

Alternate Assessment Alignment Study
Report to the State Department of Public Instruction

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EXECUTIVE SUMMARY

This study reports findings from an investigation of the alignment of State's 2007 Alternate Assessments (AAs) in English language arts (ELA), Mathematics, and Science to academic content standards. State assesses student performance in English language arts (ELA) in grades 3-8 and 10 with writing assessed in grades 4, 7, and 10. *English I* competency goals served as the content basis for the 10th grade ELA alternate assessment. Math is assessed in grades 3-8 and 10 with *Algebra I* competency goals serving as the content basis for the 10th grade Math alternate assessment. Science is assessed in grade 5, 8, and 10 with Biology serving as the content basis for the 10th grade Science alternate assessment.

The criteria used in this alignment study are being evaluated as part of the UNC Charlotte partnership in the *National Alternate Assessment Center* (NAAC). This report includes the alignment among the grade level standards, extended standards, and AA tasks/items. The alignment of professional development and teacher instruction to grade level standards will be added as an addendum to this report in February 2007.

ELA Alignment Results

ELA extended standards. All of the extended standards (i.e., grade level extensions developed by the state) were rated academic and were referenced to grade-level content standards (grade level competency goals). ELA content experts rated between 74% (3rd and 5th grades) to 93% (8th grade) of the extended standards as having either a *far* or *near link* to the grade-level content standards. The same trend was found for the performance centrality; between 58% (4th grade) to 87% (8th grade) of the extended standards had *some* or *all* of the performance level as expressed in the grade-level content standards. The depth of knowledge level found in the extended standards was similar to the depth of knowledge found in the grade-level content standard. All grades had extended standards that were accessible to students at all levels of symbol use. The indicators/descriptors provided for each grade level by symbolic level were problematic. The content experts rated most of the extended standards as having *none* or *some* of the indicators/descriptors aligned.

ELA AA items. Most of the ELA AA items were rated academic, ranging from 73% (5th grade) to 97% (6th grade) of the items. All the ELA AA tasks/items were referenced to grade level standards. Most of the AA tasks/items were rated as having a *near* or *far* link to the extended standards, ranging from 61% (6th grade) to 100% (5th grade). A similar percentage of the AA items had *some* or *all* of the performance level found in the grade-level standards, ranging from 61% (6th grade) to 100% (5th grade). In grades 3 to 5, there were no items that aligned to competency goals 4 and 5, which matched the test blueprint. The depth of knowledge for the AA items tended to be rated between the *memorize/recall* level to the *comprehension* level and fall below the depth of knowledge found in the content standards. There were ELA AA items that were accessible to students at all symbolic use levels.

ELA recommendations. It is recommended that ELA content experts review the extended standards, indicators/descriptors and the AA items that were rated as having *no link* to determine how to strengthen the link to the grade level content standards. In the elementary grades, the intended emphasis found in the extended standards did not match the emphasis found in the ELA

items but did match the test blueprint. The state should consider developing more ELA items at a higher depth of knowledge for grades 3 to 6; that is, more items are needed at the *application* and *analysis/synthesis/evaluation* levels.

Math Alignment Results

Math extended standards. All of the Math extended standards (grade level extensions developed by the state) were rated academic and were referenced to the grade-level content standards with at least one extended standard for every grade level content standard (grade level competency goal). Across all grades most of the extended standards were rated at the *performance to analysis/synthesis/evaluation* levels, which are the highest levels for depth of knowledge. Almost all extended standards were rated as having a *far* or *near* link to the grade level standards. There were extended standards that were accessible to students at all symbolic use levels.

Math AA items. Most of the Math AA tasks/items were rated academic, ranging from 82% (6th grade) to 96% (7th grade) of the items. All Math AA tasks/items were referenced to the grade level standards. Between 89% (6th grade) to 98% (3rd grade) of the items were rated as having a *far* or *near link* to the content standard. Between 85% (5th grade) to 96% (3rd grade) of the items were rated as having *some* or *all* of the performance level found in the content standards. While all of the Math standards (i.e., state competency goals) had at least one item, the categorical concurrence fell below 100% for all grades. The depth of knowledge levels of the AA items were below the depth of knowledge found in the grade level content standards. The emphasis found in the extended standards was similar to those found in the AA for all grades. There were Math AA tasks/items that were accessible to students at all symbolic use levels.

Math recommendations. It is recommended that Math content experts review the extended standards and the AA items that were rated as having *no link* to determine how to strengthen the link to the grade level content standards. Some of grade level standards (i.e., state competency goals) did not have extended standards and a rationale for the exclusion of these standards should be provided.

Science Alignment Results

Science extended standards. All the Science extended standards were rated as academic and were referenced to grade level standards, with all standards rated as having a *near* or *far link* to the grade level standards. The extended standards were rated at a depth of knowledge of *performance to analysis/synthesis/evaluation* levels. The indicators/descriptors provided for each grade level by symbolic level were problematic. The content experts rated most of the extended standards as having *none* or *some* of the indicators/descriptors aligned.

Science AA items. Almost all the 5th and 10th grade AA tasks/items were rated as academic. In contrast, only 71% of the 8th grade Science AA items were rated academic. All the Science AA items were referenced to the grade level content standards. Between 48% (5th grade) and 88% (10th grade) of the items were rated as having a *far* or *near content link* to the grade level standards. A similar pattern was found for the AA item performance centrality; between

36% (5th grade) to 97% (10th grade) of the items were rated as having *some* or *all* of the performance level found in the grade level standards. The depth of knowledge level for most of the AA items ranged from *memorize/recall* to *comprehension*, which was below the depth of knowledge found in the grade level standards. There were Science AA tasks/items that were accessible to students at all symbolic use levels.

Science recommendations. It is recommended that science content experts review the extended standards, indicators/descriptors and the AA items that were rated as having *no link* to determine how to strengthen the link to the grade level content standards, especially the 5th and 8th grade AA items.

Overall Analysis of Alignment

There is evidence supporting alignment of ELA, Mathematics, and Science alternate assessment items to grade level content standards, however it is strongly recommended that the state continue to have content experts review AAs and find ways to strengthen the alignment to grade level content standards. Some of the AA items, especially in ELA and Science, need reviewing by content experts to strengthen the content and performance links found in grade-level standards.

ELA, MATHEMATICS, AND SCIENCE ALTERNATE ASSESSMENTS ALIGNMENT STUDY REPORT TO THE STATE DEPARTMENT OF PUBLIC INSTRUCTION

This alignment study was conducted on the basis of information obtained on the 2006 State Alternate Assessment System. The state assesses student performance in English language arts (ELA) in grades 3-8 and 10 with writing assessed in grades 4, 7, and 10. *English I* competency goals served as the content basis for the 10th grade ELA alternate assessment. Math is assessed in grades 3-8 and 10 with *Algebra I* competency goals serving as the content basis for the 10th grade Math alternate assessment. Science is assessed in grade 5, 8, and 10 with *Biology* serving as the content basis for the 10th grade Science alternate assessment.

The criteria in this alignment study are being evaluated as part of the UNC Charlotte partnership in the *National Alternate Assessment Center* (NAAC). The foundation for this report is based on the conceptual framework developed by a collaboration of content experts, special educators, and measurement experts at UNC Charlotte (Browder, Wakeman, Flowers, Rickleman, Pugalee, & Karvonen, 2006). While some of the alignment criteria are similar to other alignment methods (e.g., Webb and Achieve models), some of the criteria were designed specifically as value indicators for students with significant cognitive disabilities. An additional difference between this alignment protocol and other alignment methods is the examination of extended standards (i.e., standards intentionally selected for students with significant cognitive disabilities) and grade-level content standards. These results will inform decision makers about what content standards are being emphasized and what standards are being excluded for students with significant cognitive disabilities when compared with the general education population.

DESCRIPTION OF THE STATE ALTERNATE ASSESSMENT SYSTEM

The state has grade-level content standards, grade-level extended standards (called grade level extensions in documentation), and a grade-level alternate assessments for ELA, Math, and Science. There were 114 extended standards, 87 Math extended standards, and 20 Science extended standards. The state specified the intended alignment of the extended standards to the state academic standards and indicators, but the state did not report the alignment of the extended standards to the AA items. The items were instead aligned to the grade level content standards.

The extended standards were written in two phases. First, extensions were developed by five divisions of the state department's Division of Exceptional Children, Accountability, Elementary, Middle, Secondary Education; Second, definitions of the extensions (i.e., how extensions differ by symbolic levels) were written by a task force of parents, teachers (special and general education), administrators, and higher education representatives. This task force was divided into nine subcommittees.

The AA tasks/items were written by trained item writers, which consisted of special education classroom teachers. For this alignment study, not all AA tasks/items were reviewed. A random sample of approximately 60% of the tasks stratified by content area, grade level, and symbolic level were selected for inclusion in the alignment study.

DESCRIPTION OF CONTENT EXPERTS AND SPECIAL EDUCATION EXPERTS

The alignment team consisted of two English Language Arts (ELA) experts, two Mathematics experts, two Science experts, three experts in the education of students with significant cognitive disabilities, and one measurement expert. Content experts had a range of experience in their content area of 10 to 31 years and special education experts had a range of 5-28 years. The level of education ranged from a bachelor's degree (1 content expert) to a doctoral degree (1 content expert, 2 special education expert, 1 measurement expert). All experts had participated in conducting professional development related to their content area. Six experts teach higher education classes. In addition three experts are certified by the National Board of Professional Teaching Standards. Finally, five of the experts had been item writers for their state's general and special education assessments.

At the beginning of each alignment activity, the team worked together to come to a consensus on the alignment of educational components. When experts disagreed, decision rules were made to ensure consistency. Then the reviewers independently rated a subset of items/standards/extended standards and agreement between raters was examined. When the raters agreed 90%, each rater was given specific tasks. Reliability was checked periodically throughout the tasks to ensure consistent ratings.

RELIABILITY OF CODING

At least 20% of the items for each content area and level of alignment were double coded to establish interrater reliability. The range of interrater agreement for ELA content experts for grade level standards was 82%, 94% for extended standards, and 96% for alternate assessment items. Interrater agreement for Math content experts for grade level standards was 90%, 95% for extended standards, and 95% for alternate assessment items. Interrater agreement for Science content experts for grade level standards was 97%, 95% for extended standards, and 95% for alternate assessment items. Overall interrater agreement for special education experts on ELA AA items was 100%, 83% on Math AA items, and 97% on Science AA items. Special education experts were trained first on the Math items which may account for the lower agreement percentage. Finally, the dataset was cleaned with 20% of the entries checked for data entry errors. Data entry was 97-100% accurate for all items related to ELA/special education, 99-100% accurate for all items related to Math/special education, and 100% accurate for Science/special education.

CRITERIA FOR ALIGNING ALTERNATE ASSESSMENTS TO GRADE LEVEL ACADEMIC CONTENT STANDARDS

Nonregulatory guidance has specified that alternate assessments “should be clearly related to grade-level content, although it may be restricted in scope or complexity or take the form of introductory or prerequisite skills” (U.S. Department of Education, 2005, p.26). As stated in this regulation, there should be a clear *link* to the content standards for the grade in which the student is enrolled. While this gives states flexibility to determining the scope and breadth of content of alternate assessments, it does not exempt states from designing assessments that measure an academic domain with interpretable results and accurately reflecting what the

student knows and can do within that academic domain. For this reason, the authors believe that the investigation of alignment between academic content, academic performance, alternate assessments, and instructional practices and resources should be as strenuous as those used for the assessment of students in the general population. In contrast, it is also expected there would be some differences in the depth, breadth or complexity of content addressed when the achievement target is an alternative to grade level achievement. Because of the unique characteristics and needs of students with significant cognitive disabilities (e.g., testing formats and instructional practices), additional alignment criteria also need to be considered for alternate assessments.

In our conceptual framework, we propose seven criteria for linking to grade-level academic content standards. To be linked to grade level standards, the target for achievement must be academic content (e.g., reading, Math, Science) that is referenced to the student's assigned grade based on chronological age. Functional activities and materials may be used to promote understanding, but the target skills for student achievement are academically-focused. Some prioritization of the content will occur in setting this expectation, but it should reflect the major domains of the curricular area (e.g., strands of Math) and have fidelity with this content and how it is typically taught in general education. The alternate expectation for achievement may focus on prerequisite skills or some partial attainment of the grade level, but students should still have the opportunity to meet high expectations, to demonstrate a range of cognitive demand, to achieve within their level of symbolic communication, and to show growth across grade levels or grade bands.

Criteria for Instruction and Assessment that Links to Grade Level Content

1. The content is academic and includes the major domains/ strands of the content area as reflected in state and national standards (e.g., reading, Math, Science.)
2. The content is referenced to the student's assigned grade level (based on chronological age).
3. The achievement expectation is linked to the grade level content, but differs in depth or complexity; it is not grade level achievement. It may focus on prerequisite skills or those learned at earlier grades, but with applications to the grade level content. When applied to state level alternate assessments, these priorities are accessible to IEP planning teams.
4. There is some differentiation in achievement across grade levels or grade bands.
5. The focus of achievement promotes access to the activities, materials, and settings typical of the grade level but with the accommodations, adaptations, and supports needed for individualization.
6. The focus of achievement maintains fidelity with the content of the original grade level standards (content centrality) and when possible, the specified performance (category of knowledge).
7. Multiple levels of access to the general curriculum are planned so that students with different levels of symbolic communication can demonstrate learning.

Source: Browder, Wakeman, Flowers, Rickelman, Pugalee, & Karvonen, 2006

Not all the criteria were used in this report. This report focuses on the alignment among grade level standards, extended standards, and AA items. The alignment of the professional development materials/activities and teacher instruction are not included in this report but will be added as an addendum in February 2007.

ELA ALIGNMENT RESULTS

Alignment of ELA Extended Standards¹ to National² and State³ Standards

The state's *State Standard Course of Study* provides specific competency goals (broad statements) and objectives (more detailed statements) that are crucial for continued success in subsequent years of students' public school careers and beyond. While the ELA competency goals remain consistent across 3rd through 5th and 6th through 8th, the objectives vary for each grade. The number of competency goals and ELA grade level extensions for each grade are reported in Table 1.

Table 1: Number of Competency Goals and Grade Level Extensions at Each Grade Level

	3rd	4th	5th	6th	7th	8th	10th
# of Competency Goals	5	5	5	6	6	6	6
# of Grade Level Extensions	19	19	19	13	14	15	15

For alternate assessments, grade level extensions, which will be referred to as extended standards in the remainder of this report, were created for each of the competency goals. This section describes the degree of alignment between the extended standards and the competency goals.

Are the grade level extensions academic as defined by the National Council of Teachers of English (NCTE)?

Using the strands of ELA as described by the NCTE, content experts rated the grade level extension as academic or non-academic. The experts rated all the extended standards across all the grade levels as academic (100%).

The following analyses are provided for descriptive purposes only and are not considered required for demonstrating alignment. The percentages of grade level extensions that are aligned to the NCTE strands are reported in the following table. Most of the extended standards were aligned to the *Reading* (ranged from 42% in 5th grade to 85% in 6th grade) and *Writing* (ranging from 0% in 6th grade to 37% in 5th grade). In the elementary grades, some of the extended standards were aligned to *Viewing/Visual Representation* and *Listening* but no extended standards were aligned to *Speaking*. Middle school grades and 10th grade had some extended standards aligned to *Speaking* with no extended standards aligned to *Listening* and *Viewing/Visual Representation*.

¹ Extended standards refer to the grade level extensions developed by the state.

² National Standards are based on the strands of the National Council of Teachers of English.

³ State Standards are the Competency Goals listed for each grade level.

Table 2: Percentage of Extended Standards Aligned to National Standards

Domain	3rd	4th	5th	6th	7th	8th	10th ⁴
Reading	47.4	57.9	42.1	84.6	50.0	66.7	66.7
Writing	26.3	21.1	36.8	0.0	28.6	26.7	13.3
Speaking	.0	.0	.0	7.7	21.4	6.7	13.3
Listening	5.3	5.3	5.3	.0	.0	.0	.0
Viewing/Visual	15.8	10.5	10.5	.0	.0	.0	.0
Research	5.3	5.3	5.3	7.7	.0	.0	6.7

Are the extended standards referenced to the grade level standards?

The state referenced all the extended standards to the grade level standards (state competency goals). The numbers of extended standards referenced to the competency goals are provided in the following table. There were at least two extended standards for every competency goal found across all grades.

Table 3: Number of Extended Standards to Grade Level Competency Goals

Elementary				
	<u>Competency Goals</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>
1	The learner will develop and apply enabling strategies and skills to read and write.	4	3	3
2	The learning will develop and apply strategies and skills to comprehend text that is read, heard, and viewed.	3	3	4
3	The learner will make connections through the use of oral language, written language, and media and technology.	5	4	4
4	The learner will apply strategies and skills to create oral, written and visual texts.	4	5	4
5	The learner will apply grammar and language conventions to communicate effectively.	3	4	4
Middle School				
	<u>Competency Goals</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
1	The learner will use language to express individual perspectives drawn from personal or related experience.	2	2	2
2	The learner will explore and analyze information from a variety of sources.	2	3	3
3	The learner will examine the foundations and the use of argument.	2	2	2
4	The learner will use critical thinking skills and create criteria to evaluate print and non-print materials.	2	2	3
5	The learner will respond to various literary genres using interpretative and evaluative processes.	2	2	2
6	The learner will apply conventions of grammar and language usage.	3	3	3

⁴ The extended standards are based on the *English I* grade competency goals.

High School

	Competency Goals	10th
1	The learner will express reflections and reactions to print and non-print text.	2
2	The learner will explain meaning, describe processes, and answer research questions to inform an audience.	3
3	The learner will examine argumentation and develop informed opinions.	2
4	The learner will create and use standards to critique communication	3
5	The learner will demonstrate understanding of various literary genres, concepts, elements and terms.	2
6	The learner will apply conventions of grammar and language usage.	3

What is the content and performance centrality of the extended standards to the grade level standard?

ELA Content Centrality

Using the state’s intended alignment between the extended standards and grade level standards, the ELA experts rated the quality of the alignment using content and performance centrality scales. For content centrality, experts rated the extended standard as having (1) no content link, (2) far content link, and (3) near content link. It was possible for extended standards to be rated as having an academic focus but have no content link to the grade level standard. For example, it was possible that the extended standard was stretched too far from the grade level content standard to retain the construct. The extended standard of “Connect experience and text” was rated academic but was rated as having no content centrality with the competency goal of “The learner will develop and apply enabling strategies and skills to read and write”. The results of the expert content centrality ratings are reported in the following tables. The percentage of extended standards that did not link to grade level standards ranged from 7% to 26%.

Table 4: Percentage of Extended Standards with No, Far, or Near Content Links

Content Centrality	3rd	4th	5th	6th	7th	8th	10th
No Link	26.3	21.1	26.3	7.7	7.1	6.7	13.3
Far Link	57.9	68.4	57.9	46.2	35.7	33.3	40.0
Near Link	15.8	10.5	15.8	46.2	57.1	60.0	46.7
<i>N</i>	19	19	19	13	14	15	15

The extended standards with *no link* are reported in the table below.

Table 5: Extended Standards with No Link to Grade Level Competency Goals

Grade	Extended Standard
3	Connect experience and text
3	Choose text for exploration

-
- 3 Share written or oral products in a variety of ways
 - 3 Explore technology as a tool to produce a product
 - 3 Produce two thoughts in a logical sequence
 - 4 Choose text for exploration
 - 4 Share written or oral products in a variety of ways
 - 4 Share self-selected texts
 - 4 Use technology as a tool in preparing a product
 - 5 Choose text for exploration
 - 5 Determine text for specific purpose
 - 5 Demonstrate self-determination skills through a product
 - 5 Use technology as a tool in preparing a product
 - 5 Explore communication style
 - 6 Extend vocabulary knowledge by learning and using new words
 - 7 Extend vocabulary knowledge by learning and using new words
 - 8 Extend vocabulary knowledge by learning and using new words
 - 10 Demonstrate understanding of impact of elements or parts to the work as a whole
 - 10 Extend vocabulary knowledge by learning and using new words
-

Possible reasons for a no content link for extended standards were examined by a third ELA expert. The first possibility for a rating of no link is ambiguity in the language of the content standard. The expert reported that the language in the competency goals is “generic”. This is usually to allow the school systems and teachers to be free to interpret how these standards can be operationalized for instruction. The extended standards seem to follow suit (i.e., are vague at times). The next reason is the use of unclear verbs such as "explore" and "interact". These can be interpreted in many different ways. These interpretations could be put on a continuum of being operationalized very close to the standard to no longer being connected to the standard. It is the interpretation of the expert in our case that matters- how did the expert interpret the meaning behind, for example, "Explore communication style"? The final reason is that the extended standards may contain linked content but are written poorly. For example, the extended standard 4.5.2= "Explore spelling resources" has several issues. First “explore” is a vague verb. Next, how would a student explore spelling resources? The teacher may utilize multiple resources in teaching, but a student would not likely be given differently spelling supports and then have to decide which is best to apply in situations. Spelling may be a language convention, but the standard is just too poorly written to understand what a student would do. The expert did acknowledge how the field of reading still struggles for consensus about how to best teach reading including what the cognitive processes to become a reader are (e.g., is there a linear progression) and what are the components of reading (e.g., the National Reading Panel discussed five in their meta analysis, but the report was not meant to eliminate the other components of reading (i.e., enjoyment) from consideration).

ELA Performance Centrality

The performance centrality compares the level of performance found in the extended and grade level content standards. Experts rated each extended standard as (1) none of the performance expectations found in the grade level standard, (2) some of the performance expectations found in the grade level standard, or (3) all of the performance expectations found in the grade level standard. The percentages of extended standards for each level of performance

centrality are reported in the following table. From 14% to 42% of the extended standards were rated as having *none* of the performance expectations that were found in the grade level standard; a list of those items can be found in the following table.

Table 6: Performance Centrality of Extended Competency Goals to Grade Level Competency Goals

Performance Centrality	3rd	4th	5th	6th	7th	8th	10th
None	36.8	42.1	31.6	23.1	14.3	13.3	26.7
Some	63.2	57.9	63.2	53.8	42.9	33.3	33.3
All	.0	.0	5.3	23.1	42.9	53.3	40.0
N	19	19	19	13	14	15	15

Table 7: Extended Standards Rated as No Performance Centrality

Grade	Extended Standard
3	Connect experience and text
3	Choose text for exploration
3	Share written or oral products in a variety of ways
3	Explore technology as a tool to produce a product
3	Produce two thoughts in a logical sequence
3	Increase sight-symbol vocabulary
3	Explore a variety of spelling strategies
4	Choose text for exploration
4	Share written or oral products in a variety of ways
4	Share self-selected texts
4	Use technology as a tool in preparing a product
4	Use word-identification strategies
4	Increase sight-symbol vocabulary
4	Participate in pre-writing activities
4	Explore spelling resources
5	Choose text for exploration
5	Determine text for specific purpose
5	Demonstrate self-determination skills through a product
5	Use technology as a tool in preparing a product
5	Explore communication style
5	Attends to conventional grammar
6	Extend vocabulary knowledge by learning and using new words
6	Explore and comprehend expressive materials that make connections between events and feelings
6	Extend understanding by creating products that exemplify specific types of text
7	Extend vocabulary knowledge by learning and using new words
7	Extend understanding by creating products that exemplify specific types of text
8	Extend vocabulary knowledge by learning and using new words
8	Extend understanding by creating products that exemplify specific types of text
10	Demonstrate understanding of impact of elements or parts to the work as a whole
10	Extend vocabulary knowledge by learning and using new words
10	Explore, analyze, and/or evaluate relationships of types of text, concepts, elements and terms
10	Extend understanding by creating products that exemplify specific types of text

How does the state’s intended alignment compare to the content experts ratings of the alignment of extended standards to grade level standards?

The following table reports the number of extended standards referenced to the grade level standard (intended link) and the number of extended standards that were rated by content experts as either having a *far* or *near link* to the grade level competency goals. The extended standards at the elementary school levels were rated as having the highest percentage of *no link* as rated by the experts.

Table 8: Number of Extended Standards to Intended and Expert Ratings Alignment to Grade Level Competency Goals

Elementary						
<u>Competency Goals</u>	<u>3rd</u>		<u>4th</u>		<u>5th</u>	
	<u>Intended</u>	<u>Expert</u>	<u>Intended</u>	<u>Expert</u>	<u>Intended</u>	<u>Expert</u>
1	4	2	3	2	3	2
2	3	3	3	3	4	3
3	5	5	4	4	4	4
4	4	2	5	2	4	2
5	3	2	4	4	4	3
Total	19	14	19	15	19	14

Middle School						
<u>Competency Goals</u>	<u>6th</u>		<u>7th</u>		<u>8th</u>	
	<u>Intended</u>	<u>Expert</u>	<u>Intended</u>	<u>Expert</u>	<u>Intended</u>	<u>Expert</u>
1	2	2	2	2	2	2
2	2	2	3	3	3	3
3	2	2	2	2	2	2
4	2	2	2	2	3	3
5	2	2	2	2	2	2
6	3	2	3	2	3	2
Total	13	12	14	13	15	14

High School <u>Competency</u> <u>Goals</u>	<u>10th</u> <u>Intended</u>	<u>Expert</u>
1	2	2
2	3	3
3	2	2
4	3	2
5	2	2
6	3	2
Total	15	13

What is the depth of knowledge of the extended standards?

The depth of knowledge for each of the extended standards is reported in Table 9. Across all grades most of the extended standards were rated at the application and analysis/synthesis/evaluation levels.

Table 9: Percentage of Extended Standards at Depth of Knowledge Level

DOK Levels	3rd	4th	5th	6th	7th	8th	10th
Attention	.0	.0	.0	.0	.0	.0	.0
Memorize/Recall	5.3	5.3	.0	.0	.0	.0	11.8
Performance	15.8	10.5	21.1	7.7	.0	.0	5.9
Comprehension	.0	15.8	.0	.0	7.1	.0	5.9
Application	47.4	52.6	57.9	30.8	57.1	53.3	47.1
Analysis/Synthesis/Evaluation	31.6	15.8	21.1	61.5	35.7	46.7	29.4

The percentage of extended standards that were below, at, or above the DOK level of the grade level competency goals are reported in the following table. These suggest that the extended standards and the grade level standards have similar depth of knowledge.

Table 10: Percentage of Extended Standards Below, At, or Above the DOK Level for Grade Level Competency Goals.

Grade	% Below	% At	% Above	% At or Above
3 rd	21	37	42	79
4 th	32	53	16	69
5 th	21	60	21	81
6 th	23	62	15	77
7 th	50	50	0	50
8 th	40	40	20	60
10th	13	46	40	86

Do the Indicators/Descriptors Provided in the Extended Standards Aligned to the Extended Standards?

Content experts rated the indicators/descriptors', which were organized by symbolic level, alignment to the extended standards. The experts gave a holistic score for each group regarding how many (none, some, all) of the indicators related to the extended standards. It would be expected that ratings of some or all would have been coded for all extended standards. For all the grade levels across all symbolic levels, there were descriptors that were not linked to the extended standard.

Table 11: Alignment of the Indicators/Descriptors to the Extended Standard

Elementary School

	3 rd			4th			5th		
	None	Some	All	None	Some	All	None	Some	All
Symbolic	4	15	0	10	9	0	7	12	0
Early									
Symbolic	5	14	0	10	9	0	9	10	0
PreSymbolic	11	8	0	13	5	1	14	5	0

Middle School

	6th			7th			8th		
	None	Some	All	None	Some	All	None	Some	All
Symbolic	9	3	1	4	7	3	4	10	1
Early									
Symbolic	8	4	1	6	7	1	5	8	2
PreSymbolic	10	2	1	9	4	1	6	7	2

High School (10th Grade)

	None	Some	All
Symbolic	6	7	2
Early			
Symbolic	6	7	2
PreSymbolic	13	1	1

Description of ELA AA Items Alignment to National and State Standards

The following analyses describe the alignment of the ELA AA tasks/items (referred to as items in the remainder of the report) to the competency goals. The state did not report AA tasks/item intended alignment to the grade level extension, so the degree of alignment is determined by the link between ELA AA items and grade level competency goals. Not all AA items from the 2006-2007 task pool were rated. The number of items selected for evaluation and the total number of items in the pool are provided in the following table. Because items were randomly selected for the alignment study, a 95% confidence interval⁵ will be reported for all statistics.

Table 12: Total Number of ELA AA Items and Number of Randomly Selected Items Included in Alignment Study

ELA	Items randomly selected	Total pool of items
Grade	<i>N</i>	<i>N</i>
3	60	100
4	69	117
5	44	73
6	59	100
7	47	80
8	47	80
10	74	80

Are the ELA AA Items Academically Focused?

Content experts rated the academic focus of ELA AA items as defined by the alignment team using modified standards created by NCTE. Since items were sampled from the population of items, lower and upper confidence limits based on a 95% confidence interval are reported. The results are reported in the following table. For all grade levels, most of the items were rated as academic, ranging from 73% to 97%.

Table 13: Number and Percentage of ELA AA Items rated as Not Academic and Academic

Elementary Grades

	3rd		4th		5th	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Not Academic	5	8.3	11	15.9	12	27.3
Academic	55	91.7	58	84.1	32	72.7
Academic CI						
Lower CI		85.0		76.9		62.5
Upper CI		95.8		89.4		81.1

⁵ Lower and upper confidence intervals were constructed based on finite population.

Middle School

	6 th		7 th		8 th	
	<i>N</i>	%	<i>N</i>	<i>N</i>	%	%
Not Academic	2	3.4	10	21.3	7	14.9
Academic	57	96.6	37	78.7	40	85.1
Lower CI		91.0		69.1		76.1
Upper CI		99.1		86.1		91.3

High School

	10 th		10 th Writing	
	<i>N</i>	%	<i>N</i>	%
Not Academic	4	9.1	3	10.7
Academic	42	90.9	25	89.3
Lower CI		87.1		83.4
Upper CI		94.5		93.8

A list of the items that were not academically focused is reported in the following table.

Table 14: ELA AA Items Rated Not Academic

Grade	Item
3	Respond to character voices
3	Awareness of exclamatory statement
3	Locate bookshelf/display
3	Respond to own name in story
3	Indicate "open the book"
4	Roll taking
4	Demonstrating preference between magazine or book during literacy/leisure time
4	Turn pages in response to a cue
4	Locate a bookshelf/display
4	Communicate "open the book"
4	Indicate attention to a picture in a book when paired with light cue
4	Respond to familiar phrase in story
4	Page-turning
4	Book as cue for reading area
4	Demonstrate awareness of book being read for 15 minutes
4	Connect object to schedule event
5	Identify some aspect of text
5	Communicating preference for a favorite poem
5	Object area find
5	Identification of personal area/place/seat
5	Awareness of text-based objects
5	Orient book
5	Locate bookshelf/display
5	Preference for text
5	Awareness to changes in volume within a text
5	Awareness of an object in a literary text

5	Demonstrating a preference for text
5	Interacts with text
6	Communicating perspective/feelings on a community activity or event
6	Activate recorded book
7	Demonstrate preference for community activity or event
7	Following a schedule
7	Indicate awareness of an object represented in a story
7	Attending to various literary genres
7	Recognize a book
7	Demonstrate attention to an article about a community activity or experience
7	Attend to various genres (poetry)
7	Demonstrating preference between book or magazine
7	Attend to the calendar information
7	Comprehension of story ending
8	Holding an object
8	The student will demonstrate a preference between 2 books
8	Attending to various literary genres
8	Respond to cultural object from text
8	Choose whether or not to hear a story from another culture
8	Switch to provide repeated line
8	Attention to story
10	Demonstrate attention to a story
10	Demonstrate a response
10	Attend to a poem from another culture
10	Respond to an object from a haiku
10W	Announcement delivery
10W	Print a note home
10W	Email

The alignment of the ELA AA items to the six NCTE strands is reported in the following table. These statistics are reported for descriptive purposes only and are not required for states to demonstrate alignment to grade level content standards. For the elementary grades, the ELA AA items were distributed across three strands, *Reading*, *Listening*, and *Viewing/Visual Representation*. In middle school grades, most of the items were aligned to *Listening* and *Viewing/Visual*. In high school, approximately half (45%) of the items were aligned to *Listening* with the remainder of the items evenly distributed across *Writing*, *Viewing/Visual Representation*, and *Reading*.

Table 15: Number of Items Aligned (Primary and Secondary) to National Standards

Elementary Grades

	3 RD		4 TH		5 TH	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Reading	35	32.7	38	34.5	15	23.8
Writing	0	0.0	0	0.0	0	0.0
Speaking	1	0.9	3	2.7	5	7.9
Listening	25	23.4	22	20.0	21	33.3
Viewing/Visual	46	43.0	47	42.7	22	34.9
Research	0	0.0	0	0.0	0	0.0

Middle School Grades

	6 th		7 th		8 th	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Reading	14	13.7	14	20.3	6	9.1
Writing	5	4.9	3	4.3	6	9.1
Speaking	1	1.0	2	2.9	1	1.5
Listening	39	38.2	28	40.6	28	42.4
Viewing/Visual	43	42.2	22	31.9	25	37.9
Research	0	0.0	0	0.0	0	0.0

High School Grades

	10 th		10 th Writing	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Reading	12	16.2	5	10.2
Writing	3	4.1	21	42.9
Speaking	2	2.7	0	0.0
Listening	41	55.4	15	30.6
Viewing/Visual	16	21.6	8	16.3
Research	0	.0	0	.0

Are the ELA AA items referenced to the grade level standards?

All the ELA AA items were referenced to the grade level standards. The following table reports the number of AA items referenced to the grade level standard. For the elementary grades, there were no AA items referenced to grade level standards 4 and 5. For middle school, AA items were distributed across all standards but four of the standards (competency goals 1, 2, 5, & 6) had more items than the other two standards. The same pattern was noted for the 10th grade ELA AA items.

Table 16: Number of AA Items to Grade Level Competency Goals

Elementary		3rd	4th	5th
Competency Goals				
1	The learner will develop and apply enabling strategies and skills to read and write.	16	21	7
2	The learner will develop and apply strategies and skills to comprehend text that is read, heard, and viewed.	23	21	14
3	The learner will make connections through the use of oral language, written language, and media and technology.	16	16	11
4	The learner will apply strategies and skills to create oral, written and visual texts.	0	0	0
5	The learner will apply grammar and language conventions to communicate effectively.	0	0	0

Middle School

<u>Competency Goals</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
1 The learner will use language to express individual perspectives drawn from personal or related experience.	13	8	7
2 The learner will explore and analyze information from a variety of sources.	12	8	9
3 The learner will examine the foundations and the use of argument.	1	1	3
4 The learner will use critical thinking skills and create criteria to evaluate print and non-print materials.	2	2	2
5 The learner will respond to various literary genres using interpretative and evaluative processes.	16	10	12
6 The learner will apply conventions of grammar and language usage.	13	8	7

High School

<u>Competency Goals</u>	<u>10th</u>	<u>Writing</u>
1 The learner will express reflections and reactions to print and non-print text.	9	0
2 The learner will explain meaning, describe processes, and answer research questions to inform an audience.	9	13
3 The learner will examine argumentation and develop informed opinions.	4	0
4 The learner will create and use standards to critique communication	1	0
5 The learner will demonstrate understanding of various literary genres, concepts, elements and terms.	11	0
6 The learner will apply conventions of grammar and language usage.	8	12

Note. Some (n= 7) of the sampled items were inadvertently missed by experts during coding. Those items are excluded from grade level content analyses.

What is the content centrality of the ELA AA items to the extended standards?

Content Centrality

The ratings of ELA AA items content centrality are reported in Table 17. Most of the AA items were rated as having either a *far* or *near* link. While all of the 5th grade items were rated as having at least some link to the grade level competencies, 6th grade had the highest percentage of items with *no link* to the grade level competencies (39%).

Table 17: Percentage of ELA AA Items with No, Far, or Near Content Links to Grade level Competency

Content Centrality	3rd	4th	5th	6th	7th	8th	10th	10 th Writing
No Link	10.9	10.3	0.0	38.6	27.0	27.5	31.0	12.0
Far Link	14.5	22.4	15.6	19.3	21.6	35.0	19.0	.0
Near Link	74.5	67.2	84.4	42.1	51.4	37.5	50.0	88.0

No Link CI

Lower CI	5.7	5.0	NA	29.1	14.1	15.9	24.0	7.2
Upper CI	16.7	14.7	NA	46.2	30.7	33.0	33.0	15.5
N	55	58	32	57	37	40	42	25

Note. NA indicates that confidence intervals could not be computed because there were no items rated as *no link*.

A list of the AA items with *no* content link is reported in the following table.

Table 18: ELA AA Items Rated No Link to Grade level Competency Goal

Grade	Task
3	Indicate the front and back cover of a book
3	Identify title
3	Identify own name
3	Indicate "close the book"
3	Identify front of book
3	Connect items to classroom activity
4	Identifying personal information
4	Produce a letter sound
4	Object area find
4	Sorting by gender
4	Connect items to classroom activity
4	Communicating a preference of a favorite story
6	Producing a sentence
6	Answer "what" question from simple paragraph
6	Sequencing a thought
6	Follow simple 3-step picture directions
6	Identification of setting
6	Following 3-step directions
6	Choosing title for selection
6	Understanding titles
6	Identifying main idea
6	Locating the days of the week
6	Following a schedule
6	Sequencing
6	Matching characters and events in a story
6	Recognizing environmental symbols
6	Identify one of two object symbols
6	Identifying the setting of a story
6	Understanding the meaning of a stop sign
6	Demonstrating preference related to text
6	React to object used during personal activity
6	Attend to activity
6	Awareness of object symbol
6	Recognize own name in story
7	Indicate main idea using an argumentative passage
7	Comprehension of informational material
7	Identification of setting
7	Following 3-step directions

7	Identify beginning event in a story
7	Demonstrate response to vocabulary
7	Object/vocabulary connection
7	Extend vocabulary
7	Identify one of two object-symbols
7	Inserted repeated line
8	Complete a sentence with the correct word
8	Sequence steps of an event
8	Identify personal information
8	Write complete name
8	Interact with sources containing preference or opinion
8	Matching characters with their symbols
8	Copy today's date
8	Indicating specific activities of daily schedule
8	Expressing an opinion or preference
8	Identify food items
8	Recognition of a stop sign
10	Sequencing a comic strip
10	Sequencing 5 events
10	Match personal information to a category
10	Identifying months
10	Answering yes/no comprehension questions
10	Reading 5 picture/text words
10	Identifying days of the week
10	Recognition of vocabulary words
10	Object representation of vocabulary
10	Select an object from a story
10	Characters in a story
10	Responding to new words
10	Reaching for an object
10W	Choosing new vocabulary
10W	Attendance chart
10W	Demonstrate comprehension related to text

Performance Centrality

The experts' ratings of the performance centrality are reported in Table 19. A similar pattern that was found in the content centrality was found in the performance centrality. Most AA items had some or all of the performance found in the extended standards.

Table 19: Percentage of ELA AA Items with None, Some, and All Performance Links to Grade level Competency Goals

Performance Centrality	3rd	4th	5th	6th	7th	8th	10th	10 th W
None	10.9	10.3	0.0	38.6	27.0	27.5	31.0	12.0
Some	20.0	22.4	15.6	33.3	21.6	35.0	23.8	.0
All	69.1	67.2	84.4	28.1	51.4	37.5	45.2	88.0

CI for None									
Lower CI	5.7	5.0	NA	29.1	14.1	15.9	24.0	7.2	
Upper CI	16.7	14.7	NA	46.2	30.7	33.0	33.0	15.5	
N	55	58	32	57	37	40	42	25	

The following table lists the items with none of the performance levels found in the extended standards.

Table 20: AA Items Rated None for Performance Centrality

3	Identify title
3	Identify own name
3	Indicate "close the book"
3	Identify front of book
3	Connect items to classroom activity
4	Identifying personal information
4	Produce a letter sound
4	Object area find
4	Sorting by gender
4	Connect items to classroom activity
4	Communicating a preference of a favorite story
6	Producing a sentence
6	Answer "what" question from simple paragraph
6	Sequencing a thought
6	Follow simple 3-step picture directions
6	Identification of setting
6	Following 3-step directions
6	Choosing title for selection
6	Understanding titles
6	Identifying main idea
6	Locating the days of the week
6	Following a schedule
6	Sequencing
6	Matching characters and events in a story
6	Recognizing environmental symbols
6	Identify one of two object symbols
6	Identifying the setting of a story
6	Understanding the meaning of a stop sign
6	Demonstrating preference related to text
6	React to object used during personal activity
6	Attend to activity
6	Awareness of object symbol
6	Recognize own name in story
7	Indicate main idea using an argumentative passage
7	Comprehension of informational material
7	Identification of setting
7	Following 3-step directions
7	Identify beginning event in a story
7	Demonstrate response to vocabulary

-
- 7 Object/vocabulary connection
 - 7 Extend vocabulary
 - 7 Identify one of two object-symbols
 - 7 Inserted repeated line
 - 8 Complete a sentence with the correct word
 - 8 Sequence steps of an event
 - 8 Identify personal information
 - 8 Write complete name
 - 8 Interact with sources containing preference or opinion
 - 8 Matching characters with their symbols
 - 8 Copy today's date
 - 8 Indicating specific activities of daily schedule
 - 8 Expressing an opinion or preference
 - 8 Identify food items
 - 8 Recognition of a stop sign
 - 10 Sequencing a comic strip
 - 10 Sequencing 5 events
 - 10 Match personal information to a category
 - 10 Identifying months
 - 10 Answering yes/no comprehension questions
 - 10 Reading 5 picture/text words
 - 10 Identifying days of the week
 - 10 Recognition of vocabulary words
 - 10 Object representation of vocabulary
 - 10 Select an object from a story
 - 10 Characters in a story
 - 10 Responding to new words
 - 10 Reaching for an object
 - 10W Choosing new vocabulary
 - 10W Attendance chart
 - 10W Demonstrate comprehension related to text
-

Do the ELA AA items align to the grade level content standards?

The following table reports the number of ELA AA items that were intended to align to the competency goals and the number of items that content experts rated as having a *far* or *near link* to the competency goals. The middle grades and high school ELA had the greatest percentage discrepancy (>25%) between the state's intended link and the experts' ratings.

Table 21: Number of Intended and Expert Ratings Alignment of AA Items to Grade-level Standards

	3rd		4th		5th	
	<u>Intended</u>	<u>Expert</u>	<u>Intended</u>	<u>Experts</u>	<u>Intended</u>	<u>Expert</u>
1	16	15	21	19	7	7
2	23	18	21	18	14	14

3	16	16	16	15	11	11
4	0	0	0	0	0	0
5	0	0	0	0	0	0

Middle School

	<u>6th</u>		<u>7th</u>		<u>8th</u>	
	<u>Intended</u>	<u>Expert</u>	<u>Intended</u>	<u>Experts</u>	<u>Intended</u>	<u>Expert</u>
1	13	9	8	7	7	7
2	12	8	8	7	9	5
3	1	1	1	1	3	2
4	2	1	2	2	2	1
5	16	5	10	6	12	10
6	13	11	8	4	7	4

High School

	<u>10th</u>		<u>10th Writing</u>	
	<u>Intended</u>	<u>Expert</u>	<u>Intended</u>	<u>Experts</u>
1	9	5	0	0
2	9	3	13	12
3	4	4	0	0
4	1	1	0	0
5	11	10	0	0
6	8	6	12	10

Categorical Concurrence

The following analyses examine the Categorical Concurrence of the ELA AA to grade level competency goals. The numbers of items per grade level content standards (competency goal) are reported in Table 21 (in the expert ratings columns). The following table indicates the percentage of state standards with at least one AA item and percentage of state standards with six⁶ items and the categories that are under-represented. In the elementary level, the results are consistent with the test blueprint; that is, competency goals 4 and 5 are not assessed. In middle and high school, competency goals 3 and 4 are only assessed by 5% of the items.

⁶ Six is the number of items recommended by Norman Webb for categorical concurrence.

Table 22: Alignment of ELA AA Items to Grade Level Content Standards

Grade	% of Standards w/ at least one item	Categories not represented*	% of standards w/ six or more items	Categories that are under-Represented
3 rd	60%	#4, 5	60%	#4, 5
4 th	60%	#4, 5	60%	#4, 5
5 th	60%	#4, 5	60%	#4, 5
6 th	100%		50%	#3, 4, 5
7 th	100%		50%	#3, 4, 6
8 th	100%		33%	#2, 3, 4, 6
10 th ELA	100%		33%	#1, 2, 3, 4

Note: *These results are based on a sample of items and may not reflect the entire pool of AA items.

Depth of Knowledge

The depth of knowledge ratings for the AA items are reported in Table 23. Most of the items were rated between the memorize/recall level to the comprehension level. The higher level grades, 7th to 10th, had some items that were in the application and analysis/synthesis/evaluation level.

Table 23: Percentage of AA Items at Depth of Knowledge Level

DOK Levels	3rd	4th	5th	6th	7th	8th	10th
Attention	7.3	6.9	.0	8.9	2.7	.0	3.0
Memorize/Recall	70.9	65.5	59.4	33.9	29.7	47.5	23.9
Performance	7.3	19.0	12.5	32.1	16.2	10.0	1.5
Comprehension	12.7	6.9	28.1	16.1	18.9	17.5	32.8
Application	1.8	1.7	.0	8.9	29.7	22.5	32.8
Analysis/Synthesis/Evaluation	.0	.0	.0	.0	2.7	2.5	6.0
Number of Items	55	58	32	56	37	40	67

The percentage of AA items below, at, and above the depth of knowledge for the grade level content standards is reported in Table 24. Most of the items were rated below the depth of knowledge of the grade level.

Table 24: Percentage of AA Task/Items Below, At, and Above the Grade Level Standards

Grade	% Below	% At	% Above	% At or Above
3 rd	89.1	10.9	.0	10.9
4 th	93.1	5.2	1.7	6.9
5 th	75.0	25.0	.0	25.0
6 th	94.6	5.4	.0	5.4
7 th	78.4	21.6	.0	21.6
8 th	80.0	10.0	10.0	20.0
10 th	65.7	25.4	9.0	34.3

Balance of Representation⁷

The following table provides a matrix of the proportion of the extended standards and the proportion of the ELA AA items found at each content standard (competency goal). These proportions were used to determine if the emphasis found in the extended standards consistent with the emphasis found in the AA items.

Table 25: Proportion of Extended Standards and AA Items Found within Each Competency Goal

	Competency Goal					
	1	2	3	4	5	6
Extended Standards						
3 rd	.21	.16	.26	.21	.16	NA
4 th	.16	.16	.21	.26	.21	NA
5 th	.16	.21	.21	.21	.21	NA
6 th	.15	.15	.15	.15	.15	.23
7 th	.14	.21	.14	.14	.14	.21
8 th	.13	.20	.13	.20	.13	.20
10 th	.13	.20	.13	.20	.13	.20
AA Items						
3 rd	.32	.40	.28	.00	.00	NA
4 th	.37	.37	.27	.00	.00	NA
5 th	.25	.41	.34	.00	.00	NA
6 th	.23	.20	.02	.03	.28	.23
7 th	.18	.24	.04	.04	.29	.20
8 th	.19	.19	.06	.04	.35	.17
10 th	.12	.37	.05	.01	.17	.28

⁷ The formula used to compute the balance of representation index is the following

$Balance = 1 - \left(\sum_{i=1}^k \left| \frac{1}{O} - \frac{I_k}{H} \right| \right) / 2$, where O is the total number of objectives hit (i.e., item has been judged to be aligned) for the content standard, I_k is the number of items hit corresponding to objective k , and H is the total number of items hit for the content standard.

Test Blueprint						
3 rd	.30	.40	.30	.00	.00	
4 th	.30	.40	.30	.00	.00	
5 th	.30	.40	.30	.00	.00	
6 th	.20	.20	.05	.05	.30	.20
7 th	.20	.20	.05	.05	.30	.20
8 th	.20	.20	.05	.05	.30	.20
10 th	.20	.30	.05	.05	.20	.20

Note. NA indicates that there were no competency goals at this grade level.

The discrepancy between the matrices, as measured by the absolute value of the differences between corresponding cells of the matrices, is reported in the following table. This matrix was used to calculate the balance of representation between the extended standards and the AA items. The balance of representation indices can be found in the last column of the table. The elementary grades fell below the .7 level of expected balance criterion when comparing the emphasis on the AA to the emphasis to the standards but there was high agreement in the emphasis found in the blueprint and the AA items.

Table 26: The Balance of Representation and Discrepancy between the Matrices of the Proportion of Extended Standards at each Content Standard and Proportion of AA Items

Grade	1	2	3	4	5	6	Balance
Items to Standards							
3	.11	.24	.02	.21	.16	NA	.63
4	.21	.21	.06	.26	.21	NA	.53
5	.09	.20	.13	.21	.21	NA	.58
6	.08	.05	.14	.12	.13	.00	.74
7	.04	.03	.10	.10	.14	.01	.79
8	.05	.01	.07	.16	.22	.03	.73
9	.01	.17	.08	.19	.04	.08	.72
Items to Blueprint							
3	.02	.00	.02	.00	.00	NA	.98
4	.07	.03	.03	.00	.00	NA	.94
5	.05	.01	.04	.00	.00	NA	.95
6	.03	.00	.03	.02	.02	.03	.94
7	.02	.04	.01	.01	.01	.00	.96
8	.01	.01	.01	.01	.05	.03	.94
9	.08	.07	.00	.04	.03	.08	.85

The range-of-knowledge correspondence could not be calculated because there was no attempt to align to grade-level objectives (i.e., a fine grain alignment). In future alignment studies, it is recommended that the state indicate what grade level objective is being targeted for the extended standards and the AA items.

What is symbolic level of the ELA AA items?

Special education experts rated the accessibility of the items by symbolic level. The experts were trained not to infer appropriateness of items by symbolic level, but only to identify the level of symbolic communication necessary to participate in the item (i.e., accessibility). Therefore, the ratings of the experts for the items may not match the identified symbolic level for the items by the state as the state also considered cognitive demand or difficulty of the content. The rating of the special education alignment experts and the state’s designation of the symbolic levels are reported in the following table. There were items at all symbolic levels.

Table 27: Expert and State’s Rating of Percentage of AA Items Symbolic Level

<u>Grade</u>	Experts			State Rating		
	<u>pre</u>	<u>early</u>	<u>sym</u>	<u>pre</u>	<u>early</u>	<u>sym</u>
3	25.0	41.7	33.3	23.3	40.0	36.7
4	25.4	29.6	45.1	25.4	35.2	39.4
5	27.3	38.6	34.1	25.0	43.2	31.8
6	28.3	41.7	30.0	23.3	38.3	38.3
7	36.7	28.6	34.7	34.7	26.5	38.8
8	37.5	47.9	14.6	25.0	33.3	41.7
9	20.5	19.2	57.7	22.4	36.8	40.8

MATHEMATICS ALIGNMENT RESULTS

Alignment of Math Extended Standards to National and State Standards

This section describes the alignment of Math extended standards to national and state standards. The number of extended standards for each grade level is reported in the following table. The 10th grade standards are based on *Algebra I* competency goals.

Table 28: Number of Extended Standards at Each Grade Level

	3rd	4th	5th	6th	7th	8th	10th ⁸
# of Extended Standards	13	14	14	15	13	7	11

Do the Math Extended Standards focus on academics?

All the extended standards (100%) across all the grade levels were rated as having an academic focus by the Math content experts. The percentage of extended standards that are aligned national Math Standards/Strands, as defined by the National Council of Teachers of Mathematics, are reported in the following table. The extended standards are not expected to be aligned to all the NCTM strands. These statistics are reported for descriptive purposes only.

Table 29: Percentage of Extended Standards Aligned to National Standards

Domain	3rd	4th	5th	6th	7th	8th	10th
Numbers and Operations	46.2	50.0	42.9	46.7	23.1	28.6	18.2
Algebra	.0	.0	7.1	13.3	23.1	28.6	27.3
Geometry	23.1	21.4	21.4	13.3	23.1	.0	18.2
Measurement	15.4	14.3	14.3	13.3	15.4	28.6	.0
Data/Probability	15.4	14.3	14.3	13.3	15.4	14.3	36.4

Are the extended standards referenced to the grade level standards?

All the extended standards were referenced to grade level standards (state competency goals). The following table report the number of extended standards referenced to the grade level standard.

Table 30: Number of Extended Standards to Grade Level Competency Goals

Competency Goals	3rd	4th	5th	6 th	7 th	8 th	10 th
1	4	5	5	4	4	2	2
2	2	2	2	2	2	1	2
3	3	3	3	2	3	1	4
4	2	2	2	2	2	1	3
5	2	2	2	5	2	2	NA

Note. Competency goals vary across grades

⁸ Based on Algebra I standards.

What is the content and performance centrality of the extended standards to the grade level standard?

Using the state’s intended alignment between the extended standards and grade level standards, the Math experts rated the quality of the alignment using content and performance centrality scales. For content centrality, experts rated the extended standard (as described in the definition of the extension by the symbolic level) as having (1) no content link, (2) far content link, and (3) near content link. It was possible for extended standards to be rated as having an academic focus but have no content link to the grade level standard.

Content Centrality

The percentages of extended standards with no, far, and near links are reported in the following table. The only extended standard rated with *no link* was 7th grade--*Identify relationships in which a change in one quantity relates to a change in second quantity*. It is possible that the state mismatched the extended standards to the incorrect grade level standard.

Table 31: Percentage of Extended Standards with No, Far, or Near Content Links

Content Centrality	3rd	4th	5th	6th	7th	8th	10th
No Link					7.7		
Far Link	23.1	7.1	28.6	26.7	30.8	28.6	54.5
Near Link	76.9	92.9	71.4	73.3	61.5	71.4	45.5
<i>N</i>	13	14	14	15	13	7	11

Performance Centrality

The performance centrality compares the level of performance found in the extended and grade level content standards. Experts rated each extended standard as (1) none of the performance expectations found in the grade level standard, (2) some of the performance expectations found in the grade level standard, or (3) all of the performance expectations found in the grade level standard. All extended standards had some or all of the performance levels described in the grade level content standards with the exception of one 7th grade extended standards, which was the same extended standard with no content link.

Table 32: Performance Centrality of Extended Competency Goals to Grade Level Competency Goals

Performance Centrality	3rd	4th	5th	6th	7th	8th	10th
None					7.7		
Some	53.8	71.4	85.7	80.0	76.9	85.7	72.7
All	46.2	28.6	14.3	20.0	15.4	14.3	27.3
N	13	14	14	15	13	7	11

Do the extended standards align to the grade level content standards?

The following set of analyses examines the degree of content coverage and depth of knowledge of the extended standards when compared to the grade level content standards. Extended standards that were rated as having no content centrality were excluded from the following analyses. The percentages of grade level standards that had at least one extended standards alignment are reported in the table below. All grade levels had at least one extended standard for each grade level content standard. See Table 30 for the exact number of extended standards to grade level content standard.

Table 33: Percentage of Grade Level Competency Goals with At Least One Extended Standards

Grade	% of Goals
3 rd	100%
4 th	100%
5 th	100%
6 th	100%
7 th	100%
8 th	100%
10 th	100%

Depth of Knowledge

The depth of knowledge for each of the extended standards is reported in Table 34. Across all grades most of the extended standards were rated at the *performance to analysis/synthesis/evaluation* levels. Depth of knowledge ratings for most of the extended standards were found between *performance* and *analysis/synthesis/evaluation* with few if any extended standards rated at *attention* and *memorize/recall*.

Table 34: Percentage of Extended Standards at Depth of Knowledge Level

DOK Levels	3rd	4th	5th	6th	7th	8th	10th
Attention							
Memorize/Recall					7.7		
Performance	30.8	14.3	35.7	20.0	15.4	14.3	27.3
Comprehension	23.1	28.6	28.6	33.3	15.4	28.6	27.3
Application	7.7	28.6	7.1	33.3	46.2	14.3	45.5
Analysis/Synthesis/Evaluation	38.5	28.6	28.6	13.3	15.4	42.9	

Do the Indicators/Descriptors Provided in the Extended Standards Aligned to the Extended Standards?

Content experts rated the indicators/descriptors by symbolic level for each extended standard. The experts gave a holistic score for each group regarding how many (none, some, all) of the indicators related to the extended standards. It would be expected that ratings of some or all would have been coded for all extended standards. While most of the descriptors are linked to the extended standards, there are some descriptors that are not linked to the extended standards, especially the presymbolic indicators.

Table 35: Alignment of the Indicators/Descriptors to the Extended Standard

Elementary School

	3 rd			4th			5th		
	None	Some	All	None	Some	All	None	Some	All
Symbolic	0	3	0	0	12	2	1	13	0
Early									
Symbolic	0	3	0	0	12	2	1	13	0
PreSymbolic	0	3	0	2	10	2	2	12	0

Middle School

	6th			7th			8th		
	None	Some	All	None	Some	All	None	Some	All
Symbolic	0	14	1	1	11	1	0	5	2
Early									
Symbolic	4	11	0	2	10	1	0	5	2
PreSymbolic	5	9	1	6	7	0	2	4	1

High School (10th Grade)

	None	Some	All
Symbolic	2	9	0
Early			
Symbolic	2	9	0
PreSymbolic	3	8	0

Description of Math AA Items Alignment to National and State Standards

The following analyses describe the alignment of the Math AA items to extended standards, national standards and state standards. A random sample of 60% of the items from the item pool for 2006-2007 was selected for each grade. The number of items selected and the total number of items available are reported in the following table.

Table 36: The Number of Math AA Items Selected and the Total Number of AA Items

MATH	Items randomly selected	Total pool of items
3	58	100
4	43	72
5	60	100
6	34	59
7	46	76
8	36	59
10	59	99

Are the Math AA Items Academically Focused?

Content experts rated the academic focus of Math AA items. The results are reported in the following table. A lower and upper 95% confidence interval was placed around the point estimate for the percentage of AA items that were rated academic. For all grade levels, most of the items were rated as academic, ranging from 82% to 96%. Items that were rated *not academic* are excluded from any further analyses.

Table 37: Number and Percentage of Math AA Items that were Not Academic and Academic l Elementary Grades

	3rd		4th		5th	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Not Academic	8	13.9	6	14.0	5	8.3
Academic	50	86.1	37	86.0	55	91.7
Lower CI		78.4		76.8		85.0
Upper CI		91.7		92.2		95.8

Middle and High School

	6 th		7 th		8 th		10 th	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>N</u>	<u>%</u>	<u>%</u>	<u>N</u>	<u>%</u>
Not Academic	6	17.6	2	4.3	3	8.3	5	8.5
Academic	28	82.4	44	95.7	33	91.7	54	91.5
Lower CI		70.8		88.7		82.3		84.7
Upper CI		90.3		98.8		96.7		95.7

A list of the items that were not academically focused is reported in the following table.

Table 38: Math AA Items Rated Not Academic

Grade	Item
3	Sort different objects
3	Follow a path with picture cues
3	Demonstrate emerging knowledge of directional words
3	The student will demonstrate awareness of written numbers
3	Track a toy car in motion on top of table
3	Attend to counting
3	Permutations-alertness to order of change
3	Alertness to order change
4	Sliding an object
4	Ability to track an object across a plane
4	Awareness of "in"
4	Object tracking
4	Attention to rote counting
4	Student will demonstrate awareness of graphing and data collection
5	Turn/slide
5	Recognize "slower"
5	Attention to a count
5	Choosing object to complete graph
5	Identify a sphere
6	Differentiate faster and slower
6	Something vs. nothing
6	Inside or outside
6	Interior of a circle
6	Awareness of "in"
6	Something vs. nothing
7	Combining objects
7	Concept of "around"
8	Identify object that is "faster"
8	Combine objects to add
8	Stacking blocks
10	Combine objects to add
10	Inequalities
10	Recognize different order of objects
10	React to a change in quantity
10	Motion geometry

The alignment of the Math AA items to the five national Math standards is reported in the following table. It is not required to have AA items at all strands.

Table 39: Number of Items Aligned (Primary and Secondary) to National Standards

Elementary Grades

	3 rd		4 th		5 th	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Numbers and Operations	30	60.0	20	52.6	23	41.1
Algebra	8	16.0	8	21.1	6	10.7
Geometry	3	6.0	6	15.8	19	33.9
Measurement	5	10.0	3	7.9	4	7.1
Data/Probability	4	8.0	1	2.6	4	7.1

Middle and High School

	6 th		7 th		8 th		10 th	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Numbers and Operations	12	42.9	18	40.0	16	44.4	23	37.7
Algebra	4	14.3	8	17.8	13	36.1	31	50.8
Geometry	4	14.3	10	22.2	2	5.6	1	1.6
Measurement	3	10.7	4	8.9	4	11.1	3	4.9
Data/Probability	5	17.9	5	11.1	1	2.8	3	4.9

Are the Math AA items referenced to the grade level standards?

All the Math AA items were referenced to the grade level standards. The following table report the number of AA items reference to the grade level standard as reported by the state.

Table 40: Number of Math AA Items Referenced to Grade Level Competency Goals

Competency Goals	3 rd	4 th	5 th	6 th	7 th	8 th	10 th
1	24	20	20	14	15	12	18
2	7	5	4	5	4	4	6
3	7	7	20	4	10	2	4
4	8	2	5	5	3	1	31
5	14	9	11	7	14	17	NA
Total	60	43	60	35	46	36	59

What is the content and performance centrality of the MATH AA items to the extended standards?

Content Centrality

The ratings of Math AA items content centrality are reported in Table 41. Most of the AA items were rated as having either a far or near link. Between 2% (3rd grade) to 11% (6th grade) of Math AA items were rated as having no content link to the extended standards.

Table 41: Percentage of Math AA Items with No, Far, or Near Content Links to Extended Standards

Content Centrality	3rd	4th	5th	6th	7th	8th	10th
No Link	2.0	2.7	9.1	10.7	4.5	9.1	9.3
Far Link	22.0	35.1	23.6	10.7	31.8	36.4	48.1
Near Link	76.0	62.2	67.3	78.6	63.6	54.5	42.6
<i>No Link CI</i>							
Lower CI	<.01	<.01	4.7	4.1	1.5	3.7	4.8
Upper CI	8.1	10.7	16.4	23.5	11.9	17.9	16.8
N	50	37	55	28	44	33	54

Note. Items coded *not academic* were excluded from these analyses.

A list of the AA items with *no* content link is reported in the following table.

Table 42: Math AA Items Rated No Link to Extended Standard

Grade	Task
3	Sorting
4	Place the shape in the opening
5	Graphing
5	Match objects to a set
5	A shape with corners
5	Identifying an equality
5	Completing a pattern
6	Equalities of sums of coins
6	Solving simple one-step equations
6	Match fractional pieces to pictures
7	Recognizing objects from drawings
7	Analyze drawings
8	Ordered pairs
8	Solving an equation
8	Distinguish between equal and less
10	Inequalities
10	Organizing materials by number
10	Inequality of a set
10	Slope
10	Recognize "full" vs. "empty"

Performance Centrality

The experts' ratings of the performance centrality are reported in Table 43. A similar pattern that was found in the content centrality was found in the performance centrality. Most AA items had some or all of the performance found in the extended standards.

Table 43: Percentage of Math AA Items with None, Some, and All Performance Links to Extended Standards

Performance							
Centrality	3rd	4th	5th	6th	7th	8th	10th
None	4.1	10.8	14.5	14.3	6.8	15.2	9.3
Some	91.8	89.2	85.5	82.1	84.1	84.8	90.7
All	4.1			3.6	9.1		
<i>None CI</i>							
Lower CI	1.2	5.0	8.8	6.4	2.9	8.0	4.8
Upper CI	11.1	21.1	22.8	27.7	14.6	26.4	16.8
N	49	37	55	28	44	33	54

The following table lists the items with none of the performance levels found in the extended standards.

Table 44: AA Tasks Rated None for Performance Centrality

Grade	Task
3	Sorting
3	Drop an object into a container on the count of three
4	Place the shape in the opening
4	Counting to five
4	Reflections
4	Demonstrate concept of rote counting
5	Graphing
5	Match objects to a set
5	A shape with corners
5	Identifying an equality
5	Completing a pattern
5	Bar graphs
5	Measure length of item using tape measure
5	Demonstrate knowledge of the geometric property of parallel lines
6	Equalities of sums of coins
6	Solving simple one-step equations
6	Match fractional pieces to pictures
6	Respond to rote count
7	Recognizing objects from drawings
7	Analyze drawings
7	Addition
8	Ordered pairs
8	Solving an equation
8	Distinguish between equal and less
8	Demonstrating emerging knowledge of perimeter as "distance around"
8	Patterns using rhythm
10	Inequalities
10	Organizing materials by number
10	Inequality of a set
10	Slope
10	Recognize "full" vs. "empty"

Do the Math AA items align to the grade level content standards?

The following analyses examine the content coverage, as defined by the state standards, of the AA items. Only AA items rated as academic and having *far* or *near* content link are used to calculate the statistics. The numbers of intended and expert rated items per grade level content standards (competency goal) are reported in Table 45. The following table indicates the percentage of state standards with at least six⁹ items and the categories that are under-represented. Each grade level had two categories that did not have a sufficient number of AA items.

Table 45: The Intended and Expert Ratings of the Alignment of Math AA Items to Grade-level Content Standards

Elementary School

Competency Goals	3 rd		4 th		5 th	
	Intended	Expert	Intended	Expert	Intended	Expert
1	24	21	20	19	20	19
2	7	7	5	3	4	4
3	7	3	7	4	20	17
4	8	5	2	1	5	3
5	14	13	9	9	11	7
Total	60	49	43	36	60	50

Middle School

Competency Goals	6 th		7 th		8 th	
	Intended	Expert	Intended	Expert	Intended	Expert
1	14	11	15	14	12	11
2	5	3	4	1	4	4
3	4	3	10	10	2	1
4	5	5	3	3	1	1
5	7	3	14	14	17	13
Total	35	25	46	42	36	30

High School

Competency Goals	10 th	
	Intended	Expert
1	18	16
2	6	4
3	4	3
4	31	26
Total	59	49

⁹ Six is the number of items recommended by Norman Webb for categorical concurrence.

Categorical Concurrence

The following analyses examine the Categorical Concurrence of the Math AA items to grade level competency goals. The numbers of items per grade level content standards (competency goal) are reported in Table 45 (in the expert ratings columns). The following table indicates the percentage of state standards with at least one AA item and percentage of state standards with six¹⁰ items and the categories that are under-represented.

Table 46: Alignment of Math AA Items to Grade Level Content Standards

Grade	% of Standards w/ at least one item	% of standards w/ six or more items	Categories that are under-Represented
3 rd	100%	60%	3, 4
4 th	100%	40%	2, 3, 4
5 th	100%	60%	2, 4
6 th	100%	20%	2, 3, 4, 5
7 th	100%	60%	2, 4
8 th	100%	40%	2, 3, 4
10 th	100%	50%	2, 3

Depth of Knowledge

The depth of knowledge ratings for the AA items are reported in Table 47.

Table 47: Percentage of AA Items at Depth of Knowledge Level

DOK Levels	3rd	4th	5th	6th	7th	8th	10th
Attention	6.0	16.2	1.8	3.6			
Memorize/Recall	44.0	13.5	38.2	32.1	29.5	21.2	31.5
Performance	34.0	51.4	50.9	32.1	43.2	51.5	24.1
Comprehension	2.0	5.4	3.6	14.3			
Application	14.0	13.5	5.5	17.9	11.4	9.1	24.1
Analysis/Synthesis/Evaluation	6.0	16.2	1.8	3.6	15.9	18.2	20.4
Number of Items	49	37	55	28	44	33	54

The percentage of AA items below, at, and above the depth of knowledge for the grade level content standards is reported in Table 48. Most of the items were rated below the depth of knowledge of the grade level.

¹⁰ Six is the number of items recommended by Norman Webb for categorical concurrence.

Table 48: Percentage of AA Task/Items Below, At, and Above the Grade Level Standards

Grade	% Below	% At	% Above	% At or Above
3 rd	84.0	14.0	6.0	20.0
4 th	81.1	13.5	16.2	29.7
5 th	90.9	5.5	1.8	7.3
6 th	67.8	17.9	3.6	21.5
7 th	72.7	11.4	15.9	27.3
8 th	72.1	9.1	18.2	27.3
10 th	55.6	24.1	20.4	44.5

Balance of Representation

The following table provides a matrix of the proportion of the extended standards and the proportion of the Math AA items found at each content standard (competency goal). These proportions were used to determine if the emphasis found in the extended standards consistent with the emphasis found in the AA items.

Table 49: Proportion of Extended Standards, AA Items, and Emphasis in Test Blueprint Found within Each Competency Goal

	Competency Goals				
	1	2	3	4	5
Extended Standards					
3 rd	.31	.15	.23	.15	.15
4 th	.36	.14	.21	.14	.14
5 th	.36	.14	.21	.14	.14
6 th	.27	.13	.13	.13	.33
7 th	.31	.15	.23	.15	.15
8 th	.29	.14	.14	.14	.29
10 th	.18	.18	.36	.27	
AA Items					
3 rd	.40	.12	.12	.13	.23
4 th	.47	.12	.16	.05	.21
5 th	.33	.07	.33	.08	.18
6 th	.40	.14	.11	.14	.20
7 th	.33	.09	.22	.07	.30
8 th	.33	.11	.06	.03	.47
10 th	.31	.10	.07	.53	

Test Blueprint						
3 rd	.50	.10	.10	.10	.20	
4 th	.50	.10	.10	.10	.20	
5 th	.30	.10	.30	.10	.20	
6 th	.35	.15	.15	.10	.25	
7 th	.35	.15	.15	.10	.25	
8 th	.30	.10	.10	.10	.40	
10 th	.35	.10	.05	.50		

The discrepancy between the matrices (i.e., difference between the Extended Standards and AA items and the difference between the Test Blueprint and AA items), as measured by the absolute value of the differences between corresponding cells of the matrices, is reported in the following table. This matrix was used to calculate the balance between the extended standards and the AA items and the balance between the Test Blueprint and AA items. The balance indices can be found in the last column of the table. All grades level had an acceptable balance of representation index (i.e., > .70) for the Extended Standards and the AA items expect for 10th grade. The balance of representation index for the Test Blueprint and the AA items indicated that the similar emphasis was found in the Test Blueprint as proportion of AA items.

Table 50: Discrepancy between the Matrices of the Proportion of Extended Standards at each Content Standard, Emphasis in Test Blueprint, and Proportion of AA Items

Grade	1	2	3	4	5	Balance
Extended Standards and AA Items						
3	.09	.04	.11	.02	.08	.83
4	.11	.03	.05	.10	.07	.83
5	.02	.08	.12	.06	.04	.84
6	.13	.01	.02	.01	.13	.85
7	.02	.07	.01	.09	.15	.83
8	.05	.03	.09	.12	.19	.77
10	.12	.08	.30	.25		.62
Test Blueprint Emphasis and AA Items						
3	.10	.02	.02	.03	.03	.90
4	.03	.02	.06	.05	.01	.92
5	.03	.03	.03	.02	.02	.94
6	.05	.01	.04	.04	.05	.91
7	.02	.06	.07	.03	.05	.89
8	.03	.01	.04	.07	.07	.89
10	.04	.00	.02	.03		.96

What is symbolic level of the Math AA items?

Special education experts rated the accessibility of the items by symbolic level. The experts were trained not to infer appropriateness of items by symbolic level, but only to identify the level of symbolic communication necessary to participate in the item (i.e., accessibility). As

math items tended to use manipulatives, many of the items were coded by the experts as presymbolic. Therefore, the ratings of the experts for the items may not match the identified symbolic level for the items by the state as the state also considered cognitive demand or difficulty of the content. The rating of the special education alignment experts and the state’s designation of the symbolic levels are reported in the following table. There were items at all symbolic levels.

Table 51: Expert and State’s Rating of Percentage of AA Items Symbolic Level

<u>Grade</u>	Experts			State		
	<u>pre</u>	<u>early</u>	<u>sym</u>	<u>pre</u>	<u>early</u>	<u>sym</u>
3	55.0	18.3	26.7	28.3	33.3	38.3
4	60.5	9.3	30.2	37.2	25.6	37.2
5	48.3	25.0	25.0	33.3	33.3	33.3
6	45.7	8.6	45.7	28.6	22.9	48.6
7	34.8	26.1	39.1	28.3	34.8	37.0
8	33.3	11.1	55.6	30.6	30.6	38.9
10	40.7	6.8	52.5	28.8	32.2	39.0

SCIENCE ALIGNMENT RESULTS

Alignment of Science Extended Standards to National and State Standards

This section describes the alignment of Science extended standards to national and state standards. The numbers of Science extended standards for each grade are reported in the following table.

Table 52: Number of Extended Standards at Each Grade Level

	5 th	8 th	10 th
# of Extended Standards	4	9	7

Do the Science Extended Standards focus on academics?

All the extended standards (100%) across all the grade levels were rated as having an academic focus by the Science content experts. The numbers of extended standards that are aligned to national Science standards/strands, as defined by the National Science Education Standards, are reported in the following table.

Table 53: Number of Extended Standards Aligned to National Standards

Domain	5 th	8 th	10 th
Science as Inquiry		1	
Physical Science	1	1	
Life Science	1	2	7
Earth & Space Science	2	4	
Science & Technology		1	
Personal and Social Perspectives			
History and Nature Science			

Are the extended standards referenced to the grade level standards?

All the extended standards were referenced to grade level standards (Domains of Science and state competency goals). The following table report the number of extended standards referenced to the grade level standard.

Table 54: Number of Extended Standards to Grade Level Competency Goals

Domains of Science	5 th	8 th	10 th
Life Science	1	2	7
Earth/Environmental Science	2	3	NA
Physical Science	1	2	NA
Inquiry	0	1	NA
Technological Design	0	1	NA
Grade-Level Competency Goals*	5 th	8 th	10 th
1	1	1	1
2	1	1	1
3	1	2	2
4	1	2	2
5	NA	1	1
6	NA	1	NA
7	NA	1	NA

Note. *Competency goals vary across grades. NA indicates there are no competency goals listed for that domain or grade level.

What is the content and performance centrality of the extended standards to the grade level standard?

Content Centrality

Using the state’s intended alignment between the extended standards and grade level standards, the Science experts rated the quality of the alignment using content and performance centrality scales. All extended standards were rated as having a far or near link.

Table 55: Number of Extended Standards with No, Far, or Near Content Links

Content Centrality	5 th	8 th	10 th
No Link			
Far Link		3	3
Near Link	4	6	4
<i>N</i>	4	9	7

Performance Centrality

The performance centrality compares the level of performance found in the extended and grade level content standards. Experts rated each extended standard as (1) none of the performance expectations found in the grade level standard, (2) some of the performance expectations found in the grade level standard, or (3) all of the performance expectations found

in the grade level standard. All extended standards across all grade levels were rated as having *some* of the performance expectation that were found in the grade level content standards.

Do the extended standards align to the grade level content standards?

The following set of analyses examines the degree of content coverage and depth of knowledge of the extended standards when compared to the grade level content standards. The percentages of grade level standards that had at least one extended standards alignment are reported in the table below. All grade levels had at least one extended standards for each grade level content standard. See Table 54 for the exact number of extended standards to grade level content standard.

Table 56: Percentage of Grade Level Competency Goals with At Least One Extended Standard

Grade	% of Competency Goals
5 th	100%
8 th	100%
10 th (Biology)	100%

Depth of Knowledge of the Extended Standards

The depth of knowledge for each of the extended standards is reported in Table 57. Across all grades most of the extended standards were rated at higher end of the scale for depth of knowledge.

Table 57: Number of Extended Standards at Depth of Knowledge Level

DOK Levels	5 th	8 th	10 th
Attention			
Memorize/Recall			
Performance			1
Comprehension		3	1
Application		1	1
Analysis/Synthesis/Evaluation	4	5	4

Do the Indicators/Descriptors Provided in the Extended Standards Aligned to the Extended Standards?

Content experts rated the indicators/descriptors by symbolic level for each extended standard. The experts gave a holistic score for each group regarding how many (none, some, all) of the indicators related to the extended standards. It would be expected that ratings of some or all would have been coded for all extended standards. While most of the descriptors are linked to

the extended standards, there are some descriptors that are not linked to the extended standards, especially the presymbolic indicators.

Table 58: Alignment of the Indicators/Descriptors to the Extended Standard

	5 th			8 th			10 th		
	None	Some	All	None	Some	All	None	Some	All
Symbolic Early	0	3	1	0	7	0	0	4	2
Symbolic	0	2	2	0	7	0	0	2	4
PreSymbolic	3	1	0	5	2	0	5	1	0

Description of Science AA Items Alignment to National and State Standards

The following analyses describe the alignment of the Science AA items to extended standards, national standards and state standards. A random sample of items was selected from each grade. The number of items selected and the total number of items are reported in the following table.

SCIENCE	Items randomly selected	Total pool of items
5	71	120
8	51	86
10	34	61

Are the Science AA Items Academically Focused?

Content experts rated the academic focus of Science AA items. The results are reported in the following table. A high percentage (29%) of 8th grade AA items was rated not academic.

Table 59: Number and Percentage of Science AA Items that were Not Academic and Academic

	5 th		8 th		10 th	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Not Academic	1	1.4	15	29.4	0	
Academic	70	98.6	36	70.6	34	100
Lower		94.4		61.0		NA
Upper		99.9		78.7		NA

Items that were not academically focused are reported in the following table and are not included in the remaining analyses.

Table 60: Science AA Items Rated Not Academic

Grade	Item
5	Momentum as a force
8	Electrical conductivity
8	Understanding human impact on water resources
8	Demonstrate knowledge of various bodies of water
8	Identify various bodies of water
8	Hygienic practices
8	Handwashing
8	Demonstrate awareness of personal hygiene practices of brushing teeth
8	Electrical conductivity
8	Indicate soap is needed to wash hands
8	Personal hygiene
8	Microbiology/hygiene
8	Indicates body part where grooming item is used

-
- 8 Demonstrate awareness of personal hygiene practices
 - 8 Indicate needed grooming item
 - 8 Items used in hand washing
-

The alignment of the Science AA items to the seven national Science standards is reported in the following table. It is not required to have AA items at all strands.

Table 61: Number of Items Aligned (Primary and Secondary) to National Standards

	5 th		8 th		10 th	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Science as Inquiry	7	7.9	4	7.4	0	.0
Physical Science	18	20.2	11	20.4	0	.0
Life Science	31	34.8	14	25.9	34	89.5
Earth & Space Science	28	31.5	19	35.2	4	10.5
Science & Technology	5	5.6	0	.0	0	.0
Personal and Social Perspectives	0	.0	6	11.1	0	.0
History and Nature Science	0	.0	0	.0	0	.0

Are the Science AA items referenced to the grade level standards?

All the Science AA items were referenced to the grade level standards. The following table reports the number of AA items reference to the grade level standard.

Table 62: Number of AA Items by Grade Level Competency Goals

Competency Goals	5 th	8 th	10 th
1	32	0	0
2	13	0	5
3	8	14	9
4	18	17	12
5	NA	4	10
6	NA	3	NA
7	NA	12	NA

What is the content centrality of the Science AA items to the competency goals?

The ratings of Science AA items content centrality are reported in Table 63. More than half of the 5th grade Science AA items were rated as having no link and 28% of the 8th grade Science AA items did not have a content link to the competency goals.

Table 63: Percentage of Science AA Items with No, Far, or Near Content Links to Competency Goals

Content Centrality	5 th	8 th	10 th
No Link	52.9	27.8	11.8
Far Link	32.9	55.6	52.9
Near Link	14.3	16.7	35.3
CI No Link			
Lower	44.7	17.1	5.6
Upper	61.0	41.2	22.3
N	70	36	34

A list of the AA items with no content link is reported in the following table.

Table 64: Science AA Items Rated No Link to Grade Level Competency Goals

Grade	Task
5	Differentiating habitats
5	Identify a storm cloud
5	Ordering the ocean food chain
5	Ordering of a food chain
5	Name 2 things that living things need to survive
5	Identifying living vs. non-living things
5	Forest
5	Grassland dwellers
5	Identifying ecosystems
5	Gravity as a force
5	Living vs. non-living things
5	Recognizing wheels as efficient simple machines
5	Ecological interdependence
5	Water plants
5	Describe a desert as dry and an ocean as wet
5	Identify plants/animals
5	Balanced and unbalanced forces
5	Desert
5	Tools for specific task
5	Sequencing plant growth
5	Animal/plant interaction
5	Indicates plant needs light
5	Forest
5	Environments
5	Match simple machines to tasks
5	Demonstrate awareness that plants and animals live together in an environment
5	Indicate switch is needed to activate device
5	Sand vs. Water
5	Identify parts of a landform
5	Completing a plant/animal food chain
5	Part of a landform-sand
5	Operate a simple machine

5	Demonstrate an awareness of wind, rain, sunlight
5	Landform identification
5	Awareness of a different ecosystem
5	Identify a plant
5	Demonstrate that plants and animals live together in an environment
8	Identify 5 safety symbols
8	Dinosaurs
8	Drinking water identification
8	Dinosaurs vs. plants
8	Dinosaurs and bones
8	Match safety equipment to body part protected
8	Demonstrate use of hygienic practices to reduce infection
8	Chemical awareness
8	Identify a solid
8	Indicates ice vs. water
10	Seed becomes a plant
10	Identify non-living things
10	Living vs. non-living things
10	Awareness of relationships between organisms and the physical environment

The experts' ratings of the performance centrality are reported in Table 65. A similar pattern that was found in the content centrality was found in the performance centrality. Most of the 5th grade Science AA items (64%) did not have the same performance level that was found in the competency goals and approximately half (47%) of the 8th grade Science AA items did not have the same performance as those found in the grade level standards. In contrast, almost all of the 10th grade Science AA items had some of the same performance level that were found in the grade level standards.

Table 65: Percentage of Science AA Items with None, Some, and All Performance Links to Extended Standards

Performance Centrality	5 th	8 th	10 th
None	64.3	47.2	2.9
Some	35.7	52.8	97.1
All	.0	.0	.0
N	70	36	34

The following table lists the items with none of the performance levels found in the extended standards.

Table 66: AA Tasks Rated None for Performance Centrality

Grade	Task
5	Differentiating habitats
5	Identify a storm cloud
5	Ordering the ocean food chain
5	Ordering of a food chain

5	Name 2 things that living things need to survive
5	Identifying living vs. non-living things
5	Forest
5	Grassland dwellers
5	Identifying ecosystems
5	Gravity as a force
5	Living vs. non-living things
5	Recognizing wheels as efficient simple machines
5	Ecological interdependence
5	Water plants
5	Describe a desert as dry and an ocean as wet
5	Identify plants/animals
5	Balanced and unbalanced forces
5	Desert
5	Tools for specific task
5	Sequencing plant growth
5	Animal/plant interaction
5	Indicates plant needs light
5	Forest
5	Environments
5	Match simple machines to tasks
5	Demonstrate awareness that plants and animals live together in an environment
5	Indicate switch is needed to activate device
5	Sand vs. Water
5	Identify parts of a landform
5	Completing a plant/animal food chain
5	Part of a landform-sand
5	Operate a simple machine
5	Demonstrate an awareness of wind, rain, sunlight
5	Landform identification
5	Awareness of a different ecosystem
5	Identify a plant
5	Demonstrate that plants and animals live together in an environment
5	Create a simple food chain
5	Animals and their environments
5	Indicates correct weather symbol
5	Sequence the food chain
5	Motion vs. still
5	Match animal to the plant it eats
5	Indicate an animal can use plants as its home
5	Identify outdoor thermometer
8	Identify 5 safety symbols
8	Dinosaurs
8	Drinking water identification
8	Dinosaurs vs. plants
8	Dinosaurs and bones
8	Match safety equipment to body part protected
8	Demonstrate use of hygienic practices to reduce infection
8	Chemical awareness

8	Identify a solid
8	Indicates ice vs. water
8	Extinct vs. living
8	Household chemicals
8	Identify pollution
8	Divergent boundaries
8	Disease prevention
8	Awareness of the use of water
8	Describe water properties
10	Awareness of relationships between organisms and the physical environment

Do the Science AA items align to the grade level content standards?

The following analyses examine the content coverage, as defined by the state standards, of the AA items. The numbers of items per grade level content standards, both as intended by the state and as rated by the Science experts, are reported in Table 67.

Table 67: Number of AA Items Intended and Aligned by Experts to Grade Level Competency Goals

Competency Goals	5 th		8 th		10 th	
	Intended	Expert	Intended	Expert	Intended	Expert
1	32	10	0	0	0	0
2	13	6	0	0	5	4
3	8	6	14	11	9	8
4	18	10	17	5	12	10
5	NA	NA	4	1	10	8
6	NA	NA	3	3	NA	NA
7	NA	NA	12	5	NA	NA

The following table indicates the percentage of state standards with at least one and six items and the categories that are under-represented. All of the 5th grade Science standards had at least six items that were rated as aligned to the standard. For 8th grade, only one of the seven standards had six aligned items. For 10th grade, three of the five standards had at least six aligned items.

Table 68: Alignment of Science AA Items to Grade Level Content Standards

Grade	% of Standards w/ one or More Tasks	Categories with no items	% of Standards w/ Six or More Tasks	Categories that are Under-Represented
5 th	100%		100%	
8 th	71%	1, 2	14%	#1, 2, 4, 5, 6, 7
10 th	80%	1	60%	#1, 2

Depth of Knowledge

The depth of knowledge ratings for the AA items are reported in Table 69. In the 8th and 10th grades, most of the AA items were rated as *memorize/recall*. For the 5th grade, approximately half of the items were rated as *memorize/recall*.

Table 69: Percentage of AA Items at Depth of Knowledge Level

DOK Levels	5 th	8 th	10 th
Attention			
Memorize/Recall	52.9	80.6	70.6
Performance	18.6	8.3	8.8
Comprehension	12.9	11.1	20.6
Application	14.3		
Analysis/Synthesis/Evaluation	1.4		
Number of Items	70	36	34

The percentage of AA items below, at, and above the depth of knowledge for the grade level content standards is reported in Table 70. Most of the items were rated below the depth of knowledge of the grade level.

Table 70: Percentage of AA Task/Items Below, At, and Above the Grade Level Standards

Grade	% Below	% At	% Above	% At or Above
5 th	84.3	14.3	1.4	15.7
8 th	100	0	0	0
10 th	100	0	0	0

Balance of Representation

The following table provides a matrix of the proportion of the extended standards and the proportion of the Science items found at each content standard (competency goal). These proportions were used to determine if the emphasis found in the extended standards consistent with the emphasis found in the AA items.

Table 71: Proportion of Extended Standards and AA Items Found within Each Competency Goal

	1	2	3	4	5	6	7
Extended Standards							
5 th	.25	.25	.25	.25			
8 th	.11	.11	.22	.22	.11	.11	.11
10 th	.14	.14	.29	.29	.14		
AA Items							
5 th	.31	.19	.19	.31			
8 th	.00	.00	.44	.20	.04	.12	.20
10 th	.00	.13	.27	.33	.27		
Test Blueprint							
5 th	.40	.15	.15	.30			
8 th	.00	.00	.30	.32	.10	.08	.20
10 th	.00	.10	.25	.40	.25		

The discrepancy between the matrices, as measured by the absolute value of the differences between corresponding cells of the matrices, is reported in the following table. This matrix was used to calculate the balance between the extended standards, Test Blueprint and the AA items. The balance indices can be found in the last column of the table. The results indicate that the items were balanced across the grade-level competency goals, indicating similar emphasis in the proportion of AA items as found in both the extended standards and Test Blueprint.

Table 72: Discrepancy between the Matrices of the Proportion of Extended Standards at each Content Standard and Proportion of AA Items

Grade	1	2	3	4	5	6	7	Balance
Extended Standards and AA Items								
5 th	.06	.06	.06	.06				.88
8 th	.11	.11	.22	.02	.07	.01	.09	.69
10 th	.14	.01	.02	.04	.13			.83
Test Blueprint and AA Items								
5 th	.09	.04	.04	.01				.91
8 th	.00	.00	.14	.12	.06	.04	.00	.82
10 th	.00	.03	.02	.07	.02			.93

What is symbolic level of the Science AA items?

Special education experts rated the accessibility of the items by symbolic level. The experts were trained not to infer appropriateness of items by symbolic level, but only to identify the level of symbolic communication necessary to participate in the item (i.e., accessibility). As science items tended to use hands on materials, many of the items were coded by the experts as presymbolic. Therefore, the ratings of the experts for the items may not match the identified symbolic level for the items by the state as the state also considered cognitive demand or difficulty of the content. The rating of the special education alignment experts and the state’s designation of the symbolic levels are reported in the following table. There were items at all symbolic levels.

Table 73: Expert and State’s Rating of Percentage of AA Items Symbolic Level

<u>Grade</u>	Experts			State		
	<u>pre</u>	<u>early</u>	<u>sym</u>	<u>pre</u>	<u>early</u>	<u>sym</u>
5 th	37.5	43.1	16.7	26.4	37.5	36.1
8 th	45.1	31.4	25.5	29.4	43.1	27.5
10 th	41.7	25.0	33.3	36.1	30.6	36.1