

Alabama Comprehensive Assessment Program (ACAP)

Summative

Item Specifications

Mathematics

Grade 5

Alabama Item Specifications

Grade 5 Mathematics

Alabama Comprehensive Assessment Program (ACAP) Summative

The *Alabama Comprehensive Assessment Program (ACAP) Summative* item specifications are based on the development of summative assessments that measure the Alabama Course of Study Standards. The item specifications define the purpose of the *ACAP Summative* 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 Course of Study 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:

- Evidence statements
- Content limits/constraints
- Recommended Webb’s Depth of Knowledge (DOK) or cognitive levels
- Calculator usage
- Item types for measuring a given standard
- Information regarding whether or not context is allowable
- 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 students should know and be able to do at a given grade level. The goal is to prepare students for future opportunities and options in the workplace and for everyday life. Through the implementation of the Alabama Course of Study for Mathematics, students will be well equipped for the workforce upon graduation or ready to pursue higher levels of education in Alabama’s colleges and universities.

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.

Clusters: Clusters are groups of related content standards. Because mathematics is a connected subject, standards from different clusters 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. The standard text in the item specification is preceded by a standard identifier (e.g., 4.OA.1) to indicate the student grade level as fourth (4), the Alabama content area as Operations and Algebraic Thinking (OA), and the standard number as one (1).

Evidence Statements: Evidence statements are closely aligned to the standard and do not deviate from the requirements of the standard. Standards that are substantial in content do provide for a better opportunity to “unpack the standard,” which is the case for many of the Alabama Course of Study Standards. The evidence statements serve that purpose.

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. Most recently, Webb’s 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. Webb’s Depth of Knowledge includes four levels, from the lowest (basic recall) to the highest (extended thinking). The mathematics *ACAP Summative* 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 Summative* 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) Summative* assessments are composed of various item types. These item types are described below.

Multiple-Choice (MC) Items: MC items have four answer choices, including three 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 Summative*.

Multiple-Select (MS) Items: MS items are similar in structure to MC items. However, unlike an MC item, an MS item has more than four options and more than one correct answer. In other words, multiple responses are required for a given item. For mathematics, there are two types of MS configurations. One has five answer options, two of which are correct, and the other has six answer options, two or three of which are correct. Directions for the number of options to select are provided with each item. A correct response to an MS item is worth one score point in the mathematics *ACAP Summative*.

Short-Answer (SA) Items: SA items are constructed-response items that require a keyed response from the student. The number of characters is limited to a relatively small number in order to facilitate autoscoring. The types of characters allowed can also be limited to text only, numbers only, or a mix. In the mathematics *ACAP Summative*, this item type is autoscored using scoring guidelines for the correct answer. A correct response to an SA item is worth one score point in the mathematics *ACAP Summative*.

Technology-Enhanced (TE) Items: TE items share the same functional structure as traditional paper-and-pencil test items; however, the expansive features and functions of a computer-based medium allow for the incorporation of technical enhancements into traditional elements of a test item, such as the stem, the stimulus (if any), the response area, or a combination of all three. These items require the use of one or more tools. A correct response to a TE item is worth one score point in the mathematics *ACAP Summative*. Mathematics TE items include, but are not limited to, the following:

- **Angle Draw Input:** These TE items provide a student with a given ray, and then the student completes the angle by drawing a second ray.
- **Drag-and-Drop Input:** These TE items provide a student with draggable entities that can be configured to be used once or multiple times.
- **Drop-Down List Input:** These TE items allow a student to select elements in drop-down lists that can be embedded within text or tables.
- **Hot Spot:** These TE items allow for an image to be highlighted or replaced with another image when selected by the student.
- **Line Plot Input:** These TE items provide another way for a student to graphically represent data when the structure is provided. Certain labeling on the line plot can be done by the student.
- **Matching:** These TE items allow for the use of text or graphics as the matching objects. The student selects one object and then selects a second object to connect them.
- **Matching Table:** These TE items include a table with multiple rows and columns, and the student makes matches between the given elements in the rows and columns. The table can be customized to allow for only a single selection in a row or column or for multiple selections within each.
- **Number Line Input:** These TE items allow a student to create a number line graph that might involve plotting points only or points and lines. Both closed and open points are available, as well as line segments and rays.

Standards for Mathematical Practice

The Standards for Mathematical Practice are based on important “processes and proficiencies” that have longstanding importance in mathematics education. The first of these are the National Council of Teachers of Mathematics (NCTM) process standards of problem-solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up: Helping Children Learn Mathematics*. These proficiencies include adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations, and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently, and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy). Because these practices are an important part of the curriculum, they will be assessed throughout the mathematics *ACAP Summative*. The eight Standards for Mathematical Practice are listed below, but more detail is provided in the Alabama Course of Study for Mathematics.

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Mathematics Reference Sheets

An online reference sheet is available as a pop-up window in certain grades.

Grade	Conversions	Formulas
2	No	No
3	No	No
4	Yes	Yes
5	Yes	Yes
6	Yes	Yes
7	Yes	Yes
8	Yes	Yes

Item Specifications for Mathematics

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 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 item specifications are based on the 2019 Alabama Course of Study Standards for Mathematics.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	OA: Operations and Algebraic Thinking
Cluster	Write and interpret numerical expressions.
Standard (2019 AL COS)	5.OA.1: 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	Expressions have depth no greater than two (e.g., $3 \times [5 + (8 \div 2)]$ is acceptable but $3 \times [5 + (8 \div \{4 \times 2\})]$ is not).
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given an expression that includes grouping symbols, evaluate the expression.</p> <p>Given a simple expression written in words, identify the expression written numerically.</p> <p>Given two expressions with common parts, identify the relationship between the expressions.</p>

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	OA: Operations and Algebraic Thinking
Cluster	Analyze patterns and relationships.
Standard (2019 AL COS)	5.OA.2a: 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.
Evidence Statements	The student will use data from an input/output table to identify apparent relationships between corresponding terms.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given two patterns each represented in an input/output table, identify a relationship between corresponding terms.</p> <p>Given two patterns each represented in an input/output table, identify the rule for each pattern.</p> <p>Given two patterns each represented in an input/output table, identify missing terms.</p>

**Alabama Comprehensive Assessment Program – Summative
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Content Area	OA: Operations and Algebraic Thinking
Cluster	Analyze patterns and relationships.
Standard (2019 AL COS)	5.OA.2b: Generate two numerical patterns using two given rules and complete an input/output table for the data. b. Form ordered pairs from values in an input/output table.
Evidence Statements	The student will form ordered pairs from values in an input/output table.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given two patterns each represented in an input/output table, create ordered pairs of values.

**Alabama Comprehensive Assessment Program – Summative
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Content Area	OA: Operations and Algebraic Thinking
Cluster	Analyze patterns and relationships.
Standard (2019 AL COS)	5.OA.2c: Generate two numerical patterns using two given rules and complete an input/output table for the data. c. Graph ordered pairs from an input/output table on a coordinate plane.
Evidence Statements	The student will graph ordered pairs from an input/output table on a coordinate plane.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given two patterns each represented in an input/output table, graph the ordered pairs on a coordinate plane.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Understand the place value system.
Standard (2019 AL COS)	5.NBT.3a: Using models and quantitative reasoning, explain that in a multi-digit number, including decimals, a digit in any place represents ten times what it represents in the place to its right and 1/10 of what it represents in the place to its left. a. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, using whole-number exponents to denote powers of 10.
Evidence Statements	The student will explain patterns in the number of zeros of the product when multiplying a number by powers of 10, using whole-number exponents to denote powers of 10.
Assessment Limits / Content Constraints	Tasks have “thin context” or no context. Tasks involve patterns in the number of zeros in a substantial way.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a number (including decimals) and a power of 10, identify a model or explanation that shows patterns in the number of zeros of their product.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Understand the place value system.
Standard (2019 AL COS)	5.NBT.3b: Using models and quantitative reasoning, explain that in a multi-digit number, including decimals, a digit in any place represents ten times what it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left. b. Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10, using whole-number exponents to denote powers of 10.
Evidence Statements	The student will explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10, using whole-number exponents to denote powers of 10.
Assessment Limits / Content Constraints	Tasks have “thin context” or no context. Tasks involve patterns in the placement of the decimal point in a substantial way.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a decimal and a power of 10, identify a model or explanation that shows patterns in the placement of the decimal point of their product or quotient.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Understand the place value system.
Standard (2019 AL COS)	5.NBT.4a: Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. <i>Example:</i> $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
Evidence Statements	The student will read and write decimals to thousandths using base-ten numerals, number names, and expanded form.
Assessment Limits / Content Constraints	Tasks have “thin context” or no context. Tasks assess conceptual understanding (e.g., by including a mixture [both within and between items] of expanded form, number names, and base-ten numerals). The vocabulary of the item should match the vocabulary of the standard (e.g., base-ten numerals, number names, and expanded form).
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a number in one form (words, standard numeral, expanded form), identify the number in another form.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Understand the place value system.
Standard (2019 AL COS)	5.NBT.4b: Read, write, and compare decimals to thousandths. b. Compare two decimals to thousandths based on the meaning of the digits in each place, using $>$, $=$, and $<$ to record the results of comparisons.
Evidence Statements	The student will compare two decimals to thousandths based on the meaning of the digits in each place, using $>$, $=$, and $<$ to record the results of comparisons.
Assessment Limits / Content Constraints	Tasks have “thin context” or no context. Tasks assess conceptual understanding (e.g., by including a mixture [both within and between items] of expanded form, number names, and base-ten numerals).
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given a decimal to the thousandths, identify the place value of a digit.</p> <p>Given a list of decimal inequalities, identify the correct comparison. Numbers should go to the thousandths.</p> <p>Given a decimal, identify a decimal that is greater (or less) than the given number. At least one of the numbers must be to the thousandths.</p>

**Alabama Comprehensive Assessment Program – Summative
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Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Understand the place value system.
Standard (2019 AL COS)	5.NBT.5: Use place value understanding to round decimals to thousandths.
Evidence Statements	The student will use place value understanding to round decimals to thousandths.
Assessment Limits / Content Constraints	Tasks have “thin context” or no context.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given a decimal, round the decimal to a specified place value.</p> <p>Given a decimal that is rounded to a specified place value, identify a number that could have resulted in that rounding.</p>

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Perform operations with multi-digit whole numbers and decimals to hundredths.
Standard (2019 AL COS)	5.NBT.6: Fluently multiply multi-digit whole numbers using the standard algorithm.
Evidence Statements	The student will fluently multiply multi-digit whole numbers using the standard algorithm.
Assessment Limits / Content Constraints	<p>Tasks assess accuracy. The given factors are such as to require an efficient/standard algorithm (e.g., 26×4871).</p> <p>Factors in the task do not suggest any obvious ad hoc or mental strategy (as would be present in a case such as 7250×40).</p> <p>Tasks do not have a context.</p> <p>For purposes of assessment, the possibilities are 1-digit \times 2-digit, 1-digit \times 3-digit, 2-digit \times 3-digit, or 2-digit \times 4-digit.</p>
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	Given two multi-digit whole numbers, find the product of the numbers.

**Alabama Comprehensive Assessment Program – Summative
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Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Perform operations with multi-digit whole numbers and decimals to hundredths.
Standard (2019 AL COS)	5.NBT.7: Use strategies based on place value, properties of operations, and/or the relationship between multiplication and division to find whole-number quotients and remainders with up to four-digit dividends and two-digit divisors. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Evidence Statements	<p>The student will use strategies based on place value, properties of operations, and/or the relationship between multiplication and division to find whole-number quotients and remainders with up to four-digit dividends and two-digit divisors.</p> <p>The student will use equations, rectangular arrays, and/or area models to illustrate and explain calculations.</p>
Assessment Limits / Content Constraints	Tasks involve 3- or 4-digit dividends and one- or two-digit divisors.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given two multi-digit whole numbers, find the quotient of one number divided by the other.</p> <p>Given two multi-digit whole numbers, identify equation(s), array(s), and/or area model(s) that illustrate the quotient of one number divided by the other.</p>

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Perform operations with multi-digit whole numbers and decimals to hundredths.
Standard (2019 AL COS)	5.NBT.8a: 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.
Evidence Statements	The student will use concrete models and drawings to solve problems with decimals to hundredths.
Assessment Limits / Content Constraints	<p>Tasks do not have a context.</p> <p>Each addend is greater than or equal to 0.01 and less than or equal to 99.99.</p> <p>The subtrahend and minuend are each greater than or equal to 0.01 and less than or equal to 99.99. Positive differences only.</p> <p>Each factor is greater than or equal to 0.01 and less than or equal to 99.99. The product must not have any nonzero digits beyond the thousandths place.</p> <p>Divisors are of the form XY, $X0$, X, $X.Y$, $0.XY$, $0.X$, or $0.0X$, where X and Y represent nonzero digits. Dividends are of the form XY, $X0$, X, $XYZ.W$, $XY0.Z$, $X00.Y$, $XY.Z$, $X0.Y$, $X.YZ$, $X.Y$, $X.0Y$, $0.XY$, or $0.0X$, where X, Y, Z, and W represent nonzero digits.</p> <p>Quotients are either whole numbers or decimals terminating at the tenths or hundredths place.</p>
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	<p>Given two decimals, find the sum, difference, product, or quotient of the decimals.</p> <p>Given two decimals, identify a concrete model or drawing that illustrates the sum, difference, product, or quotient of the decimals.</p>

**Alabama Comprehensive Assessment Program – Summative
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Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Perform operations with multi-digit whole numbers and decimals to hundredths.
Standard (2019 AL COS)	5.NBT.8b: 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. b. Solve problems in a real-world context with decimals to hundredths.
Evidence Statements	The student will solve problems in a real-world context with decimals to hundredths.
Assessment Limits / Content Constraints	<p>Each addend is greater than or equal to 0.01 and less than or equal to 99.99.</p> <p>The subtrahend and minuend are each greater than or equal to 0.01 and less than or equal to 99.99. Positive differences only.</p> <p>Each factor is greater than or equal to 0.01 and less than or equal to 99.99. The product must not have any nonzero digits beyond the thousandths place.</p> <p>Divisors are of the form XY, $X0$, X, $X.Y$, $0.XY$, $0.X$, or $0.0X$, where X and Y represent nonzero digits. Dividends are of the form XY, $X0$, X, $XYZ.W$, $XY0.Z$, $X00.Y$, $XY.Z$, $X0.Y$, $X.YZ$, $X.Y$, $X.0Y$, $0.XY$, or $0.0X$, where X, Y, Z, and W represent nonzero digits.</p> <p>Quotients are either whole numbers or decimals terminating at the tenths or hundredths place.</p>
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	

Content Area	NF: Operations with Numbers: Fractions
Cluster	Use equivalent fractions as a strategy to add and subtract fractions.
Standard (2019 AL COS)	5.NF.9: Model and solve real-world 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. <i>Example: Recognize an incorrect result $2/5 + 1/2 = 3/7$ by observing that $3/7 < 1/2$.</i>
Evidence Statements	<p>The student will model and solve real-world 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.</p> <p>The student will use benchmark fractions and number sense of fractions to estimate mentally, and assess the reasonableness of answers.</p>
Assessment Limits / Content Constraints	Tasks may involve fractions greater than one, including mixed numbers.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given a context with two fractions or mixed numbers, find the sum or difference of the numbers.</p> <p>Given a context with two fractions or mixed numbers, identify visual fraction model(s) and/or equation(s) that represent the problem.</p> <p>Given a context with two fractions or mixed numbers (including one benchmark fraction), identify reasonable and unreasonable estimations of the sum or difference of the numbers.</p>

**Alabama Comprehensive Assessment Program – Summative
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Content Area	NF: Operations with Numbers: Fractions
Cluster	Use equivalent fractions as a strategy to add and subtract fractions.
Standard (2019 AL COS)	5.NF.10: Add and subtract fractions and mixed numbers with unlike denominators, using fraction equivalence to calculate a sum or difference of fractions or mixed numbers with like denominators.
Evidence Statements	The student will add and subtract fractions and mixed numbers with unlike denominators, using fraction equivalence to calculate a sum or difference of fractions or mixed numbers with like denominators.
Assessment Limits / Content Constraints	<p>Tasks have no context.</p> <p>Tasks ask for the answer or ask for an intermediate step that shows evidence of using equivalent fractions as a strategy.</p> <p>Tasks may involve fractions greater than 1 (including fractions equal to whole numbers).</p> <p>Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy.</p>
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Not Allowable
Sample Stem Information (as applicable)	<p>Given two fractions or mixed numbers, find the sum of the numbers.</p> <p>Given two fractions or mixed numbers, find the difference of the numbers.</p>

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.11a: 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 ($a/b = a \div b$)
Evidence Statements	The student will model and interpret a fraction as division of the numerator by the denominator.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a word problem involving division of whole numbers leading to answers in the form of fractions or mixed numbers, identify the solution that models the fraction as a division expression.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.11b: Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a word problem involving division of whole numbers leading to answers in the form of fractions or mixed numbers, identify visual fraction model(s), drawing(s), and/or equation(s) that represent the problem.

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Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.12a: 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 $(a/b) \times q$ and create a story context for this equation to interpret the product as a parts of a partition of q into b equal parts.
Evidence Statements	The student will use a visual fraction model to show $(a/b) \times q$ and create a story context for this equation to interpret the product as a parts of a partition of q into b equal parts.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a fraction and a whole number, identify a visual fraction model that represents the product of the numbers. Given a fraction and a whole number, identify a story context that represents the product of the numbers.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.12b: Apply and extend previous understandings of multiplication to find the product of a fraction times a whole number or a fraction times a fraction. b. Use a visual fraction model (area model, set model, or linear model) to show $(a/b) \times (c/d)$ and create a story context for this equation to interpret the product.
Evidence Statements	The student will use a visual fraction model (area model, set model, or linear model) to show $(a/b) \times (c/d)$ and create a story context for this equation to interpret the product.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given two fractions, identify a visual fraction model that represents the product of the numbers. Given two fractions, identify a story context that represents the product of the numbers.

**Alabama Comprehensive Assessment Program – Summative
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Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.12c: Apply and extend previous understandings of multiplication to find the product of a fraction times a whole number or a fraction times a fraction. c. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
Evidence Statements	The student will multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a rectangle with fractional edge lengths, find the area of the rectangle.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.12d: Apply and extend previous understandings of multiplication to find the product of a fraction times a whole number or a fraction times a fraction. 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.13a: Interpret multiplication as scaling (resizing). a. Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. <i>Example: Use reasoning to determine which expression is greater. 225 or $\frac{3}{4} \times 225$; $\frac{11}{50}$ or $\frac{3}{2} \times \frac{11}{50}$</i>
Evidence Statements	The student will compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
Assessment Limits / Content Constraints	Insofar as possible, tasks are designed to be completed without performing the indicated multiplication. Products involve at least one factor that is a fraction or mixed number.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given two numbers, explain how the product compares to one of the factors based on the other factor being greater (or less) than 1. Given a number, identify another number that can be multiplied to create a product that is greater (or less) than the given number.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.13b: Interpret multiplication as scaling (resizing). b. Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and relate the principle of fraction equivalence.
Evidence Statements	The student will explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and relate the principle of fraction equivalence.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given two numbers, explain how the product compares to one of the factors based on the other factor being greater than 1.</p> <p>Given a number, identify another number that can be multiplied to create a product that is greater than the given number.</p>

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.13c: Interpret multiplication as scaling (resizing). c. Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number and relate the principle of fraction equivalence.
Evidence Statements	The student will explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number and relate the principle of fraction equivalence.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given two numbers, explain how the product compares to one of the factors based on the other factor being less than 1.</p> <p>Given a number, identify another number that can be multiplied to create a product that is less than the given number.</p>

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.14: Model and solve real-world problems involving multiplication of fractions and mixed numbers using visual fraction models, drawings, or equations to represent the problem.
Evidence Statements	The student will model and solve real-world problems involving multiplication of fractions and mixed numbers using visual fraction models, drawings, or equations to represent the problem.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a real-world context involving two fractions or mixed numbers, identify visual fraction model(s), drawing(s), and/or equation(s) that represent the problem.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.15a: 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	Tasks involve equal group (partition) situations with part size unknown and number of parts unknown.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a real-world context involving division of unit fractions by whole numbers or whole numbers by unit fractions, solve the problem. Given a real-world context involving division of unit fractions by whole numbers or whole numbers by unit fractions, identify visual fraction model(s), drawing(s), and/or equation(s) that represent the problem.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.15b: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. b. Create a story context for a unit fraction divided by a whole number, and use a visual fraction model to show the quotient.
Evidence Statements	The student will create a story context for a unit fraction divided by a whole number, and use a visual fraction model to show the quotient.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given the division of a unit fraction by a whole number, identify a story context for the situation. Given the division of a unit fraction by a whole number, identify a visual fraction model that represents the quotient.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	NF: Operations with Numbers: Fractions
Cluster	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Standard (2019 AL COS)	5.NF.15c: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. c. Create a story context for a whole number divided by a unit fraction, and use a visual fraction model to show the quotient.
Evidence Statements	The student will create a story context for a whole number divided by a unit fraction, and use a visual fraction model to show the quotient.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given the division of a whole number by a unit fraction, identify a story context for the situation. Given the division of a whole number by a unit fraction, identify a visual fraction model that represents the quotient.

Content Area	DA: Data Analysis
Cluster	Represent and interpret data.
Standard (2019 AL COS)	5.DA.16a: Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). a. Add, subtract, multiply, and divide fractions to solve problems involving information presented in line plots. <i>Note: Division is limited to unit fractions by whole numbers and whole numbers by unit fractions.</i>
Evidence Statements	The student will make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). The student will add, subtract, multiply, and divide fractions to solve problems involving information presented in line plots.
Assessment Limits / Content Constraints	Tasks requiring students to produce a line plot should only involve the fractions $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$. Division is limited to unit fractions by whole numbers and whole numbers by unit fractions.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a data set, identify a line plot representing the data. Given a line plot, find the total of the data in the data set.

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	M: Measurement
Cluster	Convert like measurement units within a given measurement system.
Standard (2019 AL COS)	5.M.17: Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real-world problems.
Evidence Statements	The student will convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real-world problems.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given a measurement in one unit, convert the measurement to a different unit.</p> <p>Given a multi-step, real-world problem that includes measurement conversion within one system, solve the problem.</p>

**Alabama Comprehensive Assessment Program – Summative
2023 Item Specifications**

Content Area	M: Measurement
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard (2019 AL COS)	5.M.18a: 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.
Evidence Statements	<p>The student will 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.</p> <p>The student will pack a solid figure without gaps or overlaps using n unit cubes to demonstrate volume as n cubic units.</p>
Assessment Limits / Content Constraints	Tasks assess conceptual understanding of volume as applied to a specific situation—not applying a volume formula.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given a rectangular prism partitioned with unit cubes, find the volume of the prism.</p> <p>Given a description of a solid figure being packed with n unit cubes, identify the volume of the solid figure as n cubic units.</p>

Content Area	M: Measurement
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard (2019 AL COS)	5.M.19a: 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	

Content Area	M: Measurement
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard (2019 AL COS)	5.M.19b: Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume. 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	Tasks are with and without contexts. Tasks may require students to measure to find edge lengths to the nearest cm, mm, or in.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given the dimensions of a rectangular prism in a real-world or mathematical problem, find the volume of the prism. Dimensions can be given in words or in a graphic.

Content Area	M: Measurement
Cluster	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
Standard (2019 AL COS)	5.M.19c: Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume. 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.
Evidence Statements	The student will find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the two parts and apply this technique to solve real-world problems.
Assessment Limits / Content Constraints	Tasks require students to solve a contextual problem by applying the indicated concepts and skills.
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given a solid figure made up of rectangular prisms, find the volume of the figure.

Content Area	G: Geometry
Cluster	Graph points on the coordinate plane to solve real-world and mathematical problems.
Standard (2019 AL COS)	5.G.20: Graph points in the first quadrant of the coordinate plane, and interpret coordinate values of points to represent real-world and mathematical problems.
Evidence Statements	The student will graph points in the first quadrant of the coordinate plane, and interpret coordinate values of points to represent real-world and mathematical problems.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given a context involving a point on a coordinate grid, identify the coordinates of the point.</p> <p>Given a context involving the coordinates of a point, identify the point on a coordinate grid.</p> <p>Given a context involving the coordinates of a point, identify the meaning of the point in the context.</p>

Content Area	G: Geometry
Cluster	Classify two-dimensional figures into categories based on their properties.
Standard (2019 AL COS)	5.G.21: Classify triangles according to side length (isosceles, equilateral, scalene) and angle measure (acute, obtuse, right, equiangular).
Evidence Statements	The student will classify triangles according to side length (isosceles, equilateral, scalene) and angle measure (acute, obtuse, right, equiangular).
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	

**Alabama Comprehensive Assessment Program – Summative
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Content Area	G: Geometry
Cluster	Classify two-dimensional figures into categories based on their properties.
Standard (2019 AL COS)	5.G.22: Classify quadrilaterals in a hierarchy based on properties.
Evidence Statements	The student will classify quadrilaterals in a hierarchy based on properties.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	<p>Given a list of quadrilaterals, identify the quadrilaterals that belong to the same hierarchical category.</p> <p>Given a list of quadrilaterals, identify the hierarchical category that describes all the given quadrilaterals.</p> <p>Given a list of statements about quadrilaterals, identify the true statement.</p>

Content Area	G: Geometry
Cluster	Classify two-dimensional figures into categories based on their properties.
Standard (2019 AL COS)	5.G.23: Explain that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. <i>Example: All rectangles have four right angles, and squares have four right angles, so squares are rectangles.</i>
Evidence Statements	The student will explain that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.
Assessment Limits / Content Constraints	
DOK(s)	1, 2, or 3
Calculator	NO – a calculator will not be available for items
Item Type(s)	MC, MS, SA, TE
Context	Allowable
Sample Stem Information (as applicable)	Given two shapes, identify common attributes of the shapes. Given a list of statements about a shape, identify the true statement.

Appendix A: Sample Items

Sample Items

Appendix A: Sample Items

Sample Item 1

What is the value of $(3 \times 10) + (4 \times 6)$?

- a. 23
- b. 54
- c. 204
- d. 720

Item Information		Option Annotations
Item Type	Multiple Choice	A. The student adds all the values. B. Correct C. The student evaluates from left to right. D. The student multiplies both quantities instead of adding.
Page Reference	9	
Alignment	5.OA.1	
Depth of Knowledge	2	
Answer Key	B	

Appendix A: Sample Items

Sample Item 2

Sarah and Mike are making stress balls out of balloons and sand. Sarah starts making stress balls before Mike and has already made 2 stress balls when Mike starts. The table shows the total number of stress balls each person has made after each minute once Mike starts.

Making Stress Balls

Minutes Since Mike Started	0	1	2	3	4
Stress Balls Made by Sarah	2	4	6	8	10
Stress Balls Made by Mike	0	3	6	9	12

Which statement is correct?

- a. Mike makes one more stress ball than Sarah every minute.
- b. Mike makes twice as many stress balls as Sarah every minute.
- c. Sarah and Mike make the same number of stress balls every minute.
- d. Five minutes after Mike started, Sarah has made more stress balls than Mike has made.

Item Information		Option Annotations
Item Type	Multiple Choice	<p>A. Correct</p> <p>B. The student incorrectly compares the rates and only notices that Mike makes more, equating that to twice as much.</p> <p>C. The student only considers one data point instead of the rates.</p> <p>D. The student does not recognize that Mike has a faster rate, so we will always have more made after the second minute.</p>
Page Reference	10	
Alignment	5.OA.2a	
Depth of Knowledge	3	
Answer Key	A	



Appendix A: Sample Items

Sample Item 3

A table of inputs and outputs is shown.

Input	Output
2	8
4	17
6	26
8	35
10	44

Which ordered pair also could be in the table?

- (a) (12, 48)
- (b) (14, 53)
- (c) (16, 68)
- (d) (18, 80)

Item Information		Option Annotations
Item Type	Multiple Choice	A. The student thinks the input is multiplied by 4 to find the output. B. The student adds 4 to the last input instead of adding 2. C. The student multiplies the ordered pair (4, 17) by 4. D. Correct
Page Reference	11	
Alignment	5.OA.2b	
Depth of Knowledge	2	
Answer Key	D	

Appendix A: Sample Items

Sample Item 4

Nia and Olivia each make a number pattern. The first four terms in each of their number patterns are shown in the table.

Term	Nia's Pattern	Olivia's Pattern
1	3	10
2	5	8
3	7	6
4	9	4

Nia graphs the four points shown on the coordinate plane to represent the first four ordered pairs in her number pattern. Plot four points to represent the first four ordered pairs in Olivia's number pattern.

Item Information		Answer Key(s) Description
Item Type	Technology Enhanced	Points plotted at (1, 10), (2, 8), (3, 6), and (4, 4)
Page Reference	12	
Alignment	5.OA.2c	
Depth of Knowledge	2	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 5

Which statement about 7.8×10^4 is true?

- Ⓐ The product is 78,000 because the power of 4 means the place values of 7.8 increase by 4 places.
- Ⓑ The product is 78,000 because the power of 4 means that there are always 3 zeros in the product.
- Ⓒ The product is 780,000 because the power of 4 means the place values of 7.8 increase by 4 places.
- Ⓓ The product is 780,000 because the power of 4 means that there are always 4 zeros in the product.

Item Information		Option Annotations
Item Type	Multiple Choice	<p>A. Correct</p> <p>B. The student finds the correct product but incorrectly explains how the pattern is shown in the number of zeros.</p> <p>C. The student explains the change in place value but incorrectly finds the product.</p> <p>D. The student incorrectly explains the pattern of zeros and incorrectly finds the product.</p>
Page Reference	13	
Alignment	5.NBT.3a	
Depth of Knowledge	2	
Answer Key	A	

Appendix A: Sample Items

Sample Item 6

What is 682.301 written in expanded form?

Ⓐ $(6 \times 100) + (8 \times 10) + (2 \times 1) + \left(3 \times \frac{1}{10}\right) + \left(1 \times \frac{1}{100}\right)$

Ⓑ $(6 \times 100) + (8 \times 10) + (2 \times 1) + (3 \times 10) + (1 \times 1,000)$

Ⓒ $(6 \times 100) + (8 \times 10) + (2 \times 1) + \left(3 \times \frac{1}{10}\right) + \left(1 \times \frac{1}{1,000}\right)$

Ⓓ $(6 \times 100,000) + (8 \times 10,000) + (2 \times 1,000) + (3 \times 100) + (1 \times 1)$

Item Information		Option Annotations
Item Type	Multiple Choice	A. The student confuses hundredths and thousandths. B. The student uses tens instead of tenths and thousands instead of thousandths. C. Correct D. The student confuses the placement of the decimal point.
Page Reference	15	
Alignment	5.NBT.4a	
Depth of Knowledge	1	
Answer Key	C	

Appendix A: Sample Items

Sample Item 7

Which number, when rounded to the nearest hundredth, is equal to 682.75?

- a. 682.0745
- b. 682.705
- c. 682.751
- d. 682.7555

Item Information		Option Annotations
Item Type	Multiple Choice	<p>A. The student confuses the hundredths place with the thousandths place.</p> <p>B. The student thinks the 5 in the thousandths place causes the hundredths place to round to 5.</p> <p>C. Correct</p> <p>D. The student thinks the 5s in the thousandths and hundred thousandths places have no effect on the hundredths place.</p>
Page Reference	17	
Alignment	5.NBT.5	
Depth of Knowledge	1	
Answer Key	C	

Appendix A: Sample Items

Sample Item 8

Divide.

$$1,127 \div 23$$

a. 44
 b. 49
 c. 51
 d. 56

Item Information		Option Annotations
Item Type	Multiple Choice	A. The student incorrectly regroups when dividing by the ones place. B. Correct C. The student incorrectly divides in the tens place and regroups incorrectly. D. The student incorrectly divides in the tens place and ones place and regroups incorrectly.
Page Reference	19	
Alignment	5.NBT.7	
Depth of Knowledge	1	
Answer Key	B	

Appendix A: Sample Items

Sample Item 9


Which fraction model represents the expression $\frac{2}{3} \times \frac{1}{5}$?

Item Information		Option Annotations
Item Type	Multiple Choice	A. Correct B. The student represents $\frac{2}{3}$ and $\frac{1}{5}$ correctly but only shades a single overlapping square. C. The student represents $\frac{2}{5}$ and $\frac{1}{3}$. D. The student represents $\frac{2}{5}$ and $\frac{1}{3}$ and only shades a single overlapping square.
Page Reference	27	
Alignment	5.NF.12b	
Depth of Knowledge	1	
Answer Key	A	

Appendix A: Sample Items

Sample Item 10

A recipe for a batch of cupcakes calls for $2\frac{1}{2}$ cups of flour. A baker uses the recipe to make $2\frac{1}{2}$ batches of cupcakes. How many cups of flour, in total, does the baker use?

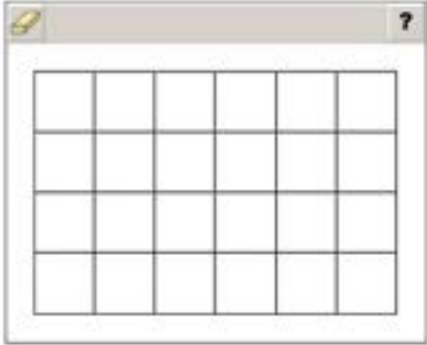


Item Information		Answer Key(s) Description
Item Type	Short Answer	$6\frac{1}{4}$ (or equivalent)
Page Reference	33	
Alignment	5.NF.14	
Depth of Knowledge	2	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 11

Mama hikes $\frac{1}{3}$ of the way up the side of a mountain in 4 hours. The large rectangle represents the side of the mountain. Select squares in the rectangle to show the fraction of the side of the mountain Mama can hike up in 1 hour if she hikes at the same pace.



Item Information		Answer Key(s) Description
Item Type	Technology Enhanced	Any 2 squares selected.
Page Reference	35	
Alignment	5.NF.15b	
Depth of Knowledge	3	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 12

Hector is practicing juggling. He records the lengths of time he juggles without dropping anything for 7 attempts. His times, rounded to the nearest $\frac{1}{4}$ of a minute, are shown in the line plot.

Hector's Juggling Times

Minutes

What is the total length of time, in minutes, Hector juggled for his 2 longest attempts?

← → ↶ ↷ ✖ ?

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Item Information		Answer Key(s) Description
Item Type	Short Answer	$3\frac{1}{4}$ (or equivalent)
Page Reference	37	
Alignment	5.DA.16a	
Depth of Knowledge	2	
Answer Key	(see description)	



Appendix A: Sample Items

Sample Item 13

Select the **two** measurements that are equivalent to 5 meters.

- a. 0.005 kilometers
- b. 0.05 decameters
- c. 50 centimeters
- d. 500 decimeters
- e. 5,000 millimeters

Item Information		Option Annotations
Item Type	Multiple Select	A. Correct B. The student divides the length by 100 instead of 10. C. The student multiplies the length by 10 instead of 100. D. The student multiplies the length by 100 instead of 10. E. Correct
Page Reference	38	
Alignment	5.M.17	
Depth of Knowledge	2	
Answer Key	A, E	

Appendix A: Sample Items

Sample Item 14

Carter built a storage bin in the shape of a rectangular prism for his baseball equipment. The bin is 6 feet long and 3 feet wide and has a total volume of 90 cubic feet. What is the height, in feet, of the storage bin?

Ⓐ 5
Ⓑ 9
Ⓒ 15
Ⓓ 18


Item Information		Option Annotations
Item Type	Multiple Choice	A. Correct B. The student adds the given dimensions. C. The student divides 90 by 6. D. The student multiplies the given dimensions.
Page Reference	41	
Alignment	5.M.19b	
Depth of Knowledge	2	
Answer Key	A	



Appendix A: Sample Items

Sample Item 15

A right rectangular prism has a base area of 20 square inches and a height of 8 inches. What is the volume, in cubic inches, of the right rectangular prism?

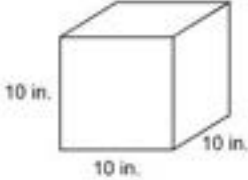


Item Information		Answer Key(s) Description
Item Type	Short Answer	160 (or equivalent)
Page Reference	41	
Alignment	5.M.19b	
Depth of Knowledge	1	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 16

Wyatt has 2 cubes that he stacks side by side to make a large storage container. One of Wyatt's cubes is shown.



What is the total volume, in cubic inches, of the large storage container?

- a. 100
- b. 200
- c. 1,000
- d. 2,000

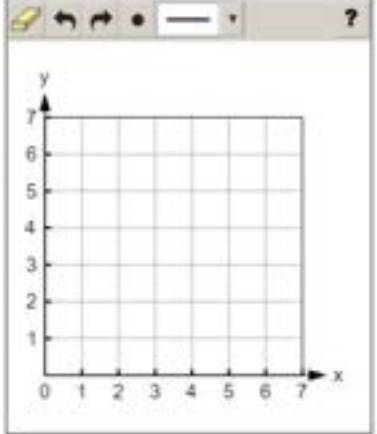
Item Information		Option Annotations
Item Type	Multiple Choice	A. The student finds the area of one face of the cube instead of the volume. B. The student finds the area of one face of the cube, and multiplies it by 2, since there are 2 cubes. C. The student finds the volume of the cube, but does not multiply it by 2. D. Correct
Page Reference	42	
Alignment	5.M.19c	
Depth of Knowledge	2	
Answer Key	D	

Appendix A: Sample Items

Sample Item 17

Nadine is going to draw a shape. She plans to plot points at (1, 2), (2, 5), (5, 5), and (6, 2). Once the points are plotted, she will connect the points with lines to form a polygon.

Plot Nadine's points on the coordinate grid. Then use the drop-down menu to complete the sentence.



Nadine's shape is a


- rectangle
- rhombus
- trapezoid
- triangle
- parallelogram

Item Information		Answer Key(s) Description
Item Type	Technology Enhanced	Figure plotted with vertices at the points given. Nadine's shape is a <u>trapezoid</u> .
Page Reference	43	
Alignment	5.G.20	
Depth of Knowledge	2	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 18

A triangle is shown.



Select the **two** words that correctly describe the triangle.

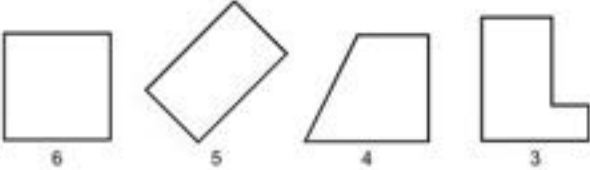
- (a) right
- (b) scalene
- (c) isosceles
- (d) equilateral
- (e) equiangular

Item Information		Option Annotations
Item Type	Multiple Select	A. Correct B. Correct C. The student thinks the triangle has two sides with equal lengths. D. The student thinks the triangle has all equal sides. E. The student thinks the triangle has all equal angles.
Page Reference	44	
Alignment	5.G.21	
Depth of Knowledge	1	
Answer Key	A, B	


Appendix A: Sample Items

Sample Item 19

Kerry has 18 tiles of four different shapes. The number below each shape shows how many of that tile Kerry has.



Kerry puts all the rectangular tiles inside an empty bucket. How many tiles does Kerry put inside the bucket?



Item Information		Answer Key(s) Description
Item Type	Short Answer	11 (or equivalent)
Page Reference	45	
Alignment	5.G.22	
Depth of Knowledge	1	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 20

Select the **three** statements that are true.

- a All trapezoids have four sides.
- b All quadrilaterals have four equal sides.
- c All squares have four equal sides.
- d All squares have four right angles.
- e All trapezoids have four right angles.
- f All quadrilaterals have four right angles.

Item Information		Option Annotations
Item Type	Multiple Select	A. Correct B. The student confuses quadrilaterals with the attributes of a rhombus. C. Correct D. Correct E. The student confuses trapezoids with the attributes of a rectangle. F. The student confuses quadrilaterals with the attributes of a rectangle.
Page Reference	46	
Alignment	5.G.23	
Depth of Knowledge	1	
Answer Key	A, C, D	