.SP.2	7.SP.6
21	3.MD.3	6.SP.5	3.MD.3	6.SP.5	7.SP.2	7.EE.1	7.SP.2	6.SP.5
22	3.MD.3	6.SP.5	3.MD.3	6.SP.5	7.SP.2	7.EE.1	7.SP.2	7.SP.2
23	4.MD.1	4.MD.1	4.MD.1	4.MD.1	N-Q.3	7.EE.1	4.MD.1	4.MD.1
24	7.EE.3	7.NS.2	6.EE.6	6.EE.7	7.NS.3	7.NS.3	8.EE.7	6.EE.7
25	8.F.4	7.EE.4	6.EE.5	8.F.2	7.EE.4	7.NS.3	A-CED.1	6.EE.9
26	4.G.2	4.G.2	4.G.2	5.G.3	7.G.2	7.G.5	5.G.4	4.G.2
27	6.RP.3	6.RP.3	6.RP.3	6.RP.3	7.NS.3	7.EE.3	7.RP.3	7.SP.1
28	7.G.1	7.G.1	7.RP.2	7.G.1	7.RP.2	7.RP.2	7.G.1	7.G.1
29	6.NS.3	5.NBT.5	5.NBT.3	5.NBT.7	7.NS.2	7.NS.1	5.NBT.7	6.NS.3
30	6.G.1	7.G.6	3.MD.6	6.G.1	7.G.1	7.G.1	6.G.1	6.G.1
31	5.NBT.4	5.NBT.3	4.MD.1	N-Q.3	5.NBT.4	7.RP.3	5.NBT.4	4.MD.1
32	A-REI.3	6.EE.5	6.EE.5	A-REI.3	7.EE.3	7.EE.4	7.EE.4	7.EE.4
33	4.OA.4	4.OA.4	4.OA.4	4.OA.4	4.OA.4	7.NS.1	4.OA.4	4.OA.4
34	7.SP.8	7.SP.7	7.SP.7	7.SP.6	7.RP.2	7.SP.6	7.SP.2	7.SP.6
35	6.NS.4	4.OA.4	4.OA.4	4.OA.4	7.EE.1	7.EE.3	6.NS.4	4.OA.4
36	6.G.1	7.G.6	3.MD.6	6.G.1	7.G.1	7.G.4	6.G.1	6.G.1
37	4.MD.1	4.MD.1	4.MD.1	4.MD.1	N-Q.3	7.G.1	4.MD.1	4.MD.1
38	8.G.3	8.G.2	8.G.2	8.G.3	7.G.1	7.G.2	8.G.3	8.G.2

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 7 (Table D2 Continued)

Items	Standards							
	R1	R2	R3	R4	R5	R6	R7	R8
39	5.NBT.3	5.NBT.3	5.NBT.3	5.NBT.3	7.EE.3	7.NS.1	5.NBT.3	5.NBT.3
40	7.EE.4	8.EE.7	7.EE.4	7.EE.3	7.EE.3	7.EE.1	7.EE.4	6.EE.1
41	G-CO.7	8.G.2	G-CO.7	G-CO.7	7.G.5	7.G.5	G-CO.7	G-CO.7
42	3.MD.1	7.NS.1	3.MD.1	4.MD.2	7.NS.3	7.NS.1	3.MD.1	3.MD.1
43	4.OA.5	7.NS.2	4.OA.5	3.OA.9	7.EE.1	7.NS.2	4.OA.5	4.OA.5
44*	N-Q.1	6.EE.2	4.OA.1	5.OA.2	7.NS.3	7.NS.3	5.OA.2	4.MD.2
45	4.OA.3	7.NS.3	4.NBT.4	3.NBT.3	7.NS.3	7.NS.1	4.NBT.4	7.EE.3
46	7.NS.1	5.OA.2	NA	7.NS.1	7.NS.1	7.NS.1	7.NS.1	7.NS.1
47	6.G.1	6.G.1	4.G.2	6.G.1	7.G.6	7.G.5	5.G.4	4.G.2
48	8.EE.4	8.EE.4	8.EE.4	8.EE.1	8.EE.3	7.NS.1	8.EE.4	5.NBT.2
49	6.SP.1	6.SP.1	7.SP.1	6.SP.1	7.SP.1	7.SP.1	6.SP.1	6.SP.1
50	7.SP.8	7.SP.7	7.SP.7	7.SP.6	7.RP.2	7.SP.7	7.SP.2	7.SP.7
51	6.RP.2	6.RP.3	6.RP.3	7.RP.1	7.NS.3	7.NS.2	7.RP.1	7.RP.1
52	7.RP.2	6.RP.3	7.RP.2	7.RP.3	7.RP.2	7.EE.4	7.RP.3	7.RP.2
53	3.MD.3	6.SP.5	6.SP.4	6.SP.4	7.SP.1	7.SP.1	6.SP.5	6.SP.5
54	3.MD.3	6.SP.5	6.SP.4	6.SP.4	7.SP.1	7.SP.1	6.SP.5	7.SP.4
55	6.RP.3	6.RP.3	6.SP.4	6.SP.4	7.NS.3	7.SP.1	6.SP.5	7.SP.4
56	7.RP.3	7.RP.3	6.RP.3	7.RP.3	7.NS.3	7.SP.2	6.RP.3	8.SP.4
57	7.G.1	7.G.1	6.RP.3	7.G.1	7.RP.1	7.EE.3	6.RP.3	NA
58	3.MD.4	3.MD.4	4.MD.1	4.MD.1	7.NS.1	7.NS.1	NA	NA
59	4.NF.7	5.NBT.3	N-Q.3	N-Q.3	N-Q.3	7.NS.2	N-Q.3	5.NBT.3
60	6.G.4	7.G.6	7.G.3	6.G.4	7.G.6	7.G.6	7.G.6	5.MD.5
61	8.EE.7	6.EE.3	6.EE.6	7.EE.4	7.NS.1	7.RP.2	7.NS.1	6.EE.4
62	4.MD.2	4.MD.2	4.MD.2	4.NBT.4	7.NS.3	7.RP.3	4.NBT.4	6.NS.3
63	6.RP.3	7.RP.3	6.RP.3	7.RP.3	7.NS.3	7.EE.3	6.RP.3	6.RP.3
64	6.EE.6	7.EE.4	6.EE.6	7.EE.4	7.EE.4	7.EE.4	6.EE.6	7.EE.4
65	4.MD.3	4.MD.3	3.MD.8	4.MD.3	7.G.6	7.G.3	3.MD.8	4.MD.3
66	6.RP.2	6.RP.3	4.MD.1	4.MD.1	7.RP.2	7.NS.1	4.MD.1	7.RP.3
67	6.EE.7	7.EE.4	6.EE.6	6.EE.7	7.EE.4	7.EE.2	7.EE.4	7.EE.4
68	7.SP.8	7.SP.8	7.SP.8	7.SP.7	7.NS.3	7.SP.1	7.SP.8	7.SP.7
69	7.G.6	5.MD.5	5.MD.5	6.EE.2	7.G.6	7.G.6	5.MD.5	7.G.6
70	6.NS.5	6.NS.5	6.NS.6	6.NS.5	7.NS.3	7.NS.1	6.NS.5	7.NS.1

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 8
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards							
	R1	R2	R3	R4	R5	R6	R7	R8
1	6.NS.4	4.OA.4	4.OA.4	4.OA.4	7.EE.1	7.EE.3	6.NS.4	4.OA.4
2	6.G.1	7.G.6	3.MD.6	6.G.1	7.G.1	7.G.4	6.G.1	6.G.1
3	4.MD.1	4.MD.1	4.MD.1	4.MD.1	N-Q.3	7.G.1	4.MD.1	4.MD.1
4	8.G.3	8.G.2	8.G.2	8.G.3	7.G.1	7.G.2	8.G.3	8.G.2
5	5.NBT.3	5.NBT.3	5.NBT.3	5.NBT.3	7.EE.3	7.NS.1	5.NBT.3	5.NBT.3
6	7.EE.4	8.EE.7	7.EE.4	7.EE.3	7.EE.3	7.EE.1	7.EE.4	6.EE.1
7	G-CO.7	8.G.2	G-CO.7	G-CO.7	7.G.5	7.G.5	G-CO.7	G-CO.7
8	3.MD.1	7.NS.1	3.MD.1	4.MD.2	7.NS.3	7.NS.1	3.MD.1	3.MD.1
9	4.OA.5	7.NS.2	4.OA.5	3.OA.9	7.EE.1	7.NS.2	4.OA.5	4.OA.5
10	N-Q.1	6.EE.2	4.OA.1	5.OA.2	7.NS.3	7.NS.3	5.OA.2	4.MD.2
11	4.OA.3	7.NS.3	4.NBT.4	3.NBT.3	7.NS.3	7.NS.1	4.NBT.4	7.EE.3
12	7.NS.1	5.OA.2	NA	7.NS.1	7.NS.1	7.NS.1	7.NS.1	7.NS.1
13	6.G.1	6.G.1	4.G.2	6.G.1	7.G.6	7.G.5	5.G.4	4.G.2
14	8.EE.4	8.EE.4	8.EE.4	8.EE.1	8.EE.3	7.NS.1	8.EE.4	5.NBT.2
15	6.SP.1	6.SP.1	7.SP.1	6.SP.1	7.SP.1	7.SP.1	6.SP.1	6.SP.1
16	7.SP.8	7.SP.7	7.SP.7	7.SP.6	7.RP.2	7.SP.7	7.SP.2	7.SP.7
17	6.RP.2	6.RP.3	6.RP.3	7.RP.1	7.NS.3	7.NS.2	7.RP.1	7.RP.1
18	7.RP.2	6.RP.3	7.RP.2	7.RP.3	7.RP.2	7.EE.4	7.RP.3	7.RP.2
19	3.MD.3	6.SP.5	6.SP.4	6.SP.4	7.SP.1	7.SP.1	6.SP.5	6.SP.5
20	3.MD.3	6.SP.5	6.SP.4	6.SP.4	7.SP.1	7.SP.1	6.SP.5	7.SP.4
21	6.RP.3	6.RP.3	6.SP.4	6.SP.4	7.NS.3	7.SP.1	6.SP.5	7.SP.4
22	7.RP.3	7.RP.3	6.RP.3	7.RP.3	7.NS.3	7.SP.2	6.RP.3	8.SP.4
23	7.G.1	7.G.1	6.RP.3	7.G.1	7.RP.1	7.EE.3	6.RP.3	NA
24	3.MD.4	3.MD.4	4.MD.1	4.MD.1	7.NS.1	7.NS.1	NA	NA
25	4.NF.7	5.NBT.3	N-Q.3	N-Q.3	N-Q.3	7.NS.2	N-Q.3	5.NBT.3
26	6.G.4	7.G.6	7.G.3	6.G.4	7.G.6	7.G.6	7.G.6	5.MD.5
27	8.EE.7	6.EE.3	6.EE.6	7.EE.4	7.NS.1	7.RP.2	7.NS.1	6.EE.4
28	4.MD.2	4.MD.2	4.MD.2	4.NBT.4	7.NS.3	7.RP.3	4.NBT.4	6.NS.3
29	6.RP.3	7.RP.3	6.RP.3	7.RP.3	7.NS.3	7.EE.3	6.RP.3	6.RP.3
30	6.EE.6	7.EE.4	6.EE.6	7.EE.4	7.EE.4	7.EE.4	6.EE.6	7.EE.4
31	4.MD.3	4.MD.3	3.MD.8	4.MD.3	7.G.6	7.G.3	3.MD.8	4.MD.3
32	6.RP.2	6.RP.3	4.MD.1	4.MD.1	7.RP.2	7.NS.1	4.MD.1	7.RP.3
33	6.EE.7	7.EE.4	6.EE.6	6.EE.7	7.EE.4	7.EE.2	7.EE.4	7.EE.4
34	7.SP.8	7.SP.8	7.SP.8	7.SP.7	7.NS.3	7.SP.1	7.SP.8	7.SP.7
35	7.G.6	5.MD.5	5.MD.5	6.EE.2	7.G.6	7.G.6	5.MD.5	7.G.6
36	6.NS.5	6.NS.5	6.NS.6	6.NS.5	7.NS.3	7.NS.1	6.NS.5	7.NS.1
37	6.EE.1	8.EE.1	6.EE.1	6.EE.1	8.EE.1	8.EE.2	8.EE.1	8.EE.1
38	6.G.4	6.G.4	6.G.4	6.G.4	7.G.6	8.G.9	6.G.4	6.G.4

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 8 (Table D2 Continued)

Items	Standards							
	R1	R2	R3	R4	R5	R6	R7	R8
39	6.RP.2	7.RP.2	7.RP.2	7.RP.3	7.RP.2	8.EE.4	7.RP.3	7.RP.3
40	3.MD.1	5.MD.1	3.MD.1	4.MD.2	8.EE.8	8.EE.4	3.MD.1	4.MD.2
41	S-CP.1	7.SP.5	7.SP.7	S-CP.1	S-CP.1	8.SP.1	S-CP.1	S-CP.1
42	6.EE.2	7.EE.1	6.EE.2	7.NS.3	8.EE.1	8.NS.2	6.EE.2	6.EE.2
43	5.NBT.7	6.NS.3	3.OA.8	7.NS.3	7.EE.3	8.EE.5	5.NBT.7	7.EE.3
44	6.SP.5	6.SP.5	6.SP.5	6.SP.5	7.NS.3	8.NS.2	6.SP.5	6.SP.5
45	3.MD.1	4.MD.2	3.MD.1	4.MD.2	7.NS.3	8.NS.2	3.MD.1	4.MD.2
46	7.G.1	8.G.4	6.RP.3	7.RP.2	8.G.7	8.G.7	7.RP.3	G-SRT.5
47	6.SP.5	4.MD.1	N-Q.3	N-Q.3	6.SP.5	8.EE.4	N-Q.3	4.MD.1
48	8.NS.1	5.NF.3	4.NF.6	7.NS.2	7.EE.3	8.NS.2	3.NF.3	7.NS.2
49	7.EE.4	7.EE.4	6.EE.2	8.EE.7	8.EE.7	8.EE.7	8.EE.8	7.EE.4
50	6.EE.7	7.EE.4	6.EE.6	7.EE.4	8.EE.7	8.EE.7	6.EE.2	7.EE.4
51	4.OA.4	4.OA.4	4.OA.4	6.EE.1	6.EE.2	8.EE.3	4.OA.4	8.EE.1
52	6.RP.3	7.RP.2	6.RP.3	6.RP.3	7.NS.3	8.F.1	7.RP.3	7.RP.3
53	4.MD.1	7.RP.1	4.MD.1	5.MD.1	7.RP.2	8.NS.2	5.MD.1	5.MD.1
54	7.SP.2	7.SP.1	7.RP.3	7.SP.2	7.NS.3	8.SP.1	7.RP.3	7.RP.3
55	6.SP.4	6.SP.5	6.SP.4	7.SP.4	7.NS.1	8.EE.7	7.SP.3	7.SP.4
56	6.SP.5	6.SP.4	6.SP.4	7.SP.4	6.SP.5	8.EE.7	6.SP.5	6.SP.5
57	6.SP.4	6.SP.4	6.SP.4	7.SP.4	7.NS.1	8.EE.7	6.SP.5	6.SP.5
58	6.G.4	6.G.4	6.G.4	6.G.4	7.G.3	8.G.2	6.G.4	6.G.4
59	N-Q.3	N-Q.3	NA	8.EE.4	8.EE.4	8.EE.4	N-Q.3	NA
60	3.NF.3	4.NF.3	4.NF.3	3.NF.3	7.RP.1	8.SP.1	5.NF.3	4.NBT.1
61	6.EE.3	7.EE.2	7.EE.2	6.EE.3	8.EE.7	8.SP.1	6.EE.3	6.EE.3
62	6.NS.4	4.OA.4	6.NS.2	6.NS.4	7.RP.2	8.SP.1	6.NS.4	5.NBT.6
63	7.EE.4	8.EE.7	7.EE.4	7.EE.3	8.EE.7	8.EE.7	7.EE.4	7.EE.4
64	6.EE.1	7.G.6	7.G.6	7.EE.3	7.G.1	8.EE.6	6.G.1	5.NF.4
65	4.MD.1	4.MD.1	NA	6.NS.5	7.NS.3	8.NS.1	N-Q.3	NA
66	7.EE.4	8.EE.7	7.EE.4	7.EE.4	8.EE.7	8.EE.6	6.EE.5	7.EE.4
67	3.OA.9	7.NS.1	3.OA.9	7.NS.3	8.EE.7	8.EE.7	4.OA.5	NA
68	4.NBT.3	3.NBT.1	3.NBT.2	4.NBT.3	8.NS.2	8.F.1	3.NBT.1	5.NF.2
69	7.G.3	8.G.9	NA	7.G.6	8.G.9	8.G.9	5.G.4	NA
70	8.G.7	8.G.7	8.G.7	8.G.2	8.G.7	8.EE.7	8.G.7	8.G.7
71	6.RP.3	7.G.1	7.G.1	6.RP.2	7.G.1	8.EE.5	7.RP.2	7.RP.2
72	3.MD.7	7.G.6	7.G.4	7.G.6	8.G.1	8.G.2	7.G.6	7.G.4
73	7.NS.1	7.NS.1	6.NS.5	7.NS.1	7.NS.1	8.NS.1	7.NS.1	7.NS.1
74	F-IF.1	F-IF.4	F-IF.1	F-IF.5	8.F.1	8.EE.7	F-IF.1	F-IF.1
75	7.SP.8	7.SP.7	7.SP.8	7.SP.8	8.EE.8	8.SP.4	NA	7.SP.8

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 10
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards							
	R1	R2	R3	R4	R5	R6	R7	R8
1	3.OA.3	4.OA.2	3.OA.8	5.NBT.5	7.NS.3	N-Q.1	3.OA.7	7.NS.3
2	5.MD.5	5.MD.5	5.MD.5	7.G.6	7.G.6	N-Q.1	7.G.6	7.G.6
3	6.RP.3	7.RP.2	6.RP.3	6.RP.3	7.NS.3	N-Q.1	7.RP.3	7.RP.3
4	7.EE.4	7.EE.4	A-CED.3	A-CED.1	A-CED.1	N-Q.1	A-CED.2	A-CED.1
5	7.EE.4	7.G.6	3.MD.8	7.G.6	A-CED.1	N-Q.1	7.G.6	7.G.6
6	7.SP.1	6.SP.5	NA	6.SP.1	S-ID.2	N-Q.1	6.SP.2	NA
7	7.G.1	G-SRT.5	7.RP.3	G-SRT.5	G-SRT.2	G-CO.11	G-SRT.5	G-SRT.5
8	7.SP.1	N-Q.3	NA	N-Q.3	N-Q.2	N-Q.1	N-Q.3	NA
9	6.RP.3	7.RP.2	6.RP.3	6.RP.3	7.NS.3	N-Q.1	7.RP.3	7.RP.3
10	7.EE.4	A-CED.1	4.OA.5	7.NS.3	A-CED.1	N-Q.1	7.EE.3	7.NS.3
11	F-IF.4	8.F.3	8.EE.6	8.SP.3	A-REI.2	A-REI.1	F-IF.4	F-IF.4
12	6.SP.4	S-ID.1	S-ID.1	S-ID.2	S-ID.2	N-Q.1	S-ID.1	S-ID.2
13	6.SP.5	S-ID.1	S-ID.1	S-ID.2	S-ID.2	N-Q.1	S-ID.1	S-ID.2
14	7.G.2	7.G.2	7.G.2	7.G.2	7.G.2	N-Q.1	7.G.6	7.G.2
15	7.EE.4	A-REI.3	6.EE.8	7.EE.4	A-CED.1	N-Q.1	7.EE.4	A-REI.3
16	7.NS.3	7.NS.3	NA	7.NS.1	7.NS.1	N-Q.1	7.NS.1	7.NS.1
17	8.EE.4	8.EE.4	6.RP.3	8.EE.4	8.EE.4	N-Q.1	7.RP.1	F-IF.6
18	6.RP.3	6.RP.3	6.EE.6	6.RP.3	N-Q.3	N-Q.1	7.RP.3	7.RP.3
19	6.EE.3	7.EE.1	6.EE.3	7.EE.1	8.EE.7	N-Q.1	7.EE.1	7.EE.1
20	7.G.3	NA	NA	G-CO.1	G-CO.1	N-Q.1	NA	G-CO.1
21	7.RP.3	A-CED.1	7.NS.3	7.NS.3	7.NS.3	N-Q.2	7.RP.3	7.RP.3
22	8.SP.1	NA	NA	6.EE.9	S-ID.2	N-Q.2	8.SP.2	NA
23	8.EE.4	8.EE.4	8.EE.4	8.EE.4	N-Q.1	N-Q.3	8.EE.3	8.EE.4
24	6.EE.3	A-SSE.1	7.RP.1	7.NS.3	A-CED.2	N-Q.1	7.RP.3	NA
25	G-CO.2	G-CO.6	G-CO.2	8.G.3	G-CO.2	G-SRT.1	8.G.3	G-CO.2
26	N-Q.1	6.RP.3	7.RP.2	6.RP.3	A-CED.2	N-Q.1	N-Q.1	N-Q.1
27	6.G.1	A-CED.2	7.G.6	7.G.6	G-CO.10	G-CO.10	7.G.6	7.G.6
28	8.EE.4	8.EE.4	8.EE.4	8.EE.4	8.EE.4	N-Q.1	8.EE.3	8.EE.4
29	8.EE.1	8.EE.1	6.EE.1	8.EE.1	N-RN.2	N-Q.1	8.EE.1	8.EE.1
30	S-ID.6	A-CED.2	F-IF.5	8.F.5	A-REI.10	A-CED.2	A-REI.10	S-ID.6
31	8.SP.1	S-IC.6	NA	8.SP.4	S-ID.5	N-RN.3	6.SP.5	F-IF.6
32	8.SP.1	S-IC.6	NA	8.SP.4	S-ID.5	A-CED.2	6.SP.5	S-ID.2
33	7.RP.2	A-CED.2	6.EE.9	7.EE.4	A-REI.6	A-CED.2	A-CED.2	7.RP.2
34	6.RP.3	6.RP.3	7.RP.3	NA	N-Q.2	N-Q.1	7.RP.3	NA
35	6.SP.1	N-Q.3	NA	N-Q.3	N-Q.2	N-Q.1	S-IC.4	NA
36	7.G.3	NA	7.G.3	NA	G-CO.1	G-CO.9	G-CO.1	NA
37	7.EE.4	A-REI.1	8.EE.7	A-REI.2	A-REI.1	A-SSE.3	A-REI.1	A-REI.2
38	F-IF.4	F-IF.4	F-IF.5	F-LE.1	A-REI.10	A-CED.2	A-CED.2	F-IF.7
39	6.G.1	7.G.6	G-GPE.7	G-GPE.7	G-CO.10	A-CED.2	6.G.1	6.G.1
40	7.SP.8	S-CP.2	S-CP.2	S-CP.2	7.SP.8	N-Q.1	S-CP.7	S-CP.2

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Mathematics Grade 11
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards							
	R1	R2	R3	R4	R5	R6	R7	R8
1	7.RP.3	A-CED.1	7.NS.3	7.NS.3	7.NS.3	N-Q.2	7.RP.3	7.RP.3
2	8.SP.1	NA	NA	6.EE.9	S-ID.2	N-Q.2	8.SP.2	NA
3	8.EE.4	8.EE.4	8.EE.4	8.EE.4	N-Q.1	N-Q.3	8.EE.3	8.EE.4
4	6.EE.3	A-SSE.1	7.RP.1	7.NS.3	A-CED.2	N-Q.1	7.RP.3	NA
5	G-CO.2	G-CO.6	G-CO.2	8.G.3	G-CO.2	G-SRT.1	8.G.3	G-CO.2
6	N-Q.1	6.RP.3	7.RP.2	6.RP.3	A-CED.2	N-Q.1	N-Q.1	N-Q.1
7	6.G.1	A-CED.2	7.G.6	7.G.6	G-CO.10	G-CO.10	7.G.6	7.G.6
8	8.EE.4	8.EE.4	8.EE.4	8.EE.4	8.EE.4	N-Q.1	8.EE.3	8.EE.4
9	8.EE.1	8.EE.1	6.EE.1	8.EE.1	N-RN.2	N-Q.1	8.EE.1	8.EE.1
10	S-ID.6	A-CED.2	F-IF.5	8.F.5	A-REI.10	A-CED.2	A-REI.10	S-ID.6
11	8.SP.1	S-IC.6	NA	8.SP.4	S-ID.5	N-RN.3	6.SP.5	F-IF.6
12	8.SP.1	S-IC.6	NA	8.SP.4	S-ID.5	A-CED.2	6.SP.5	S-ID.2
13	7.RP.2	A-CED.2	6.EE.9	7.EE.4	A-REI.6	A-CED.2	A-CED.2	7.RP.2
14	6.RP.3	6.RP.3	7.RP.3	NA	N-Q.2	N-Q.1	7.RP.3	NA
15	6.SP.1	N-Q.3	NA	N-Q.3	N-Q.2	N-Q.1	S-IC.4	NA
16	7.G.3	NA	7.G.3	NA	G-CO.1	G-CO.9	G-CO.1	NA
17	7.EE.4	A-REI.1	8.EE.7	A-REI.2	A-REI.1	A-SSE.3	A-REI.1	A-REI.2
18	F-IF.4	F-IF.4	F-IF.5	F-LE.1	A-REI.10	A-CED.2	A-CED.2	F-IF.7
19	6.G.1	7.G.6	G-GPE.7	G-GPE.7	G-CO.10	A-CED.2	6.G.1	6.G.1
20	7.SP.8	S-CP.2	S-CP.2	S-CP.2	7.SP.8	N-Q.1	S-CP.7	S-CP.2
21	7.RP.3	NA	7.RP.3	7.NS.3	7.NS.3	F-BF.1	7.RP.3	F-IF.6
22	7.NS.3	7.NS.3	NA	7.NS.2	7.NS.2	F-BF.1	7.NS.1	7.NS.2
23	7.G.5	4.MD.5	8.G.5	7.G.5	G-SRT.7	F-BF.1	7.G.5	G-CO.10
24	A-SSE.3	F-IF.8	7.EE.1	A-APR.6	N-CN.7	F-LE.1	7.EE.2	F-IF.8
25	F-IF.7	NA	A-REI.11	A-REI.3	A-REI.7	F-LE.1	NA	NA
26	6.G.1	7.G.6	G-GPE.7	7.G.6	G-GPE.7	F-BF.1	6.G.1	7.G.6
27	4.OA.3	7.G.6	A-CED.3	7.G.6	7.EE.3	F-BF.1	7.G.6	4.MD.3
28	3.MD.3	S-ID.1	NA	N-Q.1	S-ID.6	F-IF.7	6.SP.2	NA
29	7.RP.3	7.RP.3	7.RP.3	7.RP.3	7.NS.3	F-BF.1	7.RP.3	7.RP.3
30	8.SP.3	8.SP.2	S-ID.6	S-ID.6	S-ID.6	F-BF.1	8.SP.2	8.SP.2
31	6.RP.3	7.EE.4	7.RP.2	7.RP.3	7.NS.3	F-IF.8	7.RP.3	7.RP.2
32	F-IF.7	F-IF.7	F-IF.7	F-IF.7	F-IF.7	F-IF.7	F-IF.7	F-IF.7
33	8.G.7	8.G.7	G-SRT.8	8.G.7	8.G.7	F-IF.8	8.G.8	8.G.8
34	N-RN.3	A-APR.3	A-APR.3	A-SSE.3	A-REI.7	F-IF.8	A-APR.4	A-APR.3
35	7.RP.3	6.RP.3	7.RP.3	6.RP.3	7.NS.3	S-IC.4	7.RP.3	8.SP.4
36	S-ID.6	A-CED.2	F-IF.5	F-IF.9	A-REI.10	F-IF.8	A-REI.10	S-ID.6
37	S-CP.1	NA	NA	NA	S-ID.6	F-IF.8	NA	NA
38	A-APR.3	F-IF.7	F-IF.7	F-IF.7	F-LE.3	A-REI.7	F-IF.7	F-IF.4
39	7.G.1	7.G.1	7.G.1	7.G.1	A-CED.2	F-BF.1	7.RP.3	7.G.1
40	6.RP.3	NA	7.RP.2	7.EE.3	N-Q.2	F-BF.1	7.RP.3	7.RP.2

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards.

Reading Grade 3
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	RL.3.1	RL.3.1	RL.3.1	RL.3.1	RL.3.1	RL.3.1	RL.3.1
2	RL.3.3	RL.3.3	RL.3.3	RL.3.1	RL.3.3	RL.3.3	RL.3.3
3	RL.3.1	RL.3.1	RL.3.1	RL.4.1	RL.3.1	RL.3.5	RL.3.1
4	RL.3.1	RL.3.1	RL.3.1	RL.4.1	RL.3.1	RL.3.1	RL.3.1
5	RI.3.1	RI.3.1	***RI.3.1**	RI.3.1	RI.3.1	***RI.3.1**	RI.3.1
6	RI.3.1	RI.3.1	***RI.3.1**	RI.3.7	RI.3.1	***RI.3.1**	RI.3.1
7	RI.3.3	RI.3.1	***RI.3.1**	RI.3.1	RI.3.1	***RI.3.1**	RI.3.1
8	RI.3.4	RI.3.4	***RI.3.4**	RI.3.4	RI.3.4	***RI.3.4**	RI.3.4
9	RI.2.6	RI.2.6	RI.2.6	RI.3.2	RI.3.6	***RI.3.6**	RI.3.2
10	RI.3.1	RI.3.4	***RI.3.4**	RI.3.4	RL.3.4	RI.3.1	***RI.3.4**
11	RI.3.1	RI.3.1	***RI.4.1**	RI.3.1	RI.3.1	RI.3.1	***RI.3.1**
12	RI.3.1	RI.3.3	***RI.3.1**	RI.3.1	RI.3.1	RI.3.1	***RI.3.1**
13	RI.3.1	RI.3.3	***RI.4.1**	RI.3.7	RI.3.1	RI.3.1	***RI.3.1**
14	RI.3.2	RI.3.2	***RI.3.2**	RI.3.2	RI.3.2	RI.3.2	***RI.3.2**
15	RI.3.5	RI.3.5	RI.2.5	RI.2.5	RI.3.5	RL.3.5	***RI.3.1**
16	RL.3.1	RL.3.2	RL.4.1	RL.3.1	RL.3.1	RL.3.1	RL.3.1
17	RL.3.1	RL.3.7	***RL.3.4**	RL.4.1	RL.2.7	RI.3.7	RI.3.7
18	RL.3.3	RL.3.2	RL.3.6	RL.3.1	RL.3.3	RL.3.3	RL.3.3
19	RL.3.2	RL.3.2	RL.3.2	RL.3.2	RL.3.2	RL.3.2	RL.3.2
20	RI.3.5	RI.3.5	RL.3.5	RI.3.5	RI.2.5	RI.3.5	RL.3.1
21	RI.3.3	RI.3.1	***RI.4.1**	RI.3.1	RI.3.1	RI.3.1	RI.3.1
22	RI.3.1	RI.3.1	***RI.4.1**	RI.3.1	RI.3.1	RI.3.1	RI.3.1
23	RI.3.1	RI.3.7	***RI.4.7**	RI.3.1	RI.3.7	RI.3.7	RI.3.7
24	RI.3.3	RI.3.1	***RI.4.1**	RI.4.1	RI.3.1	RI.3.2	RI.3.1
25	RL.3.4	RI.3.4	***RI.3.1**	RI.3.4	RL.3.4	RL.3.4	RI.3.4
26	RI.3.2	RI.3.2	RI.3.2	RI.3.2	RI.3.2	RI.3.2	RI.3.2
27	RL.3.1	RL.3.1	RL.3.1	RL.3.1	RL.3.3	RL.3.1	RL.3.1
28	RL.3.3	RL.3.3	***RL.3.3**	RL.4.1	RL.3.3	RL.3.3	RL.3.3
29	RL.3.3	RL.3.4	RL.3.4	RL.3.4	RL.3.3	RL.3.3	RL.3.4
30	RL.4.1	RL.3.3	RL.3.4	RL.4.1	RL.3.3	RL.3.1	RL.3.1
31	RL.4.3	RL.3.3	RL.3.3	RL.3.3	RL.3.3	RL.3.3	RL.3.1
32	NA	RI.3.5	RL.3.5	NA	NA	RI.3.5	RL.3.1
33	RI.3.1	***RI.3.1**	RI.3.3	***RI.3.1**	***RI.3.1**	RI.3.1	***RI.3.2**
34	RI.3.4	***RI.3.4**	***RI.3.4**	***RI.3.4**	***RI.3.3**	RI.3.4	***RI.3.4**
35	RI.3.3	***RI.3.1**	***RI.3.1**	***RI.3.1**	***RI.3.1**	RI.3.1	***RI.3.1**
36	RI.3.1	***RI.3.1**	***RI.4.4**	***RI.3.1**	***RI.3.1**	***RI.3.1**	***RI.3.1**
37	RI.3.8	RI.3.8	***RI.3.2**	***RI.3.2**	RI.3.10	RI.3.2	***RI.3.2**
38	RL.3.3	RL.3.6	RL.3.3	RL.3.3	RL.3.3	RL.3.1	RL.3.6
39	RL.3.1	RL.3.1	RL.3.4	RL.4.1	RL.3.1	RL.3.1	RL.3.4
40	RL.3.1	RL.3.4	RL.3.4	RL.3.4	RL.3.4	RL.3.4	RL.3.4
41	RL.2.4	RL.4.5	RL.3.5	RL.2.4	RL.3.5	RL.3.5	RL.3.1

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Reading Grade 4
Table D2
Standards Coded to Each Item by Reviewers

Item	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	RI.3.3	RI.3.1	***RI.4.1**	RI.3.1	RI.3.1	RI.3.1	RI.3.1
2	RI.3.1	RI.3.1	***RI.4.1**	RI.3.1	RI.3.1	RI.3.1	RI.3.1
3	RI.3.1	RI.3.7	***RI.4.7**	RI.3.1	RI.3.7	RI.3.7	RI.3.7
4	RI.3.3	RI.3.1	***RI.4.1**	RI.4.1	RI.3.1	RI.3.2	RI.3.1
5	RL.3.4	RI.3.4	***RI.3.1**	RI.3.4	RL.3.4	RL.3.4	RI.3.4
6	RI.3.2	RI.3.2	RI.3.2	RI.3.2	RI.3.2	RI.3.2	RI.3.2
7	RL.3.1	RL.3.1	RL.3.1	RL.3.1	RL.3.3	RL.3.1	RL.3.1
8	RL.3.3	RL.3.3	RL.3.3	RL.4.1	RL.3.3	RL.3.3	RL.3.3
9	RL.3.3	RL.3.4	RL.3.4	RL.3.4	RL.3.3	RL.3.3	RL.3.4
10	RL.4.1	RL.3.3	RL.3.4	RL.4.1	RL.3.3	RL.3.1	RL.3.1
11	RL.4.3	RL.3.3	RL.3.3	RL.3.3	RL.3.3	RL.3.3	RL.3.1
12	NA	RI.3.5	RL.3.5	NA	NA	RI.3.5	RL.3.1
13	RI.3.1	RL.3.1	RI.3.3	RL.3.1	RL.3.1	RI.3.1	RL.3.2
14	RI.3.4	RL.3.4	RL.3.4	RL.3.4	RL.3.3	RI.3.4	RL.3.4
15	RI.3.3	RL.3.1	RL.3.1	RL.3.1	RL.3.1	RI.3.1	RL.3.1
16	RI.3.1	RL.3.1	RL.4.4	RL.3.1	RL.3.1	RL.3.1	RL.3.1
17	RI.3.8	RI.3.8	RL.3.2	RL.3.2	RI.3.10	RI.3.2	RL.3.2
18	RL.3.3	RL.3.6	RL.3.3	RL.3.3	RL.3.3	RL.3.1	RL.3.6
19	RL.3.1	RL.3.1	RL.3.4	RL.4.1	RL.3.1	RL.3.1	RL.3.4
20	RL.3.1	RL.3.4	RL.3.4	RL.3.4	RL.3.4	RL.3.4	RL.3.4
21	RL.2.4	RL.4.5	RL.3.5	RL.2.4	RL.3.5	RL.3.5	RL.3.1
22	RI.4.1	RI.4.1	RI.4.2	RL.4.1	RI.3.2	RI.4.1	RL.4.2
23	RI.4.3	RI.4.3	RI.4.1	RL.4.1	RI.3.1	RI.4.4	RL.4.1
24	RI.4.1	RI.4.1	RI.4.1	RL.4.1	RI.3.1	RI.4.1	RL.4.1
25	RI.4.2	RI.4.2	RI.3.1	RL.4.2	RI.3.2	RI.4.1	RL.4.3
26	RL.4.1	RL.4.1	RL.4.1	RL.4.1	RL.4.3	RL.4.3	RL.4.1
27	RL.4.1	RL.4.2	RL.4.4	RL.4.1	RL.4.3	RL.4.4	RL.4.1
28	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4
29	RL.4.1	RL.4.3	RL.4.3	RL.4.1	RL.3.1	RL.4.3	RL.4.1
30	RL.4.1	RL.4.1	RI.4.9	NA	RL.3.1	RL.4.2	RL.4.1
31	RL.3.6	RL.4.2	RL.4.2	RL.3.6	RL.3.6	RL.4.3	RL.4.2
32	RL.4.1	RL.4.3	RL.3.1	RL.4.1	RL.3.3	RL.4.3	RL.4.3
33	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4
34	RL.3.3	RL.4.1	RL.4.1	RL.4.1	RL.4.3	RL.4.3	RL.4.1
35	RL.5.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4
36	RL.4.1	RL.4.1	RL.4.9	NA	RL.3.1	RL.4.2	RL.4.1
37	RI.2.5	RI.3.5	RL.4.5	RL.5.9	RI.3.5	RL.4.3	RL.4.1
38	RI.4.1	RI.4.1	RI.4.1	RI.4.1	RI.4.1	***RI.4.1**	RI.4.7
39	RI.4.1	RI.4.1	RI.4.7	RI.4.1	RI.4.7	RI.4.5	RI.4.7
40	RI.4.1	RI.4.1	RI.3.1	RI.4.1	RL.3.5	RI.4.1	RI.4.1
41	RI.4.1	RI.4.3	RI.4.4	RI.4.1	RI.4.1	RI.4.1	RL.4.1
42	RI.4.1	RI.4.5	RI.4.2	RI.4.7	RI.3.1	RI.4.2	RI.4.1

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Reading Grade 5
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	RI.4.1	RI.4.1	RI.4.2	***RI.4.1**	RI.3.2	RI.4.1	***RI.4.2**
2	RI.4.3	RI.4.3	RI.4.1	***RI.4.1**	RI.3.1	RI.4.4	***RI.4.1**
3	RI.4.1	RI.4.1	RI.4.1	***RI.4.1**	RI.3.1	RI.4.1	***RI.4.1**
4	RI.4.2	RI.4.2	RI.3.1	***RI.4.2**	RI.3.2	RI.4.1	***RI.4.3**
5	RL.4.1	RL.4.1	RL.4.1	RL.4.1	RL.4.3	RL.4.3	RL.4.1
6	RL.4.1	RL.4.2	RL.4.4	RL.4.1	RL.4.3	RL.4.4	RL.4.1
7	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.3	RL.4.4
8	RL.4.1	RL.4.3	RL.4.3	RL.4.1	RL.3.1	RL.4.2	RL.4.1
9	RL.4.1	RL.4.1	RI.4.9	NA	RL.3.1	RL.4.2	RL.4.1
10	RL.3.6	RL.4.2	RL.4.2	RL.3.6	RL.3.6	RL.4.3	RL.4.2
11	RL.4.1	RL.4.3	RL.3.1	RL.4.1	RL.3.3	RL.4.3	RL.4.3
12	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4
13	RL.3.3	RL.4.1	RL.4.1	RL.4.1	RL.4.3	RL.4.3	RL.4.1
14	RL.5.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4	RL.4.4
15	RL.4.1	RL.4.1	RL.4.9	NA	RL.3.1	RL.4.2	RL.4.1
16	RI.2.5	RI.3.5	RL.4.5	RL.5.9	RI.3.5	RL.4.3	RL.4.1
17	RI.4.1	RI.4.1	RI.4.1	RI.4.1	RI.4.1	RL.4.1	RI.4.7
18	RI.4.1	RI.4.1	RI.4.7	RI.4.1	RI.4.7	RI.4.5	RI.4.7
19	RI.4.1	RI.4.1	RI.3.1	RI.4.1	RL.3.5	RI.4.1	RI.4.1
20	RI.4.1	RI.4.3	RI.4.4	RI.4.1	RI.4.1	RI.4.1	***RI.4.1**
21	RI.4.1	RI.4.5	RI.4.2	RI.4.7	RI.3.1	RI.4.2	RI.4.1
22	RI.5.1	RI.5.1	***RI.5.1**	RL.5.1	RI.3.1	RI.5.2	RL.5.1
23	RI.5.1	RI.5.2	***RI.5.3**	RL.5.3	RI.3.2	RI.5.2	RL.5.2
24	RI.5.3	RI.5.1	***RI.5.4**	RL.5.1	RI.3.1	RI.5.1	RL.5.1
25	RI.5.3	RI.6.8	***RI.5.1**	RL.5.1	RI.3.1	***RI.5.3**	RL.5.1
26	RI.5.1	RI.6.8	***RI.6.1**	RL.4.3	NA	RI.5.8	RL.5.2
27	RI.4.5	RI.5.2	***RI.5.2**	NA	RI.3.8	RI.5.8	RL.5.2
28	RL.4.3	RL.5.1	RL.5.1	RL.5.1	RL.3.1	RL.5.1	RL.5.2
29	RL.4.3	RL.5.1	RL.5.1	RL.4.3	RL.3.3	RL.5.2	RL.5.1
30	RL.5.1	RL.5.1	RL.5.2	RL.5.3	RL.3.3	RL.5.3	RL.5.3
31	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.5.4
32	RL.6.3	RL.5.2	RL.5.3	RL.5.2	RL.3.1	RL.5.2	RL.5.2
33	RL.6.6	RL.5.3	RL.5.5	RL.5.6	RL.3.6	RL.5.6	RL.5.1
34	RI.5.7	NA	RL.3.5	NA	RI.3.5	RL.5.9	RL.5.1
35	RI.5.1	RI.5.1	RI.5.1	RI.5.4	RI.3.1	RI.5.2	RI.5.1
36	RI.5.1	RI.5.1	RI.5.4	RI.5.4	***RI.5.4**	RI.5.4	RI.5.4
37	RI.5.1	RI.5.6	RI.5.3	RI.5.3	RI.3.1	RI.5.3	RI.5.2
38	RI.5.3	RI.5.1	RI.5.1	RI.5.1	RI.3.1	***RI.5.1**	RI.5.1
39	NA	RI.5.3	RI.5.3	RI.5.7	NA	RI.5.9	***RI.5.4**
40	RI.4.2	RL.5.2	RL.5.3	RL.5.2	RL.3.1	RL.5.2	RL.5.2
41	RL.5.4	RL.5.3	RL.5.4	RL.5.3	RL.3.1	RL.5.3	RL.5.1
42	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.6.4	RL.5.4	RL.5.4
43	RL.5.5	RL.5.2	RL.5.5	RL.5.7	RL.3.5	RL.5.5	RL.5.7

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Reading Grade 6
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards						
	R1	R2	R3	R4	R5	R6	R7
1	RI.5.1	RI.5.1	***RI.5.1**	***RI.5.1**	RI.3.1	RI.5.2	RL.5.1
2	RI.5.1	RI.5.2	***RI.5.3**	***RI.5.3**	RI.3.2	RI.5.2	RL.5.2
3	RI.5.3	RI.5.1	***RI.5.4**	***RI.5.1**	RI.3.1	RI.5.1	RL.5.1
4	RI.5.3	RI.6.8	***RI.5.1**	***RI.5.1**	RI.3.1	***RI.5.3**	RL.5.1
5	RI.5.1	RI.6.8	***RI.6.1**	***RI.4.3**	NA	RI.5.8	RL.5.2
6	RI.4.5	RI.5.2	***RI.5.2**	NA	RI.3.8	RI.5.8	RL.5.2
7	RL.4.3	RL.5.1	RL.5.1	RL.5.1	RL.3.1	RL.5.1	RL.5.2
8	RL.4.3	RL.5.1	RL.5.1	RL.4.3	RL.3.3	RL.5.2	RL.5.1
9	RL.5.1	RL.5.1	RL.5.2	RL.5.3	RL.3.3	RL.5.3	RL.5.3
10	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.5.4
11	RL.6.3	RL.5.2	RL.5.3	RL.5.2	RL.3.1	RL.5.2	RL.5.2
12	RL.6.6	RL.5.3	RL.5.5	RL.5.6	RL.3.6	RL.5.6	RL.5.1
13	RI.5.7	NA	RL.3.5	NA	RI.3.5	RL.5.9	RL.5.1
14	RI.5.1	RI.5.1	RI.5.1	RI.5.4	RI.3.1	RI.5.2	RI.5.1
15	RI.5.1	RI.5.1	RI.5.4	RI.5.4	***RI.5.4**	RI.5.4	RI.5.4
16	RI.5.1	RI.5.6	RI.5.3	RI.5.3	RI.3.1	RI.5.3	RI.5.2
17	RI.5.3	RI.5.1	RI.5.1	RI.5.1	RI.3.1	***RI.5.1**	RI.5.1
18	NA	RI.5.3	RI.5.3	RI.5.7	NA	RI.5.9	***RI.5.4**
19	RI.4.2	RL.5.2	RL.5.3	RL.5.2	RL.3.1	RL.5.2	RL.5.2
20	RL.5.4	RL.5.3	RL.5.4	RL.5.3	RL.3.1	RL.5.3	RL.5.1
21	RL.5.4	RL.5.4	RL.5.4	RL.5.4	RL.6.4	RL.5.4	RL.5.4
22	RL.5.5	RL.5.2	RL.5.5	RL.5.7	RL.3.5	RL.5.5	RL.5.7
23	RI.3.1	RI.6.2	RI.6.2	RI.6.2	RI.4.7	RI.6.1	RI.6.2
24	RI.6.1	RI.6.3	RI.6.4	RI.6.1	RI.3.1	RI.6.3	RI.6.1
25	RI.3.1	RI.6.5	RI.6.1	RI.6.1	RI.3.1	RI.6.1	RI.6.1
26	RI.6.7	RI.6.2	RI.6.2	RI.6.2	RI.3.1	RL.6.7	RI.6.4
27	RI.6.1	RI.6.4	RI.6.1	RI.6.7	RI.4.7	RI.6.7	RI.6.4
28	RI.4.7	RI.6.5	RI.6.1	RI.6.1	RI.3.5	RI.6.5	RI.6.4
29	NA	RI.6.6	RI.6.8	NA	NA	RI.6.8	RI.6.4
30	RL.3.1	RL.6.1	RL.6.1	RL.6.1	RL.3.1	RL.6.1	RL.6.1
31	RL.6.4	RL.6.4	RL.6.4	RL.6.4	RL.6.4	RL.6.4	RL.6.4
32	RL.3.1	RL.6.6	RL.6.1	RL.6.3	RL.6.3	RL.6.1	RL.6.1
33	RL.6.4	RL.6.5	RL.6.4	RL.6.4	RL.6.4	RL.6.4	RL.6.4
34	RL.6.5	RL.6.5	RL.6.5	RL.6.2	RL.3.1	RL.6.3	RL.6.2
35	RI.6.1	RI.6.4	RI.6.4	RI.6.1	RI.6.4	RI.6.4	RI.6.1
36	RI.3.1	RI.6.1	RI.6.1	RI.6.1	RI.3.1	***RI.6.1**	RI.6.1
37	RI.3.1	RI.6.1	RI.6.1	RI.6.1	RI.3.1	RI.6.3	RI.6.1
38	RI.6.1	RI.6.1	RI.6.3	RI.6.4	RI.3.1	RI.6.2	RI.6.2
39	RI.4.7	RI.6.2	RI.6.5	RI.6.5	RI.4.7	RI.6.7	RI.6.6
40	RI.3.1	RI.6.1	RI.6.2	RI.6.2	NA	RI.6.1	RI.6.2
41	RI.6.1	RI.6.6	RI.6.8	RI.6.1	NA	RI.6.3	RI.6.2
42	RI.5.3	RI.6.1	RI.6.4	RI.6.4	NA	RI.6.4	RI.6.4
43	RI.6.4	RI.6.4	RI.6.4	RI.6.4	NA	RI.6.4	RI.6.4
44	RI.3.1	RI.6.1	RI.6.5	RI.6.1	NA	RI.6.1	RI.6.1

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Reading Grade 7
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards					
	R1	**R2**	**R3**	**R4**	**R5**	**R6**
1	RI.7.2	RI.7.1	RI.7.1	RI.7.1	RI.7.1	RI.7.2
2	RI.7.1	RI.7.1	RI.7.1	RL.7.4	RI.7.1	RI.7.1
3	RI.7.1	RI.7.1	RI.7.1	***RI.7.1**	RI.7.1	RI.7.1
4	RI.7.2	RI.7.1	RI.7.2	RI.7.1	RI.7.1	RI.7.5
5	RI.7.5	RI.7.1	RI.7.5	RI.7.5	RI.7.4	RI.7.1
6	RI.7.2	RI.7.1	RI.7.3	RL.7.3	RI.7.5	RI.7.2
7	RI.7.1	RI.7.1	NA	RI.7.5	RI.7.4	RI.7.6
8	RL.7.1	RL.7.1	RL.7.1	RL.7.4	RL.7.1	RL.7.3
9	RL.7.4	RL.7.4	RL.7.1	***RL.7.4**	RL.7.4	RL.7.4
10	RL.7.1	RL.7.1	RL.7.1	RI.7.6	RL.7.1	RL.7.3
11	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4
12	RL.7.2	RL.7.1	RL.7.2	RI.7.5	RL.7.1	RL.7.1
13	RI.7.4	RI.7.1	***RI.7.1**	***RI.7.3**	RI.7.4	RI.7.4
14	RI.7.1	RI.7.1	RI.7.1	***RI.7.1**	RI.7.1	RI.7.1
15	RI.7.1	RI.7.1	RI.7.1	***RI.7.1**	RI.7.1	RI.7.3
16	RI.7.1	RI.7.1	RI.7.1	RI.7.6	RI.7.1	RI.7.1
17	RI.7.5	RI.7.5	RI.7.5	RI.7.1	RI.7.5	RI.7.4
18	RI.7.1	RI.7.1	RI.7.1	RL.7.4	RI.7.1	RI.7.2
19	RI.7.1	RI.7.1	RI.7.1	RI.7.1	RI.7.1	RI.7.2
20	RI.7.3	RI.7.4	RI.7.4	RI.7.1	RI.7.4	RI.7.4
21	RI.7.4	RI.7.4	RI.7.4	***RI.7.4**	RI.7.4	RI.7.4
22	RI.7.1	RI.7.1	RI.7.2	RI.7.1	RI.7.1	RI.7.2
23	RI.7.1	RI.7.1	RI.7.1	***RI.7.1**	RI.7.1	RI.7.3
24	RI.7.1	RI.7.1	RI.7.1	RL.7.6	RI.7.1	RI.7.2
25	RI.7.2	RI.7.5	RI.7.2	RI.7.2	RI.7.1	RI.7.6
26	RI.7.4	RI.7.4	RI.7.4	***RI.7.4**	RI.7.4	RI.7.4
27	RI.7.2	RI.7.1	RI.7.2	***RI.7.1**	RI.4.2	RI.7.5
28	RI.7.1	RI.7.1	RI.7.1	RI.7.1	RI.7.1	RI.7.3
29	RL.7.1	RL.7.1	RL.7.3	RL.7.1	RL.7.1	RL.7.6
30	RL.7.3	RL.7.4	RL.7.3	RL.7.4	RL.7.4	RL.7.4
31	RL.7.1	RL.7.1	RL.7.3	RL.7.3	RL.7.1	RL.7.3
32	RL.7.1	RL.7.1	RL.7.3	RL.7.4	RL.7.1	RL.7.6
33	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4
34	RL.7.3	RL.7.1	RL.7.2	RL.7.4	RL.7.1	RL.7.6
35	RL.7.1	RL.7.1	RL.7.3	RL.7.4	RL.7.1	RL.7.2
36	RI.7.1	RI.7.1	RI.7.4	RL.7.1	RI.7.1	RI.7.1
37	RI.7.1	RI.7.1	RI.7.1	RL.7.2	RI.7.1	RI.7.2
38	RI.7.1	RI.7.1	RI.7.4	RL.7.4	RI.7.4	RI.7.4
39	RI.7.1	RI.7.1	RI.7.2	RL.7.4	RI.7.3	RI.7.3
40	RI.7.2	RI.7.5	RI.7.2	RL.7.1	RI.7.1	RI.7.3

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Reading Grade 7 (Table D2 Continued)

41	RI.7.2	RI.7.6	RI.7.6	RL.7.2	RI.7.1	RI.7.2
42	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4
43	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4
44	RL.7.4	RL.7.4	RL.7.1	RL.7.4	RL.7.4	RL.7.1
45	RL.7.5	RL.7.1	RL.7.5	RL.7.1	RL.7.1	RL.7.5

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Reading Grade 8
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards					
	R1	R2	R3	R4	R5	R6
1	RI.7.1	RI.7.1	RI.7.1	***RI.7.1**	RI.7.1	RI.7.3
2	RI.7.1	RI.7.1	RI.7.1	RL.7.6	RI.7.1	RI.7.2
3	RI.7.2	RI.7.5	RI.7.2	RI.7.2	RI.7.1	RI.7.6
4	RI.7.4	RI.7.4	RI.7.4	***RI.7.4**	RI.7.4	RI.7.4
5	RI.7.2	RI.7.1	RI.7.2	***RI.7.1**	RI.4.2	RI.7.5
6	RI.7.1	RI.7.1	RI.7.1	RI.7.1	RI.7.1	RI.7.3
7	RL.7.1	RL.7.1	RL.7.3	RL.7.1	RL.7.1	RL.7.6
8	RL.7.3	RL.7.4	RL.7.3	RL.7.4	RL.7.4	RL.7.4
9	RL.7.1	RL.7.1	RL.7.3	RL.7.3	RL.7.1	RL.7.3
10	RL.7.1	RL.7.1	RL.7.3	RL.7.4	RL.7.1	RL.7.6
11	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4
12	RL.7.3	RL.7.1	RL.7.2	RL.7.4	RL.7.1	RL.7.6
13	RL.7.1	RL.7.1	RL.7.3	RL.7.4	RL.7.1	RL.7.2
14	RI.7.1	RI.7.1	RI.7.4	***RI.7.1**	RI.7.1	RI.7.1
15	RI.7.1	RI.7.1	RI.7.1	***RI.7.2**	RI.7.1	RI.7.2
16	RI.7.1	RI.7.1	RI.7.4	***RI.7.4**	RI.7.4	RI.7.4
17	RI.7.1	RI.7.1	RI.7.2	***RI.7.4**	RI.7.3	RI.7.3
18	RI.7.2	RI.7.5	RI.7.2	***RI.7.1**	RI.7.1	RI.7.3
19	RI.7.2	RI.7.6	RI.7.6	***RI.7.2**	RI.7.1	RI.7.2
20	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4
21	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4	RL.7.4
22	RL.7.4	RL.7.4	RL.7.1	RL.7.4	RL.7.4	RL.7.1
23	RL.7.5	RL.7.1	RL.7.5	RL.7.1	RL.7.1	RL.7.5
24	RI.8.1	RI.8.1	RI.8.1	RI.8.1	RI.8.1	RI.8.1
25	RI.8.3	RI.8.1	RI.8.1	RI.8.3	RI.8.1	RI.8.4
26	RI.8.4	RI.8.4	RI.8.4	RI.8.4	RI.8.4	RI.8.4
27	RI.8.6	RI.8.6	RI.8.6	RI.8.9	RI.8.6	RI.8.6
28	RI.8.1	RI.8.2	RI.8.2	RI.8.3	RI.8.2	RI.8.2
29	RI.8.1	NA	RI.8.5	RI.8.1	RI.8.8	RI.8.8
30	RL.8.3	RL.8.1	RL.8.3	RL.8.3	RL.8.2	RL.8.1
31	RL.8.4	RL.8.4	RL.8.4	RL.8.4	RL.8.4	RL.8.4
32	RL.8.3	RL.8.1	RL.8.3	RL.8.2	RL.6.2	RL.8.5
33	RL.8.3	RL.8.1	RL.8.3	RL.8.4	RL.8.2	RL.8.3
34	RL.8.4	RL.8.2	RL.8.4	RL.8.3	RL.8.2	RL.8.4
35	RI.8.5	RI.8.5	RI.8.2	RI.8.2	RI.8.5	RI.8.2
36	RI.8.4	RI.8.4	RI.8.4	RI.8.4	RI.8.4	RI.8.4
37	RI.8.3	RI.8.1	RI.8.1	RI.8.4	RI.8.1	RI.8.1
38	RI.8.1	RI.8.1	RI.8.1	RI.8.1	RI.8.1	RI.8.1
39	RI.8.6	RI.8.1	RI.8.1	RI.8.5	RI.8.5	RI.8.3
40	RI.8.4	RI.8.1	RI.8.1	RI.8.1	RI.8.8	RI.8.5
41	RI.8.4	RI.8.4	RI.8.4	RI.8.4	RI.8.4	RI.8.4
42	RI.8.1	RI.8.1	***RI.8.1**	***RI.8.1**	RI.8.1	RI.8.1

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Reading Grade 8 (Table D2 Continued)

43	RI.8.2	RI.8.1	***RI.8.1**	***RI.8.4**	RI.8.1	RI.8.2
44	RI.8.4	RI.8.4	***RI.8.1**	***RI.8.2**	RI.8.4	RI.8.4
45	RI.8.1	RI.8.1	***RI.8.1**	***RI.8.1**	RI.8.5	RI.8.1
46	RI.8.3	RI.8.3	***RI.8.5**	***RI.8.2**	RI.8.5	RI.8.5

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Grades 9-10
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards					
	R1	**R2**	**R3**	**R4**	**R5**	**R6**
1	RI.9-10.6	RI.9-10.3	***RI.9-10.5**	RI.9-10.2	RI.9-10.6	RI.9-10.5
2	RI.9-10.5	RI.8.5	***RI.9-10.2**	RI.9-10.6	RI.4.2	RI.9-10.1
3	RI.9-10.4	RI.9-10.4	***RI.9-10.3**	RI.9-10.4	RI.9-10.4	RI.9-10.4
4	RI.8.5	RI.8.5	***RI.9-10.5**	RI.9-10.5	RI.8.3	RI.9-10.5
5	RI.9-10.4	RI.9-10.4	***RI.9-10.4**	RI.9-10.4	RI.9-10.4	RI.9-10.4
6	RI.9-10.5	RI.9-10.5	***RI.9-10.3**	RI.9-10.2	RI.9-10.3	RI.9-10.6
7	RI.9-10.3	RI.9-10.1	***RI.9-10.3**	RI.9-10.6	RI.9-10.2	RI.9-10.2
8	RI.11-12.7	NA	RI.9-10.7	RI.9-10.8	RI.9-10.1	NA
9	RI.9-10.1	RI.9-10.1	RI.9-10.2	RI.9-10.4	RI.9-10.1	RI.9-10.1
10	RI.9-10.5	RI.9-10.1	RI.9-10.5	RI.9-10.3	RI.9-10.4	RI.9-10.6
11	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4
12	RI.9-10.5	RI.9-10.5	RI.9-10.1	RI.9-10.5	RI.9-10.5	RI.9-10.1
13	RI.9-10.4	RI.9-10.4	RI.9-10.1	RL.9-10.1	RI.9-10.4	RI.9-10.4
14	RI.9-10.3	RI.9-10.1	RI.9-10.2	RI.9-10.8	RI.9-10.3	RI.9-10.1
15	RI.9-10.2	RI.8.5	RI.9-10.2	RI.9-10.2	RI.9-10.3	RI.9-10.5
16	RI.9-10.1	RI.9-10.1	RI.9-10.7	RI.9-10.7	RI.6.3	RI.9-10.1
17	***RI.9-10.1**	RI.9-10.1	***RI.9-10.1**	RI.9-10.1	RI.9-10.1	***RI.9-10.1**
18	***RI.9-10.3**	RI.9-10.4	***RI.9-10.1**	RI.9-10.4	RI.9-10.1	***RI.9-10.4**
19	***RI.9-10.3**	RI.9-10.1	***RI.9-10.2**	RI.9-10.7	RI.9-10.1	***RI.9-10.1**
20	***RI.9-10.4**	RI.9-10.4	***RI.9-10.4**	RI.9-10.4	RI.9-10.4	***RI.9-10.4**
21	***RI.9-10.1**	RI.9-10.1	***RI.9-10.1**	RI.9-10.3	RI.9-10.3	***RI.9-10.1**
22	***RI.9-10.2**	RI.9-10.1	***RI.9-10.1**	RI.9-10.4	RI.9-10.1	***RI.9-10.1**
23	***RI.9-10.2**	RI.9-10.1	***RI.9-10.2**	RI.9-10.4	RI.9-10.2	***RI.9-10.1**
24	***RI.9-10.1**	RI.9-10.1	***RI.9-10.2**	RI.9-10.4	RI.9-10.2	***RI.9-10.2**
25	RL.9-10.2	RL.9-10.4	RL.9-10.4	RL.9-10.4	RL.9-10.4	RL.9-10.5
26	RL.9-10.3	RL.9-10.1	RL.9-10.3	RL.9-10.3	RL.9-10.4	RL.9-10.3
27	RL.9-10.4	NA	RL.9-10.4	RL.9-10.4	RL.9-10.4	RL.9-10.4
28	RL.9-10.1	RL.9-10.1	RL.9-10.3	RL.9-10.4	RL.9-10.4	RL.9-10.4
29	RL.9-10.3	RL.9-10.1	RL.9-10.4	RL.9-10.5	RL.9-10.1	RL.9-10.1
30	RL.9-10.4	NA	RL.9-10.4	RL.9-10.9	RL.9-10.4	RL.9-10.4
31	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.4	RL.9-10.5	RL.9-10.5
32	RL.9-10.3	RL.9-10.2	RL.9-10.2	RL.9-10.2	RL.9-10.2	RL.9-10.2
33	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.5
34	RI.9-10.2	RI.9-10.2	RI.9-10.2	RI.9-10.2	RI.9-10.2	RI.9-10.2
35	RI.9-10.3	RI.9-10.1	RI.9-10.1	RI.9-10.3	RI.9-10.1	RI.9-10.1
36	RI.9-10.3	RI.9-10.2	RI.9-10.2	RI.9-10.2	RI.9-10.1	RI.9-10.2
37	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4
38	RI.9-10.3	RI.9-10.1	RI.9-10.1	RI.9-10.6	RI.9-10.1	RI.9-10.1
39	RI.9-10.3	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.1
40	RI.9-10.5	RI.9-10.1	RI.9-10.2	RI.9-10.5	RI.9-10.2	RI.9-10.2

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Grades 11-12
Table D2
Standards Coded to Each Item by Reviewers

Items	Standards					
	R1	R2	R3	R4	R5	R6
1	***RI.11-12.4**	***RI.11-12.4**	***RI.11-12.3**	RI.11-12.1	RI.11-12.1	***RI.11-12.4**
2	***RI.11-12.1**	***RI.11-12.1**	***RI.11-12.3**	RI.11-12.6	RI.11-12.1	***RI.11-12.1**
3	***RI.11-12.3**	***RI.11-12.1**	***RI.11-12.1**	RI.11-12.4	RI.11-12.1	***RI.11-12.1**
4	***RI.11-12.5**	***RI.11-12.5**	***RI.11-12.6**	RI.11-12.5	RI.11-12.6	***RI.11-12.5**
5	***RI.11-12.1**	***RI.11-12.1**	***RI.11-12.3**	RI.11-12.6	RI.11-12.1	***RI.11-12.1**
6	***RI.11-12.1**	***RI.11-12.1**	***RI.11-12.2**	RI.11-12.2	RI.11-12.1	***RI.11-12.1**
7	***RI.11-12.3**	***RI.11-12.1**	***RI.11-12.2**	RI.11-12.3	RI.11-12.1	***RI.11-12.2**
8	RL.9-10.2	RL.9-10.4	RL.9-10.4	RL.9-10.4	RL.9-10.4	RL.9-10.5
9	RL.9-10.3	RL.9-10.1	RL.9-10.3	RL.9-10.3	RL.9-10.4	RL.9-10.3
10	RL.9-10.4	NA	RL.9-10.4	RL.9-10.4	RL.9-10.4	RL.9-10.4
11	RL.9-10.1	RL.9-10.1	RL.9-10.3	RL.9-10.4	RL.9-10.4	RL.9-10.4
12	RL.9-10.3	RL.9-10.1	RL.9-10.4	RL.9-10.5	RL.9-10.1	RL.9-10.1
13	RL.9-10.4	NA	RL.9-10.4	RL.9-10.9	RL.9-10.4	RL.9-10.4
14	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.4	RL.9-10.5	RL.9-10.5
15	RL.9-10.3	RL.9-10.2	RL.9-10.2	RL.9-10.2	RL.9-10.2	RL.9-10.2
16	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.5	RL.9-10.5
17	RI.9-10.1	RI.9-10.1	RI.9-10.2	RI.9-10.4	RI.9-10.1	RI.9-10.1
18	RI.9-10.5	RI.9-10.1	RI.9-10.5	RI.9-10.3	RI.9-10.4	RI.9-10.6
19	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4	RI.9-10.4
20	RI.9-10.5	RI.9-10.5	RI.9-10.1	RI.9-10.5	RI.9-10.5	RI.9-10.1
21	RI.9-10.4	RI.9-10.4	RI.9-10.1	RL.9-10.1	RI.9-10.4	RI.9-10.4
22	RI.9-10.3	RI.9-10.1	RI.9-10.2	RI.9-10.8	RI.9-10.3	RI.9-10.1
23	RI.9-10.2	RI.8.5	RI.9-10.2	RI.9-10.2	RI.9-10.3	RI.9-10.5
24	RI.9-10.1	RI.9-10.1	RI.9-10.7	RI.9-10.7	RI.6.3	RI.9-10.1
25	***RI.9-10.1**	RI.9-10.1	***RI.9-10.1**	RI.9-10.1	RI.9-10.1	***RI.9-10.1**
26	RL.11-12.3	RL.11-12.1	RL.11-12.3	***RL.11-12.1**	RL.11-12.1	RL.11-12.1
27	RL.11-12.4	RL.11-12.4	RL.11-12.2	***RL.11-12.4**	RL.11-12.1	RL.11-12.4
28	RL.11-12.3	RL.11-12.4	RL.11-12.2	***RL.11-12.3**	RL.11-12.4	RL.11-12.4
29	RL.11-12.3	RL.11-12.1	RL.11-12.2	***RL.11-12.2**	RL.11-12.1	RL.11-12.5
30	RL.11-12.6	RL.11-12.1	RL.11-12.2	***RL.11-12.6**	RL.11-12.1	RL.11-12.6
31	RL.11-12.4	RL.11-12.4	RL.11-12.4	***RL.11-12.5**	RL.11-12.4	RL.11-12.4
32	RL.11-12.2	RL.11-12.1	RL.11-12.2	***RL.11-12.6**	RL.11-12.1	RL.11-12.2
33	RI.11-12.7	NA	NA	***RL.11-12.7**	NA	NA
34	RI.11-12.4	RI.11-12.4	***RI.11-12.3**	RI.11-12.4	RI.11-12.1	RI.11-12.4
35	RI.11-12.4	RI.11-12.4	***RI.11-12.4**	RI.11-12.1	RI.11-12.4	RI.11-12.1
36	RI.11-12.4	RI.11-12.4	***RI.11-12.4**	RI.11-12.7	RI.11-12.1	RI.11-12.6
37	RI.11-12.3	RI.11-12.1	***RI.11-12.1**	RL.11-12.6	RI.11-12.1	RI.11-12.1
38	RI.11-12.3	RI.11-12.1	***RI.11-12.2**	RL.11-12.3	RI.9-10.2	RI.11-12.6
39	RI.11-12.6	RI.11-12.1	***RI.11-12.2**	RI.11-12.1	RI.9-10.5	RI.11-12.5
40	RI.11-12.2	RI.11-12.1	***RI.11-12.2**	RI.11-12.2	RI.9-10.2	RI.11-12.2

Note: NA indicates that no alignment was found, either on or off-grade, to a standard. Highlighted cells indicate items aligned to off-grade standards. An asterisk indicates that the domain was changed per discussion with the Iowa Department of Education.

Mathematics Grade 3
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
3.OA.1	43	43						
3.OA.2								
3.OA.3	10	18	18	29	36	43	43	
3.OA.4	18							
3.OA.5	9	9						
3.OA.6	9	9	9					
3.OA.7	9	9	9	19				
3.OA.8	16	16	16	16	16	16	16	18
	29	29	29	29	29	34	35	35
	35	35	36	37	37	37	41	41
	48							
3.OA.9	10	10	10	10	10	10	18	25
	25	25	25	25	25	36		
3.NBT.1	20							
3.NBT.2	8	22	22	22	31	34	34	34
	45							
3.NBT.3								
3.NF.1	1	1	1	1	1	1	1	19
	46	46						
3.NF.2								
3.NF.3	24	24	30	30				
3.MD.1	5	5	5	5	5	5	5	30
3.MD.2	11	26	48	48				
3.MD.3	13	13	13	13	14	14	14	14
	14	15	15	15	15	26	38	38
	38	38	38	39	39	39	39	39
	39	39	40	40	40	40	40	
3.MD.4								
3.MD.5	12	12						
3.MD.6	12	12	12	12	12	43		
3.MD.7	43							
3.MD.8	17	17	17	17	17	17		
3.G.1	42	49						
3.G.2								

Mathematics Grade 4
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number						
4.OA.1	36	41	41				
4.OA.2	30	36	36	36	36	41	50
	50						
4.OA.3	5	12	12	31	31	31	31
	32	47	47	47	47	47	49
	49	49	51	51	51	51	51
	51						
4.OA.4							
4.OA.5	1	33					
4.NBT.1	27	27	39				
4.NBT.2	7	23	23	23	27	27	55
	55	55	55	55	55	55	
4.NBT.3	23	39	39	39	39	39	39
4.NBT.4	47						
4.NBT.5	19						
4.NBT.6	31	31	49				
4.NF.1	6	31					
4.NF.2							
4.NF.3							
4.NF.4							
4.NF.5							
4.NF.6							
4.NF.7	13	29					
4.MD.1	4	4	4	4	4	4	4
	20	20	20	24	24	24	24
	29	34	34	34	34	34	52
	52	52	52	52	52		
4.MD.2	6	6	6	13	13	13	32
	33	33	33	34	49		
4.MD.3	32						
4.MD.4							
4.MD.5	3	3					
4.MD.6	3	3	3				
4.MD.7	3						
4.G.1	3						
4.G.2	52						
4.G.3	37	37	37	37	37	37	37

Mathematics Grade 5
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number						
5.OA.1	27	58	58	58	58	58	
5.OA.2	4	4	15	32	40	45	56
	56						
5.OA.3	34	34					
5.NBT.1	1	30	30				
5.NBT.2	55	55	55				
5.NBT.3	1	1	49	49	49		
5.NBT.4							
5.NBT.5							
5.NBT.6	55						
5.NBT.7							
5.NF.1							
5.NF.2							
5.NF.3	40	40	52				
5.NF.4	40						
5.NF.5	12	12					
5.NF.6	40						
5.NF.7	51						
5.MD.1	26	54	54	55	55		
5.MD.2							
5.MD.3							
5.MD.4							
5.MD.5							
5.G.1							
5.G.2							
5.G.3	38	45	45				
5.G.4	2	57					

Mathematics Grade 6
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number						
6.RP.1	65	65					
6.RP.2	35	44					
6.RP.3	22	22	35	35	35	35	44
	44	45	58	58	58	58	58
	59						
6.NS.1	41						
6.NS.2	44						
6.NS.3	26	42	50	60	60	60	60
	60						
6.NS.4	10	10	10	10	37	37	37
	37	37	37	37			
6.NS.5	33	33	33	33			
6.NS.6	4	33	40	40	40		
6.NS.7	63						
6.NS.8	43						
6.EE.1	15	15	15	15	15	15	32
6.EE.2	3	15	24	24	27	27	27
	29	49	55	55	56	56	
6.EE.3	29						
6.EE.4	24						
6.EE.5	24	55	55	63	63	63	63
6.EE.6							
6.EE.7	24	27					
6.EE.8	63						
6.EE.9	9	56	56				
6.G.1	39	61	61	61	61	61	
6.G.2	46	46	46	46	46		
6.G.3	43						
6.G.4	36	36	36	36	36	36	36
6.SP.1	31						
6.SP.2							
6.SP.3	35						
6.SP.4	51						
6.SP.5	8	8	8	8	17	18	19
	47	47	51	52	52	52	52
	53	53	53	62	65		

Mathematics Grade 7
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
7.RP.1	1	2	3	4	4	13	13	13
	14	51	51	51	57			
7.RP.2	1	4	9	28	28	28	34	50
	52	52	52	52	61	66		
7.RP.3	10	27	31	52	52	56	56	56
	62	63	63	63	66			
7.NS.1	2	2	2	2	2	6	7	9
	9	9	11	29	33	39	42	45
	46	46	46	46	46	46	48	58
	58	61	61	66	70			
7.NS.2	6	10	16	24	29	43	43	51
	59							
7.NS.3	1	9	13	14	16	24	24	25
	27	42	44	44	45	45	51	55
	56	62	63	68	70			
7.EE.1	18	21	22	23	35	40	43	
7.EE.2	19	67						
7.EE.3	1	24	27	32	35	39	40	40
	45	57	63					
7.EE.4	2	18	25	25	32	32	32	40
	40	40	52	61	64	64	64	64
	64	67	67	67	67			
7.G.1	8	12	15	15	28	28	28	28
	28	30	30	36	37	38	57	57
	57							
7.G.2	26	38						
7.G.3	5	5	60	65				
7.G.4	8	17	36					
7.G.5	17	26	41	41	47			
7.G.6	8	8	15	15	15	15	15	18
	30	36	47	60	60	60	60	65
	69	69	69	69				
7.SP.1	27	49	49	49	53	53	54	54
	55	68						
7.SP.2	20	21	21	22	22	22	34	50
	56							
7.SP.3								
7.SP.4	54	55						
7.SP.5	20							
7.SP.6	20	20	20	34	34	34	34	50
7.SP.7	20	34	34	50	50	50	50	68
	68							
7.SP.8	20	34	50	68	68	68	68	

Mathematics Grade 8
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
8.NS.1	48	65	73					
8.NS.2	42	44	45	48	53	68		
8.EE.1	14	37	37	37	37	42	51	
8.EE.2	37							
8.EE.3	14	51						
8.EE.4	14	14	14	14	39	40	47	59
	59	59						
8.EE.5	43	71						
8.EE.6	64	66						
8.EE.7	6	27	49	49	49	50	50	55
	56	57	61	63	63	63	66	66
	67	67	70	74				
8.EE.8	40	49	75					
8.F.1	52	68	74					
8.F.2								
8.F.3								
8.F.4								
8.F.5								
8.G.1	72							
8.G.2	4	4	4	7	58	70	72	
8.G.3	4	4	4					
8.G.4	46							
8.G.5								
8.G.6								
8.G.7	70	70	70	70	70	70	46	46
8.G.8								
8.G.9	38	69	69	69				
8.SP.1	41	54	60	61	62			
8.SP.2								
8.SP.3								
8.SP.4	22	75						

Mathematics Grade 10
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
N-RN.1								
N-RN.2	29							
N-RN.3	31							
N-Q.1	1	2	3	4	5	6	8	9
	10	12	13	14	15	16	17	18
	19	20	23	24	26	26	26	26
	28	29	34	35	40			
N-Q.2	8	21	22	34	35			
N-Q.3	8	8	8	18	23	35	35	
A-SSE.1	24							
A-SSE.2								
A-SSE.3	37							
A-SSE.4								
A-APR.1								
A-APR.2								
A-APR.3								
A-APR.4								
A-APR.6								
A-CED.1	4	4	4	5	10	10	15	21
A-CED.2	4	24	26	27	30	30	32	33
	33	33	38	38	39			
A-CED.3	4							
A-CED.4								
A-REI.1	11	37	37	37	37			
A-REI.2	4	24	26	27	30	30	32	33
	33	33	38	38	39			
A-REI.3	15	15						
A-REI.4								
A-REI.5								
A-REI.6	33							
A-REI.10	30	30	38					
A-REI.12								
F-IF.1								
F-IF.2								
F-IF.3								
F-IF.4	11	11	11	38	38			
F-IF.5	30	38						
F-IF.6	17	31						
G-CO.1	20	20	20	36	36			
G-CO.2	25	25	25	25				
G-CO.3								
G-CO.4								
G-CO.5								
G-CO.6	25							
G-CO.7								
G-CO.8								
G-CO.9	36							

Mathematics Grade 10 (Table D3 Continued)

Standard	Item Number							
G-CO.10	27	27	39					
G-CO.11	7							
G-CO.12								
G-CO.13								
G-SRT.1	25							
G-SRT.2	7							
G-SRT.3								
G-SRT.4								
G-SRT.5	7	7	7	7				
G-C.1								
G-C.2								
G-C.3								
G-C.5								
G-GPE.1								
G-GPE.2								
G-GPE.4								
G-GPE.5								
G-GPE.6								
G-GPE.7	39	39						
G-GMD.1								
G-GMD.3								
G-MG.1								
G-MG.2								
S-ID.1	12	12	12	13	13	13		
S-ID.2	6	12	12	12	13	13	13	22
	32							
S-ID.5	31	32						

Mathematics Grade 11
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
N-CN.1								
N-CN.2								
N-CN.7	24							
A-REI.7	25	34	38					
A-REI.11	25							
F-IF.7	18	25	28	32	32	32	32	32
	32	32	32	38	38	38	38	
F-IF.8	24	24	31	33	34	36	37	
F-IF.9	36							
F-BF.1	21	22	23	26	27	29	30	39
	40							
F-BF.2								
F-BF.3								
F-BF.4								
F-LE.1	18	24	25					
F-LE.2								
F-LE.3	38							
F-LE.4								
F-LE.5								
F-TF.1								
F-TF.2								
F-TF.5								
G-SRT.6								
G-SRT.7	23							
G-SRT.8	33							
G-GMD.4								
G-MG.3								
S-ID.3								
S-ID.4								
S-ID.6	10	10	28	30	30	30	36	36
	37							
S-ID.7								
S-ID.8								
S-ID.9								
S-IC.1								
S-IC.2								
S-IC.3								
S-IC.4	15	35						
S-IC.5								
S-IC.6	11	12						
S-CP.1	37							
S-CP.2	20	20	20	20				
S-CP.3								
S-CP.4								
S-CP.5								
S-CP.6								
S-CP.7	20							

Reading Grade 3
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
RL.3.1	1	1	1	1	1	1	1	2
	3	3	3	3	3	4	4	4
	4	4	4	5	5	6	6	7
	7	11	12	12	13	15	16	16
	16	16	16	17	18	18	20	25
	27	27	27	27	27	27	30	30
	31	32	33	33	33	35	35	35
	35	35	36	36	36	36	36	38
	38	39	39	39	39	40	41	
RL.3.2	14	14	16	18	19	19	19	19
	19	19	19	33	37	37	37	
RL.3.3	2	2	2	2	2	2	2	18
	18	18	18	27	28	28	28	28
	28	28	28	29	29	29	30	30
	31	31	31	31	31	34	35	35
	35	36	36	38	38	38	38	
RL.3.4	8	8	10	10	10	25	25	25
	29	29	29	29	30	34	34	34
	34	39	39	40	40	40	40	40
	40	40						
RL.3.5	3	15	20	20	32	41	41	41
	41							
RL.3.6	9	18	31	38	38			
RL.3.7	17							
RL.3.9								
RL.3.10								
RI.3.1	5	5	5	5	5	6	6	6
	6	7	7	7	7	10	10	11
	11	11	11	11	12	12	12	12
	13	13	13	21	21	21	21	21
	22	22	22	22	22	22	23	23
	24	24	24	33	33	35	36	
RI.3.2	9	9	14	14	14	14	14	24
	26	26	26	26	26	26	26	37
	37							
RI.3.3	7	12	13	21	24	26	33	35
RI.3.4	8	8	8	8	8	10	10	17
	25	25	25	34	34			
RI.3.5	15	15	15	15	20	20	20	20
	32	32						
RI.3.6	9							
RI.3.7	6	13	17	17	21	22	23	23
	23	23	24					
RI.3.8	37	37						
RI.3.9								
RI.3.10	37							

Reading Grade 4
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
RL.4.1	1	2	4	8	10	10	19	22
	23	23	24	24	26	26	26	26
	26	27	27	27	29	29	29	30
	30	30	31	32	32	32	34	34
	34	34	34	36	36	36	37	38
	41							
RL.4.2	22	25	27	30	31	31	31	36
RL.4.3	11	25	26	26	27	29	29	29
	29	31	32	32	32	34	34	35
	36	37						
RL.4.4	16	27	27	28	28	28	28	28
	28	28	33	33	33	33	33	33
	33	35	35	35	35	35	35	
RL.4.5	21	37						
RL.4.6								
RL.4.7	3							
RL.4.9	36							
RL.4.10								
RI.4.1	4	22	22	22	23	24	24	24
	24	25	25	38	38	38	38	38
	39	39	39	40	40	40	40	40
	41	41	41	41	42	42		
RI.4.2	22	25	25	42	42			
RI.4.3	23	23	41					
RI.4.4	23	41						
RI.4.5	39	42						
RI.4.6								
RI.4.7	38	39	39	39	40	40	42	
RI.4.8								
RI.4.9	30							
RI.4.10								

Reading Grade 5
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
RL.5.1	22	22	22	24	24	25	25	25
	26	26	28	28	28	28	29	29
	29	29	30	30	33	34	38	41
RL.5.2	23	25	26	27	27	28	29	30
	32	32	32	32	40	40	40	40
	43							
RL.5.3	23	23	25	30	30	30	32	33
	40	41	41	41				
RL.5.4	14	24	31	31	31	31	31	31
	31	36	39	41	41	42	42	42
	42	42	42					
RL.5.5	33	43	43	43	43			
RL.5.6	33	33						
RL.5.7	42	43	43					
RL.5.9	16	34						
RL.5.10								
RI.5.1	22	22	23	24	24	26	35	35
	35	35	36	36	37	38	38	38
	38							
RI.5.2	22	23	23	27	35	37		
RI.5.3	24	25	35	37	37	37	38	39
	39							
RI.5.4	35	36	36	36	36			
RI.5.5								
RI.5.6	37							
RI.5.7	34	39						
RI.5.8	26	27						
RI.5.9	39							
RI.5.10								

Reading Grade 6
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
RL.6.1	5	30	30	30	30	30	32	32
	32	36						
RL.6.2	32	34	34					
RL.6.3	11	32	32	34				
RL.6.4	21	31	31	31	31	31	31	31
	33	33	33	33	33	33		
RL.6.5	32	33	34	34	34			
RL.6.6	12	32						
RL.6.7	26							
RL.6.9								
RL.6.10								
RI.6.1	23	23	24	24	24	25	25	25
	25	27	27	28	28	35	35	35
	36	36	36	36	37	37	37	37
	38	38	38	40	40	41	41	41
	42	44	44	44	44			
RI.6.2	23	23	23	23	26	26	26	38
	38	39	40	40	40	41		
RI.6.3	23	24	24	37	38	40	41	
RI.6.4	24	26	27	27	28	29	35	35
	35	35	38	42	42	42	42	43
	43	43	43	43	43			
RI.6.5	25	26	28	28	39	39	41	44
RI.6.6	29	39	41					
RI.6.7	26	27	27	39	39			
RI.6.8	4	5	29	29	41			
RI.6.9								
RI.6.10								

Reading Grade 7
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
RL.7.1	3	8	8	8	8	9	10	10
	10	10	12	12	12	14	14	15
	23	27	29	29	29	29	31	31
	31	32	32	32	34	34	35	35
	35	36	40	44	44	45	45	45
RL.7.2	12	12	34	35	37	41		
RL.7.3	6	8	10	13	29	30	30	31
	31	31	32	34	35			
RL.7.4	2	8	9	9	9	9	11	11
	11	11	11	11	18	21	26	30
	30	30	30	32	33	33	33	33
	33	33	34	35	38	39	42	42
	42	42	42	42	43	43	43	43
	43	43	44	44	44	44		
RL.7.5	45	45	45					
RL.7.6	24	29	32	34				
RL.7.7								
RL.7.9								
RL.7.10								
RI.7.1	1	1	1	1	2	2	2	2
	2	3	3	3	3	3	4	4
	4	5	5	6	7	7	13	13
	14	14	14	14	15	15	15	15
	16	16	16	16	16	17	18	18
	18	18	19	19	19	19	19	20
	22	22	22	22	23	23	23	23
	24	24	24	24	25	27	28	28
	28	28	28	36	36	36	36	37
	37	37	37	38	38	39	39	40
	41							
RI.7.2	1	1	4	4	6	6	18	19
	22	22	24	25	25	25	27	27
	37	39	40	40	41	41		
RI.7.3	6	15	20	23	28	39	39	40
RI.7.4	5	7	9	13	13	13	17	20
	20	20	20	21	21	21	21	21
	26	26	26	26	26	36	38	38
	38							
RI.7.5	4	5	5	5	6	7	12	17
	17	17	17	25	27	40		
RI.7.6	7	10	16	25	41	41		
RI.7.7								
RI.7.8								
RI.7.9								
RI.7.10								

Reading Grade 8
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
RL.8.1	30	30	32	33	42	42	43	44
	45	45						
RL.8.2	30	30	32	33	34	34	44	46
RL.8.3	30	30	30	32	32	33	33	33
	34							
RL.8.4	31	31	31	31	31	31	32	33
	34	34	34	34	43			
RL.8.5	32	46						
RL.8.6								
RL.8.7								
RL.8.9								
RL.8.10								
RI.8.1	24	24	24	24	24	24	25	25
	25	25	28	29	29	29	35	37
	37	37	37	38	38	38	38	38
	38	39	39	39	40	40	40	42
	42	42	42	43	43	45	45	45
	45	46						
RI.8.2	28	28	28	28	35	35	35	39
	43	43	46					
RI.8.3	25	25	28	37	39	45	46	46
RI.8.4	25	26	26	26	26	26	26	36
	36	36	36	36	36	37	40	41
	41	41	41	41	41	44	44	44
	44							
RI.8.5	29	35	35	35	39	39	40	45
	46	46						
RI.8.6	27	27	27	27	27	39		
RI.8.7								
RI.8.8	29	29	40					
RI.8.9	27							
RI.8.10								

Reading Grade 9-10
Table D3
Items Coded by Reviewers to Each Standard

Standard	Item Number							
RL.9-10.1	13	17	17	17	18	19	21	21
	21	22	22	23	24	24	26	26
	28	28	29	29	29			
RL.9-10.2	2	19	22	23	23	24	24	25
	25	32	32	32	32	32		
RL.9-10.3	3	6	7	18	19	19	26	26
	26	26	28	29	32			
RL.9-10.4	5	18	20	20	20	25	25	25
	25	26	27	27	27	27	27	28
	28	28	29	29	30	30	30	30
	31							
RL.9-10.5	1	4	25	25	26	29	31	31
	31	31	31	33	33	33	33	33
	33							
RL.9-10.6								
RL.9-10.7								
RL.9-10.9	30							
RL.9-10.10								
RI.9-10.1	2	6	7	7	8	9	9	9
	9	10	12	12	13	14	14	16
	16	16	17	17	17	18	19	19
	21	21	22	22	23	24	34	35
	35	35	35	36	38	38	38	38
	39	40						
RI.9-10.2	1	2	6	7	7	9	14	14
	15	15	15	23	24	34	34	34
	34	34	34	36	36	36	36	40
	40	40						
RI.9-10.3	1	6	7	10	10	12	14	14
	15	21	21	24	35	35	35	36
	36	38	38	39	39			
RI.9-10.4	3	3	3	3	3	5	5	5
	5	5	9	10	11	11	11	11
	11	11	13	13	13	13	13	18
	18	20	20	20	22	23	24	37
	37	37	37	37	37	39	39	39
	39							
RI.9-10.5	1	1	2	3	4	4	6	6
	9	10	10	12	12	12	12	14
	15	15	19	40	40			
RI.9-10.6	1	1	2	6	7	10	38	39
RI.9-10.7	8	16	16	19				
RI.9-10.8	8	14						
RI.9-10.9								
RI.9-10.10								

Reading Grade 11-12
Table D3
Items Coded by Reviewers to Each Standard

Standard	**Item Number**							
RL.11-12.1	2	2	2	3	3	3	5	5
	5	6	6	6	7	26	26	26
	27	27	29	29	30	30	32	32
	32	37						
RL.11-12.2	6	7	7	27	28	29	30	32
	32	32	38	39	40			
RL.11-12.3	1	2	2	3	3	5	7	26
	26	28	28	29	34	38		
RL.11-12.4	1	1	1	27	27	27	28	28
	28	31	31	31	31	31	35	36
RL.11-12.5	4	4	4	26	29			
RL.11-12.6	5	29	30	30	37			
RL.11-12.7								
RL.11-12.9								
RL.11-12.10								
RI.11-12.1	1	1	2	3	5	6	7	26
	34	35	35	36	37	37	37	38
	39	39	40					
RI.11-12.2	6	29	40	40	40			
RI.11-12.3	7	28	37	38				
RI.11-12.4	3	27	34	34	34	34	35	35
	35	35	36	36	36	36	38	
RI.11-12.5	4	31	39					
RI.11-12.6	2	4	4	5	30	32	34	36
	38	39	39					
RI.11-12.7	33	33	36					
RI.11-12.8								
RI.11-12.9								
RI.11-12.10								

Appendix E

Results of Intra-Class Correlation

Results of Intra-Class Correlation

Reliability can be increased by adding more training to reduce the One-Judge Reliability or by adding more judges to reduce the variability of the mean.

Number of Judges needed to reach Aspiration Level of Reliability

Aspiration Level	One-Judge Reliability			Number of Judges Needed		
	0.335	0.421	0.399	**Mathematics**	**Reading**	**Science**
0.7	4.6	3.2	3.5	5	4	4
0.8	7.9	5.5	6.0	8	6	7
0.9	17.9	12.4	13.6	18	13	14
0.95	37.7	26.1	28.6	38	27	29

Notes: The minimum number of judges calculation is based on the Spearman Browne Prophecy formula, $m = \left\{ \frac{\rho^*}{1-\rho^*} \Big/ \frac{\rho_L}{1-\rho_L} \right\} = \frac{\rho^* \langle 1-\rho_L \rangle}{\rho_L \langle 1-\rho^* \rangle}$, where ρ^* is the reliability aspired to and ρ_L is the reliability estimate for a single judge.

The two-way analysis assuming both random items and fixed judges gives a result for the mean correlation identical to Cronbach's Alpha, i.e., $\alpha = \frac{\sigma^2_{Bet} - \sigma^2_e}{\sigma^2_{Bet}}$.

While SPSS allows the user to select between the random and mixed models, the calculations come out the same with either model. Assuming the judges are fixed would imply these are the only judges that would ever be used so there is no component of variance associated with them. *Random judges* assume the judges used are one of many possible selections of judges; then the variability among judges must be taken into account, which will result in a lower value for the intra-class correlation (or any other measure of reliability.)

For the mixed model (i.e., fixed judges), the intra-class correlation would be calculated identically to Alpha.

$$ICC_{FixedJudges} = \frac{ItemMS - EMS}{ItemMS}$$

For the random model, the correct calculation is:

$$ICC_{RandomJudges} = \frac{ItemMS - EMS}{ItemMS + \frac{\langle JudgeMS - EMS \rangle}{n}}$$

Calculation Modes

Calculation for two-way model with both questions and judges random:

Mathematics Grade 3

	Mathematics	
	DF	MS
Questions	49	0.93
Judges	6	0.56
Error	294	0.18
Intra-Class Correlation		.79
Cronbach's Alpha		.80

Mathematics Grade 4

	Mathematics	
	DF	MS
Questions	54	.81
Judges	6	.74
Error	324	.18
Intra-Class Correlation		.77
Cronbach's Alpha		.77

Mathematics Grade 5

	Mathematics	
	DF	MS
Questions	59	.66
Judges	6	.94
Error	354	.15
Intra-Class Correlation		.75
Cronbach's Alpha		.77

Mathematics Grade 6

	Mathematics	
	DF	MS
Questions	64	.60
Judges	6	.91
Error	384	.17
Intra-Class Correlation		.70
Cronbach's Alpha		.72

Mathematics Grade 7

	Mathematics	
	DF	MS
Questions	69	.82
Judges	7	4.77
Error	483	.19
Intra-Class Correlation		.71
Cronbach's Alpha		.78

Mathematics Grade 8

	Mathematics	
	DF	MS
Questions	74	.79
Judges	7	6.16
Error	518	.18
Intra-Class Correlation		.70
Cronbach's Alpha		.79

Mathematics Grade 10

	Mathematics	
	DF	MS
Questions	39	.84
Judges	7	2.26
Error	273	.20
Intra-Class Correlation		.72
Cronbach's Alpha		.78

Mathematics Grade 11

	Mathematics	
	DF	MS
Questions	39	.83
Judges	7	3.00
Error	273	.18
Intra-Class Correlation		.73
Cronbach's Alpha		.80

Calculation Modes

Calculation for two-way model with both questions and judges random:

Reading Grade 3

	Reading	
	DF	MS
Questions	40	.90
Judges	6	.66
Error	240	.21
Intra-Class Correlation		.76
Cronbach's Alpha		.77

Reading Grade 4

	Reading	
	DF	MS
Questions	41	.42
Judges	6	.49
Error	246	.19
Intra-Class Correlation		.53
Cronbach's Alpha		.54

Reading Grade 5

	Reading	
	DF	MS
Questions	42	.44
Judges	6	.52
Error	252	.19
Intra-Class Correlation		.55
Cronbach's Alpha		.56

Reading Grade 6

	Reading	
	DF	MS
Questions	43	.57
Judges	6	1.46
Error	258	.19
Intra-Class Correlation		.63
Cronbach's Alpha		.66

Reading Grade 7

	Reading	
	DF	MS
Questions	44	.26
Judges	5	1.06
Error	220	.13
Intra-Class Correlation		.45
Cronbach's Alpha		.47

Reading Grade 8

	Reading	
	DF	MS
Questions	45	.74
Judges	5	.29
Error	225	.19
Intra-Class Correlation		.75
Cronbach's Alpha		.73

Reading Grades 9-10

	Reading	
	DF	MS
Questions	39	.69
Judges	5	1.79
Error	195	.22
Intra-Class Correlation		.64
Cronbach's Alpha		.66

Reading Grades 11-12

	Reading	
	DF	MS
Questions	39	.79
Judges	5	3.05
Error	195	.19
Intra-Class Correlation		.69
Cronbach's Alpha		.73

Appendix F

Biographies of the National Experts

Dr. Carsten Wilmes, PhD

Dr. Carsten Wilmes is the Director of Assessment for the World-Class Instructional Design and Assessment (WIDA) Consortium. Dr. Wilmes supervises the development and operational implementation for WIDA's assessments and is responsible for the planning and implementation of alignment studies for English language learners. In addition, he coordinates the data analysis for and manages the development of each individual study's final report. Prior to his current position, he served as WIDA's Alignment Coordinator/Researcher; in this capacity he was the presenter and facilitator for alignment workshops at the University of Wisconsin–Madison and for the states of Wisconsin and Oklahoma and conducted alignment research pursuant to the requirements of the No Child Left Behind Act of 2001. Dr. Wilmes has served as a national alignment expert for alignment studies in Louisiana, Maryland, Oklahoma, and Pennsylvania.

Dr. Wilmes has reviewed the book *Diagnosing foreign language proficiency: The interface between learning and assessment*. His review was published in the *Modern Language Journal*. Furthermore, Dr. Wilmes has presented at numerous professional organizations that include the American Educational Research Association (AERA) Annual Meeting and the 14th World Congress of Applied Linguistics. He is a member of the AERA, the International Language Testing Association (ILTA), and the Modern Language Association (MLA).

He earned a BA in Linguistics from the University of Paderborn in Germany. Additionally, he earned an MA in Germanic Languages and Literatures with a concentration in Second Language Acquisition and a PhD in Second Language Acquisition with a concentration in Educational Measurement.

MATHEMATICS

Linda Ray Green Bridges, MEd

Ms. Linda Bridges is currently a secondary Alabama Mathematics, Science, and Technology Initiative (AMSTI) Specialist at the University of Alabama in Huntsville, Alabama. In this capacity, Ms. Bridges serves as an AMSTI trainer for grades 6–12 Mathematics teachers; develops and presents professional development sessions and workshops to grades 6–12 mathematics teachers; models inquiry-based, hands-on lessons in grades 5–12 AMSTI mathematics classrooms; models and uses appropriate forms of technology in lesson presentations and teacher training; and presents AMSTI overview sessions to preservice teachers at local universities. Ms. Bridges has also worked as a college algebra adjunct teacher at Northwest Mississippi Community College and the University of Mississippi in Oxford, MS.

In addition to her university teaching experience, Ms. Bridges has over 32 years of teaching experience at the middle and high school level, including five years teaching geometry, algebra II, pre-calculus, trigonometry, foundations of higher mathematics, AP Calculus I and II, AP Statistics, probability and statistics, Integrating Science/mathematics with Technology and Data Analysis, Theory of Equations, and other individualized courses at the Mississippi School for Mathematics and Science. Ms. Bridges is also a mentor for teachers seeking National Board Certification and a member of the Alabama Council of Teachers of Mathematics, the National Council of Teachers of Mathematics, and the Council of Presidential Awardees in Mathematics. She has been extensively involved in state and national mathematics initiatives throughout her educational career.

Ms. Bridges received a BS in Mathematics from Mississippi University for Women and an MEd in Secondary Mathematics Education from the University of Mississippi. She also holds a Class AA Secondary Mathematics (6–12) teacher certification in the state of Alabama and is a National Board Certified Teacher in Secondary Mathematics.

Leo Edwards Jr. EdD (Group Facilitator)

Dr. Leo Edwards has participated as a Mathematics national expert for Alaska, Idaho, Nebraska, and Oklahoma alignment studies based on Dr. Norman Webb's methodology. He currently serves as a mathematics education consultant for state departments of education, school districts, and other educational resource groups and agencies. His work includes many research and professional practices, including projects awarded and funded by the Eisenhower Fund, NASA, Texas Instruments, the National Science Foundation, and other states, universities, and educational organizations. He is a contributing author for several mathematics textbooks for elementary and secondary levels from publishers that include Silver Burdett Ginn and Glencoe/Merrill. Dr. Edwards has conducted numerous mathematics and education-related workshops and made conference presentations related to mathematics topics at the elementary and secondary levels. In addition to his position on the faculty at Fayetteville State University, Dr. Edwards has held leadership positions that include director of the Mathematics & Science Education Center, acting dean of Colleges of Arts and Sciences, and acting vice chancellor for Academic Affairs.

Dr. Edwards received a BS in Mathematics from Fayetteville State University, a MEd in Mathematics education from Temple University, an MA in computer sciences from Goddard College, and an EdD in curriculum and instruction from Utah State University.

Angela Hochstetter, BA

Ms. Angela Hochstetter has more than five years of education experience. As mathematics Test Development Specialist at DRC, Ms. Hochstetter has participated in all aspects of DRC's mathematics item and test development, item acquisition and editing, test construction, standard alignment studies, item translation, forms production, and development of curriculum/instructional ancillary materials for elementary, middle, and high school student populations. Ms. Hochstetter is also responsible for conducting and facilitating review committees. Since joining DRC, Ms. Hochstetter has contributed to DRC's projects for the states of Alabama, Alaska, Idaho, Louisiana, and Pennsylvania.

Complementing her assessment background, Ms. Hochstetter has classroom experience teaching high school Mathematics and Spanish, and she also spent two years teaching as a Peace Corps volunteer. She holds a B.A. in Mathematics and Spanish from Milligan College in Johnson City, Tennessee.

Eric Jenson, BA

In his role as mathematics Test Development Specialist, Mr. Eric Jenson participates in all aspects of the test development process. He develops mathematics assessments according to test and item specifications: creating, editing, and reviewing items. He also provides assessment design, item development, and curriculum content services to DRC's state education clients and works closely with item writers. Through his expertise, he helps to construct tests that are compliant with both content and psychometric requirements. At DRC, he has provided services for numerous large-scale statewide assessments, including those for Alaska, Alabama, Idaho, Louisiana, Nebraska, and Pennsylvania.

In addition to his assessment experience, Mr. Jenson has five years of high school and college classroom experience at economically diverse schools, teaching Mathematics including Basic Skills, Pre-Algebra, Algebra I, Geometry, Algebra II, and College Mathematics. He also has experience with both reformed and traditional curriculum and developing alternative education programs for students who do not meet assessment requirements.

Mr. Jenson earned a BA in Mathematics from Carleton College in Northfield, MN.

Linda McQuillen, MS

Ms. Linda McQuillen has served as a reviewer and lead reviewer for more than thirty years for mathematics and special education alignment studies. She has conducted professional development programs for Marion County, West Virginia, on depth-of-knowledge levels and the alignment process. She has also chaired alignment studies with WestEd and ACT for the United States Department of Education–NAEP Governing Board.

Ms. McQuillen has co-taught and developed summer mathematics institutes for teachers of Algebra I at California State University–Dominguez Hills and Northridge. She has also served on the review team for the University of Wisconsin–Madison Secondary Mathematics Program 10-year review. In addition, Ms. McQuillen had developed course sequence, syllabi, and practicum requirements for a certification program for Special Education–Learning Disabilities.

Ms. McQuillen received a BS in secondary education from Northern State College–Aberdeen, as well as an MS in Exceptional Education, and a Learning Coordinators Certification from the University of Wisconsin–Madison.

Tom Muchlinski, PhD

A dedicated mathematics education professional, Dr. Muchlinski has been a Mathematics Specialist for the Minnesota Department of Education and an Assistant Professor at Southwest Minnesota State University. As a Mathematics Specialist, he facilitated state mathematics standards development and advised the State Commissioner of Education on policy and legislation affecting mathematics education. He taught undergraduate Mathematics education courses as well as supervised student teachers at Southwest Minnesota State University. As a high school teacher, Dr. Muchlinski taught in the Minnesota schools for twenty-six years; courses include Algebra I through Advanced Placement Calculus. He is active in many organizations such as the National Council of Supervisors of Mathematics, National Council of Teachers of Mathematics, and Phi Delta Kappa International. Currently, Dr. Muchlinski is a Project Coordinator for the Minnesota Mathematics Achievement Project (MNMAP) at the University of Minnesota. His responsibilities include designing and coordinating data collection procedures and assisting with data analysis. Dr. Muchlinski disseminates his research findings through journal articles and conference presentations.

Dr. Muchlinski received a B.A. in Mathematics from St. John's University, a M.S. in Curriculum and Instruction from St. Cloud State University, and a Ph.D. in Mathematics education from University of North Carolina at Chapel Hill.

Rachelle D. Rogers PhD (Group Facilitator)

Dr. Rogers is currently a lecturer in the Department of Curriculum and Instruction at Baylor University in Waco, Texas. Her responsibilities include teaching content pedagogy for secondary and middle school Mathematics teaching associates and supervising university interns. She has also served as the Mathematics laboratory coordinator at Baylor University and as a mentor teacher at Texas State University. Dr. Rogers is also extensively involved in a number of mathematics initiatives and community programs, including: university liaison for University High School; coprincipal investigator for Action Research and Its Impact on PDS Partnerships; director of GEAR UP: Project S.T.O.M.P.; co-director of GEAR UP Lesson Study; instructor for Teacher Quality Grant; instructor for GEAR UP Super Saturdays; president for the Central Texas Council of Teachers of Mathematics; member of the PDS Coordinating Council; member of the PDS Research Symposium; chair of the middle school task force; member of the secondary certificate team; member of the middle school certificate team; and member of NCATE middle and secondary Mathematics SPA report teams. Dr. Rogers has authored and coauthored numerous manuscripts and research publications, professionally presented at state and national educational conferences, and she has reviewed for NCTM *Mathematics Teaching in the Middle School.*

John Selisky, EdD

Dr. John Selisky has been in practice as a test development and educational measurement professional since 1996, working on large-scale assessment projects for fifteen states, one province, and four of the largest urban school districts in the U.S. and Canada. This work has included both criterion-referenced and norm-referenced instruments. His experience includes item development, test specification and construction, psychometric analysis, standard setting, content review, rangefinding, scoring, and reporting. He has provided oversight in the management of assessment programs as project director, content manager, and senior consultant. His knowledge of test development policy and execution encompasses all major components including cost analysis, budgeting, operations, quality assurance, and product delivery. As a Senior Project Lead for DRC's Test Development Department, he is responsible for development of the high school Mathematics component of the Pennsylvania Voluntary Model Curriculum. These instructional and assessment materials are designed as exemplars of standards-aligned best practices in classroom activities for teachers, and these materials include supporting resource documents and standards-based assessments created by DRC.

Dr. Selisky began building his educational assessment knowledge as a teacher, first as a Peace Corps volunteer teacher in Sierra Leone, West Africa, then as a Mathematics teacher in the public schools of Pennsylvania, New York, and Illinois. He also held university teaching positions in Mathematics and teacher education. His professional work in large-scale assessment began with item and test development for the States of Ohio, New Jersey, and Washington, where he created Mathematics tests for Grade 3 through high school. He developed multiple-choice items, constructed-response items, and scoring rubrics, as well as strategies for reliable handscoring, analysis, and reporting. He also served as the content development manager and project manager for the Georgia Criterion-Referenced Competency Tests in English and language arts, mathematics, science, and social studies. He was responsible for staffing, budgeting, developing, delivering, and reporting for Georgia's principal educational accountability program that includes approximately one million students. He also supervised the content delivery components of item and test development to the automated item management systems.

As a senior content consultant in Mathematics, Dr. Selisky worked in collaboration with the education departments of Washington, Michigan, Oklahoma, and Georgia to train educators in the most appropriate and effective uses of assessments and to help teachers improve their skills in interpreting and reporting results. Some of Dr. Selisky's most important policy contributions to large-scale assessment programs have been in the area of organizing, mapping, and coding state curriculum content standards, including the development of mathematics learning progressions (scope and sequence). The products of these efforts have contributed to more efficient and transparent assessment initiatives and increased instructional effectiveness by teachers.

Dr. Selisky has also written and developed a variety of ancillary products in support of assessment programs. These products include sample item sets, training materials for teachers, and interpretive products for students, parents, and administrators. He has also worked with large urban school districts, including Los Angeles, Clark County (Las Vegas), and Chicago in the development and implementation of high school formative and course assessments to improve student and teacher accountability.

Dr. Selisky has also conducted training presentations, committee reviews, and analytical procedures for educators and measurement professionals. His presentations to state and national professional organizations have included original work in item development, scoring, and instructional practice for teachers. Through his work in the private, not-for profit, and public sectors, Dr. Selisky has trained and mentored assessment professionals in item writing and development, test construction, and data analysis.

Dr. Selisky is a graduate of the University of Pittsburgh with a B.S. in Earth and Planetary Sciences and Mathematics. He holds an M.A. in Secondary Education from Lehigh University and in Instructional Technology from Teachers College, Columbia University. He earned his Ed.D. in Mathematics Education from Teachers College, Columbia University.

READING

Mary Basch, MA

As a Project Lead at DRC, Ms. Mary Basch works with Test Development Directors, Senior Project Leads, and Content Specialists to plan, organize, and establish priorities for all phases of the development and production process for assigned large-scale assessments. Ms. Basch is responsible for the adaptive components of assessments such as large print forms and Spanish language versions, as well as ancillary documents. She also maintains the electronic item bank for assigned projects and contributes to reports for state departments of education. Ms. Basch provides support for project schedules as well as maintaining accurate records concerning costs. In addition, Ms. Basch coordinates assignments to outside consultants and provides training documents as needed. She has previously provided content area expertise in reading and language arts, and her areas of experience include passage and item development, editing, proofreading, and verifying assessments. She has worked on several state testing programs, including those for Alabama, Alaska, Idaho, Georgia, Louisiana, Nebraska, Oklahoma, Pennsylvania, and Washington.

In addition to her test development work at DRC, Ms. Basch has 19 years of classroom experience teaching elementary students. She worked on the Graduation Standards Committee for Columbia Heights Independent School District, matching curriculum to the Minnesota State Standards. She also served on the district leadership team, fulfilling the roles of both grade-level and department chairs. In addition, Ms. Basch is trained in Gifted and Talented education and has taught the gifted and talented cluster for second grade.

Ms. Basch holds an M.A. in Curriculum and Instruction from St. Mary's University in Minneapolis, Minnesota and a B.S. in Elementary Education with an Early Childhood minor from the College of St. Teresa in Winona, Minnesota.

Jacquelyn Graham, PhD (Group Facilitator)

Dr. Jacquelyn Graham has extensive experience in the field of English language arts education, including reading. She has served as an English language arts national expert for alignment studies based on the methodology of Dr. Norman Webb in Nebraska and Oklahoma. Currently she is a professional development coach consultant with the Association for Supervision and Curriculum Development in Virginia and an adjunct professor of elementary education at St. Petersburg College in Florida. As a professional development reading and English language arts consultant, Dr. Graham helps administrators and teacher leaders build expertise in faculty members to improve teaching quality. As an adjunct professor, she teaches core education online courses for teacher education program candidates in both undergraduate and alternative certification programs.

Dr. Graham's English language arts experience includes ten years as a classroom teacher at the elementary, middle school, and college levels. She has coordinated the reading/English language arts program in elementary and secondary education settings, assisted students with reading difficulties via small-group instruction, taught a developmental writing course, and diagnosed students' reading difficulties at grades seven and eight. In addition, Dr. Graham has served as a research analyst for the American Institutes for Research (AIR). Her responsibilities included directing research and policy analyses over a range of education, assessment, and evaluation programs for all aspects of research, including project management, research design, survey instrument development, statistical analysis, reports, and briefings.

Dr. Graham received a BS in elementary education, a MEd in reading education from Indiana University in Pennsylvania, and a PhD in English education with a specialty in composition from the University of Maryland. Her related professional work experience includes curriculum development and test development. As a curriculum developer, Dr. Graham helped to develop a plan for the implementation of reading portfolios for use in county middle schools. Dr. Graham also has test development experience with the Maryland Department of Education. In addition, she served as a consultant on a development team at the Maryland State Department of Education to create an integrated writing, language usage, and reading task for the Maryland School Performance Assessment Program (MSPAP) test.

Cynthia Jacobson, MS

Ms. Cynthia Jacobson has a broad range of experience in assessment and education with over thirty-five years of teaching in grades K–12 in Michigan and Wisconsin. Ms. Jacobson has served in leadership roles on the *WRSA Journal* editorial board and as a liaison between WILEARNS and IDEAS, the Wisconsin Literacy Education and Reading Network Source and the Interactive Dialogue with Educators from Across the State Web site. She has served as a group leader in thirty-five alignment studies and as a reviewer in twenty-four. Some of the most recent alignment studies include those for Kansas, Nebraska, Nevada, California, Florida, and the ACT. Most of the studies were conducted under the leadership of Dr. Norman Webb of the University of Wisconsin–Madison. Ms. Jacobson has been the recipient of the WSRA Pat Bricker Award for Reading Research.

Ms. Jacobson has served as a presenter in numerous conferences and programs, including the Wisconsin Title I Directors Association meeting, Wisconsin State Reading Association conferences, Great Lakes and Plains International Reading Association (IRA) regional conferences, and Content Reading Including Study Systems (CRISS).

Ms. Jacobson received a BA from Michigan State University, an MS in teaching from the University of Wisconsin–Madison, and certifications from the University of Wisconsin–LaCrosse for reading teacher, reading specialist, and director of instruction.

Bobbie Reiten, MA

Ms. Bobbie Reiten has twenty-two years of experience in education. Since joining DRC, she has provided her expertise to large-scale assessment projects for several states. As a Reading Test Development Specialist, Ms. Reiten has contributed to item and test development for the Alabama Reading and Mathematics Test, the Alaska Comprehensive System of Student Assessment, the Idaho Standards Achievement Tests, and the Pennsylvania Classroom Diagnostic Tools and Keystone Exams.

During her time as an educator, Ms. Reiten worked with diverse student populations, including both high and low income areas in rural and suburban settings. As an English/Language Arts classroom teacher for grades 7-12, Ms. Reiten used a variety of different teaching models, and her daily instruction included lessons that were differentiated to meet the needs of individual students and included many hands-on, inquiry based activities. In addition to her classroom experience, she served as a middle and high school guidance counselor, and also as a high school testing coordinator, data analyst, and administrator. Ms. Reiten helped implement the Kentucky Instructional Results Information System (KIRIS) in her school, district, and region.

Both in the classroom and in administrative roles, Ms. Reiten continually sought opportunities to increase her knowledge of best practices. She attended district-provided training and participated in national and regional conferences, where she explored strategies and methods to better meet student needs. Ms. Reiten earned her K–12 administrative license from Saint Mary's University in Minneapolis, Minnesota. She earned a MA in Secondary Guidance and Counseling from Eastern Kentucky University in Richmond, and a BA in Secondary English Education from the University of Kentucky, Lexington.

Roxanne Semon, MA

Ms. Roxanne Semon serves as a consultant in educational assessment at DRC. She has an extensive background in assessment, including item writing and review, form building, electronic item bank development, state standards alignment, rubric scoring, and development of ancillary materials. She is also an editor of nationally distributed informational booklets and posters for high school counseling offices. In addition, Ms. Semon was an adjunct instructor at Sinclair Community College where she taught courses such as beginning and advanced Composition and Literature.

Ms. Semon earned her BA in English with a minor in French and religion from The College of Wooster (Ohio) and an MA in English from Wright State University (Ohio).

Sandra Starr, MA

Sandra Starr is a successful educator experienced in secondary (RLA and ESL), higher, and adult English education, including development and assessment. She has served as a language arts assessment coordinator for the West Virginia Department of Education and as a department chair for the Houston Independent School District. Currently, she serves as a reading language arts solutions education specialist for Region 4 Education Service Center in Houston. As a professional development provider, Ms. Starr has built capacity through training the DOK team, has served as a RLA marketing project lead, RLA advisory lead, and as a RLA annual conference lead. In addition, she has developed products for STELLAR platforms and provided development for state funded English EOC, ELPS and RLA programs.

Ms. Starr's abundant English as a second/other language arts experience includes seventeen years as an instructor at the middle school and college level. She has developed and implemented computer assisted learning courses, developed placement and cumulative assessments for non-native speakers, developed and coordinated TAKS/TAAS tutorials for at-risk and ESL students, and designed and implemented the first public two-way dual language program for grades 9-12 in Texas. In addition, Ms. Starr was designated ESL Teacher of the Year for Texas, 2000-2001.

Ms. Starr received a BS in liberal studies from the University of New York in Albany, New York, and a MA in Applied English Linguistics from the University of Texas. Her related professional work experience includes assessment, program and grant coordination. As an assessment coordinator, she was involved in all aspects of creating state performance assessments and state summative assessments, from conception to operational management. Ms. Starr has acted as program coordinator for the Houston Independent School District and the University of Texas at El Paso. In addition, she served as a USDOE FLAP grant writer/recipient to implement a Spanish/English dual language program, and as grant coordinator for Project BLISS for the Houston Independent School District.

Margaret E. Weldon, EdD (Group Facilitator)

Dr. Margaret Weldon has served as an English language arts national expert for alignment studies based on the methodology of Dr. Norman Webb for Alaska, Nebraska, Idaho, Maryland, and Oklahoma. She has served both as a trainer/facilitator as well as an independent reviewer. She was an assessment specialist for the Alabama Department of Education where she managed the writing assessment program development and administration for grades 5, 7, and 11. She led the development of the reading assessment (grades 3–8) for the Alabama Reading and Mathematics Test and the reading comprehension and language subject-area tests of the Alabama High School Graduation Exam (3rd ed.). She also collaborated on the development of the Alabama Early Learning Assessment—K, 1, and 2 reading tests. Dr. Weldon has conducted statewide writing programs for teachers and administrators on composition, instructional strategies, holistic scoring, and reading instruction. She has participated in NAEP item reviews for reading and writing and in standard setting using bookmark and modified-Angoff methodologies.

Dr. Weldon was a classroom teacher and administrator for nineteen years in Montgomery public schools and worked as a central office administrator where she directed the implementation of the state assessment program for a school system of 35,000 students. She has also served as an English department chairperson and a Title I reading specialist.

She received a BS in secondary English education, a MEd degree in secondary reading education, and an EdD in educational leadership, foundations, and technology from Auburn University.

Carole Wicklander, BA

Ms. Carole Wicklander's test development experience began more than six years ago with her work on reading and language arts assessments for state testing programs. Prior to joining DRC, she worked as a content lead on several statewide assessments, providing subject-specific expertise relative to the test-development process. Her experience includes selecting or commissioning passages, directing and participating in item writing and scoring guidelines development, and constructing test forms. She has also participated in item/passage reviews and rangefinding committee meetings.

In addition to her experience in large-scale state assessments, Ms. Wicklander has served as a project manager for some national assessments, grades K–12. She also worked in educational publishing as a senior editor for textbooks and related materials. She has teaching experience in grades K–8 and has worked as a tutor for adult English language learners. Ms. Wicklander has a BA in American Studies and Education from Dominican University.

PROJECT SUPPORT

Dan Maghrak, BA

Dan Maghrak started with DRC in May of 2012 as a member of the reading team in Test Development. During his time with the reading team, Dan helped with various tasks for several projects. After assisting the reading team, Mr. Maghrak began working as a Project Lead and was eventually hired full-time. As a Project Lead at DRC, Dan works with Test Development Directors, Senior Project Leads, and Content Specialists to plan, organize, and establish priorities for all phases of the development and production process for assigned large-scale assessments. Mr. Maghrak holds a BA in Business Management from the Offutt School of Business as well as a minor in political philosophy from Concordia College in Moorhead, Minnesota.