ACAP

Alabama Comprehensive Assessment Program

ALTERNATE

Alabama Comprehensive Assessment Program (ACAP) *Alternate*

Item Specifications

Mathematics

Grade 10

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

The appendix to this document includes sample test items, along with information about the item, including item type, page reference, alignment, depth of knowledge, and answer key. These sample items are provided to be an additional resource for educators to help guide instruction and assessment-building in the classroom. Teachers can use the sample items as models when leading classroom discussion as well as creating items for classroom tests or quizzes. In each sample item, the level of rigor needed in the item in order to align with the content standard is evident.

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	**10**
Content Area	**Geometry and Measurement**
Essential Concept	**Areas and volumes of figures can be computed by determining how the figure might be obtained from simpler figures by dissection and recombination.**
Standard	**Identify the shapes of two-dimensional cross sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.**
Alternate Achievement Standard	**M.G.AAS.10.16: Given a cross section of a three-dimensional object, identify the shapes of two-dimensional cross sections (limited to sphere, rectangular prism, or triangular prism).**
Assessment Limits/Content Constraints	Limit to cross sections parallel or perpendicular to the base of a three-dimensional object. Limit three-dimensional shapes to sphere, rectangular prism or triangular prism and two-dimensional cross section to circle, square, rectangle, or triangle.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a rectangular prism with a cross section cut parallel to its base. Which shape shows the cross section of the prism?

Grade	**10**
Content Area	**Geometry and Measurement**
Essential Concept	**Areas and volumes of figures can be computed by determining how the figure might be obtained from simpler figures by dissection and recombination.**
Standard	**Model and solve problems using surface area and volume of solids, including composite solids and solids with portions removed.** **a. Give an informal argument for the formulas for the surface area and volume of a sphere, cylinder, pyramid, and cone using dissection arguments, Cavalieri's principle, and informal limit arguments.** **b. Apply geometric concepts to find missing dimensions to solve surface area or volume problems.**
Alternate Achievement Standard	**M.G.AAS.10.17: Compare and contrast the volume of real-world geometric figures.**
Assessment Limits/Content Constraints	Limit to whole-number side lengths and whole-number volumes.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is the formula for finding the volume of a rectangular prism: volume equals length times width times height. Which box has a greater volume?

Grade	**10**
Content Area	**Geometry and Measurement**
Essential Concept	**Constructing approximations of measurements with different tools, including technology, can support an understanding of measurement.**
Standard	**Given the coordinates of the vertices of a polygon, compute its perimeter and area using a variety of methods, including the distance formula and dynamic geometry software, and evaluate the accuracy of the results.**
Alternate Achievement Standard	**M.G.AAS.10.18: Find the perimeter or area of a square, rectangle, or equilateral triangle to solve real-world problems when given the length of at least one side.**
Assessment Limits/Content Constraints	Limit to whole-number side lengths and whole-number answers.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a model of Lisa's garden. Lisa is placing a decorative string all around the garden. How much string will Lisa need?

Grade	**10**
Content Area	**Geometry and Measurement**
Essential Concept	**Applying geometric transformations to figures provides opportunities for describing the attributes of the figures preserved by the transformation and for describing symmetries by examining when a figure can be mapped onto itself.**
Standard	**Develop definitions of rotation, reflection, and translation in terms of angles, circles, perpendicular lines, parallel lines, and line segments.**
Alternate Achievement Standard	**M.G.AAS.10.21: Identify and/or model characteristics of a geometric figure that has undergone a transformation (reflection, rotation, translation) by drawing, explaining, or using manipulatives.**
Assessment Limits/Content Constraints	Limit to reflections about the x- and y-axis and rotations about the origin.
DOK(s)	2 or 3
Item Type(s)	MC
Sample Item Stem(s)	Here is triangle ABC. Which triangle is the result of translating triangle ABC?

Grade	**10 Algebra IB**
Content Area	**Geometry and Measurement**
Essential Concept	**Showing that two figures are congruent involves showing that there is a rigid motion (translation, rotation, reflection, or glide reflection) or, equivalently, a sequence of rigid motions that maps one figure to the other.**
Standard	**Verify criteria for showing triangles are similar using a similarity transformation (sequence of rigid motions and dilations) that maps one triangle to another.** **a. Verify that two triangles are similar if and only if corresponding pairs of sides are proportional and corresponding pairs of angles are congruent.** **b. Verify that two triangles are similar if (but not only if) two pairs of corresponding angles are congruent (AA), the corresponding sides are proportional (SSS), or two pairs of corresponding sides are proportional and the pair of included angles is congruent (SAS).** **Example: Given two triangles with two pairs of congruent corresponding sides and a pair of congruent included angles, show there must be a set of rigid motions that maps one onto the other.**
Alternate Achievement Standard	**M.G.AAS.10.24: When given two congruent triangles that have been transformed (limit to a translation), determine the congruent parts. (Ex: Determine which leg on Triangle A is congruent to which leg on Triangle B)**
Assessment Limits/Content Constraints	Limit to translations (triangles with the same orientation).
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is triangle PQR. After triangle PQR is translated, it results in triangle XYZ. Which angle is congruent to angle P?

Grade	**10**
Content Area	**Geometry and Measurement**
Essential Concept	**Proof is the means by which we demonstrate whether a statement is true or false mathematically, and proofs can be communicated in a variety of ways (e.g., two-column, paragraph).**
Standard	**Develop and use precise definitions of figures such as angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.**
Alternate Achievement Standard	**M.G.AAS.10.30: Demonstrate perpendicular lines, parallel lines, line segments, angles, and circles by drawing, modeling, identifying, or creating.**
Assessment Limits/Content Constraints	Mark perpendicular lines with a right angle.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here are three pairs of lines. Which figure shows a pair of parallel lines?

Grade	**10**
Content Area	**Geometry and Measurement**
Essential Concept	**Proof is the means by which we demonstrate whether a statement is true or false mathematically, and proofs can be communicated in a variety of ways (e.g., two-column, paragraph)**
Standard	**Justify whether conjectures are true or false in order to prove theorems and then apply those theorems in solving problems, communicating proofs in a variety of ways, including flow chart, two-column, and paragraph formats. a. Investigate, prove, and apply theorems about lines and angles, including but not limited to: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; the points on the perpendicular bisector of a line segment are those equidistant from the segment's endpoints. b. Investigate, prove, and apply theorems about triangles, including but not limited to: the sum of the measures of the interior angles of a triangle is 180˚; the base angles of isosceles triangles are congruent; the segment joining the midpoints of two sides of a triangle is parallel to the third side and half the length; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem using triangle similarity.**
Alternate Achievement Standard	**M.G.AAS.10.31a: When given an isosceles triangle and a measure of a leg or base angle, identify the measure of the other leg or base angle.** **M.G.AAS.10.31b: When given a parallelogram and the measure of one side or one angle, identify the measure of the opposite side or angle.**
Assessment Limits/Content Constraints	Limit to acute isosceles triangles (no right isosceles triangles). Limit to parallelograms with no right angles.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is an isosceles triangle with two side lengths labeled. What is the length of the third side of the triangle?

Grade	**10**
Content Area	**Geometry and Measurement**
Essential Concept	**Recognizing congruence, similarity, symmetry, measurement opportunities, and other geometric ideas, including right triangle trigonometry, in real-world contexts provides a means of building understanding of these concepts and is a powerful tool for solving problems related to the physical world in which we live.**
Standard	**Use congruence and similarity criteria for triangles to solve problems in real-world contexts.**
Alternate Achievement Standard	**M.G.AAS.10.36: Use geometric shapes to describe real-world objects.**
Assessment Limits/Content Constraints	Limit to three-dimensional objects.
DOK(s)	1 or 2
Item Type(s)	MC
Sample Item Stem(s)	Here is a picture of a metal can. Which shape best describes the metal can?