Alabama Comprehensive Assessment Program (ACAP)

Summative

Item Specifications

Mathematics

Grade 4

Alabama Item Specifications
Grade 4 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.

Content Area	OA: Operations and Algebraic Thinking
Cluster	Solve problems with whole numbers using the four operations.
Standard (2019 AL COS)	4.OA.1: Interpret and write equations for multiplicative comparisons.
Evidence Statements	The student will interpret and write equations for multiplicative comparisons.
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)	Given a multiplication equation, identify a verbal statement that represents the equation. Given a verbal statement, identify a multiplication equation that represents the verbal statement.

Content Area	OA: Operations and Algebraic Thinking
Cluster	Solve problems with whole numbers using the four operations.
Standard (2019 AL COS)	4.OA.2: Solve word problems involving multiplicative comparison using drawings and write equations to represent the problem, using a symbol for the unknown number.
Evidence Statements	The student will solve word problems involving multiplicative comparison using drawings and write equations to represent the problem, using a symbol for the unknown number.
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 context involving multiplication or division, solve the problem. Given a context involving multiplication or division, identify an equation that can be used to solve the problem.

Content Area	OA: Operations and Algebraic Thinking
Cluster	Solve problems with whole numbers using the four operations.
Standard (2019 AL COS)	4.OA.3a: 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.
Evidence Statements	The student will write equations to show solutions for multi-step word problems with a letter standing for the unknown quantity.
Assessment Limits / Content Constraints	Tasks could involve interpreting remainders.
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 context requiring multiple steps, solve the problem.

Content Area	OA: Operations and Algebraic Thinking
Cluster	Solve problems with whole numbers using the four operations.
Standard (2019 AL COS)	4.OA.3b: Determine and justify solutions for multi-step word problems, including problems where remainders must be interpreted. b. Determine reasonableness of answers for multi-step word problems, using mental computation and estimation strategies including rounding.
Evidence Statements	The student will determine reasonableness of answers for multi-step word problems, using mental computation and estimation strategies including rounding.
Assessment Limits / Content Constraints	Tasks could involve interpreting remainders.
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 context involving estimation, identify the best estimate for the solution.

Content Area	OA: Operations and Algebraic Thinking
Cluster	Gain familiarity with factors and multiples.
Standard (2019 AL COS)	4.OA.4a: For whole numbers in the range 1 to 100, find all factor pairs, identifying a number as a multiple of each of its factors. a. Determine whether a whole number in the range 1 to 100 is a multiple of a given one-digit number.
Evidence Statements	The student will determine whether a whole number in the range 1 to 100 is a multiple of a given one-digit number.
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)	Choose all factors or factor pairs of a given number. Identify multiples of a given number.

Content Area	OA: Operations and Algebraic Thinking
Cluster	Gain familiarity with factors and multiples.
Standard (2019 AL COS)	4.OA.4b: For whole numbers in the range 1 to 100, find all factor pairs, identifying a number as a multiple of each of its factors. b. Determine whether a whole number in the range 1 to 100 is prime or composite.
Evidence Statements	The student will determine whether a whole number in the range 1 to 100 is prime or composite.
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)	Choose a prime or composite number from a list.

Content Area	OA: Operations and Algebraic Thinking
Cluster	Generate and analyze patterns.
Standard (2019 AL COS)	4.OA.5: Generate and analyze a number or shape pattern that follows a given rule.
Evidence Statements	The student will generate and analyze a number or shape pattern that follows a given rule.
Assessment Limits / Content Constraints	Tasks do not require students to determine a rule; the rule is given.
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 pattern, identify a missing number or shape in the pattern. Given a rule, identify a pattern that fits the rule. Given a rule or pattern, identify a feature of the pattern.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard (2019 AL COS)	4.NBT.6: Using models and quantitative reasoning, explain that in a multi-digit whole number, a digit in any place represents ten times what it represents in the place to its right.
Evidence Statements	The student will explain that in a multi-digit whole number, a digit in any place represents ten times what it represents in the place to its right by using models and quantitative reasoning.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
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 multi-digit whole number, compare the values of digits in the numbers.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard (2019 AL COS)	4.NBT.7: Read and write multi-digit whole numbers using standard form, word form, and expanded form.
Evidence Statements	The student will read and write multi-digit whole numbers using standard form, word form, and expanded form.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000. Tasks assess conceptual understanding (e.g., by including a mixture of standard form, word form, and expanded form within items). The vocabulary of the item should match the vocabulary of the standard (e.g., standard form, word form, and expanded form). *Vocabulary in 2016 COS 4.NBT.7 is 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, identify the number in a different form.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard (2019 AL COS)	4.NBT.8: Use place value understanding to compare two multi-digit numbers using >, =, and < symbols.
Evidence Statements	The student will use place value understanding to compare two multi-digit numbers using >, =, and < symbols.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
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 numerical comparisons as answer options, identify the correct comparison. Given two numbers, identify the correct reasoning for how the numbers should be compared.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Generalize place value understanding for multi-digit whole numbers.
Standard (2019 AL COS)	4.NBT.9: Round multi-digit whole numbers to any place using place value understanding.
Evidence Statements	The student will round multi-digit whole numbers to any place using place value understanding.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
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 which was rounded to a specified place value, identify a number that rounds to the given number.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers.
Standard (2019 AL COS)	4.NBT.10: Use place value strategies to fluently add and subtract multi-digit whole numbers and connect strategies to the standard algorithm.
Evidence Statements	The student will use place value strategies to fluently add and subtract multi-digit whole numbers and connect strategies to the standard algorithm.
Assessment Limits / Content Constraints	Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000; for purposes of assessment, both of the given numbers should have at least 4 digits. The given addends are such as to require an efficient/standard algorithm (e.g., 7263 + 4875). Addends in the task do not suggest any obvious ad hoc or mental strategy (as would be present in a case such as 16,999 + 3,501). The given subtrahend and minuend are such as to require an efficient/standard algorithm (e.g., 7263 – 4875 or 7406 – 4637). The subtrahend and minuend do not suggest any obvious ad hoc or mental strategy (as would be present in a case such as 7300 – 6301). Tasks do not have a context.
DOK(s)	1
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 whole numbers, determine the sum or difference.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers.
Standard (2019 AL COS)	4.NBT.11a: Find the product of two factors (up to four digits by a one-digit number and two two-digit numbers), using strategies based on place value and the properties of operations. a. Illustrate and explain the product of two factors using equations, rectangular arrays, and area models.
Evidence Statements	The student will find the product of two factors (up to four digits by a one-digit number and two two-digit numbers), using strategies based on place value and the properties of operations. The student will illustrate and explain the product of two factors using equations, rectangular arrays, and area models.
Assessment Limits / Content Constraints	Tasks do not have a 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	Not Allowable
Sample Stem Information (as applicable)	Given two whole number factors, calculate the product. Given two whole number factors, select the equation(s), array(s), and/or area model(s) that represent the product.

Content Area	NBT: Operations with Numbers: Base Ten
Cluster	Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers.
Standard (2019 AL COS)	4.NBT.12a: 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 one-digit divisors and up to four-digit dividends. a. Illustrate and/or explain quotients using equations, rectangular arrays, and/or area models.
Evidence Statements	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 one-digit divisors and up to four-digit dividends. The student will illustrate and/or explain quotients using equations, rectangular arrays, and/or area models.
Assessment Limits / Content Constraints	Tasks do not have a 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	Not Allowable
Sample Stem Information (as applicable)	Given two whole numbers, calculate the quotient and/or remainder. Given two whole numbers, select the equation(s), array(s), and/or area model(s) that represent the quotient.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Extend understanding of fraction equivalence and ordering. *Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100.*
Standard (2019 AL COS)	4.NF.13a: Using area and length fraction models, explain why one fraction is equivalent to another, taking into account that the number and size of the parts differ even though the two fractions themselves are the same size. a. Apply principles of fraction equivalence to recognize and generate equivalent fractions. *Example: a/b is equivalent to (n × a)/(n × b).*
Evidence Statements	The student will explain why one fraction is equivalent to another, taking into account that the number and size of the parts differ even though the two fractions themselves are the same size using area and length fraction models. The student will apply principles of fraction equivalence to recognize and generate equivalent fractions.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Tasks may include fractions that equal whole numbers. Whole numbers are limited to 0 through 5.
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, identify an equivalent fraction. Given a fraction model, identify the number of parts of another fraction model that must be shaded to represent an equivalent fraction.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Extend understanding of fraction equivalence and ordering. *Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100.*
Standard (2019 AL COS)	4.NF.14a: Compare two fractions with different numerators and different denominators using concrete models, benchmarks (0, 1/2, 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.
Evidence Statements	The student will compare two fractions with different numerators and different denominators using concrete models, benchmarks (0, 1/2, 1), common denominators, and/or common numerators, recording the comparisons with symbols >, =, or <, and justifying the conclusions. The student will explain that comparison of two fractions is valid only when the two fractions refer to the same whole.
Assessment Limits / Content Constraints	Only the answer is required. Tasks require the student to choose the comparison strategy autonomously. Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Tasks may include fractions that equal whole numbers. Whole numbers are limited to 0 through 5.
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 comparisons as answer options, choose the correct comparison. Given a fraction, identify a fraction that is greater than (or less than) the given fraction.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard (2019 AL COS)	4.NF.15a: 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Only the answer is required. Tasks may include fractions that equal whole numbers. Whole numbers are limited to 0 through 5.
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, identify a decomposition of the fraction using the same denominator. Given a decomposition of a fraction, identify the fraction.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard (2019 AL COS)	4.NF.15b: Model and justify decompositions of fractions and explain addition and subtraction of fractions as joining or separating parts referring to the same whole. b. Add and subtract fractions and mixed numbers with like denominators using fraction equivalence, properties of operations, and the relationship between addition and subtraction.
Evidence Statements	The student will add and subtract fractions and mixed numbers with like denominators using fraction equivalence, properties of operations, and the relationship between addition and subtraction.
Assessment Limits / Content Constraints	Tasks do not have a context. Denominators are limited to grade 3 possibilities (2, 3, 4, 6, 8) so as to keep computational difficulty lower.
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 fractions (can include mixed numbers) with like denominators, add or subtract the fractions.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard (2019 AL COS)	4.NF.15c: Model and justify decompositions of fractions and explain addition and subtraction of fractions as joining or separating parts referring to the same whole. 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.
Evidence Statements	The student will 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.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
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 addition and/or subtraction of fractions (can include mixed numbers) with like denominators, determine the solution to the problem.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard (2019 AL COS)	4.NF.16a: Apply and extend previous understandings of multiplication to multiply a whole number times a fraction. a. Model and explain how a non-unit fraction can be represented by a whole number times the unit fraction. *Example*: 9/8 = 9 × (1/8)
Evidence Statements	The student will model and explain how a non-unit fraction can be represented by a whole number times the unit fraction.
Assessment Limits / Content Constraints	Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
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 non-unit fraction, identify an equivalent expression in which the unit fraction is multiplied by a whole number.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard (2019 AL COS)	4.NF.16b: Apply and extend previous understandings of multiplication to multiply a whole number times a fraction. b. Extend previous understanding of multiplication to multiply a whole number times any fraction less than one. *Example*: 4 × (2/3) = (4 × 2)/3 = 8/3
Evidence Statements	The student will extend previous understanding of multiplication to multiply a whole number times any fraction less than one.
Assessment Limits / Content Constraints	Tasks do not have a context. Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy. Results may equal fractions greater than 1 (including fractions equal to whole numbers limited to 0 through 5). Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
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 a fraction less than one and a whole number, find their product.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Standard (2019 AL COS)	4.NF.16c: Apply and extend previous understandings of multiplication to multiply a whole number times a fraction. c. Solve word problems involving multiplying a whole number times a fraction using visual fraction models and equations to represent the problem. *Examples*: 3 × (1/2), 6 × (1/8)
Evidence Statements	The student will solve word problems involving multiplying a whole number times a fraction using visual fraction models and equations to represent the problem.
Assessment Limits / Content Constraints	Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy. Situations are limited to those in which the product is unknown (situations do not include unknown factors). Situations involve a whole number of fractional quantities—not a fraction of a whole-number quantity. Results may equal fractions greater than 1 (including fractions equal to whole numbers limited to 0 through 5). Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
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 multiplication of a fraction and a whole number, determine the solution to the problem by using visual fraction models and/or equations.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Understand decimal notation for fractions, and compare decimal fractions. *Denominators are limited to 10 and 100.*
Standard (2019 AL COS)	4.NF.17a: 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.
Evidence Statements	The student will express, model, and explain the equivalence between fractions with denominators of 10 and 100. The student will use fraction equivalency to add two fractions with denominators of 10 and 100.
Assessment Limits / Content Constraints	Tasks do not have a 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	Not Allowable
Sample Stem Information (as applicable)	Given a fraction with a denominator of 10, identify an equivalent fraction with a denominator of 100. Given a fraction with a denominator of 10 and a fraction with a denominator of 100, add the fractions. Given a fraction with a denominator of 10 and a fraction with a denominator of 100, identify a model that represents the sum of the fractions.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Understand decimal notation for fractions, and compare decimal fractions. *Denominators are limited to 10 and 100.*
Standard (2019 AL COS)	4.NF.18: Use models and decimal notation to represent fractions with denominators of 10 and 100.
Evidence Statements	The student will use models and decimal notation to represent fractions with denominators of 10 and 100.
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 with a denominator of 10 or 100, identify an equivalent decimal. Given a decimal to the tenths or hundredths, identify an equivalent fraction. Given a fraction or decimal to the hundredths, locate the number on a number line. Given a fraction with a denominator of 10 or 100, identify a model that represents the fraction.

Content Area	NF: Operations with Numbers: Fractions
Cluster	Understand decimal notation for fractions, and compare decimal fractions. *Denominators are limited to 10 and 100.*
Standard (2019 AL COS)	4.NF.19: 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.
Evidence Statements	The student will 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.
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)	Given a decimal to hundredths, identify a decimal that is greater than or less than the given decimal. Given a list of decimals to the hundredths, identify a correct comparison of two decimals in the list or identify the decimal with the greatest or least value in the list. Given two decimals to hundredths, identify a visual model that compares the decimals.

Content Area	DA: Data Analysis
Cluster	Represent and interpret data.
Standard (2019 AL COS)	4.DA.20a: Interpret data in graphs (picture, bar, and line plots) to solve problems using numbers and operations. a. Create a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).
Evidence Statements	The student will create a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).
Assessment Limits / Content Constraints	Tasks may include mixed numbers. Fractions equivalent to whole numbers are limited to 0 through 5.
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 that represents the data. Given a line plot, find the total of the data represented.

Content Area	DA: Data Analysis
Cluster	Represent and interpret data.
Standard (2019 AL COS)	4.DA.20b: Interpret data in graphs (picture, bar, and line plots) to solve problems using numbers and operations. b. Solve problems involving addition and subtraction of fractions using information presented in line plots.
Evidence Statements	The student will solve problems involving addition and subtraction of fractions using information presented in line plots.
Assessment Limits / Content Constraints	Tasks may include mixed numbers. Fractions equivalent to whole numbers are limited to 0 through 5.
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 line plot, find the difference between the largest and smallest values represented.

Content Area	M: Measurement
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard (2019 AL COS)	4.M.21a: 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.
Evidence Statements	The student will 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. The student will express measurements of a larger unit in terms of a smaller unit within one system of units, and record measurement equivalents in a two-column 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 a measurement in one unit, identify an equivalent measurement using a different unit. Given a table of measurement equivalents with a missing value, identify the missing value. Given an attribute in context, select an appropriate unit of measurement.

Content Area	M: Measurement
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard (2019 AL COS)	4.M.22a: 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.
Evidence Statements	The student will solve measurement problems involving simple fractions or decimals.
Assessment Limits / Content Constraints	Situations involve two measurements given in the same units, one a whole-number measurement and the other a non-whole-number measurement. Tasks may include measuring distances to the nearest cm or mm. Units of mass are limited to grams and kilograms. Tasks will not include division of 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 multi-step measurement word problem involving simple fractions or decimals, solve the problem.

Content Area	M: Measurement
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard (2019 AL COS)	4.M.22b: Use the four operations to solve measurement word problems with distance, intervals of time, liquid volume, mass of objects, and money. b. Solve measurement problems that require expressing measurements given in a larger unit in terms of a smaller unit.
Evidence Statements	The student will solve measurement problems that require expressing measurements given in a larger unit in terms of a smaller unit.
Assessment Limits / Content Constraints	Situations involve whole-number measurements. Tasks may include measuring distances to the nearest cm or mm. Units of mass are limited to grams and kilograms.
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 multi-step measurement word problem that requires a change in units, solve the problem.

Content Area	M: Measurement
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard (2019 AL COS)	4.M.22c: Use the four operations to solve measurement word problems with distance, intervals of time, liquid volume, mass of objects, and money. c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
Evidence Statements	The student will represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
Assessment Limits / Content Constraints	Tasks may include measuring distances to the nearest cm or mm. Units of mass are limited to grams and kilograms. Tasks will not include division of 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 multi-step measurement word problem, represent the solution using a scaled diagram.

Content Area	M: Measurement
Cluster	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Standard (2019 AL COS)	4.M.23: Apply area and perimeter formulas for rectangles in real-world and mathematical situations.
Evidence Statements	The student will apply area and perimeter formulas for rectangles in real-world and mathematical situations.
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 length and width of a rectangle in a real-world or mathematical problem, find the area or perimeter of the rectangle. Given the area or perimeter of a rectangle and the length of one side in a real-world or mathematical problem, find the length of the other side.

Content Area	M: Measurement
Cluster	Geometric measurement: understand concepts of angle and measure angles.
Standard (2019 AL COS)	4.M.24: Identify an angle as a geometric shape formed wherever two rays share a common endpoint.
Evidence Statements	The student will identify an angle as a geometric shape formed wherever two rays share a common endpoint.
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 angle and measure angles.
Standard (2019 AL COS)	4.M.25: Use a protractor to measure angles in whole-number degrees and sketch angles of specified measure.
Evidence Statements	The student will use a protractor to measure angles in whole-number degrees and sketch angles of specified measure.
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 an angle, identify the measure of the angle. Given an angle measure, choose an angle with that measure.

Content Area	M: Measurement
Cluster	Geometric measurement: understand concepts of angle and measure angles.
Standard (2019 AL COS)	4.M.26a: Decompose an angle into non-overlapping parts to demonstrate that the angle measure of the whole is the sum of the angle measures of the parts. a. Solve addition and subtraction problems on a diagram to find unknown angles in real-world or mathematical problems.
Evidence Statements	The student will decompose an angle into non-overlapping parts to demonstrate that the angle measure of the whole is the sum of the angle measures of the parts. The student will solve addition and subtraction problems on a diagram to find unknown angles in real-world or 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)	Given the measures of two adjacent angles, find the measure of the larger angle they form. Given the measure of an angle formed by two smaller angles and the measure of one of the smaller angles, find the measure of the second smaller angle.

Content Area	G: Geometry
Cluster	Draw and identify lines and angles, and identify shapes by properties of their lines and angles.
Standard (2019 AL COS)	4.G.27: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines, and identify these in two-dimensional figures.
Evidence Statements	The student will draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines, and identify these in two-dimensional figures.
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 characteristic (acute angle, parallel lines, etc.), identify a shape that has the characteristic. Given a series of shapes, identify a true statement about the series. Given a figure, identify the term that describes a specific part of the figure.

Content Area	G: Geometry
Cluster	Draw and identify lines and angles, and identify shapes by properties of their lines and angles.
Standard (2019 AL COS)	4.G.28a: 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.
Evidence Statements	The student will 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. The student will describe right triangles as a category, and identify right triangles.
Assessment Limits / Content Constraints	Tasks may include terminology: equilateral, isosceles, scalene, acute, right, and obtuse.
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)	Identify a shape that has parallel and/or perpendicular sides. This could include identification of a specific number of parallel or perpendicular sides.

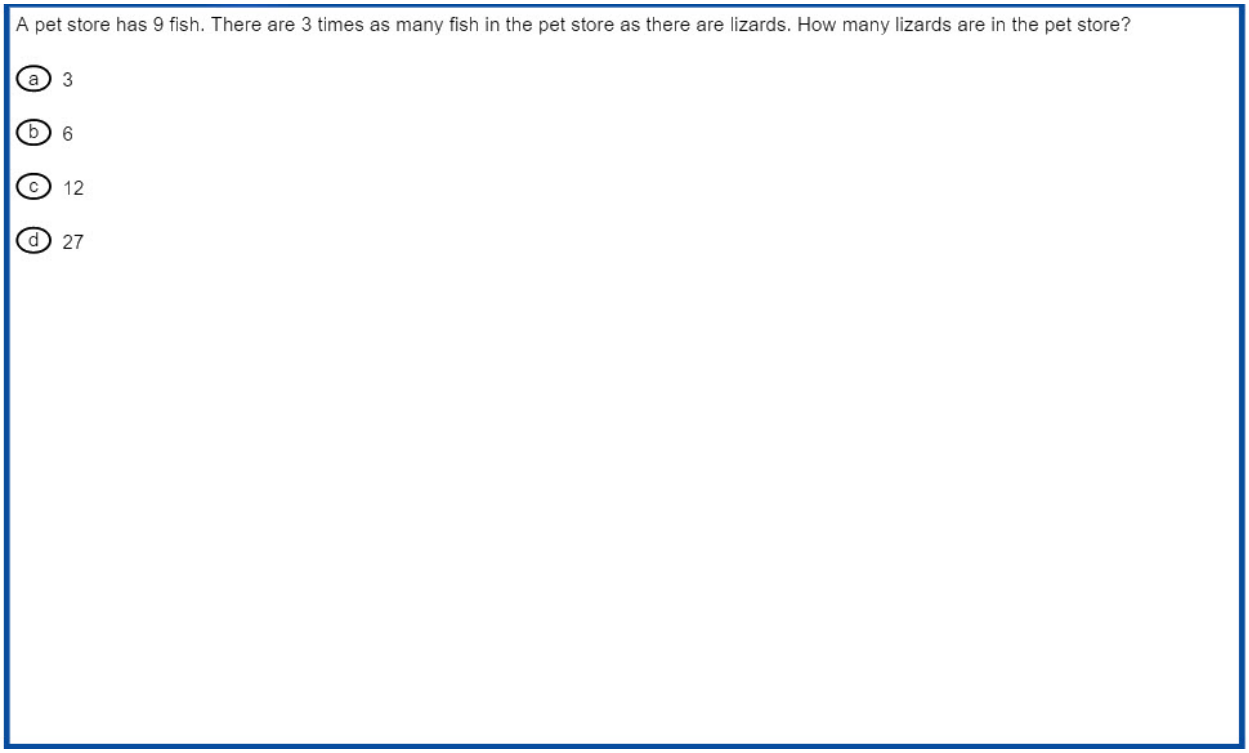
Content Area	G: Geometry
Cluster	Draw and identify lines and angles, and identify shapes by properties of their lines and angles.
Standard (2019 AL COS)	4.G.29a: Define a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. a. Identify line-symmetric figures and draw lines of symmetry.
Evidence Statements	The student will 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. The student will identify line-symmetric figures and draw lines of symmetry.
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 shape, identify a line of symmetry. Given a shape, identify the number of lines of symmetry. Given several shapes, identify which shape has a line of symmetry. Given several shapes, identify which shape has a line of symmetry drawn correctly.

Appendix A: Sample Items

Sample Items

Appendix A: Sample Items

Sample Item 1



Item Information	
Item Type	Multiple Choice
Page Reference	10
Alignment	4.OA.2
Depth of Knowledge	2
Answer Key	A

Option Annotations

A. Correct
B. The student calculates the difference between 9 and 3.
C. The student calculates the sum of 9 and 3.
D. The student calculates the product of 9 and 3.

Appendix A: Sample Items

Sample Item 2

Mrs. Pine made a snack bag for each student in her class.

- Each snack bag had 5 carrots and 4 apple slices.
- She used a total of 100 carrots.

Which pair of equations would be **most** helpful for finding the number of apple slices, *a*, Mrs. Pine used to make the snack bags?

(a) $100 \div 4 = 25$ and $25 \times 4 = a$

(b) $100 \div 4 = 25$ and $25 \times 5 = a$

(c) $100 \div 5 = 20$ and $20 \times 4 = a$

(d) $100 \div 5 = 20$ and $20 \times 5 = a$

Item Information		Option Annotations
Item Type	Multiple Choice	A. The student divides the total number of carrots by the number of apple slices in each bag. B. The student divides the total number of carrots by the number of apple slices in each bag, and then multiplies by the number of carrots in each bag. C. Correct D. The student divides correctly, but then multiplies by the number of carrots in each bag.
Page Reference	11	
Alignment	4.OA.3a	
Depth of Knowledge	3	
Answer Key	C	

Appendix A: Sample Items

Sample Item 3

Item Information	
Item Type	Multiple Choice
Page Reference	20
Alignment	4.NBT.10
Depth of Knowledge	1
Answer Key	D

Option Annotations

A. The student regroups incorrectly in the tens, thousands, and hundred thousands places.
B. The student makes an addition error in the hundreds place and regroups incorrectly in the hundred thousands place.
C. The student regroups incorrectly in the tens and thousands places.
D. Correct

Appendix A: Sample Items

Sample Item 4

Item Information		Option Annotations
Item Type	Multiple Choice	A. Correct B. The student reverses the standard algorithm for the second step and calculates the number of times 5 can go into 8. C. The student incorrectly divides by trying to break up the dividend. D. The student reverses the standard algorithm by calculating the number of times each digit of 6,456 goes into 8 and adding up the resulting remainders.
Page Reference	22	
Alignment	4.NBT.12a	
Depth of Knowledge	1	
Answer Key	A	

Appendix A: Sample Items

Sample Item 5

The water depth of a fish tank decreases $\frac{3}{10}$ of an inch each day. How much does the water depth decrease, in inches, over 3 days?

(a) $\frac{3}{30}$

(b) $\frac{9}{30}$

(c) $\frac{9}{10}$

(d) $3\frac{3}{10}$

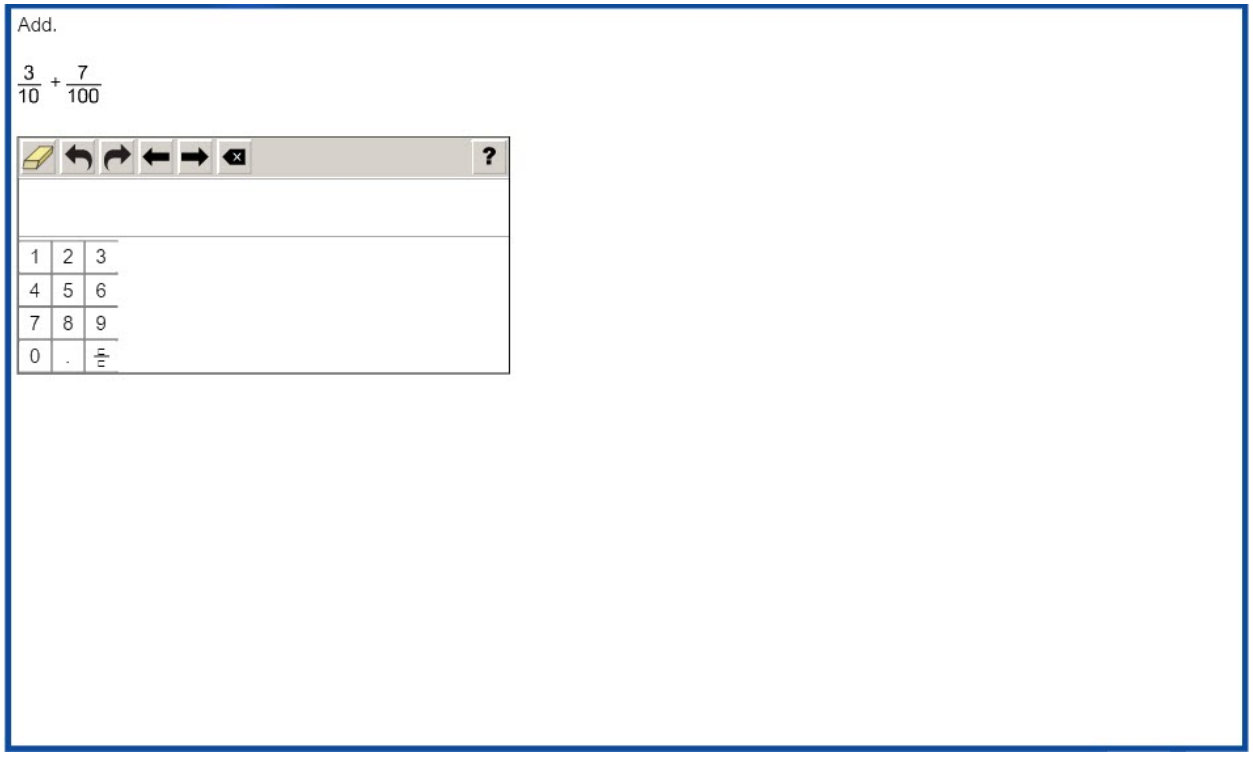
Item Information	
Item Type	Multiple Choice
Page Reference	30
Alignment	4.NF.16c
Depth of Knowledge	1
Answer Key	C

Option Annotations

A. The student adds the denominator 3 times.
B. The student attempts to use repeated addition but adds the denominators.
C. Correct
D. The student adds 3 days to 3/10.

Appendix A: Sample Items

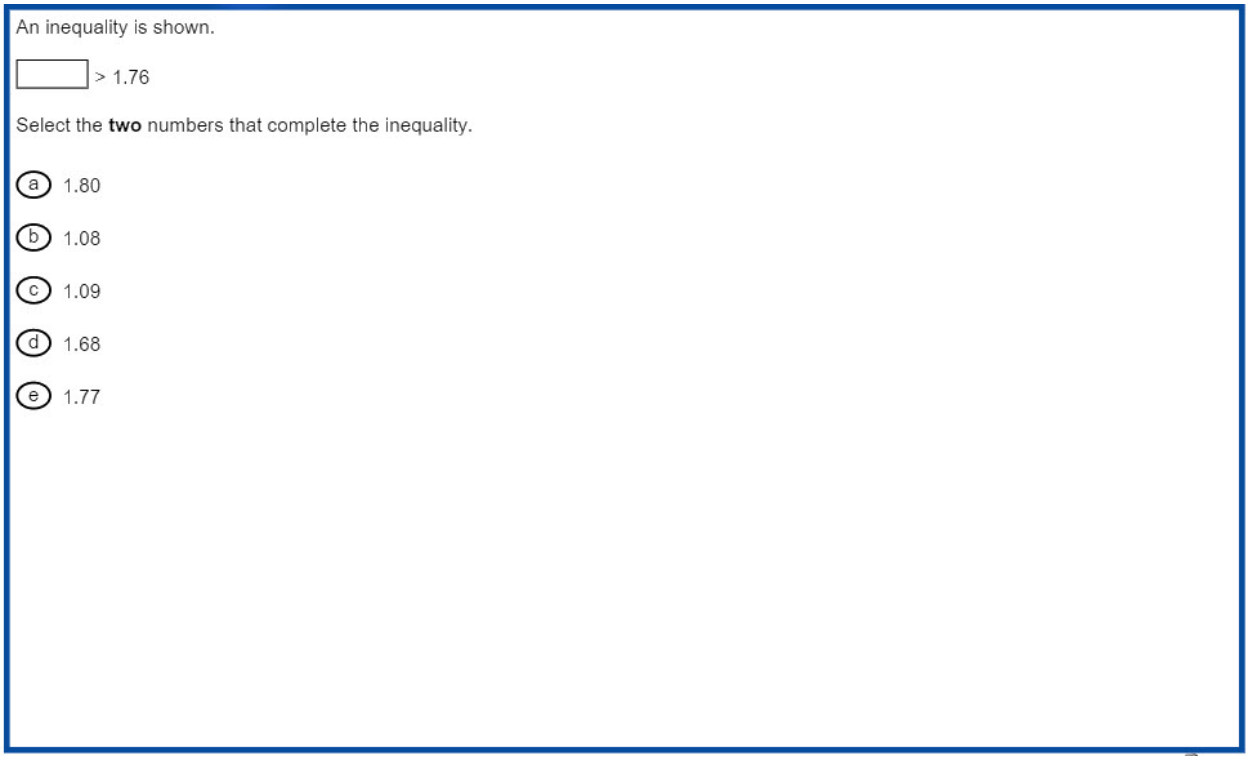
Sample Item 6



Item Information		Answer Key(s) Description
Item Type	Short Answer	$\frac{37}{100}$ (or equivalent)
Page Reference	31	
Alignment	4.NF.17a	
Depth of Knowledge	1	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 7



Item Information	
Item Type	Multiple Select
Page Reference	33
Alignment	4.NF.19
Depth of Knowledge	2
Answer Key	A, E

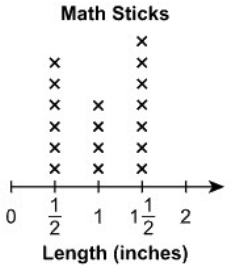
Option Annotations

A. Correct
B. The student confuses 8 hundredths with 8 tenths.
C. The student confuses 9 hundredths for 9 tenths.
D. The student only compares the values in the hundredths place.
E. Correct

Appendix A: Sample Items

Sample Item 8

Kai has three groups of math sticks arranged by length, in inches. The line plot shows how many sticks of each length Kai has.



Which table shows the same information as the line plot?

(a)

Length (inches)	Number of Math Sticks
$\frac{1}{2}$	$\frac{1}{2}$
1	1
$1\frac{1}{2}$	$1\frac{1}{2}$

(b)

Length (inches)	Number of Math Sticks
$\frac{1}{2}$	7
1	4
$1\frac{1}{2}$	6

(c)

Length (inches)	Number of Math Sticks
$\frac{1}{2}$	6
1	4
$1\frac{1}{2}$	7

(d)

Length (inches)	Number of Math Sticks
$\frac{1}{2}$	17
1	17
$1\frac{1}{2}$	17

Item Information	
Item Type	Multiple Choice
Page Reference	34
Alignment	4.DA.20a
Depth of Knowledge	1
Answer Key	C

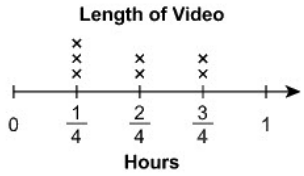
Option Annotations

A. The student uses the length of the stick instead of the number of each length.
B. The student confuses the values for $\frac{1}{2}$ and $1\frac{1}{2}$.
C. Correct
D. The student adds to find the total number of sticks.

Appendix A: Sample Items

Sample Item 9

Barry watches videos online. He records the lengths, in hours, of his 7 favorite videos. The lengths are shown on the line plot.

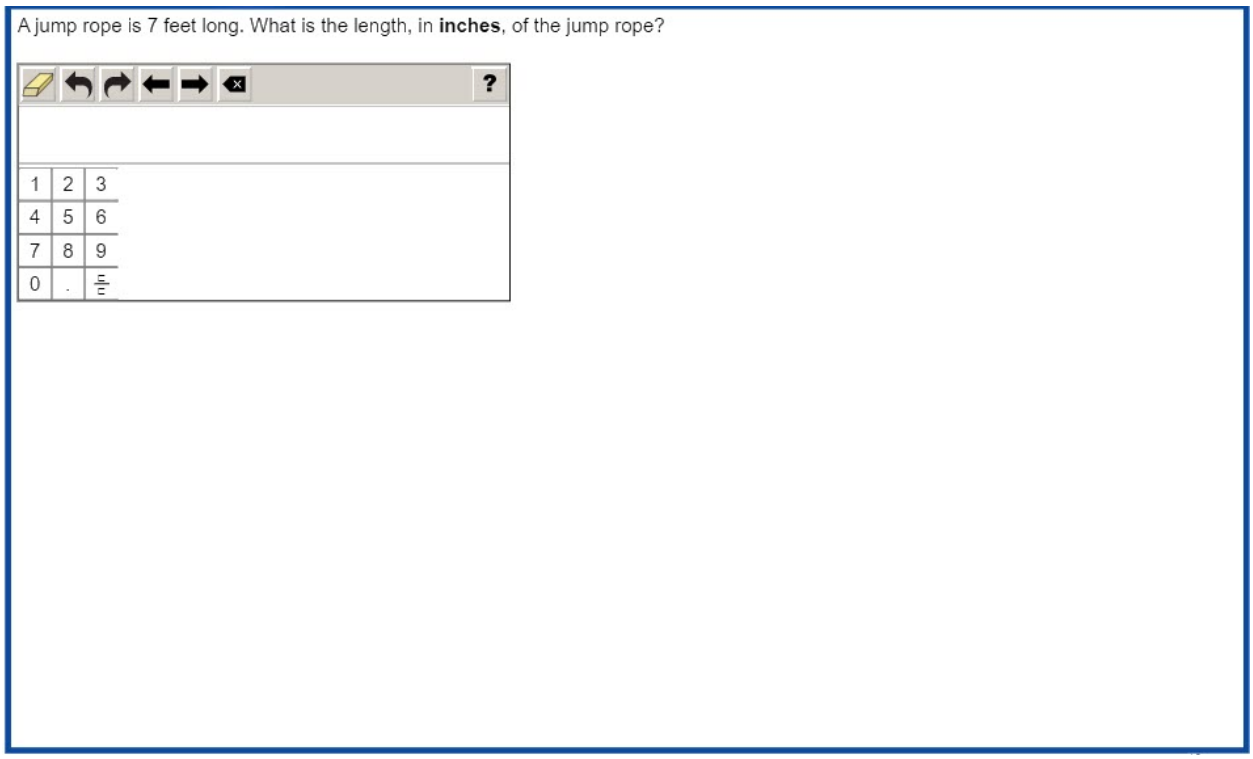


What is the combined length, in hours, of the 2 longest videos?

Item Information		Answer Key(s) Description
Item Type	Short Answer	$1\frac{1}{2}$ (or equivalent)
Page Reference	35	
Alignment	4.DA.20b	
Depth of Knowledge	2	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 10



Item Information		Answer Key(s) Description
Item Type	Short Answer	84 (or equivalent)
Page Reference	36	
Alignment	4.M.21a	
Depth of Knowledge	2	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 11

Zola is building a fence around her square garden. The length of the garden is 20 feet, and the width is 20 feet. How many feet of fence will she need?

(a) 40

(b) 80

(c) 160

(d) 400

Item Information	
Item Type	Multiple Choice
Page Reference	40
Alignment	4.M.23
Depth of Knowledge	2
Answer Key	B

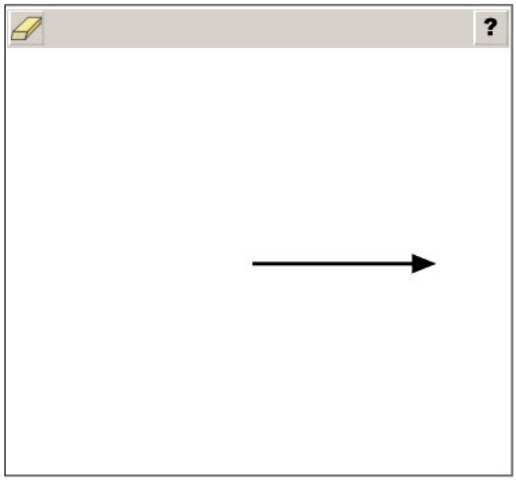
Option Annotations

A. The student adds the length and the width.
B. Correct
C. The student adds the length and the width and multiplies by 4.
D. The student multiplies the length and the width.

Appendix A: Sample Items

Sample Item 12

One ray of an angle is shown. Place another ray so that the angle formed by the two rays is a right angle.

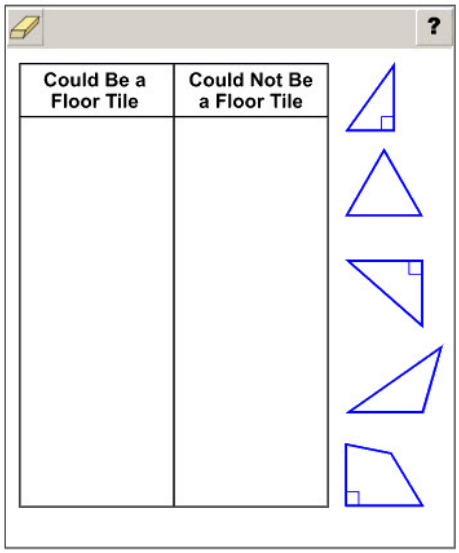


Item Information		Answer Key(s) Description
Item Type	Technology Enhanced	A ray that is perpendicular to the given ray, so the two rays make a 90-degree angle. The ray can point up or down.
Page Reference	44	
Alignment	4.G.27	
Depth of Knowledge	1	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 13

Each tile of a floor is a right triangle. Drag each shape into the table to show whether it could be or could not be a floor tile.

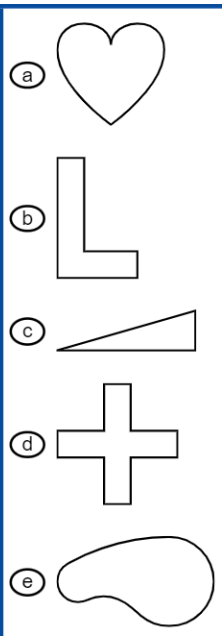


Item Information		Answer Key(s) Description
Item Type	Technology Enhanced	From top to bottom, the first and third shape are the only two shapes that belong in the "Could Be a Floor Tile" column. The other three shapes belong in the "Could Not Be a Floor Tile" column.
Page Reference	45	
Alignment	4.G.28a	
Depth of Knowledge	1	
Answer Key	(see description)	

Appendix A: Sample Items

Sample Item 14

Select the **two** figures that have at least one line of symmetry.



Item Information	
Item Type	Multiple Select
Page Reference	46
Alignment	4.G.29a
Depth of Knowledge	1
Answer Key	A, D

Option Annotations

A. Correct
B. The student selects a figure that has all straight sides.
C. The student selects a figure with a right angle.
D. Correct
E. The student selects a figure with curved sides.