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Evaluation of the Alignment of Transcend Item Pool to Common Core State Standards

EDMETRIC LLC

Executive Summary

The purpose of this alignment study was to align Pearson's Transcend assessment's item bank to the *Common Core State Standards* (CCSS) of mathematics and reading in grades 3-8. Transcend is an interim, adaptive assessment that can be administered within a class period and is currently available for grades 3-8 in mathematics and reading.

The study examined the extent to which the Transcend item pools represent the CCSS. The results of the study contribute to the evidence gathered by Pearson to evaluate the use of the Transcend assessments in education systems aligned to the CCSS. Research questions guiding this research are:

- *To what extent do the item pools represent the full range of the assessable CCSS?*
- *To what extent do the item pools measure student knowledge at the same level of complexity expected by the CCSS?*

The alignment study was implemented with expert content specialists who had extensive experience with the content area, assessment development, and alignment studies (Table 1). Through a series of online group and individual activities, the group of alignment raters went through training, qualification, and rating processes. Content leads led their teams, provided assignments and discussed the mechanics of item rating, as well as monitoring all alignment activities. Agreement with the master rater's results was reviewed for each rater. Raters were required to agree with at least eight items (80%) to continue participating in the study.

Study raters completed their ratings independently, reviewing all of the assigned items and providing depth of knowledge (DOK) and standard assignments for each item. Master raters followed behind each rater with a representative review of 20% of the items. In the cases where the rater and master rater disagreed, they discussed the disagreement and were permitted to make a change in a second round of ratings. If the raters could not agree, the master rater's rating was the rating of record.

Analyses were conducted to provide alignment evaluation evidence for the Transcend item pools in terms of categorical concurrence, depth of knowledge, range of knowledge, and balance of knowledge.

In general, results indicated that the Transcend item bank is well aligned to the Common Core Content Standards. The mathematics item pool tended to show moderate to strong alignment in terms in all categories at the standard level for mathematics (Table E1). For reading, the Transcend item bank tended to show strong alignment in terms of categorical concurrence, cognitive complexity, balance of knowledge, and range of knowledge at the standard level (Table E2).

Table E1. Overall Evaluation of Alignment – Mathematics

Grade	Standard	Categorical Concurrence	Depth of Knowledge	Balance of Knowledge	Range of Knowledge
3	3.G	Strong Alignment	No Alignment	Strong Alignment	Strong Alignment
	3.MD	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	3.NBT	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	3.NF	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	3.OA	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
4	4.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.MD	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.NBT	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.NF	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.OA	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
5	5.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	5.MD	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	5.NBT	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	5.NF	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	5.OA	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
6	6.EE	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.NS	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.RP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.SP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
7	7.EE	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.NS	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.RP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.SP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
8	8.EE	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.F	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.NS	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.SP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment

Table E2. Overall Evaluation of Alignment – Reading

Grade	Standard	Categorical Concurrence	Depth of Knowledge	Balance of Knowledge	Range of Knowledge
Reading - Information					
3	RI.3	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
4	RI.4	Strong Alignment	Strong Alignment	Moderate Alignment	Strong Alignment
5	RI.5	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
6	RI.6	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
7	RI.7	Strong Alignment	Moderate Alignment	Strong Alignment	Strong Alignment
8	RI.8	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
Reading - Literature					
3	RL.3	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
4	RL.4	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
5	RL.5	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
6	RL.6	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
7	RL.7	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
8	RL.8	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment

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Section 1. Overview

The purpose of this alignment study was to align Pearson's Transcend assessment's item bank to the *Common Core State Standards* (CCSS)[1] of mathematics and reading in grades 3-8. Transcend is an interim, adaptive assessment that can be administered within a class period and is currently available for grades 3-8 in mathematics and reading. Transcend scores are intended to provide curriculum-based measurement results about student strengths and weaknesses and to provide aggregated test data for school and district decision makers to track progress over time.

Study Purpose

The study examined the extent to which the Transcend item pools represent the CCSS. The results of the study contribute to the evidence gathered by Pearson to evaluate the use of the Transcend assessments in education systems aligned to the CCSS. Research questions guiding this research were:

- *To what extent do the item pools represent the full range of the assessable CCSS?*
- *To what extent do the item pools measure student knowledge at the same level of complexity expected by the CCSS?*

Document Purpose

The purpose of this document is to provide technical documentation for the alignment study that EdMetric led in Spring 2020. Section 2 summarizes the methodology used for the study. Section 3 provides information on workshop implementation. Section 4 presents the results, and Section 5 discusses how evidence from the study is relevant to the overall validity argument.

[1] http://www.corestandards.org/

Section 2. Methodology

The intent of the study was to evaluate the alignment of the Transcend mathematics and reading assessment item pools to the CCSS. The study examined alignment in order to evaluate the "appropriateness of test content, the procedures followed in specifying and generating test content…with reference to… the construct the test is intended to measure or the domain it is intended to represent" (American Educational Research Association (AERA), American Psychological Association (APA), National Council on Measurement in Education (NCME), 2014, p. 26).

Procedure

This alignment evaluation of the Transcend item pools used the procedures based on Webb (1997, 1999, 2007). Each standard was matched to a depth-of-knowledge (DOK) level, and each item was matched to a content standard (i.e., CCSS) and to a DOK level. Evaluation criteria were then applied to judge relative alignment.

Step 1. Assign DOK to Standards

Once the set of common and unique standards was identified, content experts assigned DOK values to the CCSS as a scale of cognitive complexity. These experts used Webb's (1997, 1999, 2009) DOK scale to make their ratings. The standards were evaluated and the DOK *range* and *target* determined by examining the intended student learning outcome. Multiple DOK levels were assigned to each standard, if such decisions were consistent with expert judgment (Achieve, 2006; Forte, 2017).

Step 2. Review Items

All items were reviewed in the ABBI Portal, hosted by Pearson. Content experts were trained to navigate tasks as rendered in the portal, and to record their judgments consistently. They reviewed each item and identified the primary standard and DOK level to which the item aligned. If they deemed it appropriate, experts could assign a secondary standard.

Content experts were trained to ensure consistent understanding and application of alignment evaluation criteria. This training included discussion of the distinction between difficulty and cognitive complexity (i.e., DOK) with examples and practice. After participating in a training session, expert raters applied their training to a sample of items for discussion and feedback prior to completing a calibration exercise.

In order to align items to a given content standard (i.e., CCSS), the item addressed the whole standard or an integral part of the standard. If the item could not be matched to content at the existing grade level, the rater matched the item to a content standard from another grade level in which the content was considered aligned.

- For mathematics, content experts considered items with distractors above grade level as aligned to the higher grade-level standard only. For example, if a geometry item about classifying two-dimensional figures includes a distractor about parallel lines, this item would be considered aligned to a standard in grade 4 or higher, as grade 4 is the first time the concept *parallel* is addressed in the CCSS.

- For reading, content experts made a holistic determination of grade-level content demands. This holistic determination took into account vocabulary, context, complexity of the task, readability of the text, and the content included in distractors.

Master Review

A master rater was assigned to each content area to review 20% of items in each grade level following Steps 1 through 2.

After training, the master rater within each content area reviewed the 10 items with the content team in order to apply training instructions, promote discussion, and provide feedback to raters. Following this review, the content experts reviewed an additional 10 items that had already been rated by the master rater. Content experts were required to agree with the master rater 80% to 100% of the time before they rated items independently.

After training and calibration, the master rater conducted "read behinds" in which they reviewed 20% of the items. For any items where disagreement occurred between the master rater and the team member, the master rater's judgment became the rating of record.

Content Standards

For the purposes of this study, the following nomenclature was applied to describe the levels of these standards:

- Standard
  - Strand
    - Indicator

Figure 1 illustrates the application of this nomenclature using a Grade 3 mathematics example.

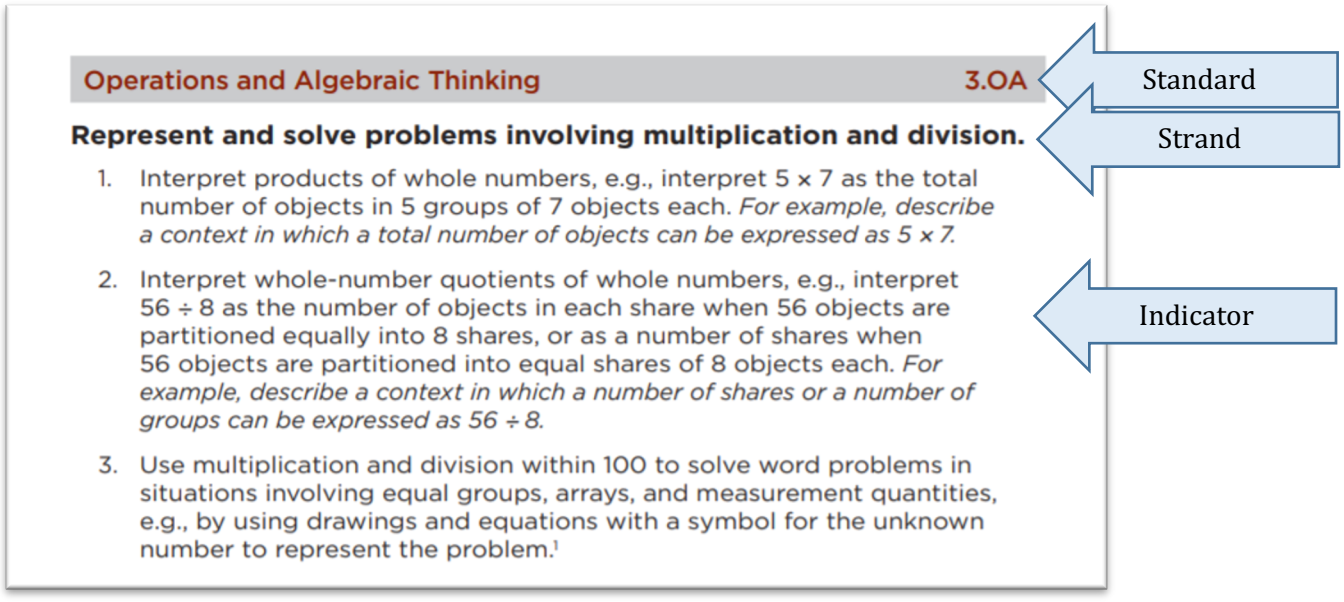

Figure 1. Outtake of Common Core State Standards

Focus Standards for English Language Arts

It is important to note that this study focused on the reading standards of the CCSS. Within those standards, Strand 10 was removed from consideration since this strand is not typically measured on assessments. Additionally, Strand 8 is not measured in Reading Literature in the CCSS.

All mathematics standards and strands were used.

Item Sample

Once the final alignment ratings were determined, the item set was limited to those items that were found to be aligned to on-grade standards. The alignment study is the first of two phases of alignment evaluation. The first phase is reported here and used random sampling of 60 items from each grade and content area (720 items total) selected by Pearson. (The second phase of the alignment study will have approximately 3200 additional items total from each grade and content area and will occur after newly developed items have been added to the Transcend item pool.)

Evaluation Criteria

Criteria for alignment addressed categorical concurrence, DOK, balance of knowledge (BOK), and range of knowledge (ROK) in order to evaluate the adequacy of alignment between the Transcend item pools and the content standards. In sum, alignment was determined in terms of content, balance of content, and cognitive complexity at the full depth and breadth of the content standards.

Categorical Concurrence

Categorical concurrence refers to how similar or consistent the content is on the standards and the assessment. Raters' alignment judgments (e.g., full, partial, none) were used to establish the average number of items assigned to a standard. Webb requires six items per reporting category (i.e., standard).

The following criteria were used:

- If there were six or more items measuring each standard, the criterion was judged strongly aligned.
- If there were five items measuring each standard, the criterion was judged moderately aligned.
- If there were four items measuring each standard, the criterion was judged weakly aligned.
- If there were fewer than four items measuring each standard, the criterion was judged not aligned.

Depth of Knowledge

With the DOK assignment, raters investigated the cognitive complexity of the standard and the items. In general, the items in the item pool should reflect the same range of cognitive complexity as what is expected by the standards. For this evaluation, the following criteria were applied:

- If 50% or more of the items corresponding to a standard were considered at or above the DOK level of that standard, the criterion was considered strongly aligned.
- If 40-49% of the items were at or above the DOK level of the standard, then the criterion was considered moderately aligned.
- If 30-39% of the items were at or above the DOK level of the standard, then the criterion was considered weakly aligned.

Each strand was assigned a DOK level by the content experts, and each item was assigned to an indicator and to a DOK. (Note that the DOK-to-item assignment is independent of the DOK of the strand.) Once data were collected, the DOK consistency of the item pool to the content standards was examined.

Balance of Knowledge

The BOK is a measure of how items are distributed across the standards. This alignment criterion examines whether the number of test items matched to a standard is proportional to the number of strands within that standard. For this, a Webb index score was computed for each standard. The following criteria were applied:

- If the BOK was 0.70 or higher, then the criterion was strongly aligned.
- If the BOK was 0.60 to 0.69, then the criterion was moderately aligned.

Range of Knowledge

The ROK examines the extent to which the item pool covers the standards. The following criteria were applied:

- If at least 50% of the strands within a standard was covered by an assessment item, then the ROK was deemed strongly aligned.
- If 40-49% of the strands within a standard was covered by an assessment item, then the ROK was deemed moderately aligned.

Study Participants

Study participants included study facilitators, program manager, master raters and content leads, and study raters. All raters were required to have at least five years of experience as content experts in the field of educational measurement and experience with alignment evaluations. Table 1 presents each study participant and a brief description of relevant expertise.

Table 1. Participants' Expertise

Contributor	Role & Responsibility	Experience
Dr. Karla Egan	Lead Facilitator *Design workshop, analyze data, lead online group meetings*	Dr. Egan has been active in the field of psychometrics for twenty years. During this time, she has conducted multiple validity studies on statewide assessments and made these studies a routine part of her technical reports for all state assessments where she was the lead psychometrician. As the lead psychometrician for several statewide assessment programs, Dr. Egan conducted psychometric and statistical analyses on student data, including item and anchor analyses, and performed data calibration, equating, and linking. She has extensive experience in the application of both classical and item response theory models, as well as broad-based knowledge of both linear and adaptive tests. She has designed and led multiple alignment studies.
Dr. Anne Davidson	Co-Facilitator *Design workshop, analyze data*	Dr. Davidson has over 14 years in applied psychometrics and high-stakes assessment, providing technical leadership and support to diverse large-scale academic assessments, including alternate assessments of alternate achievement standards, English-language proficiency tests, preK-12 general education academic assessments, and licensure/certification programs. With EdMetric,

Contributor	Role & Responsibility	Experience
		she has led or co-led 10 alignment studies and has conducted numerous psychometric studies, including calibration and linking studies, drift analyses, and third-party evaluations.
Amy Jones	Project Manager *Oversee project implementation, create Google Sheets used to collect ratings*	Ms. Jones interfaces with state departments of education and large assessment companies to guarantee customer and company goals are met. With EdMetric, Ms. Jones has assisted in orchestrating alignment reviews, standard-setting events, and achievement level descriptor meetings. She has served as an on-site project manager for several projects, organizing logistics, working collaboratively with state agency personnel, work-group participants, and assessment vendors to ensure that work is completed in the allotted timeframe.
Leslie Hall	Reading Master Rater/Content Lead *Oversee and train the Reading Team*	Ms. Hall is a consultant who provides writing, editing, research and development, training (item writing, content editing, and test construction), and senior review services to assessment and curriculum publishers. As an independent contractor, she has developed reading content directly for the Louisiana Department of Education and Miami-Dade County Public Schools. As a manager and director of content development for different publishing companies, she directed the development of high-stakes and formative assessments for multiple content areas in multiple statewide programs and for the Department of Defense Education Activity.
Cindy Wheeler	Reading Rater *Review items for DOK and content alignment*	Ms. Wheeler is a consultant who provides ELA content expertise and test development services to clients in the education industry. Having honed her content development skills for 23 years, she brings a nuanced understanding of textuality, item anatomy, and standards measurement to her work. She still remembers being a student, and students remain at the heart of her perspective.
Indiana Laub	Reading Rater *Review items for DOK and content alignment*	Ms. Laub has nine years of experience in ELA assessments. She has led arts enrichment workshops and classes for students of many ages and backgrounds. Her freelance experience encompasses all stages of assessment development, from writing items to conducting evaluations and reviews and training new content developers. She has regularly participated in committee reviews for various clients, including bias and sensitivity reviews and alignment studies for large-scale statewide testing programs. She has extensive experience providing alignments to state standards.
Gretchen Schultz	Reading Rater *Review items for DOK and content alignment*	Ms. Schultz is a consultant in educational assessment. She began her career in education as a secondary English teacher (middle, high, and community college) and transitioned to assessment development, overseeing the development of the Maryland State Department of Education's nascent High School Assessment for English. She served as a test developer for a large-scale assessment company where she managed content development of state, national, and international contracts as well as development of multiple shelf products. Her latest role was as Director of Formative Assessment for one of the nation's largest developers of

Contributor	Role & Responsibility	Experience
		educational materials. She was the Content Lead for the development of the Smarter Balanced Assessment Consortium's Achievement Level Descriptors.
Scott Lape	Mathematics Master Rater/Content Lead *Oversee and train the Mathematics Team*	Mr. Lape has worked in the field of mathematics education since 1987. He taught at the junior college and university level for 5 years, before working for 4 years as a mathematics content editor at CTB McGraw-Hill. He has served as an educational consultant since 1997, specializing in developing mathematics curriculum and assessment materials for grades K−12.
Julia Payne-Lewis	Mathematics Rater *Review items for DOK and content alignment*	Ms. Payne-Lewis is a designer of K−12 professional learning programs, curricula, and assessment, with a focus on formative strategies. Her background includes 20 years working in public education in grades K−9, with several of those years devoted to special education. She worked as a curriculum coach and assessment coordinator in a K−12 district, and at the state level as a consultant in the area of mathematics portfolio assessment. As a professional development specialist and consultant, Julia has spent the past 10 years working across the United States, providing professional development and consultation in the areas of formative and summative assessment.
Shina Roc-Bassett	Mathematics Rater *Review items for DOK and content alignment*	Ms. Roc-Bassett is a consultant in educational assessment. She began her career in education as an Academic Advisor in the College of Engineering and a middle school teacher. In 2005, she joined a publishing company as a K-12 mathematics assessment specialist. Ms. Bassett has experience in every phase of assessment development, including specifications development, item and ancillaries development, content and bias review, alignments, item selection, working with statistics research analysts, test-taking, creating alternate text/graphics, and overseeing test books through to release for production and scoring. She is fluent in English, French, and Créole.
Michael Brown	Mathematics Rater *Review items for DOK and content alignment*	Mr. Brown is a nationally known, senior-level assessment specialist. His current work includes developing, constructing, and evaluating instructional and assessment materials for use by various local, state, national, and international groups. His previous work involved development of and support for custom state tests, including evaluating the alignment of items and standards. As an educator, Michael taught mathematics at grades 6−12 and community college, and he conducted presentations on mathematics content and pedagogy at numerous conferences. He is the recipient of several grants and awards in his field.

Section 3. Implementation

The alignment study was implemented through a series of online group and individual activities. First, the group of alignment raters met for an orientation to the process. This initial training session provided the purpose for the alignment study, an overview of the assessments, an introduction to content leads, who also served as master raters, and an introduction to the first task—alignment of DOK to standard.

Once the standard alignment was complete, the content leads met with their teams to provide assignments and to discuss the mechanics of item rating. To conclude the training phase, each team member rated a representative set of items and met with their content lead/master rater to discuss the results of the training review. These discussions allowed for clarification of alignment criteria and promoted consistent interpretation of alignment concepts and their application.

All raters then participated in a qualification round in which they reviewed and rated a representative sample of 10 items. Agreement with the master rater's results was reviewed for each rater. Raters were required to agree with at least eight items (80%) to continue with participation in the study.

Study raters completed their ratings independently, reviewing all of the assigned items and providing DOK and standard assignments for each item. Master raters followed behind each rater with a review of 20% of the items. In the cases where the rater and master rater disagreed, they discussed the disagreement and were permitted to make a change in a second round of ratings. If the raters could not agree, the master rater's rating was the rating of record.

Section 4. Results

Analyses were conducted to provide alignment evaluation evidence for the Transcend item pools in terms of categorical concurrence, DOK, BOK, and ROK. Within this section, we first present the results for mathematics and then for reading.

Mathematics

Descriptive Statistics

Table 2 shows the number of items in the mathematics item pools. In addition, it shows that almost all items were assigned to an on-grade standard. The items that were aligned to off-level grades were not used in the consideration of categorical concurrence, DOK, BOK, and ROK.

Table 2 also shows the number of items that were full and partial matches. For all grade levels, less than 10% of items were viewed as a partial match by the raters.

Table 2. Number of Items, Number of On-grade Items, Number of Full and Partial Matches, Mathematics

Grade	Number of Items	Number of Items Aligned to any Standard	Number of Items Aligned to an On-grade Standard	Number of Items Assigned to Strong Matches	Number of Items Assigned to Partial Matches	Number of Items Aligned to a Secondary Standard
3	305	305	304	290	10	3
4	299	298	297	282	15	1
5	281	281	277	269	8	21
6	315	313	310	297	12	30
7	274	271	265	257	8	6
8	283	282	272	256	16	3

Table 3 shows the distribution of items by DOK. The majority of items were assigned to DOK 1 or 2.

Table 3. Percentage of Items by DOK and Grade Level, Mathematics

Grade	DOK 1	DOK 2	DOK 3	DOK 4	Total Number of Items
3	51.3%	48.7%	0.0%	0.0%	304
4	50.5%	49.2%	0.3%	0.0%	297
5	46.6%	53.4%	0.0%	0.0%	277
6	64.5%	35.5%	0.0%	0.0%	310
7	23.8%	76.2%	0.0%	0.0%	265
8	37.5%	61.8%	0.7%	0.0%	272

Rater Agreement

Table 4 shows the number of items that were used for training and for qualifying. To train raters, the master rater guided a discussion of 12 items (two items from each grade). The raters discussed each item, the primary content alignment of that item, the alignment strength (i.e., full, partial, not aligned), the DOK level, and any secondary content alignment, if applicable.

After training, the reviewers rated a set of 10 qualifying items. For the qualification round, the master rater assigned a primary and secondary (if applicable) standard, the DOK, and the alignment strength to the items in the qualifying set. To qualify, the reviewers had to agree with the master rater 80% of the time on the primary alignment and the DOK of the qualifying set.

No reviewer passed the first qualifying round. Therefore, the master rater met with each rater to discuss the qualifying set. Following this, all reviewers were assigned a second qualifying set of items. All reviewers met the threshold for agreement and qualified on the second set.

Table 4 shows that 48 items remained in the pool after qualification.

Table 4. Number of Items used for Training, Qualification, and General Rating, Mathematics

Grade Level	Training	Qualifying Set 1	Qualifying Set 2	Remainder of Pool	Total Number of Items
3	2	5	5	48	60
4	2	5	5	48	60
5	2	5	5	48	60
6	2	5	5	48	60
7	2	5	5	48	60
8	2	5	5	48	60

Tables 5 and 6 report the results of rater agreement for the 20% read-behind ratings. The ratings were broken into two items sets. Raters first aligned a small set of items (Table 5) followed by the remainder of the item pool (Table 6). Raters met the criteria of 80% agreement. Overall, the rater agreed with the master rater at least 70% of the time.

Table 5. Rater Agreement Rates, Mathematics Set 1

Grade Level	Total Items	Items Reviewed	Overall Agreement	Agreement on Content	Agreement on DOK	Alignment Strength Agreement
3	48	10	90.0%	90.0%	100.0%	100.0%
4	48	10	70.0%	90.0%	100.0%	80.0%
5	48	10	100.0%	100.0%	100.0%	100.0%
6	48	10	90.0%	100.0%	100.0%	90.0%
7	48	10	100.0%	100.0%	100.0%	100.0%
8	48	10	100.0%	100.0%	100.0%	100.0%

Table 6. Rater Agreement Rates, Mathematics Set 2

Grade Level	Total Items	Items Reviewed	Overall Agreement	Agreement on Content	Agreement on DOK	Alignment Strength Agreement
3	245	49	89.8%	89.8%	95.9%	100.0%
4	239	49	95.9%	95.9%	100.0%	100.0%
5	221	44	100.0%	100.0%	100.0%	100.0%
6	255	51	96.1%	96.1%	100.0%	100.0%
7	214	49	100.0%	100.0%	100.0%	100.0%
8	223	45	100.0%	100.0%	100.0%	100.0%

Mathematics Alignment Results

Categorical Concurrence. Categorical concurrence was evaluated using Webb's criterion of six items measuring each standard. The Transcend item pools showed strong alignment across all grade levels and standards in terms of categorical concurrence (Table 7).

Table 7. Evaluation of Categorical Concurrence – Mathematics

Grade	Standard	Item Count	Alignment Evaluation
3	3.G	33	Strong Alignment
	3.MD	91	Strong Alignment
	3.NBT	43	Strong Alignment
	3.NF	43	Strong Alignment
	3.OA	94	Strong Alignment
4	4.G	34	Strong Alignment
	4.MD	75	Strong Alignment
	4.NBT	64	Strong Alignment
	4.NF	62	Strong Alignment
	4.OA	62	Strong Alignment
5	5.G	36	Strong Alignment
	5.MD	54	Strong Alignment
	5.NBT	69	Strong Alignment
	5.NF	76	Strong Alignment
	5.OA	42	Strong Alignment
6	6.EE	97	Strong Alignment
	6.G	34	Strong Alignment
	6.NS	86	Strong Alignment
	6.RP	51	Strong Alignment
	6.SP	42	Strong Alignment
7	7.EE	49	Strong Alignment
	7.G	54	Strong Alignment
	7.NS	51	Strong Alignment

Grade	Standard	Item Count	Alignment Evaluation
	7.RP	57	Strong Alignment
	7.SP	54	Strong Alignment
8	8.EE	73	Strong Alignment
	8.F	66	Strong Alignment
	8.G	78	Strong Alignment
	8.NS	28	Strong Alignment
	8.SP	27	Strong Alignment

Depth of Knowledge. Content experts assigned each standard with a range of DOK levels (Appendix A, Table A.1) as well as a target DOK to investigate the cognitive complexity of the standard and the items. Raters assigned a DOK to each item without regard to the DOK of the intended standard.

As a reminder, the criteria for DOK were:

- If at least 50% of the items corresponding to a standard were considered at or above the target DOK level of that standard, the criterion was considered strongly aligned.
- If 40-49% of the items were at or above the target DOK level of the standard, then the criterion was considered moderately aligned.
- If 30-39% of the items were at or above the target DOK level of the standard, then the criterion was considered weakly aligned.

As reported in Table 8, all mathematics standards showed strong alignment in terms of target DOK, except for Grade 3 Geometry.

Table 8. Evaluation of Depth of Knowledge – Mathematics

Grade	Standard	DOK Range	DOK 1	DOK 2	DOK 3	DOK 4	% At or Above DOK	Alignment Evaluation
3	3.G	DOK 1, 3	29	4	0	0	12%	No Alignment
	3.MD	DOK 1, 3	27	64	0	0	76%	Strong Alignment
	3.NBT	DOK 1, 2	40	3	0	0	100%	Strong Alignment
	3.NF	DOK 1, 3	19	24	0	0	77%	Strong Alignment
	3.OA	DOK 1, 3	41	53	0	0	88%	Strong Alignment
4	4.G	DOK 1, 2	28	6	0	0	56%	Strong Alignment
	4.MD	DOK 1, 2	28	47	0	0	68%	Strong Alignment
	4.NBT	DOK 1, 2	47	17	0	0	66%	Strong Alignment
	4.NF	DOK 1, 3	32	30	0	0	63%	Strong Alignment
	4.OA	DOK 1, 3	15	46	1	0	76%	Strong Alignment
5	5.G	DOK 1, 2	16	20	0	0	67%	Strong Alignment
	5.MD	DOK 1, 3	18	36	0	0	78%	Strong Alignment
	5.NBT	DOK 1, 3	56	13	0	0	59%	Strong Alignment
	5.NF	DOK 1, 2	27	49	0	0	64%	Strong Alignment
	5.OA	DOK 1, 3	12	30	0	0	71%	Strong Alignment
6	6.EE	DOK 1, 2	73	24	0	0	69%	Strong Alignment
	6.G	DOK 1, 3	16	18	0	0	53%	Strong Alignment
	6.NS	DOK 1, 3	70	16	0	0	58%	Strong Alignment
	6.RP	DOK 1, 3	22	29	0	0	57%	Strong Alignment
	6.SP	DOK 2, 3	19	23	0	0	57%	Strong Alignment
7	7.EE	DOK 1, 2	22	27	0	0	78%	Strong Alignment
	7.G	DOK 1, 3	5	49	0	0	91%	Strong Alignment
	7.NS	DOK 1, 3	29	22	0	0	57%	Strong Alignment
	7.RP	DOK 1, 3	5	52	0	0	91%	Strong Alignment
	7.SP	DOK 1, 3	2	52	0	0	96%	Strong Alignment
8	8.EE	DOK 1, 2	49	24	0	0	55%	Strong Alignment
	8.F	DOK 1, 3	19	47	0	0	70%	Strong Alignment
	8.G	DOK 1, 3	25	51	2	0	65%	Strong Alignment
	8.NS	DOK 1, 2	9	19	0	0	68%	Strong Alignment
	8.SP	DOK 1, 3	0	27	0	0	100%	Strong Alignment

Balance of Knowledge. Balance of knowledge is a measure of how items are distributed across the standards. This alignment criterion examines whether the number of test items matched to a standard is proportional to the number of strands within that standard. For this, a Webb index score was computed for each standard. As reported in Table 9, all mathematics standards showed strong alignment in terms of BOK.

Table 9. Evaluation of Balance of Knowledge – Mathematics

Grade Level	Standard	Balance of Knowledge	Alignment Evaluation
3	3.G	1.00	Strong Alignment
	3.MD	0.90	Strong Alignment
	3.NBT	1.00	Strong Alignment
	3.NF	1.00	Strong Alignment
	3.OA	0.76	Strong Alignment
4	4.G	1.00	Strong Alignment
	4.MD	0.75	Strong Alignment
	4.NBT	0.97	Strong Alignment
	4.NF	0.94	Strong Alignment
	4.OA	0.77	Strong Alignment
5	5.G	0.92	Strong Alignment
	5.MD	0.74	Strong Alignment
	5.NBT	0.96	Strong Alignment
	5.NF	0.79	Strong Alignment
	5.OA	0.79	Strong Alignment
6	6.EE	0.79	Strong Alignment
	6.G	1.00	Strong Alignment
	6.NS	0.79	Strong Alignment
	6.RP	1.00	Strong Alignment
	6.SP	0.90	Strong Alignment
7	7.EE	0.89	Strong Alignment
	7.G	0.96	Strong Alignment
	7.NS	1.00	Strong Alignment
	7.RP	1.00	Strong Alignment
	7.SP	0.83	Strong Alignment
8	8.EE	0.83	Strong Alignment
	8.F	0.97	Strong Alignment
	8.G	0.87	Strong Alignment
	8.NS	1.00	Strong Alignment
	8.SP	1.00	Strong Alignment

Range of Knowledge. ROK examined the extent to which the item pool covered the standards. Following Webb, if at least 50% of the strands within a standard was covered by an assessment item, then the ROK was deemed "strongly aligned." If 40-49% of the standard was covered by an assessment item, then the ROK was deemed "moderately aligned." The Transcend item pools showed strong alignment across all grade levels and standards in terms of ROK (Table 10).

Table 10. Evaluation of Range of Knowledge – Mathematics

Grade	Standard	Standards Count	Range of Knowledge	Alignment Evaluation
3	3.G	1	100%	Strong Alignment
	3.MD	4	100%	Strong Alignment
	3.NBT	1	100%	Strong Alignment
	3.NF	1	100%	Strong Alignment
	3.OA	4	100%	Strong Alignment
4	4.G	1	100%	Strong Alignment
	4.MD	3	100%	Strong Alignment
	4.NBT	2	100%	Strong Alignment
	4.NF	3	100%	Strong Alignment
	4.OA	3	100%	Strong Alignment
5	5.G	2	100%	Strong Alignment
	5.MD	3	100%	Strong Alignment
	5.NBT	2	100%	Strong Alignment
	5.NF	2	100%	Strong Alignment
	5.OA	2	100%	Strong Alignment
6	6.EE	3	100%	Strong Alignment
	6.G	1	100%	Strong Alignment
	6.NS	3	100%	Strong Alignment
	6.RP	1	100%	Strong Alignment
	6.SP	2	100%	Strong Alignment
7	7.EE	2	100%	Strong Alignment
	7.G	2	100%	Strong Alignment
	7.NS	1	100%	Strong Alignment
	7.RP	1	100%	Strong Alignment
	7.SP	3	100%	Strong Alignment
8	8.EE	3	100%	Strong Alignment
	8.F	2	100%	Strong Alignment
	8.G	3	100%	Strong Alignment
	8.NS	1	100%	Strong Alignment
	8.SP	1	100%	Strong Alignment

Reading

Descriptive Statistics

Table 11 shows the number of items in the reading item pools. The vast majority of items were aligned to an on-grade standard with only a handful of items aligning to an off-grade standard. It is also important to note that a few items were aligned to Language standards. The items that were aligned to off-level grades or to Language were not used in the consideration of categorical concurrence, DOK, BOK, and ROK.

Table 11 also shows the number of items that were strong and partial matches. Less than 10% of items at each grade level were viewed as a partial match by the raters.

Table 11. Number of Items, Number of On-grade Items, Number of Strong and Partial Matches, Reading

Grade Level	Number of Items	Number of Items Aligned to any Standard	Number of Items Aligned to an On-grade Standard	Number of Items Assigned to Strong Matches	Number of Items Assigned to Partial Matches	Number of Items Aligned to a Secondary Standard
3	256	256	251	239	12	106
4	238	236	221	199	22	75
5	252	252	252	251	1	44
6	249	249	248	247	1	46
7	251	250	249	243	6	26
8	264	260	256	240	16	16

Table 12 shows the distribution of DOKs by text type and grade level. In each grade, the majority of items align to DOK 2. The items are fairly evenly split between Informational and Literature.

Table 12. Percentage of Items by DOK, Text Type, and Grade Level, Reading

Grade Level	Text Type	DOK 1	DOK 2	DOK 3	DOK 4	Total %	Number of Items
3	Informational	9.6%	34.8%	4.0%	0.0%	48.4%	
	Literature	10.8%	32.4%	8.4%	0.0%	51.6%	250
4	Informational	8.6%	38.9%	5.4%	0.0%	52.9%	
	Literature	7.7%	31.2%	8.1%	0.0%	47.1%	221
5	Informational	4.0%	36.1%	7.5%	0.0%	47.6%	
	Literature	3.6%	36.9%	11.9%	0.0%	52.4%	252
6	Informational	3.2%	38.7%	13.7%	0.0%	55.6%	
	Literature	2.0%	32.3%	10.1%	0.0%	44.4%	248
7	Informational	11.2%	33.1%	14.0%	0.0%	58.3%	
	Literature	4.5%	23.6%	13.6%	0.0%	41.7%	242
8	Informational	8.9%	37.1%	9.7%	0.0%	55.6%	
	Literature	6.0%	23.8%	14.5%	0.0%	44.4%	248

Rater Agreement

Table 13 shows the number of items that were used for training and for qualifying. As with mathematics, the master rater trained raters by discussing 12 items (two items from each grade). The raters discussed each item, the primary content alignment of that item, the alignment strength (i.e., full, partial, not aligned), the DOK level, and any secondary content alignment, if applicable.

After training, the reviewers rated a set of 10 qualifying items. For the qualification round, the master rater assigned a primary and secondary (if applicable) standard, the DOK, and the alignment strength to the items in the qualifying set. To qualify, the reviewers had to agree with the master rater 80% of the time on the primary alignment and the DOK of the qualifying set.

No reviewer passed the first qualifying round. Therefore, the master rater met with each rater to discuss the qualifying set. Following this, all reviewers were assigned a second qualifying set of items. Reviewers for Grades 3/4 and 7/8 met the threshold for agreement and qualified on the second set. The reviewer for Grades 5/6 qualified on the third set.

Table 13 shows that 43 to 48 items remained in the pool after qualification.

Table 13. Number of Items used for Training, Qualification, and General Rating, Reading

Grade Level	Training	Qualifying Set 1	Qualifying Set 2	Qualifying Set 3	Remainder of Pool	Total Number of Items
3	2	5	5	0	48	60
4	2	5	5	0	48	60
5	2	5	5	5	43	60
6	2	5	5	5	43	60
7	2	5	5	0	48	60
8	2	5	5	0	48	60

Tables 14 and 15 report the results of rater agreement for the 20% read-behind ratings. Table 14 shows the agreement rates for the first set of items. Table 15 shows the agreement rates for the second set of items. The agreement rates improved in Set 2.

Table 14. Rater Agreement Rates – Reading Set 1

Grade Level	Total Items	Items Reviewed	Overall Agreement	Agreement on Content	Agreement on DOK	Perfect + Partial Agreement
3	48	12	83.3%	91.7%	91.7%	83.3%
4	48	10	100.0%	100.0%	100.0%	100.0%
5	43	9	88.9%	100.0%	100.0%	88.9%
6	43	11	90.9%	100.0%	100.0%	90.9%
7	48	17	88.2%	100.0%	100.0%	88.2%
8	48	16	87.5%	100.0%	100.0%	87.5%

Table 15. Rater Agreement Rates – Reading Set 2

Grade Level	Total Items	Items Reviewed	Overall Agreement	Agreement on Content	Agreement on DOK	Perfect + Partial Agreement
3	196	48	93.8%	97.9%	95.8%	100.0%
4	178	48	97.9%	100.0%	97.9%	100.0%
5	192	55	94.5%	100.0%	96.4%	100.0%
6	189	46	97.8%	100.0%	97.8%	100.0%
7	191	52	94.2%	96.2%	98.1%	98.1%
8	204	60	96.7%	100.0%	96.7%	100.0%

Reading Alignment Results

Categorical Concurrence. Categorical concurrence was evaluated using Webb's criterion of six items measuring each standard. For reading, we investigated Categorical Concurrence at the standard *and* strand levels. At the standard level, the Transcend item pools showed strong alignment across all grade levels in terms of categorical concurrence (see Table 16).

Table 16. Evaluation of Categorical Concurrence at the Standard Level – Reading

Grade	Standard	Item Count	Alignment Evaluation
Reading - Informational			
3	RI.3	121	Strong Alignment
4	RI.4	117	Strong Alignment
5	RI.5	120	Strong Alignment
6	RI.6	138	Strong Alignment
7	RI.7	141	Strong Alignment
8	RI.8	138	Strong Alignment
Reading – Literature			
3	RL.3	129	Strong Alignment
4	RL.4	104	Strong Alignment
5	RL.5	132	Strong Alignment
6	RL.6	110	Strong Alignment
7	RL.7	101	Strong Alignment
8	RL.8	110	Strong Alignment

Table 17 shows the item counts at the strand level. Even though there is strong alignment at the standard level, there is room for improvement at the strand level. In general, Strands 1–6 tend to have better coverage than Strands 7–9 across all grades with the exception of Grade 4 where there no alignment for Strand 6.

Table 17. Evaluation of Categorical Concurrence at the Strand Level – Reading[2]

Grade Level	Strand	Item Count	Alignment Evaluation	Strand	Item Count	Alignment Evaluation
3	RI.3.1	24	Strong Alignment	RL.3.1	16	Strong Alignment
	RI.3.2	18	Strong Alignment	RL.3.2	18	Strong Alignment
	RI.3.3	22	Strong Alignment	RL.3.3	36	Strong Alignment
	RI.3.4	20	Strong Alignment	RL.3.4	21	Strong Alignment
	RI.3.5	10	Strong Alignment	RL.3.5	16	Strong Alignment
	RI.3.6	12	Strong Alignment	RL.3.6	13	Strong Alignment
	RI.3.7	4	Weak Alignment	RL.3.7	6	Strong Alignment
	RI.3.8	5	Moderate Alignment			
	RI.3.9	6	Strong Alignment	RL.3.9	3	No Alignment
4	RI.4.1	18	Strong Alignment	RL.4.1	21	Strong Alignment
	RI.4.2	20	Strong Alignment	RL.4.2	18	Strong Alignment
	RI.4.3	23	Strong Alignment	RL.4.3	25	Strong Alignment
	RI.4.4	20	Strong Alignment	RL.4.4	18	Strong Alignment
	RI.4.5	22	Strong Alignment	RL.4.5	4	Weak Alignment
	RI.4.6	2	No Alignment	RL.4.6	9	Strong Alignment
	RI.4.7	5	Moderate Alignment	RL.4.7	5	Moderate Alignment
	RI.4.8	4	Weak Alignment			
	RI.4.9	3	No Alignment	RL.4.9	4	Weak Alignment
5	RI.5.1	19	Strong Alignment	RL.5.1	22	Strong Alignment
	RI.5.2	23	Strong Alignment	RL.5.2	22	Strong Alignment
	RI.5.3	16	Strong Alignment	RL.5.3	18	Strong Alignment
	RI.5.4	20	Strong Alignment	RL.5.4	23	Strong Alignment
	RI.5.5	16	Strong Alignment	RL.5.5	18	Strong Alignment
	RI.5.6	16	Strong Alignment	RL.5.6	18	Strong Alignment

[2] Missing cells represent Standard 8 which is not measured in Reading Literature.

Grade Level	Strand	Item Count	Alignment Evaluation	Strand	Item Count	Alignment Evaluation
	RI.5.7	4	Weak Alignment	RL.5.7	7	Strong Alignment
	RI.5.8	4	Weak Alignment			
	RI.5.9	2	No Alignment	RL.5.9	4	Weak Alignment
6	RI.6.1	22	Strong Alignment	RL.6.1	20	Strong Alignment
	RI.6.2	22	Strong Alignment	RL.6.2	20	Strong Alignment
	RI.6.3	19	Strong Alignment	RL.6.3	16	Strong Alignment
	RI.6.4	24	Strong Alignment	RL.6.4	20	Strong Alignment
	RI.6.5	19	Strong Alignment	RL.6.5	14	Strong Alignment
	RI.6.6	19	Strong Alignment	RL.6.6	14	Strong Alignment
	RI.6.7	5	Moderate Alignment	RL.6.7	4	Weak Alignment
	RI.6.8	5	Moderate Alignment			
	RI.6.9	3	No Alignment	RL.6.9	2	No Alignment
7	RI.7.1	28	Strong Alignment	RL.7.1	16	Strong Alignment
	RI.7.2	25	Strong Alignment	RL.7.2	20	Strong Alignment
	RI.7.3	14	Strong Alignment	RL.7.3	14	Strong Alignment
	RI.7.4	21	Strong Alignment	RL.7.4	15	Strong Alignment
	RI.7.5	22	Strong Alignment	RL.7.5	14	Strong Alignment
	RI.7.6	21	Strong Alignment	RL.7.6	15	Strong Alignment
	RI.7.7	3	No Alignment	RL.7.7	3	No Alignment
	RI.7.8	5	Moderate Alignment			
	RI.7.9	2	No Alignment	RL.7.9	4	Weak Alignment
8	RI.8.1	35	Strong Alignment	RL.8.1	22	Strong Alignment
	RI.8.2	23	Strong Alignment	RL.8.2	20	Strong Alignment
	RI.8.3	18	Strong Alignment	RL.8.3	25	Strong Alignment
	RI.8.4	20	Strong Alignment	RL.8.4	17	Strong Alignment
	RI.8.5	19	Strong Alignment	RL.8.5	5	Moderate Alignment
	RI.8.6	16	Strong Alignment	RL.8.6	15	Strong Alignment
	RI.8.7	0	No Alignment	RL.8.7	4	Weak Alignment

Grade Level	Strand	Item Count	Alignment Evaluation	Strand	Item Count	Alignment Evaluation
	RI.8.8	5	Moderate Alignment			
	RI.8.9	2	No Alignment	RL.8.9	2	No Alignment

Depth of Knowledge. Content experts assigned each standard with a range of DOK levels (Appendix A, Table A.2) as well as a target DOK to investigate the cognitive complexity of the standard and the items. Raters assigned a DOK to each item without regard to the DOK of the intended standard. Items were compared to the target DOK.

Table 18 shows the results of the DOK study at the standard level. At this level, the item pools demonstrated moderate to strong alignment for all Standards.

Table 18. Evaluation of Depth of Knowledge at Standard Level – Reading

Grade Level	Standard	DOK Range	DOK 1	DOK 2	DOK 3	DOK 4	% At or Above DOK	Alignment Evaluation
Reading - Informational								
3	RI.3	DOK 1, 2	24	87	10	0	77.7%	Strong Alignment
4	RI.4	DOK 1, 2	19	86	12	0	82.1%	Strong Alignment
5	RI.5	DOK 1, 3	10	91	19	0	73.3%	Strong Alignment
6	RI.6	DOK 1, 3	8	96	34	0	63.8%	Strong Alignment
7	RI.7	DOK 1, 3	27	80	34	0	45.4%	Moderate Alignment
8	RI.8	DOK 1, 3	22	92	24	0	50.0%	Strong Alignment
Reading - Literature								
3	RL.3	DOK 1, 2	27	81	21	0	76.0%	Strong Alignment
4	RL.4	DOK 1, 2	17	69	18	0	82.7%	Strong Alignment
5	RL.5	DOK 1, 3	9	93	30	0	78.8%	Strong Alignment
6	RL.6	DOK 1, 3	5	80	25	0	74.5%	Strong Alignment
7	RL.7	DOK 1, 3	11	57	33	0	61.4%	Strong Alignment
8	RL.8	DOK 1, 3	15	59	36	0	50.9%	Strong Alignment

Table 19 shows the result of the DOK study at the strand level. At this level, there tends to be strong alignment when the Target DOK of the strand is 1 or 2.

Table 19. Evaluation of Depth of Knowledge at Strand Level – Reading

Grade Level	Strand	DOK Range	Target DOK	DOK 1	DOK 2	DOK 3	DOK 4	% At or Above DOK	Alignment Evaluation
	Reading – Informational								
3	RI.3.1	DOK 1, 2	**2**	9	15	0	0	63%	Strong Alignment
	RI.3.2	DOK 2, 3	**2**	0	16	2	0	100%	Strong Alignment
	RI.3.3	DOK 1, 3	**2**	11	11	0	0	50%	Strong Alignment
	RI.3.4	DOK 2, 2	**2**	0	19	1	0	100%	Strong Alignment
	RI.3.5	DOK 1, 2	**2**	4	6	0	0	60%	Strong Alignment
	RI.3.6	DOK 2, 3	**2**	0	10	2	0	100%	Strong Alignment
	RI.3.7	DOK 1, 2	**2**	0	3	1	0	100%	Strong Alignment
	RI.3.8	DOK 2, 3	**2**	0	4	1	0	100%	Strong Alignment
	RI.3.9	DOK 2, 3	**3**	0	3	3	0	50%	Strong Alignment
4	RI.4.1	DOK 1, 2	**2**	5	11	2	0	72%	Strong Alignment
	RI.4.2	DOK 2, 3	**2**	0	20	0	0	100%	Strong Alignment
	RI.4.3	DOK 1, 3	**2**	13	10	0	0	43%	Moderate Alignment
	RI.4.4	DOK 2, 2	**2**	0	20	0	0	100%	Strong Alignment
	RI.4.5	DOK 1, 3	**2**	0	19	3	0	100%	Strong Alignment
	RI.4.6	DOK 2, 3	**3**	0	1	1	0	50%	Strong Alignment
	RI.4.7	DOK 1, 3	**2**	1	4	0	0	80%	Strong Alignment
	RI.4.8	DOK 2, 3	**2**	0	0	4	0	100%	Strong Alignment
	RI.4.9	DOK 2, 4	**3**	0	1	2	0	67%	Strong Alignment
5	RI.5.1	DOK 1, 3	**2**	4	15	0	0	79%	Strong Alignment
	RI.5.2	DOK 2, 3	**2**	0	17	6	0	100%	Strong Alignment
	RI.5.3	DOK 1, 3	**2**	4	12	0	0	75%	Strong Alignment
	RI.5.4	DOK 2, 2	**2**	1	19	0	0	95%	Strong Alignment
	RI.5.5	DOK 2, 4	**3**	0	12	4	0	25%	No Alignment
	RI.5.6	DOK 2, 4	**3**	0	10	6	0	38%	Weak Alignment
	RI.5.7	DOK 2, 4	**2**	0	4	0	0	100%	Strong Alignment
	RI.5.8	DOK 2, 3	**2**	1	2	1	0	75%	Strong Alignment
	RI.5.9	DOK 2, 4	**3**	0	0	2	0	100%	Strong Alignment
6	RI.6.1	DOK 1, 3	**2**	6	14	2	0	73%	Strong Alignment
	RI.6.2	DOK 2, 3	**2**	0	16	6	0	100%	Strong Alignment
	RI.6.3	DOK 2, 3	**3**	2	14	3	0	16%	No Alignment
	RI.6.4	DOK 2, 3	**2**	0	24	0	0	100%	Strong Alignment
	RI.6.5	DOK 2, 3	**3**	0	10	9	0	47%	Moderate Alignment
	RI.6.6	DOK 2, 3	**3**	0	12	7	0	37%	Weak Alignment

Grade Level	Strand	DOK Range	Target DOK	DOK 1	DOK 2	DOK 3	DOK 4	% At or Above DOK	Alignment Evaluation
	RI.6.7	DOK 2, 4	**3**	0	3	2	0	40%	Moderate Alignment
	RI.6.8	DOK 2, 3	**3**	0	2	3	0	60%	Strong Alignment
	RI.6.9	DOK 2, 4	**3**	0	1	2	0	67%	Strong Alignment
7	RI.7.1	DOK 1, 3	**2**	10	13	5	0	64%	Strong Alignment
	RI.7.2	DOK 2, 3	**3**	0	14	11	0	44%	Moderate Alignment
	RI.7.3	DOK 2, 3	**3**	6	6	2	0	14%	No Alignment
	RI.7.4	DOK 2, 3	**2**	3	18	0	0	86%	Strong Alignment
	RI.7.5	DOK 2, 3	**3**	3	15	4	0	18%	No Alignment
	RI.7.6	DOK 2, 3	**3**	2	10	9	0	43%	Moderate Alignment
	RI.7.7	DOK 2, 4	**3**	1	2	0	0	0%	No Alignment
	RI.7.8	DOK 2, 3	**3**	2	1	2	0	40%	Moderate Alignment
	RI.7.9	DOK 3, 4	**4**	0	1	1	0	0%	No Alignment
8	RI.8.1	DOK 1, 3	**2**	5	27	3	0	86%	Strong Alignment
	RI.8.2	DOK 2, 3	**3**	0	15	8	0	35%	Weak Alignment
	RI.8.3	DOK 2, 3	**3**	13	4	1	0	6%	No Alignment
	RI.8.4	DOK 2, 3	**2**	0	19	1	0	100%	Strong Alignment
	RI.8.5	DOK 2, 3	**3**	2	15	2	0	11%	No Alignment
	RI.8.6	DOK 2, 3	**3**	1	11	4	0	25%	No Alignment
	RI.8.7	DOK 2, 3	**3**	0	0	0	0	0%	No Alignment
	RI.8.8	DOK 2, 3	**3**	1	0	4	0	80%	Strong Alignment
	RI.8.9	DOK 3, 4	**4**	0	1	1	0	0%	No Alignment
	Reading - Literature								
3	RL.3.1	DOK 1, 2	**2**	10	6	0	0	38%	Weak Alignment
	RL.3.2	DOK 2, 3	**3**	0	2	16	0	89%	Strong Alignment
	RL.3.3	DOK 1, 3	**2**	10	24	2	0	72%	Strong Alignment
	RL.3.4	DOK 2, 2	**2**	1	20	0	0	95%	Strong Alignment
	RL.3.5	DOK 1, 2	**2**	1	13	2	0	94%	Strong Alignment
	RL.3.6	DOK 1, 2	**2**	4	9	0	0	69%	Strong Alignment
	RL.3.7	DOK 1, 3	**2**	1	5	0	0	83%	Strong Alignment
	RL.3.9	DOK 2, 3	**3**	0	2	1	0	33%	Weak Alignment
4	RL.4.1	DOK 1, 2	**2**	8	13	0	0	62%	Strong Alignment
	RL.4.2	DOK 2, 3	**2**	0	6	12	0	100%	Strong Alignment
	RL.4.3	DOK 1, 3	**2**	4	19	2	0	84%	Strong Alignment
	RL.4.4	DOK 2, 2	**2**	0	18	0	0	100%	Strong Alignment
	RL.4.5	DOK 1, 3	**2**	1	3	0	0	75%	Strong Alignment

Grade Level	Strand	DOK Range	Target DOK	DOK 1	DOK 2	DOK 3	DOK 4	% At or Above DOK	Alignment Evaluation
	RL.4.6	DOK 2, 3	**2**	4	5	0	0	56%	Strong Alignment
	RL.4.7	DOK 1, 3	**2**	0	4	1	0	100%	Strong Alignment
	RL.4.9	DOK 2, 4	**3**	0	1	3	0	75%	Strong Alignment
5	RL.5.1	DOK 1, 3	**2**	5	17	0	0	77%	Strong Alignment
	RL.5.2	DOK 2, 3	**2**	1	10	11	0	95%	Strong Alignment
	RL.5.3	DOK 2, 3	**2**	1	14	3	0	94%	Strong Alignment
	RL.5.4	DOK 2, 3	**2**	1	22	0	0	96%	Strong Alignment
	RL.5.5	DOK 2, 3	**2**	0	11	7	0	100%	Strong Alignment
	RL.5.6	DOK 2, 3	**3**	1	9	8	0	44%	Moderate Alignment
	RL.5.7	DOK 2, 3	**3**	0	7	0	0	0%	No Alignment
	RL.5.9	DOK 2, 4	**3**	0	3	1	0	25%	No Alignment
6	RL.6.1	DOK 1, 3	**2**	4	16	0	0	80%	Strong Alignment
	RL.6.2	DOK 2, 3	**2**	0	8	12	0	100%	Strong Alignment
	RL.6.3	DOK 2, 3	**2**	1	14	1	0	94%	Strong Alignment
	RL.6.4	DOK 2, 3	**2**	0	19	1	0	100%	Strong Alignment
	RL.6.5	DOK 2, 3	**3**	0	7	7	0	50%	Strong Alignment
	RL.6.6	DOK 2, 3	**3**	0	13	1	0	7%	No Alignment
	RL.6.7	DOK 2, 4	**3**	0	3	1	0	25%	No Alignment
	RL.6.9	DOK 2, 4	**3**	0	0	2	0	100%	Strong Alignment
7	RL.7.1	DOK 1, 3	**2**	4	12	0	0	75%	Strong Alignment
	RL.7.2	DOK 2, 3	**3**	0	11	9	0	45%	Moderate Alignment
	RL.7.3	DOK 2, 3	**2**	3	6	5	0	79%	Strong Alignment
	RL.7.4	DOK 2, 3	**2**	0	14	1	0	100%	Strong Alignment
	RL.7.5	DOK 2, 3	**3**	2	6	6	0	43%	Moderate Alignment
	RL.7.6	DOK 2, 3	**3**	1	7	7	0	47%	Moderate Alignment
	RL.7.7	DOK 2, 4	**3**	1	0	2	0	67%	Strong Alignment
	RL.7.9	DOK 2, 4	**4**	0	1	3	0	0%	No Alignment
8	RL.8.1	DOK 1, 3	**2**	8	9	5	0	64%	Strong Alignment
	RL.8.2	DOK 2, 3	**3**	0	12	8	0	40%	Moderate Alignment
	RL.8.3	DOK 2, 3	**3**	2	19	4	0	16%	No Alignment
	RL.8.4	DOK 2, 3	**2**	1	11	5	0	94%	Strong Alignment
	RL.8.5	DOK 2, 4	**3**	0	1	4	0	80%	Strong Alignment
	RL.8.6	DOK 2, 3	**3**	1	6	8	0	53%	Strong Alignment
	RL.8.7	DOK 2, 4	**3**	3	1	0	0	0%	No Alignment
	RL.8.9	DOK 2, 4	**3**	0	0	2	0	100%	Strong Alignment

Balance of Knowledge. Balance of knowledge is a measure of how items are distributed across the strands within a standard. Table 20 shows this measure for reading. The items appear to be well distributed within the standard across the strands for all grades.

Table 20. Evaluation of Balance of Knowledge – Reading

Grade Level	Standard	Balance of Knowledge	Alignment Evaluation
Reading - Informational			
3	RI.3	0.75	Strong Alignment
4	RI.4	0.68	Moderate Alignment
5	RI.5	0.75	Strong Alignment
6	RI.6	0.76	Strong Alignment
7	RI.7	0.73	Strong Alignment
8	RI.8	0.72	Strong Alignment
Reading - Literature			
3	RL.3	0.79	Strong Alignment
4	RL.4	0.71	Strong Alignment
5	RL.5	0.83	Strong Alignment
6	RL.6	0.80	Strong Alignment
7	RL.7	0.82	Strong Alignment
8	RL.8	0.73	Strong Alignment

Range of Knowledge. Table 21 shows the ROK for the reading standards. Here, there is strong alignment across all standards.

Table 21. Evaluation of Range of Knowledge – Reading

Grade Level	Standard	Standards Count	Count of Strands Measured By > 1 Item	Range of Knowledge	Alignment Evaluation
Reading - Informational					
3	RI.3	9	9	100.0%	Strong Alignment
4	RI.4	9	9	100.0%	Strong Alignment
5	RI.5	9	9	100.0%	Strong Alignment
6	RI.6	9	9	100.0%	Strong Alignment
7	RI.7	9	9	100.0%	Strong Alignment
8	RI.8	9	8	88.9%	Strong Alignment
Reading - Literature					
3	RL.3	8	8	100.0%	Strong Alignment
4	RL.4	8	8	100.0%	Strong Alignment
5	RL.5	8	8	100.0%	Strong Alignment
6	RL.6	8	8	100.0%	Strong Alignment

Grade Level	Standard	Standards Count	Count of Strands Measured By > 1 Item	Range of Knowledge	Alignment Evaluation
7	RL.7	8	8	100.0%	Strong Alignment
8	RL.8	8	8	100.0%	Strong Alignment

Section 5. Discussion

The study asked,

- *To what extent do the item pools represent the full range of the assessable CCSS?*
- *To what extent do the item pools measure student knowledge at the same level of complexity expected by the CCSS?*

Adequate rater reliability was necessary in order to evaluate the alignment criteria with consistency. To obtain this, raters were trained and qualified prior to starting the rating on their own. The study found that rater reliability was generally strong with agreement between 70% and 100% (Tables 5, 6, 14, and 15).

In general, results indicated that the Transcend item bank is well aligned to the Common Core State Standards. The mathematics item pool tended to show moderate to strong alignment in terms in all categories at the standard level for mathematics (Table 22). For reading, the Transcend item bank tended to show strong alignment in terms of categorical concurrence, cognitive complexity, balance of knowledge, and range of knowledge at the standard level (Table 23).

Table 22. Overall Evaluation of Alignment – Mathematics

Grade	Standard	Categorical Concurrence	Depth of Knowledge	Balance of Knowledge	Range of Knowledge
3	3.G	Strong Alignment	No Alignment	Strong Alignment	Strong Alignment
	3.MD	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	3.NBT	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	3.NF	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	3.OA	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
4	4.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.MD	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.NBT	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.NF	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	4.OA	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
5	5.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment

Grade	Standard	Categorical Concurrence	Depth of Knowledge	Balance of Knowledge	Range of Knowledge
	5.MD	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	5.NBT	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	5.NF	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	5.OA	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
6	6.EE	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.NS	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.RP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	6.SP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
7	7.EE	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.NS	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.RP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	7.SP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
8	8.EE	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.F	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.G	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.NS	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
	8.SP	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment

Table 23. Overall Evaluation of Alignment – Reading

Grade	Standard	Categorical Concurrence	Depth of Knowledge	Balance of Knowledge	Range of Knowledge
Reading - Information					
3	RI.3	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
4	RI.4	Strong Alignment	Strong Alignment	Moderate Alignment	Strong Alignment
5	RI.5	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
6	RI.6	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
7	RI.7	Strong Alignment	Moderate Alignment	Strong Alignment	Strong Alignment
8	RI.8	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
Reading - Literature					
3	RL.3	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
4	RL.4	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
5	RL.5	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
6	RL.6	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
7	RL.7	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment
8	RL.8	Strong Alignment	Strong Alignment	Strong Alignment	Strong Alignment

Based on evidence from study results, the Transcend item pools covered the full range of assessable CCSS content standards. The results of this study provide strong evidence that the item pools measure student knowledge at the same level of complexity expected by the CCSS for mathematics (Table 22) and for reading (Table 23).

Evaluating Validity Evidence

Evidence from this alignment study supports the validity argument by addressing relevant portions of the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014). Specifically, the study provides evidence to support Standard 1.11 that states,

> When rationale for test score interpretation for a given use rests in part on the appropriateness of test content, the procedures followed in specifying and generating test content should be described and justified with reference to… the construct the test is intended to measure or the domain it is intended to represent. If the definition of the content sampled incorporates criteria such as importance, frequency, or criticality, these criteria should also be clearly explained and justified.

Evidence for Standard 1.1 should therefore justify adequate representation of the construct, specifically between the Transcend item pools and the CCSS in terms of content, balance of content, and cognitive complexity and address the depth and breadth of the content standards. Results support the argument that the Transcend item pools address these requirements for both mathematics and reading.

Procedurally, the study was designed and implemented to include relevant experts external to the test program itself. Standard 4.6 states,

> When appropriate to documenting the validity of test score interpretations for intended uses, relevant experts external to testing program should review the test specifications to evaluate their appropriateness for intended uses of the test scores… The purpose of the review, the process by which the review is conducted, and the results of the review should be documented. The qualifications, relevant experiences, and demographic characteristics of the expert judges should also be documented.

The study purpose, process, and results as well as the qualifications, experiences, and demographic characteristics of all expert reviewers are captured in this technical report (see Section 3).

Finally, Standard 12.4 states,

> When a test is used as an indicator of achievement in an instructional domain or with respect to specified content standards, evidence of the extent to which the test samples the range of knowledge and elicits the processes reflected in the target domain should be provided. Both the tested and the target domains should be described in sufficient detail for their relationship to be evaluated. The analyses should make explicit those aspects of the target domain that the test represents, as well as those aspects that the test fails to represent.

The study provides evidence to support the claim that the Transcend item pools represent the CCSS.

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Appendix A. DOK to Standard Assignment

Table A. 1 DOK to Mathematics Standard

			Final	
Grade	Strand	Lowest DOK	Highest DOK	Target DOK
3	3.G.A	1	3	2
3	3.G.A.1	1	3	2
3	3.G.A.2	1	2	2
3	3.MD.A	1	3	2
3	3.MD.A.1	1	3	2
3	3.MD.A.2	1	3	2
3	3.MD.B	2	3	2
3	3.MD.B.3	2	3	2
3	3.MD.B.4	2	3	2
3	3.MD.C	1	3	2
3	3.MD.C.5	1	2	2
3	3.MD.C.5.a	1	2	1
3	3.MD.C.5.b	1	2	1
3	3.MD.C.6	1	2	2
3	3.MD.C.7	1	2	2
3	3.MD.C.7a	1	3	2
3	3.MD.C.7b	1	3	2
3	3.MD.C.7c	2	3	2
3	3.MD.C.7d	2	3	2
3	3.MD.D	1	3	2
3	3.MD.D.8	2	3	2
3	3.NBT.A	1	2	1
3	3.NBT.A.1	1	2	1
3	3.NBT.A.2	1	2	1
3	3.NBT.A.3	1	2	1
3	3.NF.A	1	3	2
3	3.NF.A.1	1	2	1
3	3.NF.A.2	1	2	2
3	3.NF.A.2a	1	2	2
3	3.NF.A.2b	1	2	2
3	3.NF.A.3	2	3	2
3	3.NF.A.3a	1	2	2
3	3.NF.A.3b	1	3	2

Grade	Strand	Lowest DOK	Final Highest DOK	Target DOK
3	3.NF.A.3c	1	2	1
3	3.NF.A.3d	1	3	2
3	3.OA.A	1	3	2
3	3.OA.A.1	1	3	2
3	3.OA.A.2	1	3	2
3	3.OA.A.3	2	3	2
3	3.OA.A.4	1	2	1
2	3.OA.B	1	2	1
3	3.OA.B.5	1	2	1
3	3.OA.B.6	1	2	1
3	3.OA.C	1	2	1
3	3.OA.C.7	1	2	1
3	3.OA.D	2	3	2
3	3.OA.D.8	2	3	2
3	3.OA.D.9	2	3	2
4	4.G.A	1	2	2
4	4.G.A.1	1	2	1
4	4.G.A.2	1	2	2
4	4.G.A.3	1	2	2
4	4.MD.A	1	3	2
4	4.MD.A.1	1	2	2
4	4.MD.A.2	2	3	2
4	4.MD.A.3	1	3	2
4	4.MD.B	1	3	2
4	4.MD.B.4	2	3	2
4	4.MD.C	1	3	2
4	4.MD.C.5	1	2	1
4	4.MD.C.5.a	1	2	1
4	4.MD.C.5.b	1	2	1
4	4.MD.C.6	1	2	2
4	4.MD.C.7	2	3	2
4	4.NBT.A	1	2	2
4	4.NBT.A.1	1	2	1
4	4.NBT.A.2	1	2	2
4	4.NBT.A.3	1	2	1
4	4.NBT.B	1	3	2
4	4.NBT.B.4	1	2	1

Grade	Strand	Final Lowest DOK	Final Highest DOK	Final Target DOK
4	4.NBT.B.5	1	3	2
4	4.NBT.B.6	1	3	2
4	4.NF.A	1	3	2
4	4.NF.A.1	2	3	2
4	4.NF.A.2	1	3	2
4	4.NF.B	1	3	2
4	4.NF.B.3	1	3	2
4	4.NF.B.3a	1	2	1
4	4.NF.B.3b	1	2	2
4	4.NF.B.3c	1	2	2
4	4.NF.B.3d	2	3	2
4	4.NF.B.4	1	3	2
4	4.NF.B.4a	1	2	1
4	4.NF.B.4b	1	2	1
4	4.NF.B.4c	2	3	2
4	4.NF.C	1	2	2
4	4.NF.C.5	1	2	1
4	4.NF.C.6	1	2	1
4	4.NF.C.7	1	2	2
4	4.OA.A	1	3	2
4	4.OA.A.1	1	3	2
4	4.OA.A.2	2	3	2
4	4.OA.A.3	2	3	2
4	4.OA.B	1	2	2
4	4.OA.B.4	1	2	2
4	4.OA.C	1	3	2
4	4.OA.C.5	1	3	2
5	5.G.A	1	3	2
5	5.G.A.1	1	2	1
5	5.G.A.2	1	3	2
5	5.G.B	1	2	2
5	5.G.B.3	1	2	2
5	5.G.B.4	1	2	2
5	5.MD.A	1	3	2
5	5.MD.A.1	1	3	2
5	5.MD.B	2	3	2
5	5.MD.B.2	2	3	2

Grade	Strand	Lowest DOK	Final Highest DOK	Final Target DOK
5	5.MD.C	1	3	2
5	5.MD.C.3	1	2	1
5	5.MD.C.3.a	1	2	1
5	5.MD.C.3.b	1	2	1
5	5.MD.C.4	1	2	2
5	5.MD.C.5	1	3	2
5	5.MD.C.5.a	1	3	2
5	5.MD.C.5.b	1	3	2
5	5.MD.C.5.c	2	3	2
5	5.NBT.A	1	3	2
5	5.NBT.A.1	1	2	1
5	5.NBT.A.2	1	3	2
5	5.NBT.A.3	1	2	2
5	5.NBT.A.3a	1	2	1
5	5.NBT.A.3b	1	2	2
5	5.NBT.A.4	1	2	1
5	5.NBT.B	1	3	2
5	5.NBT.B.5	1	2	1
5	5.NBT.B.6	1	3	2
5	5.NBT.B.7	1	3	2
5	5.NF.A	1	3	2
5	5.NF.A.1	1	2	2
5	5.NF.A.2	2	3	2
5	5.NF.B	1	3	2
5	5.NF.B.3	1	3	2
5	5.NF.B.4	1	3	2
5	5.NF.B.4a	2	3	2
5	5.NF.B.4b	1	3	2
5	5.NF.B.5a	1	2	2
5	5.NF.B.5b	2	3	2
5	5.NF.B.6	2	3	2
5	5.NF.B.7	1	3	2
5	5.NF.B.7a	1	3	2
5	5.NF.B.7b	1	3	2
5	5.NF.B.7c	2	3	2
5	5.OA.A	1	3	2
5	5.OA.A.1	1	2	2

Grade	Strand	Lowest DOK	Final Highest DOK	Final Target DOK
5	5.OA.A.2	1	3	2
5	5.OA.B	1	3	2
5	5.OA.B.3	1	3	2
6	6.EE.A	1	2	1
6	6.EE.A.1	1	2	1
6	6.EE.A.2	1	2	1
6	6.EE.A.2.a	1	2	1
6	6.EE.A.2.b	1	2	1
6	6.EE.A.2.c	1	2	1
6	6.EE.A.3	1	2	1
6	6.EE.A.4	1	2	1
6	6.EE.B	1	3	2
6	6.EE.B.5	1	2	1
6	6.EE.B.6	1	3	2
6	6.EE.B.7	2	3	2
6	6.EE.B.8	2	3	2
6	6.EE.C	2	3	2
6	6.EE.C.9	2	3	2
6	6.G.A	1	3	2
6	6.G.A.1	1	3	2
6	6.G.A.2	1	3	2
6	6.G.A.3	1	3	2
6	6.G.A.4	2	3	2
6	6.NS.A	1	3	2
6	6.NS.A.1	1	3	2
6	6.NS.B	1	2	2
6	6.NS.B.2	1	2	1
6	6.NS.B.3	1	2	1
6	6.NS.B.4	1	2	2
6	6.NS.C	1	3	2
6	6.NS.C.5	1	2	2
6	6.NS.C.6	1	2	2
6	6.NS.C.6.a	1	2	1
6	6.NS.C.6.b	1	2	1
6	6.NS.C.6.c	1	2	1
6	6.NS.C.7	1	3	2
6	6.NS.C.7.a	1	2	1

Grade	Strand	Lowest DOK	Final Highest DOK	Final Target DOK
6	6.NS.C.7.b	1	3	2
6	6.NS.C.7.c	1	3	2
6	6.NS.C.7.d	1	2	2
6	6.NS.C.8	1	3	2
6	6.RP.A	1	3	2
6	6.RP.A.1	1	2	2
6	6.RP.A.2	1	2	2
6	6.RP.A.3	2	3	2
6	6.RP.A.3.a	1	2	2
6	6.RP.A.3.b	2	3	2
6	6.RP.A.3.c	1	3	2
6	6.RP.A.3.d	1	3	2
6	6.SP.A	1	3	2
6	6.SP.A.1	2	3	2
6	6.SP.A.2	2	3	2
6	6.SP.A.3	1	3	2
6	6.SP.B	1	3	2
6	6.SP.B.4	2	3	2
6	6.SP.B.5	1	3	2
6	6.SP.B.5.a	1	2	1
6	6.SP.B.5.b	1	2	2
6	6.SP.B.5c	1	3	2
6	6.SP.B.5d	2	3	2
7	7.EE.A	1	2	2
7	7.EE.A.1	1	2	1
7	7.EE.A.2	1	2	2
7	7.EE.B	2	3	2
7	7.EE.B.3	2	3	2
7	7.EE.B.4	2	3	2
7	7.EE.B.4.a	2	3	2
7	7.EE.B.4.b	2	3	2
7	7.G.A	1	3	2
7	7.G.A.1	2	3	2
7	7.G.A.2	1	3	2
7	7.G.A.3	2	3	2
7	7.G.B	1	3	2
7	7.G.B.4	1	3	2

Grade	Strand	Lowest DOK	Final Highest DOK	Final Target DOK
7	7.G.B.5	2	3	2
7	7.G.B.6	2	3	2
7	7.NS.A	1	3	2
7	7.NS.A.1	1	2	1
7	7.NS.A.1.a	1	2	2
7	7.NS.A.1.b	1	3	2
7	7.NS.A.1.c	1	3	2
7	7.NS.A.1.d	1	2	1
7	7.NS.A.2	1	3	2
7	7.NS.A.2.a	1	3	2
7	7.NS.A.2.b	1	3	2
7	7.NS.A.2.c	1	2	1
7	7.NS.A.2.d	1	2	1
7	7.NS.A.3	2	3	2
7	7.RP.A	1	3	2
7	7.RP.A.1	2	3	2
7	7.RP.A.2	1	3	2
7	7.RP.A.2a	1	2	2
7	7.RP.A.2b	1	2	2
7	7.RP.A.2c	2	3	2
7	7.RP.A.2d	2	3	2
7	7.RP.A.3	2	3	2
7	7.SP.A	1	3	2
7	7.SP.A.1	1	2	2
7	7.SP.A.2	2	3	2
7	7.SP.B	2	3	2
7	7.SP.B.3	2	3	2
7	7.SP.B.4	2	3	2
7	7.SP.C	1	3	2
7	7.SP.C.5	1	2	2
7	7.SP.C.6	2	3	2
7	7.SP.C.7	2	3	2
7	7.SP.C.7.a	2	3	2
7	7.SP.C.7.b	2	3	2
7	7.SP.C.8	2	3	2
7	7.SP.C.8.a	2	3	2
7	7.SP.C.8.b	2	3	2

Grade	Strand	Lowest DOK	Highest DOK	Final Target DOK
7	7.SP.C.8.c	2	3	2
8	8.EE.A	1	2	2
8	8.EE.A.1	1	2	1
8	8.EE.A.2	1	2	1
8	8.EE.A.3	1	2	2
8	8.EE.A.4	1	3	2
8	8.EE.B	2	3	2
8	8.EE.B.5	2	3	2
8	8.EE.B.6	2	3	2
8	8.EE.C	1	3	2
8	8.EE.C.7	1	2	2
8	8.EE.C.7.a	1	3	2
8	8.EE.C.7.b	1	2	2
8	8.EE.C.8	1	3	2
8	8.EE.C.8.a	1	2	2
8	8.EE.C.8.b	1	3	2
8	8.EE.C.8c	1	3	2
8	8.F.A	1	3	2
8	8.F.A.1	1	2	2
8	8.F.A.2	2	3	2
8	8.F.A.3	1	2	2
8	8.F.B	2	3	2
8	8.F.B.4	2	3	2
8	8.F.B.5	2	3	2
8	8.G.A	1	3	2
8	8.G.A.1	1	2	2
8	8.G.A.1.A	1	2	2
8	8.G.A.1.B	1	2	2
8	8.G.A.1.C	1	2	2
8	8.G.A.2	1	3	2
8	8.G.A.3	2	3	2
8	8.G.A.4	1	3	2
8	8.G.A.5	2	3	2
8	8.G.B	1	3	2
8	8.G.B.6	2	3	3
8	8.G.B.7	1	3	2
8	8.G.B.8	2	3	2

Grade	Strand	Final Lowest DOK	Final Highest DOK	Final Target DOK
8	8.G.C	1	3	2
8	8.G.C.9	1	3	2
8	8.NS.A	1	2	2
8	8.NS.A.1	1	2	2
8	8.NS.A.2	1	2	2
8	8.SP.A	1	3	2
8	8.SP.A.1	2	3	2
8	8.SP.A.2	1	3	2
8	8.SP.A.3	2	3	2
8	8.SP.A.4	1	3	2

Table A. 2 DOK to Reading Standard

Grade	Strand	Lowest DOK	Final Highest DOK	Final Target DOK
3	RI.3.1	1	2	2
3	RI.3.10	1	3	2
3	RI.3.2	2	3	2
3	RI.3.3	1	3	2
3	RI.3.4	2	2	2
3	RI.3.5	1	2	2
3	RI.3.6	2	3	2
3	RI.3.7	1	2	2
3	RI.3.8	2	3	2
3	RI.3.9	2	3	3
3	RL.3.1	1	2	2
3	RL.3.10	1	3	2
3	RL.3.2	2	3	3
3	RL.3.3	1	3	2
3	RL.3.4	2	2	2
3	RL.3.5	1	2	2
3	RL.3.6	1	2	2
3	RL.3.7	1	3	2
3	RL.3.9	2	3	3
4	RI.4.1	1	2	2
4	RI.4.10	1	3	2
4	RI.4.2	2	3	2
4	RI.4.3	1	3	2
4	RI.4.4	2	2	2
4	RI.4.5	1	3	2
4	RI.4.6	2	3	3
4	RI.4.7	1	3	2
4	RI.4.8	2	3	2
4	RI.4.9	2	4	3
4	RL.4.1	1	2	2
4	RL.4.10	1	3	2
4	RL.4.2	2	3	2
4	RL.4.3	1	3	2
4	RL.4.4	2	2	2
4	RL.4.5	1	3	2
4	RL.4.6	2	3	2
4	RL.4.7	1	3	2
4	RL.4.9	2	4	3
5	RI.5.1	1	3	2
5	RI.5.2	2	3	2
5	RI.5.3	1	3	2
5	RI.5.4	2	2	2
5	RI.5.5	2	4	3
5	RI.5.6	2	4	3

Grade	Strand	Lowest DOK	Final Highest DOK	Target DOK
5	RI.5.7	2	4	2
5	RI.5.8	2	3	2
5	RI.5.9	2	4	3
5	RI.5.10	1	3	2
5	RL.5.1	1	3	2
5	RL.5.2	2	3	2
5	RL.5.3	2	3	2
5	RL.5.4	2	3	2
5	RL.5.5	2	3	2
5	RL.5.6	2	3	3
5	RL.5.7	2	3	3
5	RL.5.9	2	4	3
5	RL.5.10	1	3	2
6	RI.6.1	1	3	2
6	RI.6.2	2	3	2
6	RI.6.3	2	3	3
6	RI.6.4	2	3	2
6	RI.6.5	2	3	3
6	RI.6.6	2	3	3
6	RI.6.7	2	4	3
6	RI.6.8	2	3	3
6	RI.6.9	2	4	3
6	RI.6.10	1	3	3
6	RL.6.1	1	3	2
6	RL.6.2	2	3	2
6	RL.6.3	2	3	2
6	RL.6.4	2	3	2
6	RL.6.5	2	3	3
6	RL.6.6	2	3	3
6	RL.6.7	2	4	3
6	RL.6.9	2	4	3
6	RL.6.10	1	3	3
7	RI.7.1	1	3	2
7	RI.7.2	2	3	3
7	RI.7.3	2	3	3
7	RI.7.4	2	3	2
7	RI.7.5	2	3	3
7	RI.7.6	2	3	3

Grade	Strand	Lowest DOK	Final Highest DOK	Target DOK
7	RI.7.7	2	4	3
7	RI.7.8	2	3	3
7	RI.7.9	3	4	4
7	RI.7.10	1	3	3
7	RL.7.1	1	3	2
7	RL.7.2	2	3	3
7	RL.7.3	2	3	2
7	RL.7.4	2	3	2
7	RL.7.5	2	3	3
7	RL.7.6	2	3	3
7	RL.7.7	2	4	3
7	RL.7.9	2	4	4
7	RL.7.10	1	3	3
8	RI.8.1	1	3	2
8	RI.8.2	2	3	3
8	RI.8.3	2	3	3
8	RI.8.4	2	3	2
8	RI.8.5	2	3	3
8	RI.8.6	2	3	3
8	RI.8.7	2	3	3
8	RI.8.8	2	3	3
8	RI.8.9	3	4	4
8	RI.8.10	1	3	3
8	RL.8.1	1	3	2
8	RL.8.2	2	3	3
8	RL.8.3	2	3	3
8	RL.8.4	2	3	2
8	RL.8.5	2	4	3
8	RL.8.6	2	3	3
8	RL.8.7	2	4	3
8	RL.8.9	2	4	3
8	RL.8.10	1	3	3