ACAP

Alabama Comprehensive Assessment Program

ALTERNATE

Alabama Comprehensive Assessment Program (ACAP) *Alternate*

Item Specifications

Mathematics

Grade 5

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Mathematics

The *Alabama Comprehensive Assessment Program* (ACAP) *Alternate* item specifications are based on the development of alternate assessments that measure the 2019 *Alabama Alternate Achievement Standards: Math*. The item specifications define the purpose of the *ACAP Alternate* and provide important information regarding the content to be measured. The item specifications also serve as a road map to guide Alabama educators in the development and subsequent review of items that best measure the 2019 Alabama Alternate Achievement Standards for a given grade and subject area. Each item specification is aligned to the given Alabama content area, cluster, and standard and includes the following key information:

- Course of Study Standard
- Alternate Achievement Standard
- Content limits/constraints
- Recommended depth of knowledge (DOK) or cognitive levels
- Sample item stem information

Definitions

Course of Study Standards: The Course of Study Standards are a set of content curriculum statements that define what general education students should know and be able to do at a given grade level.

Alternate Achievement Standards: The 2019 *Alabama Alternate Achievement Standards: Math* are directly aligned to the 2019 Alabama Course of Study Standards. The 2019 *Alabama Alternate*

Achievement Standards: Math define what students with the most significant support needs should understand (know) and be able to do at the conclusion of a course or grade.

Alabama Content Areas: Alabama content areas are large groups of related clusters and content standards. Because mathematics is a connected subject, standards from different Alabama content areas may sometimes be closely related.

Standards: Standards define what students should understand (know) and be able to do at the conclusion of a course or grade.

Assessment Limits/Content Constraints: Assessment limits and/or content constraints define the range of content knowledge and the degree of difficulty allowable when items are written to measure a given standard.

Depth of Knowledge (DOK): Depth of knowledge involves the cognitive complexity or the nature of thinking required for a given item. Depth of knowledge levels are used in the development of items for cognitive demand. Therefore, when developing items for depth of knowledge, the item should be as demanding cognitively as what the actual standard expects. The depth of knowledge includes three levels, from the lowest (basic recall) to the highest (strategic thinking). The *ACAP Alternate* assessment items are written to one of three cognitive levels of complexity:

- Level 1: Recall
- Level 2: Application of a Skill/Concept
- Level 3: Strategic Thinking

Item Types: The *ACAP Alternate* assessments are composed of various item types. These item types are described in the following section.

Context: Context provides information regarding the types of stimulus materials that can be used in the items. If a context is allowable, it means that the item may have context. If context is required, then the item measuring the given standard must have context. If no context is noted, then the items measuring the given standard should not have context.

Sample Stem Information: This statement explains what students are expected to do when they respond to a given item.

Item Types

The *Alabama Comprehensive Assessment Program* (ACAP) *Alternate* assessments are composed of various item types. These item types are described below.

Multiple-Choice (MC) Items: MC items have three answer choices, including two distractors and one correct answer. Distractors for mathematics represent common misconceptions, incorrect logic, incorrect application of an algorithm, computational errors, etc. A correct response to an MC item is worth one score point in the mathematics *ACAP Alternate.*

Performance Task Items:

Multiple-Select (MS) Items: MS items are similar in structure to MC items. However, unlike an MC item, an MS item has four options and more than one correct answer. In other words, multiple responses are required for a given item. A correct response to an MS item is worth two score points in the mathematics *ACAP Alternate*.

Two-Part Multiple-Choice Items: Two-Part Multiple-Choice Items have two questions. The questions may require the student to identify the sides and then angles of a shape, perform computations, identify information of a graph or chart, etc. A correct response to a Two-Part MC item is worth two score points in the mathematics *ACAP Alternate* when both parts are correct.

Item Specifications

Item specifications are one of the key requirements for a high-quality, legally defensible, standards-based assessment. Item specifications help define important characteristics of the items (i.e., test questions) developed for each Alternate Achievement Standard. These item specifications provide guidelines to help clarify the focus of what is to be assessed, what items may include, and what items may not include (i.e., assessment limits). Item specifications are used by item writers, item editors, and item reviewers as a common reference throughout the item-development process, from initial writing to final approval. These mathematics item specifications are based on the 2019 *Alabama Alternate Achievement Standards: Math*.

Grade	**5**
Content Area	**Operations and Algebraic Thinking**
Cluster	**Write and interpret numerical expressions.**
Standard	**Write, explain, and evaluate simple numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving parentheses, brackets, or braces, using commutative, associative, and distributive properties.**
Alternate Achievement Standard	**M.AAS.5.1: Evaluate simple numerical expressions involving the four operations.**
Assessment Limits/Content Constraints	Limit expressions to one step. Limit numbers, including answers, to within 50. Limit to one-step expressions with whole-number coefficients and integer constants.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is the equation nine plus *x*. What is the value of the equation when *x* equals four?

Grade	**5**
Content Area	**Operations and Algebraic Thinking**
Cluster	**Analyze patterns and relationships.**
Standard	**Generate two numerical patterns using two given rules and complete an input/output table for the data.** **a. Use data from an input/output table to identify apparent relationships between corresponding terms.** **b. Form ordered pairs from values in an input/output table.** **c. Graph ordered pairs from an input/output table on a coordinate plane.**
Alternate Achievement Standard	**M.AAS.5.2: Given a rule, identify and extend numerical patterns (e.g., given the rule "Add 3" and the starting number 0).**
Assessment Limits/Content Constraints	Limit to numerical patterns within 50. Limit rules to addition, subtraction, and multiplication.
DOK(s)	2 or 3
Item Type(s)	MC, EBSR
Sample Item Stem(s)	Here are three number patterns. Which number pattern has the rule "subtract five"? Here is a number pattern: three, five, seven, <u>blank</u>, <u>blank</u>. What are the next <u>two</u> numbers in the pattern?

Grade	**5**
Content Area	**Operations with Numbers: Base Ten**
Cluster	**Understand the place value system.**
Standard	**Read, write, and compare decimals to thousandths.** **Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. Example: 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).** **Compare two decimals to thousandths based on the meaning of the digits in each place, using >, =, and < to record the results of comparisons.**
Alternate Achievement Standard	**M.AAS.5.3: Compare base-10 models up to 99 and whole numbers up to 100 to determine symbols (<, >, =).**
Assessment Limits/Content Constraints	Limit to whole numbers. May use base-10 models. Limit symbols to <, >, and =.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here are base-ten models using tens blocks of twenty and thirty. Which symbol correctly compares the two numbers?

Grade	**5**
Content Area	**Operations with Numbers: Base Ten**
Cluster	**Perform operations with multi-digit whole numbers and decimals to hundredths.**
Standard	**Fluently multiply multi-digit whole numbers using the standard algorithm.**
Alternate Achievement Standard	**M.AAS.5.6: Model multiplication with two-digit whole numbers by one-digit whole numbers with regrouping using strategies such as arrays, decomposition, and manipulatives.**
Assessment Limits/Content Constraints	Limit the multiplicand to a two-digit number within 40. Limit the multiplier to 2 through 9. Use regrouping. Use strategies including arrays, decomposition, and manipulatives.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a multiplication problem: twelve times two. What is twelve times two?

Grade	**5**
Content Area	**Operations with Numbers: Base Ten**
Cluster	**Perform operations with multi-digit whole numbers and decimals to hundredths.**
Standard	**Add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationships between addition/subtraction and multiplication/division; relate the strategy to a written method, and explain the reasoning used.** **a. Use concrete models and drawings to solve problems with decimals to hundredths.** **b. Solve problems in a real-world context with decimals to hundredths.**
Alternate Achievement Standard	**M.AAS.5.8: Add decimals to tenths using concrete models, drawings, and manipulatives without regrouping.**
Assessment Limits/Content Constraints	Limit decimals to tenths. No regrouping. May use values greater than 1. Use models, drawings, or manipulatives.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a model to represent three-tenths. Here is a model to represent six-tenths. What is the sum of three-tenths and six-tenths?

Grade	**5**
Content Area	**Operations with Numbers: Fractions**
Cluster	**Use equivalent fractions as a strategy to add and subtract fractions.**
Standard	**Model and solve real-word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.** **Example: Recognize an incorrect result 2/5 + 1/2 = 3/7 by observing that 3/7 < 1/2.**
Alternate Achievement Standard	**M.AAS.5.9: Illustrate equivalent fractions using models of wholes, halves, thirds, and fourths to add fractions with like denominators.**
Assessment Limits/Content Constraints	Limit fractions to wholes, halves, thirds, and fourths. Limit to fractions with like denominators. Do not include regrouping or mixed numbers. Limit to addition.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is an addition problem with fractions: one-third plus two-thirds. What is the solution to one-third plus two-thirds?

Grade	**5**
Content Area	**Operations with Numbers: Fractions**
Cluster	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Standard	**Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.** **a. Model and interpret a fraction as division of the numerator by the denominator (a/b= a ÷ b).** **b. Use visual fraction models, drawings, or equations to represent word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.**
Alternate Achievement Standard	**M.AAS.5.11: Using vocalization, sign language, augmentative communication, or assistive technology, identify models of thirds (e.g., 1/3, 2/3, 3/3) and tenths (e.g., 1/10, 2/10, 3/10, 4/10, 5/10, 6/10, 7/10, 8/10, 9/10, 10/10).**
Assessment Limits/Content Constraints	Limit fractions to thirds and tenths. Use models.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is the model of a fraction. Which fraction is shown in the model?

Grade	**5**
Content Area	**Operations with Numbers: Fractions**
Cluster	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Standard	**Apply and extend previous understandings of multiplication to find the product of a fraction times a whole number or a fraction times a fraction.** **a. Use a visual fraction model (area model, set model, or linear model) to show (a/b) × q and create a story context for this equation to interpret the product as a parts of a partition of q into b equal parts.** **b. Use a visual fraction model (area model, set model, or linear model) to show (a/b) × (c/d) and create a story context for this equation to interpret the product.** **c. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.** **d. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths to show that the area is the same as would be found by multiplying the side lengths.**
Alternate Achievement Standard	**M.AAS.5.12: Determine the product of unit fractions with unlike denominators (limited to denominators of 2, 3, 4, 10) using visual models.**
Assessment Limits/Content Constraints	Limit fraction denominators to 2, 3, 4, and 10. Limit to unit fractions with only 1 as the numerator. Use unlike denominators. Use visual models.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a model of one-fourth times one-third. What is the product of one-fourth and one-third?

Grade	**5**
Content Area	**Operations with Numbers: Fractions**
Cluster	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Standard	**Model and solve real-world problems involving multiplication of fractions and mixed numbers using visual fraction models, drawings, or equations to represent the problem.**
Alternate Achievement Standard	**M.AAS.5.14: Use a model to solve multiplying a whole number by a unit fraction of 1/2, 1/3, and 1/4.**
Assessment Limits/Content Constraints	Limit multiplicand to a whole number within 10. Limit the multiplier to 1/2, 1/3, or 1/4. May use real-life scenarios.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Four friends each eat one-half of a pizza. How many pizzas do the four friends eat in all?

Grade	**5**
Content Area	**Operations with Numbers: Fractions**
Cluster	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**
Standard	**Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.** **a. Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions and illustrate using visual fraction models, drawings, and equations to represent the problem.** **b. Create a story context for a unit fraction divided by a whole number, and use a visual fraction model to show the quotient.** **c. Create a story context for a whole number divided by a unit fraction, and use a visual fraction model to show the quotient.**
Alternate Achievement Standard	**M.AAS.5.15: Use a model to solve dividing a whole number by a unit fraction of 1/2.**
Assessment Limits/Content Constraints	Limit dividend to a whole number from 1 to 20. Limit divisor to 1/2. Use a model. May use real-life scenarios.
DOK(s)	2 or 3
Item Type(s)	MC, EBSR
Sample Item Stem(s)	Julie has six ribbons that she divides in half. How many ribbons does Julie have after she divides them?

Grade	**5**
Content Area	**Data Analysis**
Cluster	**Represent and interpret data.**
Standard	**Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).** **a. Add, subtract, multiply, and divide fractions to solve problems involving information presented in line plots.** **Note: Division is limited to unit fractions by whole numbers and whole numbers by unit fractions.**
Alternate Achievement Standard	**M.AAS.5.16: Using vocalization, sign language, augmentative communication, or assistive technology, represent and interpret data on a picture, bar graph, or line plot when given a model or a graph.**
Assessment Limits/Content Constraints	Limit graph to pictograph, bar graph, or line plot. Limit categories to 4. Limit data in each category to 20.
DOK(s)	2 or 3
Item Type(s)	MC, MS, EBSR
Sample Item Stem(s)	Here is a graph showing the amount of rainfall per week for four weeks. How much did it rain in week four?

Grade	**5**
Content Area	**Measurement**
Cluster	**Convert like measurement units within a given measurement system.**
Standard	**Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real-world problems.**
Alternate Achievement Standard	**M.AAS.5.17: Using vocalization, sign language, augmentative communication, or assistive technology, tell time using an analog or digital clock to the half or quarter hour.** **M.AAS.5.17a: Use standard units to measure the weight and length of objects.** **M.AAS.5.17b: Sort a collection of coins according to their value.**
Assessment Limits/Content Constraints	Use analog or digital clock. Limit time to half hour or quarter hour. Limit weight units to pounds and ounces. Limit length units to inches and feet. Limit coins to pennies, nickels, dimes, and quarters.
DOK(s)	1 or 2
Item Type(s)	MC, MS, EBSR
Sample Item Stem(s)	Here are some lemons on a scale. How much do the lemons weigh?

Grade	**5**
Content Area	**Measurement**
Cluster	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
Standard	**Identify volume as an attribute of solid figures, and measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised (non-standard) units.** **a. Pack a solid figure without gaps or overlaps using n unit cubes to demonstrate volume as n cubic units.**
Alternate Achievement Standard	**M.AAS.5.18: Using vocalization, sign language, augmentative communication, or assistive technology, identify cubes, cylinders, and spheres as three-dimensional shapes.**
Assessment Limits/Content Constraints	Limit three-dimensional shapes to cubes, cylinders, and spheres.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here are three shapes. Which shape is a three-dimensional shape?

Grade	**5**
Content Area	**Measurement**
Cluster	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
Standard	**Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume.** **a. Use the associative property of multiplication to find the volume of a right rectangular prism and relate it to packing the prism with unit cubes. Show that the volume can be determined by multiplying the three edge lengths or by multiplying the height by the area of the base.** **b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems.** **c. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the two parts, applying this technique to solve real-world problems.**
Alternate Achievement Standard	**M.AAS.5.19: Determine the volume of a rectangular prism by counting units of measurement (e.g., unit cubes).**
Assessment Limits/Content Constraints	Limit shapes to rectangular prisms. Limit volume to within 40.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a rectangular prism made up of unit cubes. What is the volume of the rectangular prism?

Grade	**5**
Content Area	**Geometry**
Cluster	**Graph points on the coordinate plane to solve real-world and mathematical problems.**
Standard	**Graph points in the first quadrant of the coordinate plane, and interpret coordinate values of points to represent real-world and mathematical problems.**
Alternate Achievement Standard	**M.AAS.5.20: Identify a point on a horizontal number line representing the x-axis (no greater than 5) and identify a point on a vertical number line representing the y-axis (no greater than 5).**
Assessment Limits/Content Constraints	Limit the number lines to 0 through 5. For points on the *x*-axis, the *y*-value is 0 and vice versa.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a point on the *x*-axis. What number is represented by the point?