

# A L T E R N A T E

# Alabama Comprehensive Assessment Program (ACAP) Alternate

Item Specifications Mathematics Grade 4



# Alabama Comprehensive Assessment Program (ACAP) Alternate

## **Item Specifications**

# 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: Math 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



Mathematics Grade 4 Page 2 of 22





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



Mathematics Grade 4 Page 3 of 22





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.



Mathematics Grade 4 Page 4 of 22





#### **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*.



Mathematics Grade 4 Page 5 of 22





Grade	4
Content Area	Operations and Algebraic Thinking
Cluster	Solve problems with whole numbers using the four operations.
Standard	Determine and justify solutions for multi-step word problems, including problems where remainders must be interpreted.
	a. Write equations to show solutions for multi-step word problems with a letter standing for the unknown quantity.
	b. Determine reasonableness of answers for multi-step word problems, using mental computation and estimation strategies including rounding.
Alternate Achievement Standard	M.AAS.4.1: Solve one-step word problems involving real-life situations using the four operations within 100 without regrouping and select the appropriate method of computation when problem-solving.
Assessment Limits/Content Constraints	Limit to one-step word problems. Limit to addition, subtraction, multiplication, division with answers of 100 or less. Limit to addition and subtraction problems with no regrouping. Use real-life situations.
DOK(s)	1 or 2
Item Type(s)	MC, MS, EBSR
Sample Item Stem(s)	Ramon and Cindy are baking two batches of cookies. Each batch makes twelve cookies. How many cookies will there be in total?







Grade	4
Content Area	Operations and Algebraic Thinking
Cluster	Generate and analyze patterns.
Standard	Generate and analyze a number or shape pattern that follows a given rule.
Alternate Achievement Standard	M.AAS.4.5: Use repeating patterns to make predictions.
Assessment Limits/Content Constraints	Limit patterns to numbers or shapes. Limit the number of elements in the pattern to 5 or less. Limit predicted elements to 3 or less.
DOK(s)	2 or 3
Item Type(s)	MC, EBSR
Sample Item Stem(s)	Here is a pattern of shapes: triangle, circle, square, triangle, circle,, What are the next two shapes in the pattern?







Grade	4
Content Area	Operations with Numbers: Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard	Use place value understanding to compare two multi-digit numbers using >, =, and < symbols.
Alternate Achievement Standard	M.AAS.4.6: Compare whole number values to 50 using symbols (e.g., <, >, =).
Assessment	Limit to whole number values of 50 or less.
Constraints	Limit symbols to >, <, =.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a number sentence: four <u>blank</u> four. Which symbol correctly completes the sentence?







Grade	4
Content Area	Operations with Numbers: Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard	Round multi-digit whole numbers to any place using place value understanding.
Alternate Achievement Standard	M.AAS.4.9: Round a whole number from 1 to 49 to the nearest ten (using a number line and hundreds chart.)
Assessment Limits/Content Constraints	Limit numbers to be rounded to 1 through 49. Limit rounding to the nearest 10. Provide number line or hundreds chart.
DOK(s)	1 or 2
ltem Type(s)	MC
Sample Item Stem(s)	Here is the number forty-three on a hundreds chart. What is forty-three rounded to the nearest ten?







Grade	4
Content Area	Operations with Numbers: Base Ten
Cluster	Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers.
Standard	Use place value strategies to fluently add and subtract multi-digit whole numbers and connect strategies to the standard algorithm.
Alternate Achievement Standard	M.AAS.4.11: Add and subtract one- and two-digit numbers up to 49 with regrouping using concrete manipulatives and visual models.
Assessment Limits/Content Constraints	Limit numbers to 1 through 49. Limit operations to addition and subtraction. Include regrouping. Include concrete objects or visual models.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a subtraction problem: twenty minus five equals <u>blank</u> . Here is a model of twenty using tens rods. Here is a model of five using blocks. What does twenty minus five equal?







Grade	4
Content Area	Operations with Numbers: Fractions
Cluster	Extend understanding of fraction equivalence and ordering.
Standard	Compare two fractions with different numerators and different denominators using concrete models, benchmarks (0, ½, 1), common denominators, and/or common numerators, recording the comparisons with symbols >, =, or <, and justifying the conclusions. a. Explain that comparison of two fractions is valid only when the two fractions refer to the same whole.
Alternate Achievement Standard	M.AAS.4.13: Identify and compare models of a whole (1), one half (1/2), one third (1/3), and one fourth (1/4) using models, manipulatives, number lines, and a clock.
Alternate Achievement Standard Assessment	M.AAS.4.13: Identify and compare models of a whole (1), one half (1/2), one third (1/3), and one fourth (1/4) using models, manipulatives, number lines, and a clock. Limit to one (1) whole, 1/2, 1/3, and 1/4.
Alternate Achievement Standard Assessment Limits/Content Constraints	M.AAS.4.13: Identify and compare models of a whole (1), one half (1/2), one third (1/3), and one fourth (1/4) using models, manipulatives, number lines, and a clock. Limit to one (1) whole, 1/2, 1/3, and 1/4. Use models, manipulatives, number lines, or clocks.
Alternate Achievement Standard Assessment Limits/Content Constraints DOK(s)	M.AAS.4.13: Identify and compare models of a whole (1), one half (1/2), one third (1/3), and one fourth (1/4) using models, manipulatives, number lines, and a clock. Limit to one (1) whole, 1/2, 1/3, and 1/4. Use models, manipulatives, number lines, or clocks. 1 or 2
Alternate Achievement Standard Assessment Limits/Content Constraints DOK(s) Item Type(s)	M.AAS.4.13: Identify and compare models of a whole (1), one half (1/2), one third (1/3), and one fourth (1/4) using models, manipulatives, number lines, and a clock. Limit to one (1) whole, 1/2, 1/3, and 1/4. Use models, manipulatives, number lines, or clocks. 1 or 2 MC, MS







Grade	4
Content Area	Operations with Numbers: Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard	Model and justify decompositions of fractions and explain addition and subtraction of fractions as joining or separating parts referring to the same whole.
	a. Decompose a fraction as a sum of unit fractions and as a sum of fractions with the same denominator in more than one way using area models, length models, and equations.
	b. Add and subtract fractions and mixed numbers with like denominators using fraction equivalence, properties of operations, and the relationship between addition and subtraction.
	c. Solve word problems involving addition and subtraction of fractions and mixed numbers having like denominators using drawings, visual fraction models, and equations to represent the problem.
Alternate Achievement Standard	M.AAS.4.15: Model decomposing fractions having like denominators, using visual fraction models (limit to half and fourths).
Assessment	Limit to halves and fourths.
Limits/Content Constraints	Use visual fraction models.
DOK(s)	2 or 3
Item Type(s)	MC, MS
Sample Item Stem(s)	Here is a fraction model of a sum of two fractions: one-half. Which equation represents the sum shown in the fraction model?







Grade	4
Content Area	Operations with Numbers: Fractions
Cluster	Understand decimal notation for fractions and compare decimal fractions.
Standard	Express, model, and explain the equivalence between fractions with denominators of 10 and 100.
	a. Use fraction equivalency to add two fractions with denominators of 10 and 100.
Alternate	M.AAS.4.17: Model equivalence between fractions of a whole, halves and fourths using visual models
Standard	
Assessment	Limit to one (1) whole, halves, and fourths.
Limits/Content Constraints	Include visual models.
DOK(s)	1 or 2
ltem Type(s)	MC, MS, EBSR
Sample Item Stem(s)	Here is a whole rectangle. Which model shows how many fourths are in a whole rectangle?







Grade	4
Content Area	Operations with Numbers: Fractions
Cluster	Understand decimal notation for fractions and compare decimal fractions.
Standard	Use visual models and reasoning to compare two decimals to hundredths (referring to the same whole), recording comparisons using symbols >, =, or <, and justifying the conclusions.
Alternate	M.AAS.4.19: Compare fractions of a whole, halves and fourths using symbols
Achievement	(>,<,=).
Standard	
Assessment	Limit to one (1) whole, halves, and fourths. Limit to two elements.
Limits/Content	Limit symbols to >, <, and =.
Constraints	May use models.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here are two fractions: one-half <u>blank</u> one-fourth. Which symbol goes in the <u>blank</u> to correctly compare the two fractions?







Grade	4
Content Area	Data Analysis
Cluster	Represent and interpret data.
Standard	Interpret data in graphs (picture, bar, and line plots) to solve problems using numbers and operations.
	Create a line plot to display a data set of measurements in fractions of a unit (1/2,1/4,1/8).
	Solve problems involving addition and subtraction of fractions using information presented in line plots.
Alternate Achievement Standard	M.AAS.4.20: Using vocalization, sign language, augmentative communication, or assistive technology, represent and interpret data on a picture or bar graph when given a model or a graph to complete.
Assessment	Limit to picture graphs or bar graphs.
Limits/Content Constraints	Limit categories to 3 or less.
	Limit category data to 20 or less.
DOK(s)	2 or 3
Item Type(s)	MC, MS, EBSR
Sample Item Stem(s)	Ash and Tommy recorded the number of each flower type in the garden on the bar graph. The bar graph is titled "Garden Flowers." The axes labels are "Number of Flowers" and "Flower Type." Ash and Tommy saw four roses. Which graph shows the correct bar?







Grade	4
Content Area	Data Analysis
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard	Select and use an appropriate unit of measurement for a given attribute (length, mass, liquid volume, time) within one system of units: metric - km, m, cm; kg, g, l, ml; customary - lb, oz; time - hr, min, sec.
	a. Within one system of units, express measurements of a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.
Alternate Achievement Standard	M.AAS.4.21: Given an object, determine the appropriate measurement tool and units of measure using vocalization, sign language, augmentative communication, or assistive technology.
Assessment Limits/Content Constraints	Limit measurement tools and units of measurement for length to ruler, yard stick, and measuring tape/inches and feet; liquid measurement to measuring cup; mass or weight to scale/pounds and ounces; time to clock (digital and analog)/hour, half hour, and quarter hour.
	May use visuals and real-life scenarios.
DOK(s)	1 or 2
Item Type(s)	MC, MS, EBSR
Sample Item Stem(s)	Tyson needs to measure the length and width of a door. Which tool should Tyson use to measure the door?







Grade	4
Content Area	Data Analysis
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard	Use the four operations to solve measurement word problems with distance, intervals of time, liquid volume, mass of objects, and money.
	a. Solve measurement problems involving simple fractions or decimals.
	b. Solve measurement problems that require expressing measurements given in a larger unit in terms of a smaller unit.
	c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
Alternate Achievement Standard	M.AAS.4.22: Using vocalization, sign language, augmentative communication, or assistive technology, tell time on a digital and analog clock (to the hour, half hour, quarter hour).
	M.AAS.4.22a: Measure mass, volume, or lengths of an object when given a measurement tool.
	M.AAS.4.22b: Using vocalization, sign language, augmentative communication, or assistive technology, identify and determine the value of penny, nickel, dime, and quarter.
Assessment	Limit time to hour, half hour, and quarter hour on either a digital or analog clock.
Limits/Content Constraints	Limit measurements to mass, volume, or length.
	Limit coins to penny, nickel, dime, and quarter.
DOK(s)	1 or 2
Item Type(s)	MC, MS, EBSR
Sample Item Stem(s)	Here is a coin. What is the name of this coin?
	What is the value of this coin?



Mathematics Grade 4 Page 17 of 22





Grade	4
Content Area	Data Analysis
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard	Apply area and perimeter formulas for rectangles in real-world and mathematical situations.
Alternate	M.AAS.4.23: Determine the area of a square or rectangle by counting units of
Achievement	measurement (e.g., unit squares).
Standard	
Assessment Limits/Content Constraints	Limit shapes to squares and rectangles.
	Limit area to 20 or less.
	Include visuals such as grid lines, unit squares, or blocks.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here are unit squares set on a rectangle. What is the area of the rectangle in square units?







Grade	4
Content Area	Data Analysis
Cluster	Geometric measurement: understand concepts of angle and measure angles.
Standard	Identify an angle as a geometric shape formed wherever two rays share a common endpoint.
Alternate Achievement Standard	M.AAS.4.24: Recognize and identify angles in geometric shapes as larger or smaller.
Assessment Limits/Content Constraints	Limit shapes to squares, rectangles, or triangles.
	Limit comparisons to angles that are visibly larger or smaller than each other.
DOK(s)	1 or 2
Item Type(s)	MC, MS
Sample Item Stem(s)	Here is a triangle. The triangle has angles A, B, and C. Which angle is larger than angle C?







Grade	4
Content Area	Geometry
Cluster	Draw and identify lines and angles, and identify shapes by properties of their lines and angles.
Standard	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines, and identify these in two-dimensional figures.
Alternate Achievement Standard	M.AAS.4.27: Recognize parallel lines, intersecting lines, and angles (right, acute, obtuse).
Assessment	Limit lines to parallel and intersecting.
Limits/Content Constraints	Limit angles to right, acute, and obtuse.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is an angle. Which type of angle is this?
	Here are three pictures. Which picture shows parallel lines?







Grade	4
Content Area	Geometry
Cluster	Draw and identify lines and angles and identify shapes by properties of their lines and angles.
Standard	Identify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. a. Describe right triangles as a category, and identify right triangles.
Alternate	M.AAS.4.28: Using vocalization, sign language, augmentative communication,
Achievement	or assistive technology, describe the defining attributes of two-dimensional
Standard	shapes (e.g., humber of sides, humber of digres).
Assessment Limits/Content Constraints	Limit shapes to squares, rectangles, or triangles.
	Limit attributes to number of sides and number of angles.
DOK(s)	1 or 2
ltem Type(s)	MC, MS
Sample Item Stem(s)	Here are four shapes. Which two shapes have four sides?







Grade	4
Content Area	Geometry
Cluster	Draw and identify lines and angles and identify shapes by properties of their lines and angles.
Standard	Define a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts.
	a. Identity line-symmetric figures and draw lines of symmetry.
Alternate Achievement Standard	M.AAS.4.29: Given a drawing of a shape with a line drawn across the shape, identify if it is divided symmetrically.
Assessment Limits/Content Constraints	Limit shapes to circles, triangles, squares, or rectangles.
DOK(s)	1 or 2
ltem Type(s)	MC
Sample Item Stem(s)	Here are three shapes. Which shape is divided in half with a line of symmetry?



