Sample Item Teacher Guide

Mathematics

Grades 3–5

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About this Guide

This MSAA Sample Item Teacher Guide can help teachers use the newly released sample items as a formative assessment tool, allowing teachers to understand what students may be able to know and do based on the sample items, and how teachers can respond to this information through instruction. The MSAA newly released sample items are intended to be used for several different purposes as outlined in the TAM, including to allow students to practice and become familiar with the testing platform and to ensure students are familiar with the item types and accessibility tools. These guides provide directions for using the sample items in an additional way: as an instructional tool.

Guide Terminology

The MSAA Sample Item Teacher Guide for each grade band and content area include the following:

- **Sample Item Blueprint Table.** A high-level overview of the items in each set that shows: the standard and learning targets the items align to, item type, and item position
- **Item Information.** Information about item alignment, including learning targets, instructional strategies, and scaffolds and supports
- **Student Item Thumbnail Image.** Item thumbnails are intended to help teachers easily identify the specific items in the guide as they administer the sample items through the online platform utilizing the Directions for Test Administration (DTA).

Item types in the sample item sets include the following:

- **Selected Response**
  - Multiple choice—Students select one answer from two or three possible choices
- **Constructed Response**
  - Constructed response—Students respond to a question by developing an answer rather than selecting an answer from answer options
- **Writing Prompt: ELA**
  - Open-response writing prompt—Students produce a permanent product in response to a prompt; for 2020-2021 released sample items, these will be found in grade 6 only.

MSAA Sample Item Platform

To access MSAA's Sample Items, go to www.msaaassessment.org/tap/sample-items.

Introduction to Formative Assessment

It is important to remember that formative assessment is not a test. It is a process, a practice that is part of instruction. In effective formative instruction, teachers use a variety of methods to determine what students understand and can do and adjust instruction accordingly.

Formative Assessment Data

Students and teachers are the primary users of formative assessment data. These data have the greatest effect on learning and instruction because feedback for both student and teacher occurs over a very short or nearly instantaneous time period. This allows for adjustments in instruction, reteaching, and additional practice with learning targets to occur.

How Best to Use the Mathematics Item Sets

The content in this section explains each component of the item sets and how they can best be incorporated into the classroom.

Mathematics Blueprint Table

The math blueprint table/overview should be used to help select the sample item(s) that will provide the best evidence of student learning. The learning targets differentiate between the type of evidence each item will provide. The item type informs the type of interaction that the student will have to perform to respond to the item.

To obtain evidence of understanding for each grade-level standard, teachers can do the following:

- Access the sample items for the students' grade level.
- Use items individually as the learning targets are covered in class.
- Use the items in small groups to address a series of learning targets that focus on one standard.
- Use the entire sample item set to measure students' understanding of learning targets before, during, or after instruction.
- Review sample item sets from lower grades to build understanding of prerequisite skills for a given standard.
- Review sample item sets from higher grades to know how standard and item information build from the target grade.
- Use the sample items as models to create additional items to assess the standards.

Next Steps for Formative Mathematics Item Data

After obtaining data that serve as evidence of student understanding, educators should evaluate and interpret the data to identify gaps in student understanding.

Once gaps in understanding are identified, students need appropriate feedback.

After feedback is provided to students, educators should consider documenting the instructional modifications and supplementations provided to the students. Whether a student is undergoing relearning or learning a new concept, plans can be made, documented, and implemented on how best to scaffold that learning. Teachers can use the learning targets to help guide which specific modifications, supplementations, and scaffolding will best support the student.

Mathematics Grade 3

Grade 3 Sample Item Blueprint

Domain	Standard (Core Content Connectors)	Learning Targets	Item Type*	Item Position
Geometry	**3.GM.1i1** Partition rectangles into equal parts with equal area.	• Understand the concept of equal parts (e.g., fold rectangular pieces of paper into 2 or 4 equal pieces). • Partition with concrete objects. • Find the rectangle that is the same or match two congruent rectangles. • Partition rectangles into two, three, or four equal shares. • Understand the following concepts and vocabulary: equal, partition, area, rectangle, halves, thirds, half of, a third of.	MC	1
Number and Operations Base Ten	**3.NO.2c1** Solve multi-step addition and subtraction problems up to 100.	• Use base ten blocks to create sets of objects within 100. • Use base ten blocks or other manipulatives to solve one-step addition and subtraction problems. • Understand the following concepts, symbols, and vocabulary for: +, –, =. • Create a visual representation to solve one-step addition and subtraction problems.	MC	2
Operations and Algebraic Thinking	**3.PRF.2d1** Identify multiplication patterns in a real-world setting.	• Identify that a pattern is formed by repeatedly adding the same number to a set. • Add within 100 with calculator and/or manipulatives. • Match a pattern using symbols or objects to represent a provided growing multiplication pattern in a real-world setting. • Recognize patterns and use words to describe the patterns they see. • Understand the following concepts and vocabulary: growing pattern, multiplication, level, increasing/increases, decreasing/decreases, objects or shapes.	MC	3

**MC = multiple-choice*
CR = constructed response

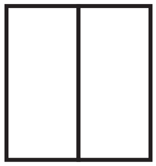
Domain	Standard (Core Content Connectors)	Learning Targets	Item Type*	Item Position
Number and Operations Fractions	**3.NO.1I3** Identify the fraction that matches the representation (rectangles and circles; halves, fourths, and thirds, eighths).	• Identify the parts of a region and the whole region when a region is partitioned when item is divided. • Count the number of the parts selected (e.g., 3 of the 4 parts; have fraction present but not required to read 3/4). • Understand how parts of a whole can be expressed as fractions using numbers. • Understand a fraction *1/b* as the quantity formed by 1 part when a whole is partitioned into b equal parts. • Recognize that fraction bars of equal lengths can be divided into different numbers of equal parts/units. • Understand a fraction *a/b* as the quantity formed by a parts of size *1/b*. • Ability to recognize that the more equal parts, the smaller the part. • Understand the following concepts, symbols, and vocabulary: numerator, denominator, _/_.	MC	4
Measurement and Data	**3.DPS.1g1** Collect data, organize into picture or bar graph.	• Identify data set based on a single attribute (e.g., pencils vs. markers). • Identify data set with more or less (e.g., this bar represents a set with more). • Organize the data into a picture or bar graph using objects that represent one piece of data (may have number symbols). • Properly label graph (e.g., axes on bar graph). • Identify data set with some number (e.g., bar graph representing 5 pencils). • Identify a picture and bar graph.	MC	5

**MC = multiple-choice*
CR = constructed response

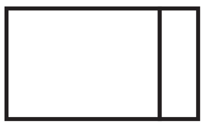
Sample Item 1		
Alignment	**Core Content Connector (CCC): 3.GM.1i1** Partition rectangles into equal parts with equal area.	
Learning Targets	**Instructional Strategies**	**Scaffolds and Supports**
I understand the concept of equal parts. I can partition with concrete objects. I can find the rectangle that is the same or match two congruent rectangles. I can partition rectangles into two, three, or four equal shares. I understand the following concepts and vocabulary: equal, partition, area, rectangle, halves, thirds, half of, a third of.	• Match to same • Tiling • Task analysis (measure length, divide by number of parts, mark each equal part) • Multiple exemplars for equal and not equal • Model-Lead-Test • Use physical models and a trial and error approach (e.g., give student the “whole” rectangle, then give student various fractional pieces; students use trial and error with fractional pieces to determine the equal pieces that fit on the “whole”).	• Computer software • Ruler • Calculator • Paper with pre-determined lines (e.g., black lines, perforated lines) • Real-world objects (graham crackers, 2 square-game that can be drawn with chalk on the hard top) • Fraction bars • Geoboards

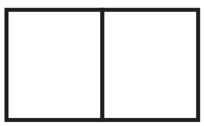
Item 1

This rectangle was divided into two equal parts. Each part is the same shape and size.



Which rectangle has also been divided into two equal parts?

A. 

B. 

<table>
<tr><th colspan="3">Sample Item 2</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 3.NO.2c1 Solve multi-step addition and subtraction problems up to 100.</td></tr>
<tr><td>Learning Targets</td><td>Instructional Strategies</td><td>Scaffolds and Supports</td></tr>
<tr><td>I can use base ten blocks to create sets of objects within 100.
I can use base ten blocks or other manipulatives to solve one-step addition and subtraction problems.
I understand the following concepts, symbols, and vocabulary for: +, –, =.
I can create a visual representation to solve one-step addition and subtraction problems.</td><td>• Task analysis for each type of problem.
• Use counting strategies.
• Model problem solving by identifying key words.
• Teach explicitly how to regroup to solve addition and subtraction problems.
• Teach explicitly the steps of addition and subtraction.
• Explicit instruction on vocabulary associated with a decision to add or subtract.</td><td>• Addition or subtraction template to fill in the steps of the word problem (___ + ____ = ____)
• Calculator
• Interactive whiteboards or other technology to manipulate representations
• Provide meaningful manipulatives or picture representations with symbols included
• Highlighted text that provides important information/vocabulary</td></tr>
</table>

Item 2

There were 19 chairs in a classroom. The teacher put 7 chairs in the hallway.

Which equation shows how many chairs were still in the classroom?

A. $19 - 7 = 12$

B. $19 - 2 = 17$

C. $19 + 7 = 26$

<table>
<tr><th colspan="3">Sample Item 3</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 3.PRF.2d1 Identify multiplication patterns in a real-world setting.</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr>
<td>I can identify that a pattern is formed by repeatedly adding the same number to a set.

I can add within 100 with calculator and/or manipulatives.

I can match a pattern using symbols or objects to represent a provided growing multiplication pattern in a real-world setting.

I can recognize patterns and use words to describe the patterns they see.

I understand the following concepts and vocabulary: growing pattern, multiplication, level, increasing/increases, decreasing/decreases, objects or shapes.</td>
<td>• Teach explicitly how to count objects in a set and that the last number said tells the number of counted objects.
– Present a set of objects for the student to count.
– Rearrange the objects and ask the student how many object there are (the student understands cardinality of numbers if s/he states the same number without recounting the objects).

• Teach explicitly how to create a group/row/set of objects for a given number or for a number provided in a simple word problem.

• Multiple Exemplar Training
– An array/row: “This is a group/row of three apples. This is another group/row of three apples. This is another group/row of three apples. This is one apple. Show me a group/row of three apples.”

• Example / Nonexample
– Present a row of objects (≤ 10). Present a second row of objects that has a different number of objects. Ask the student to select the row with a specified number of objects.
– Present three rows of objects (≤ 10), two that are equal and one that is not equal. As the student to match the two rows that both include the same number of specified objects (e.g., a row of three hats, a row of three hats, a row of 5 shoes).

• Use System of Least Prompts to form an array (group/row) given a number:
– “Make a row/group of three pencils.” The student responds correctly. “Good work. You made a row/group of three pencils.” OR The student doesn’t respond. Wait 3–5 seconds and provide a gesture prompt by pointing to the pencils, OR The student doesn’t respond. Wait 3–5 seconds and provide a verbal prompt. “Pick up three pencils. Make a group of three pencils.” OR The student makes an error; provide a physical prompt. Take the student’s hand and give him or her three pencils and help them make a row of pencils.</td>
<td>• Counters
• 2D and 3D shapes or objects, pictures
• Number lines
• Egg cartons or muffin tins to illustrate/create arrays
• Ones blocks to form different rectangles (rows and columns)
• Manipulatives, visuals, and Wiki Sticks to illustrate/define arrays
• Raised grid (to keep structure of array) or graph paper
• PPT and shape tools to create arrays to match a provided problem
• Interactive whiteboard or other technology to create arrays
• Examples of repeating patterns in a real-world setting (e.g., in the environment and art)
• T-charts for growing patterns
• Graphic organizers that illustrate a pattern of sets in which the student places 2D or 3D shapes or colors using addition or multiplication (e.g., +3 growing pattern)

(□ □ □)
(□ □ □) (□ □ □)
(□ □ □) (□ □ □) (□ □ □)

• Interactive whiteboard or other technology to model growing patterns</td>
</tr>
</table>

Sample Item 3		
	• Model-Lead-Test (“Watch me make a row of four books. Let’s make a row of four books. Now you try to make a row of four books.”) • Model-Lead-Test (“Here is a story problem. It says there are seven dogs. Watch me make a set of seven dogs to match the story problem. Let’s make a set of seven dogs together. Now you try to make a set of seven dogs.”); repeat with the other number of object in the story problem. • Backward chaining: Model setting up a one-step addition word problem using two arrays and ask the student to complete the last step by combining the arrays and/or counting the number of objects in the combined arrays. • Forward chaining: Present a one step addition or subtraction word problem and ask the student to complete the first step (e.g., Show me a row of four backpacks). Then complete the steps to solve the equation. • Multiple Exemplar Training or Example/Non-Example Training – Growing Pattern: “Here is a growing pattern. Here is a growing pattern. Here is growing pattern. This not a growing pattern. Show me a growing pattern.” • Ask students to determine if a rule exists for a provided pattern. (A pattern follows a predictable sequence OR there is no predictable sequence in this example, [e.g., no rule can be stated].) • Model-Lead-Test – Teach/model growing addition patterns using 2D shapes or 3D objects as a pattern that increases by the same number in each row of the pattern (e.g., a pattern that grows by +2 would have 1 in the first row, 3 in the second row, 5 in the third row, and 7 in the fourth row). – Teach/model a growing multiplication problem using pictures (1 flower, 2 bees; 2 flowers, 4 bees; 3 flowers, 6 bees). • Task Analysis (Backward Chaining) – Provide the first three rows of a growing addition pattern and ask the student to create the fourth row. – Using a T-chart, provide the first three parts of the growing pattern and ask the student to create the fourth part of the pattern.	

Item 3

Lightbulbs are sold in packages. This data table shows the total number of lightbulbs in different numbers of packages.

Lightbulbs

Number of packages	Total number of lightbulbs
1	4
2	8
3	12
4	?

What is the total number of lightbulbs in 4 packages?

A. 13

B. 14

C. 16

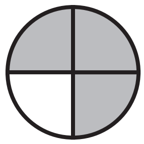
Sample Item 4

Alignment	**Core Content Connector (CCC): 3.NO.1I3** Identify the fraction that matches the representation (rectangles and circles; halves, fourths, and thirds, eighths).

Learning Targets	Instructional Strategies	Scaffolds and Supports
I can identify the parts of a region and the whole region when a region is partitioned when item is divided. I can count the number of the parts selected. I understand how parts of a whole can be expressed as fractions using numbers. I understand a fraction *1/b* as the quantity formed by 1 part when a whole is partitioned into b equal parts. I can recognize that fraction bars of equal lengths can be divided into different numbers of equal parts/units. I understand a fraction *a/b* as the quantity formed by a parts of size *1/b*. I can recognize that the more equal parts, the smaller the part. I understand the following concepts, symbols, and vocabulary: numerator, denominator, _/_.	• Before introducing fraction, use fraction bars: – Describe a fraction bar in multiple ways (e.g., present a fraction bar with four parts and two parts shaded red and describe the representation as the color and the number of parts shaded (a red bar with two parts shaded); four parts and two parts shaded (without using color); or two out of four parts are shaded). – Explicitly teach types of fraction bars (whole bars with all parts shaded; whole bars divided into parts with no parts shaded; whole bars with half of the parts shaded). – Explicitly teach that parts out of total parts shaded (e.g., two out of four parts shaded) is the language we use to name the fraction (2/4). • Teach fractions explicitly as a way to indicate part of a whole. • Teach explicitly that as the numerator increases, there will be more parts. • Multiple Exemplars (e.g., fraction bars and fractions) – Exemplar/Non-exemplar: Here is picture/representation of 1/2 (present a fraction bar). This is the fraction 1/2. This is the fraction 1/2. This is not the fraction 1/2. Show me a fraction bar that represents 1/2. • Task Analysis – Present a shaded fraction bar with the associated fraction. – State that the number is called a fraction. – State how to determine the fraction (e.g., I have a blue bar with four parts/units. Two of the parts are shaded. The fraction is two over four or two-fourths. – State that for the fraction (e.g., 2/4), the denominator means to divide something into “four” equal parts and the numerator “2” indicates two of these parts. – Present the fraction and have the student create/select the associated representation of the fraction. • Have the student give fraction statements that are true for a provided group of objects. For example, 2 out of 3 or 2/3 of the pencils are yellow. Show the corresponding fraction. • Provide “hands on” opportunities to create fractions (e.g., salt dough, pies).	• Geoboards • Dot-paper • Cuisenaire rods • Color tiles • Pattern blocks or sets of objects • Pie diagrams • Fraction bars that are ruled into certain fixed partitions • Assistive technology • iPad applications • Objects (e.g., apples) shared equally and matched with a fraction card

Item 4

This fraction circle is divided into equal parts. Some parts are shaded.



What part of the fraction circle is shaded?

A. $\frac{1}{4}$

B. $\frac{1}{3}$

C. $\frac{3}{4}$

<table>
<tr><th colspan="3">Sample Item 5</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 3.DPS.1g1 Collect data, organize into picture or bar graph.</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr><td>I can identify a data set based on a single attribute.
I can identify a data set, within a graph, that represents more or less.
I can organize the data into a picture or bar graph using objects that represent one piece of data (may have number symbols).
I can properly label graph.
I can identify a data set with a specific number.
I can identify a picture and bar graph.</td><td>• Task analysis (e.g., decide on your question, create categories, decide on source of data, collect data based on categories, count data sets, organize data, create graph)
• Match to same
• Graphic organizer to establish sets</td><td>• Template (e.g., graphic organizer) or structure for collecting and organizing data
• Numbers that physically attach to a graph
• Interactive whiteboard
• Computer software
• Grid paper to construct graph
• Pre-made graphs
• Assistive technology/voice output device
• Self-monitoring task analysis for student independence</td></tr>
</table>

Item 5

This data table shows how six students voted for their favorite after-school activity.

Favorite After-School Activity

Activity	Number of votes
Biking	3
Drawing	1
Reading	2

This incomplete picture graph can be used to show the same information as the data table.

Favorite After-School Activity

Activity	Number of votes
Biking	
Drawing	
Reading	

The data table shows that 3 students voted for biking as their favorite after-school activity.

The picture graph also shows that 3 students voted for biking as their favorite after-school activity.

The data table shows that 1 student voted for drawing as his favorite after-school activity.

The row labeled “Drawing” in the picture graph needs 1 crayon tile.

Use the book tiles to show how many students voted for reading as their favorite after-school activity. You may not need all of the tiles.

A. The student provided the correct answer.

B. The student did not provide the correct answer.

Mathematics Grade 4

Grade 4 Sample Item Blueprint

Domain	Standard (Core Content Connectors)	Learning Targets	Item Type*	Item Position
Number and Operations Base Ten	**4.NO.1j5** Use place value to round to any place (i.e., ones, tens, hundreds, thousands).	• Identify ones, tens, hundreds in bundled sets. • Make comparisons between similar/different with concrete representations (e.g., is this set of manipulatives [8 ones] closer to this set [a ten] or this set [a zero])? • Recognize that numbers 1–4 are closer to 0 and numbers 6 through 9 are closer to 10. • Identify 5 as a number in the middle but know that we round up. • Identify pictorial representation of numbers in ones, tens, hundreds blocks. • Match vocabulary of ones, tens, hundreds, thousands to digits in a number.	MC	1
Number and Operations Fractions	**4.NO.1n2** Compare up to 2 given fractions that have different denominators.	• Understand the concept of equivalency (what is and what is not equivalent; this may begin with numbers/sets of objects: e.g., 3>2, 1<2, 10 + 5 = 15). • Understand the concept of fraction (part of a whole) (i.e., Describe that the denominator of a fraction represents the number of equal parts within a whole (length unit or region). • Given a visual fraction model (region or number line), write the fraction with the correct numerator and denominator. • Determine equivalent fractions (e.g., 1/2 = 2/4).	MC	2
Operations and Algebraic Thinking	**4.NO.2d7** Determine how many objects go into each group when given the total number of objects and the number of groups where the number in each group or number of groups is not greater than 10.	• Create an array of objects given a specific number of rows and the total number, place one object in each group/row at a time. • Draw an array using the given information. • Understand the following concepts, symbols, and vocabulary for: ÷, =.	MC	3

**MC = multiple-choice*
CR = constructed response

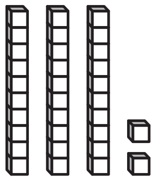
Domain	Standard (Core Content Connectors)	Learning Targets	Item Type*	Item Position
Measurement and Data	**4.ME.1g2** Solve word problems using perimeter and area where changes occur to the dimensions of a figure.	• Decompose a rectilinear figure into rectangles. • Identify the perimeter of a rectilinear figure. • Identify the area of a rectilinear figure. • Understand the following concepts and vocabulary (pictures/symbols): area, perimeter, length, width, side, +, –, ×, ÷.	MC	4
Geometry	**4.GM.1h2** Classify two-dimensional shapes based on attributes (# of angles).	• Identify attributes within a 2-dimensional figure (e.g., rectangles have sides – student identifies sides of rectangle – and angles – student identifies angles in rectangle). • Understand concepts and vocabulary: face, edge, corner, side, angle.	CR	5

**MC = multiple-choice*
CR = constructed response

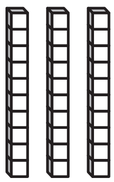
<table>
<tr><th colspan="3">Sample Item 1</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 4.NO.1j5 Use place value to round to any place (i.e., ones, tens, hundreds, thousands)</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr><td>I can identify ones, tens, hundreds in bundled sets.
I can make comparisons between similar/different sets with concrete representations.
I recognize that numbers 1-4 are closer to 0 and numbers 6 through 9 are closer to 10.
I can identify 5 as a number in the middle but know that we round up.
I can identify pictorial representation of numbers in ones, tens, hundreds blocks.
I can match vocabulary of ones, tens, hundreds, thousands to digits in a number.</td><td>• Explicit instruction on rules for rounding using a number line.
• Task analysis for rounding (e.g., circle place value, arrow next number, arrow number tells circle number what to do, make decision, enter answer).
• Model-Lead-Test (e.g., teacher models and provides guidance to support student learning. As the student learns they develop more independence with the skill or task).</td><td>• Number line or number chart
• Interactive whiteboards or other technology to manipulate representations
• Graphic organizer or place value template
• Quantities applied to coin values for a real-world application (e.g., 28₵ rounds up to 30₵)</td></tr>
</table>

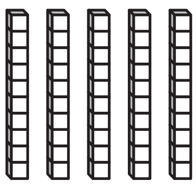
Item 1

This model shows the number 32.



Which model is closer to the number 32?

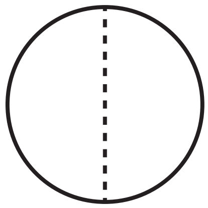
A. 

B. 

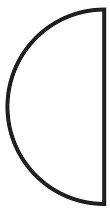
<table>
<tr><th colspan="3">Sample Item 2</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 4.NO.1n2 Compare up to 2 given fractions that have different denominators.</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr><td>I understand the concept of equivalency.
I understand the concept of fraction (part of a whole).
Given a visual fraction model, I can write the fraction with the correct numerator and denominator.
I can determine equivalent fractions.</td><td>• Compare fractions represented with models (e.g., circle divided in halves and in fourths with 1/2 and 3/4 shaded in).
• Use rectangles that are the same size for students to partition and represent fractions.
• Use sentence strips/paper to generate number lines.</td><td>• Assistive technology
• Virtual bars or tiles
• Pictures that have been divided
• Geoboards
• Dot-paper
• Cuisenaire rods
• Color tiles
• Pattern blocks or sets of objects
• Pie diagrams
• Fraction bars that are ruled into certain fixed partitions and lined up for comparisons</td></tr>
</table>

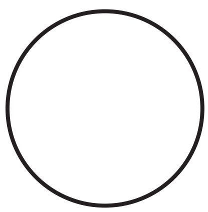
Item 2

This is a whole circle divided into two equal parts.



Which picture shows part of the circle?

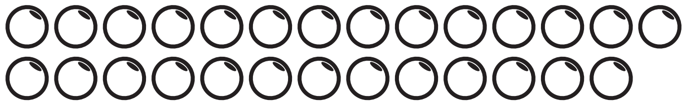
A. 

B. 

Sample Item 3		
Alignment	**Core Content Connector (CCC): 4.NO.2d7** Determine how many objects go into each group when given the total number of objects and the number of groups where the number in each group or number of groups is not greater than 10.	
Learning Targets	**Instructional Strategies**	**Scaffolds and Supports**
I can create an array of objects given a specific number of rows and the total number, place one object in each group/row at a time. I can draw an array using the given information. I understand the following concepts, symbols, and vocabulary for: ÷, =.	• Teach division as the inverse of multiplication. • Teach explicitly the steps for division. • Task analysis (e.g., identify the number of groups, put one object in each group for total number of objects, count one group of objects, write down number, count second group to verify total, write answer).	• Templates or graphic organizers that create arrays • Calculator • Interactive whiteboards or other technology to manipulate representations • Manipulatives that provide context • Structure provided for each group/row

Item 3

Sabrina had 27 beads.



Sabrina put the beads into 3 equal groups.

How many beads did Sabrina put into each group?

A. 4 beads

B. 9 beads

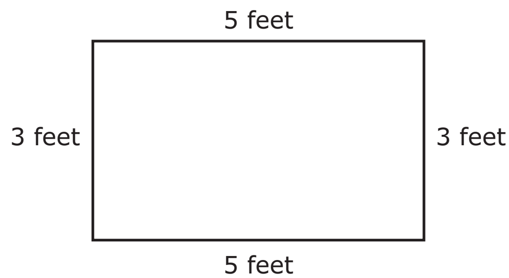
C. 14 beads

<table>
<tr><th colspan="3">Sample Item 4</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 4.ME.1g2 Solve word problems using perimeter and area where changes occur to the dimensions of a figure.</td></tr>
<tr><td>Learning Targets</td><td>Instructional Strategies</td><td>Scaffolds and Supports</td></tr>
<tr><td>I can decompose a rectilinear figure into rectangles.
I can identify the perimeter of a rectilinear figure.
I can identify the area of a rectilinear figure.
I understand the following concepts and vocabulary (pictures/symbols): area, perimeter, length, width, side, +, –, ×, ÷.</td><td>• Task analysis (solving problems using formulas); isolate each step of the solution process.
• Model-Lead-Test (e.g., “Watch me… do together... you try”).
• Least-to-Most prompts – increasing support as needed until the student has completed the task appropriately.
• Relate a story problem to everyday life/ relevant context.</td><td>• Premade formula worksheets
• Calculator
• Foldable ruler
• Conversion charts (inches to feet, feet to yards)
• 1-inch tiles
• Raised grid with squares numbered
• Graph paper or grid paper (virtual or with raised lines, on overhead transparencies, etc.)
• Graphic representation of square and rectangle
• Interactive whiteboard, PowerPoint, or other visual demonstrating how squares change to rectangles when 2 sides are elongated</td></tr>
</table>

Item 4

Perimeter is the distance around a shape.

Alisha had a poster shaped like this rectangle with a length of 5 feet and a width of 3 feet.



What was the perimeter of Alisha's poster in feet?

A. 8 feet

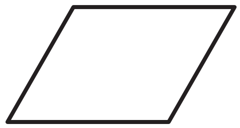
B. 15 feet

C. 16 feet

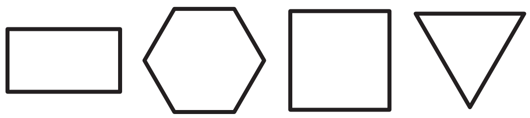
<table>
<tr><th colspan="3">Sample Item 5</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 4.GM.1h2 Classify two--dimensional shapes based on attributes (# of angles).</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr><td>I can identify attributes within a 2-dimensional figure (e.g., rectangles have sides – student identifies sides of rectangle – and angles – student identifies angles in rectangle).
I understand concepts and vocabulary: face, edge, corner, side, angle.</td><td>• Match to same
• Tiling
• Task analysis (identify sides and angles)
• Multiple exemplars for equal and not equal</td><td>• Computer software
• Ruler
• Calculator
• Paper with pre-determined lines (e.g., black lines, perforated lines)
• Real-world objects (e.g., graham crackers, 2 square-game that can be drawn with chalk on the hard top)
• Geoboards</td></tr>
</table>

Item 5

This is a parallelogram. It has 4 angles.



Here are more shapes.



This incomplete chart is for shapes with 4 angles.

Shapes with 4 angles

Look at the number of angles each shape has. Select the shape or shapes with 4 angles and place them onto the chart.

A. The student provided the correct answer.

B. The student did not provide the correct answer.

Mathematics Grade 5

Grade 5 Sample Item Blueprint

Domain	Standard (Core Content Connectors)	Learning Targets	Item Type*	Item Position
Number and Operations	**5.NO.2a5** Solve word problems that require multiplication or division.	• Combine (×) or decompose (÷) with concrete objects; use counting to get the answers. • Match the action of combining with vocabulary (i.e., in all; altogether) or the action of decomposing with vocabulary (i.e., have left; take away) in a word problem. • Understand concept of division: sharing or grouping numbers into equal parts. • Understand concept of multiplication: the result of making some number of copies of the original. • Draw or use a representation of the word problem. • Symbols ÷, =, × • Identify purpose to either find a total (multiplication) or one component (number of sets or number within each set for division), depending upon the problem. • Translate wording into numeric equation.	MC	1
Operations and Algebraic Thinking	**5.PRF.2b1** Generate or select a comparison between two graphs from a similar situation.	• Compare two pieces of information provided in a single display.	MC	2
Measurement and Data	**5.ME.1b2** Convert standard measurements of length.	• Recognize that in the same system, I can measure the same object with 2 different units (e.g., I can measure the height of a desk in both inches and feet). • Understand the following concepts and vocabulary: conversion, inch, foot, yard. • Understand standard units and abbreviations (e.g., feet = ft).	MC	3

**MC = multiple-choice*
CR = constructed response

Domain	Standard (Core Content Connectors)	Learning Targets	Item Type*	Item Position
Number and Operations Fractions	**5.NO.2c2** Solve word problems involving the addition, subtraction, multiplication, or division of fractions.	• Understand that the numerator tells the number of parts and the denominator tells the type of parts (e.g., fourths, halves). • Identify what actions to take given the context and language used in the problem (e.g., "in all" means we add, "left" means we subtract). • Build models to match fractions in a given equation (e.g., 1/3 + 2/3 =, student will build model of each fraction). • Identify key information in a word problem to represent the total and fraction. • Solve fraction problems using: – Picture – Models – Representation cards – Number sentences – Mathematical word problems – Graphic representation • Understand the following concepts, symbols and vocabulary: +, –, ×, ÷.	MC	4
Geometry	**5.GM.1c3** Use ordered pairs to graph given points.	• Identify the *x*- and *y*-axis. • Identify the origin (i.e., point of intersection). • Complete concrete graphing of points (e.g., put the straw up on 3 on the *x*-axis; put the next straw across on 2 on the *y*-axis. Put a chip there [for 3, 2]). • Identify that in an ordered pair, the first coordinate is the location on the *x*-axis and the second is the location on the *y*-axis. • Representation • Understand the following concepts and vocabulary: coordinates, ordered pair, origin, axis, grid, point.	CR	5

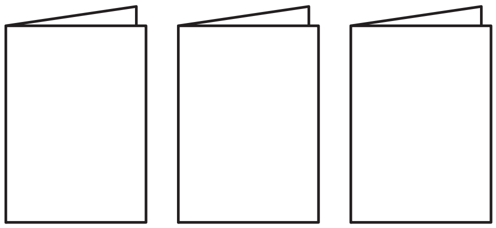
**MC = multiple-choice*
CR = constructed response

<table>
<tr><th colspan="3">Sample Item 1</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 5.NO.2a5 Solve word problems that require multiplication or division.</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr><td>I can combine (×) or decompose (÷) with concrete objects; use counting to get the answers.
I can match the action of combining or the action of decomposing with mathematical vocabulary in a word problem.
I understand concept of division: sharing or grouping numbers into equal parts.
I understand concept of multiplication: the result of making some number of copies of the original.
I can draw or use a representation of the word problem.
I understand the symbols ÷, =, ×.
I can identify purpose to either find a total (multiplication) or one component (number of sets or number within each set for division), depending upon the problem.
I can translate wording into numeric equation.</td><td>• Task analysis for each type of problem
• Use counting strategies.
• Use number patterns (e.g., skip counting).
• Model problem solving by identifying key words.
• Teach explicitly how to regroup to solve addition and subtraction problems.
• Teach explicitly the steps of multiplication, division (i.e., divide, multiply, subtract, drop down the next digit).
• Explicit instruction on vocabulary associated with a decision to multiply or divide</td><td>• Multiplication or division template to fill in the steps of the word problem (___ × ____ = ____; a horizontal structure with boxes for regrouping)
• Calculator
• Interactive whiteboards or other technology to manipulate representations
• Meaningful manipulatives or picture representations with symbols included
• Highlighted text that provides important information/vocabulary
• Multiplication and division tables</td></tr>
</table>

Item 1

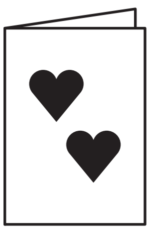
Ella had 6 hearts.

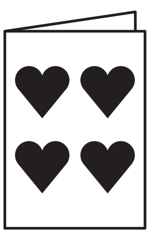
Ella had 3 cards.



Ella put the same number of hearts onto each card.

Which picture shows the number of hearts Ella put onto each card?

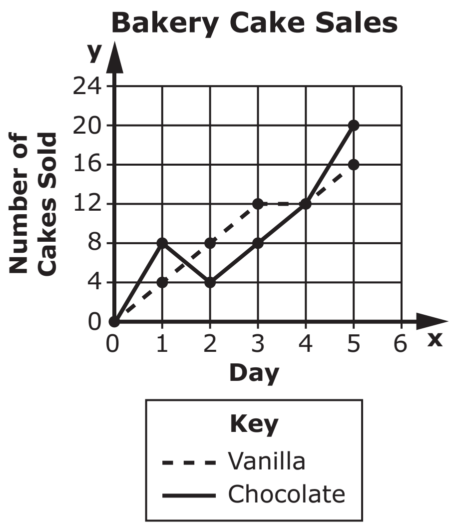
A. 

B. 

<table>
<tr><th colspan="3">Sample Item 2</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 5.PRF.2b1 Generate or select a comparison between two graphs from a similar situation.</td></tr>
<tr><td>Learning Target(s)</td><td>Instructional Strategies</td><td>Scaffolds and Supports</td></tr>
<tr><td>I can compare two pieces of information provided in a single display.</td><td>• Task analysis (e.g., decide on your question, create categories, decide on source of data, collect data based on categories, count data sets, organize data, create graph)
• Match to same
• Graphic organizer to establish sets</td><td>• Template (e.g., graphic organizer) or structure for collecting and organizing data
• Numbers that physically attach to a graph
• Interactive whiteboard
• Computer software
• Grid paper to construct graph
• Pre-made graphs
• Assistive technology/voice output device
• Self-monitoring task analysis for student independence</td></tr>
</table>

Item 2

This graph shows the number of vanilla and chocolate cakes sold at a bakery over 5 days.



On which day were the number of cakes sold equal?

A. Day 2

B. Day 4

C. Day 7

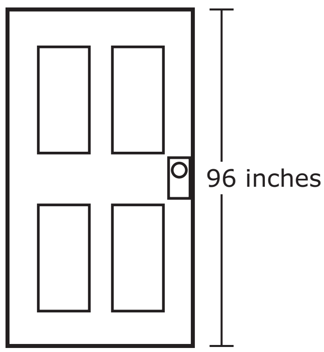
<table>
<tr><th colspan="3">Sample Item 3</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 5.ME.1b2 Convert standard measurements of length.</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr><td>I can recognize that in the same system, I can measure the same object with 2 different units.
I understand the following concepts and vocabulary: conversion, inch, foot, yard.
I understand standard units and abbreviations.</td><td>• Multiple exemplar training (e.g., “This is an inch, this is an inch… this is not an inch, show me an inch.”)
• Task analysis steps to convert from inches to feet using a table
• Teach student to use proportions (e.g., 12:1, 12 inches = 1 foot) to convert the same measurement from one unit to another.
• Measure length using one inch increments (how many) and one foot increments (how many).
• Have students place the U.S. unit cards/ representations in order from smallest to largest.</td><td>• Conversion table, adapted or unadapted measuring tools
• Calculator
• Counting blocks or manipulatives
• Counting mechanism (e.g., number line)
• Measuring tools that match to unit (e.g., “Identify the tool to measure inches”)
• Software
• Rulers with limited measurement (e.g., only 1-inch and 1/2-inch tabs)</td></tr>
</table>

Item 3

There are 12 inches in 1 foot.

$$12 \text{ inches} = 1 \text{ foot}$$

This door has a height of 96 inches.



What is the height of this door in feet?

A. 7 feet

B. 8 feet

C. 9 feet

Sample Item 4

Alignment	**Core Content Connector (CCC): 5.NO.2c2** Solve word problems involving the addition, subtraction, multiplication, or division of fractions.

Learning Targets	Instructional Strategies	Scaffolds and Supports
I understand that the numerator tells the number of parts and the denominator tells the type of parts. I can identify what actions to take given the context and language used in a word problem). I can build models to match fractions in a given equation or expression. I can identify key information in a word problem to represent the total and fraction. I can solve fraction problems using: pictures, models, representation cards, number sentences, word problems, graphic representation. I understand the following concepts, symbols and vocabulary: +, –, ×, ÷.	• Teach explicitly how to express a verbal description of a fraction (“one-fourth” as 1/4). • Task analysis: – Highlight/circle important words. – Choose the correct operation (+, –, ×, ÷). – Compute the answer. – State the answer. • Teach explicitly how to represent the total number of objects in a word problem as an array by creating sets based on the denominator of the provided fraction in a word problem (e.g., 1/2 of the 20 students would be a group of 20 objects shown as two arrays of 10 each). • Teach explicitly how to use a number line/ conversion tables to solve a word problem. • Use Model-Lead-Test. • Give students problems to model such as these: Charlene ate 1/4 of the sandwich at breakfast and 2/4 of the sandwich at lunch. How much of the sandwich did she eat?	• Arrays that represent the denominator as sets • Number line • Objects to represent arrays and perform operation • Rectangular blocks engraved with dots (can be used to teach students who have visual impairment) • Fraction strips • Assistive technology • Adapted text for word problems

Item 4

Marta had 7 squares. Each square had a height of $\frac{3}{8}$ of an inch.

This picture shows how Marta glued all of her squares together.

What was the height of all 7 squares, in inches, after Marta glued them together?

A. $\frac{21}{8}$ inches

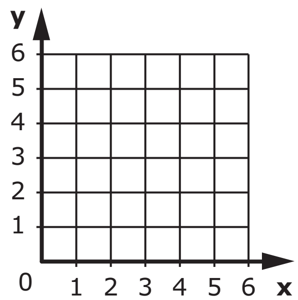
B. $\frac{39}{8}$ inches

C. $\frac{59}{8}$ inches

<table>
<tr><th colspan="3">Sample Item 5</th></tr>
<tr><td>Alignment</td><td colspan="2">Core Content Connector (CCC): 5.GM.1c3 Use ordered pairs to graph given points.</td></tr>
<tr><th>Learning Targets</th><th>Instructional Strategies</th><th>Scaffolds and Supports</th></tr>
<tr><td>I can identify the x- and y-axis.
I can identify the origin.
I can complete concrete graphing of points.
I can identify that in an ordered pair, the first coordinate is the location on the x-axis and the second is the location on the y-axis.
I understand the following concepts and vocabulary: coordinates, ordered pair, origin, axis, grid, point.</td><td>• Task analysis: Identify number to be plotted on x-axis, plot, identify number to be plotted on the y-axis, plot.
• Use games such as “Battleship” to practice graphing.
• Use a grid on the floor and have students move to coordinates.
• Make a treasure hunt with ordered pairs.
• Use ordered pairs that create a picture when graphed.</td><td>• Grid paper
• Models
• Graphic organizer
• Computer websites
• Raised graph paper
• Raised coordinate plane with raised x- and y-axis and raised horizontal and vertical lines
• Visual representation of task analysis
• Maps of local and/or well-known cities
• Maps of school or classroom</td></tr>
</table>

Item 5

This is a coordinate grid and a small object.



This is an ordered pair.

$(3, 4)$

Use the small object to plot the point $(3, 4)$ on the coordinate grid.

A. The student provided the correct answer.

B. The student did not provide the correct answer.

Multi-State Alternate Assessment