Preview of Common Core State Standards Sample EAGLE Items

Grade 5
Mathematics

July 11, 2012

Louisiana Believes.

Grade 5

Technology-enabled, multiple-part, constructed-response item types use a common context and contain several prompts that increase in difficulty or cognitive complexity and guide students to a culminating activity. This type of item can show where a student is within the difficulty or cognitive complexity ranges within a particular standard. It can also be a very effective item type to connect content and practices and assess both conceptual and procedural skills.

The first item in this set assesses fluency expectations given by 5.NBT.5. This item asks the student to utilize drop-down menus to mark each multiplication fact with multi-digit whole numbers as being true or false. The format of the item greatly reduces the probability that the student can obtain credit by guessing. Also, the item elicits five statements of evidence regarding the student's fluency. Standards involving fluency may be assessed directly or indirectly. To directly assess fluency, both speed and accuracy need to be measured. This item is an example of a task model that assesses fluency indirectly because it does not measure speed. Direct task models may be similar to this item, but they also include a timer so that a student is scored by their accuracy within time intervals.

The second item utilizes drag-and-drop functionality to compare four decimal numbers. This is another example of an item format that greatly reduces the probability that the student can obtain credit by guessing.

The third item focuses on standard 5.NBT.7 with strong connections to several practices (MP.1, MP.2, MP.6). To find the cost of five necklaces, the student must break the problem into smaller parts. First, the student breaks the problem into finding the cost of one necklace. The student further breaks the problem into smaller parts by finding the cost of each necklace component (beads, clasp, and wire). The student then determines the quantities of beads, clasps, and wire needed (MP.2) and relates them to the given costs. The student perseveres in solving the problem (MP.1) by using all of the calculations to build toward the ultimate goal of finding the total cost of five necklaces. The student attends to precision (MP.6) by accurately performing many decimal calculations throughout the problem.

At this grade level, students are expected to extend their previous understanding of multiplication to multiply a fraction by a fraction. The fourth item assesses whether the student can create and connect an area model that represents multiplying a fraction by a fraction. This item illustrates a technology enhancement that enables an efficient approach to drawing polygons on a grid. Instead of dragging line segments to the grid, connecting them, and then manipulating their orientation, students click on the grid to create the vertices of the polygon. After the student chooses each vertex, a line segment is automatically drawn, connecting the last two vertices chosen. After a polygon has been created, it can be moved or modified by dragging on the lines and vertices. This item also connects to two practices (MP.4, MP.7) by connecting area concepts with multiplicative reasoning.

The fifth item connects multiplication and addition skills with the process of finding the volume of a figure using unit cubes (5.MD.5c). This is a key focus for this grade and part of the progression as students build multiplicative and additive reasoning. In this item, the student must look for and make use of structure (MP.7) to complete the expression representing the volume of the L-shaped figure and then use the expression to calculate the total volume.

UIN:	E15001	Subject:	Math	Grade:	5	Item Type:	SR
CCSS:	5.NBT.5	Fluently multiply multi-digit whole numbers using the standard algorithm.					
Practice Standards:							
MC Key:	NA	**Item Name:**	Fluency with multi-digit multiplication	**Calculator:**	NC	**Est. Difficulty:** E	**DOK** 1
Points:	0–2	**Accommodations:**				**Scoring Method:**	AS
Passage Title(s):							
Source info:							

Use the drop-down menus to mark each equation as true or false.

20 × 35 = 700

50 × 50 = 250

36 × 22 = 144

74 × 63 = 4,662

125 × 62 = 7,750

True
False

Exemplary Response

True ▼ 20 × 35 = 700

False ▼ 50 × 50 = 250

False ▼ 36 × 22 = 144

True ▼ 74 × 63 = 4,662

True ▼ 125 × 62 = 7,750

Points Assigned

- 1 point for four drop-down menus correctly marked as true or false
- 2 points for five drop-down menus correctly marked as true or false

Scoring Rubric

Score	Description
2	2 points
1	1 point
0	The student's response is incorrect or blank.

UIN:	E15002		Subject:	Math		Grade:		5	Item Type:		CR
CCSS:	5.NBT.3b		Read, write, and compare decimals to thousandths. b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.								
Practice Standards:			6. Attend to precision.								
MC Key:	NA		Item Name:		Comparing decimals		Calculator:		NC	Est. Difficulty:	E	DOK	1
Points:	0–1		Accommodations:							Scoring Method:	AS	
Passage Title(s):											
Source info:											

Drag the numbers into the empty boxes to show a correct comparison.

1.093		2.309		1.487		0.847

	<		<		<	

Rubric

<u>Exemplary Response</u>

| 0.847 | < | 1.093 | < | 1.487 | < | 2.309 |

<u>Points Assigned</u>

- 1 point for a correct ordering of all the given numbers

<u>Scoring Rubric</u>

Score	Description
1	1 point
0	The student's response is incorrect, incomplete, or blank.

UIN:	E15003	Subject:	Math	Grade:	5	Item Type:	CR
CCSS:	5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.					
Practice Standards:		1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 6. Attend to precision.					
MC Key:	NA	Item Name:	Performing multiple operations with decimals	Calculator:	NC	Est. Difficulty:	H	DOK	3
Points:	0–4	Accommodations:				Scoring Method:	Mixed
Passage Title(s):							
Source info:							

Use the picture to answer the question.

Susan wants to make 5 necklaces. Each bead she plans to use is 0.4 inch long.

Each necklace will include these materials:

- 24 inches of beads
- 1 clasp
- 27 inches of wire

What is the total cost for Susan to buy the materials for 5 necklaces? Do not include tax in the total cost.

Show your work to find the total cost.

Rubric

<u>Exemplary Response</u>

$18.10

24/0.4 = 60 beads per necklace

60 x $0.03 x 5 = $9.00 for beads

27 x $0.02 x 5 = $2.70 for wire

$1.28 x 5 = $6.40 for clasps

$9.00 + $2.70 + $6.40 = $18.10 total cost

<u>Points Assigned</u>

- 1 point for finding the correct total cost for all 5 necklaces
- 1 point for finding the correct cost of the beads for one necklace or all 5 necklaces
- 1 point for finding the correct cost of the wire for one necklace or all 5 necklaces
- 1 point for finding the correct cost of the clasps for all 5 necklaces

<u>Scoring Rubric</u>

| Score	Description
4	4 points
3	3 points
2	2 points
1	1 point or demonstrates minimal understanding of adding, subtracting, multiplying, and dividing decimals to hundredths
0	The student's response is incorrect, irrelevant, too brief to evaluate, or blank.

UIN:	E15004	Subject:	Math	Grade:	5	Item Type:	CR

CCSS:	5.NF.4b	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Practice Standards:	4. Model with Mathematics. 7. Look for and make use of structure.

MC Key:	NA	**Item Name:**	Modeling multiplication of fractions	**Calculator:**	NC	**Est. Difficulty:**	M	**DOK**	2

Points:	0–2	**Accommodations:**			**Scoring Method:**	AS

Passage Title(s):	
Source info:	

Part A

Draw a rectangle on the grid with side lengths of $\dfrac{5}{2}$ units and $\dfrac{3}{2}$ units.

Create a rectangle on the grid by clicking four points on the grid to represent the corners of the rectangle. The sides of the rectangle will be automatically drawn as each corner is selected. To move the rectangle, click and drag any of the sides. To change the shape, click and drag any of the corners. To start over, click the Reset button below the grid.
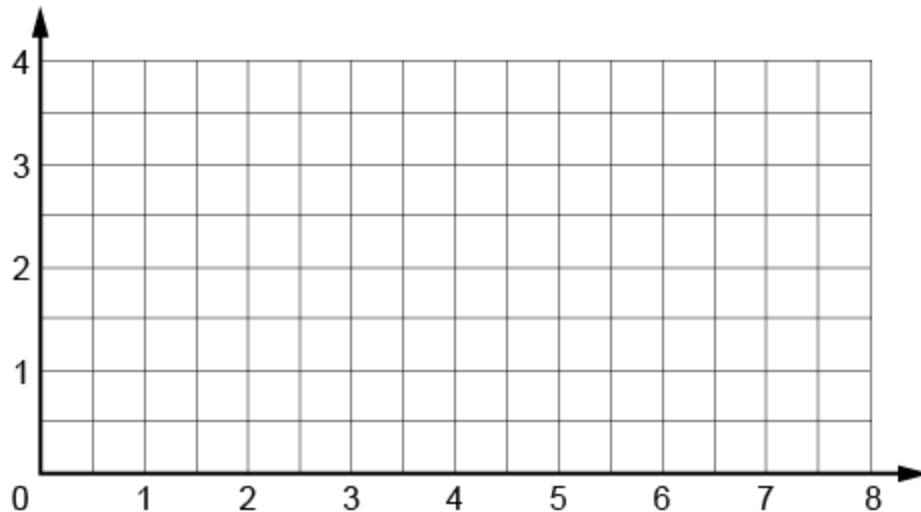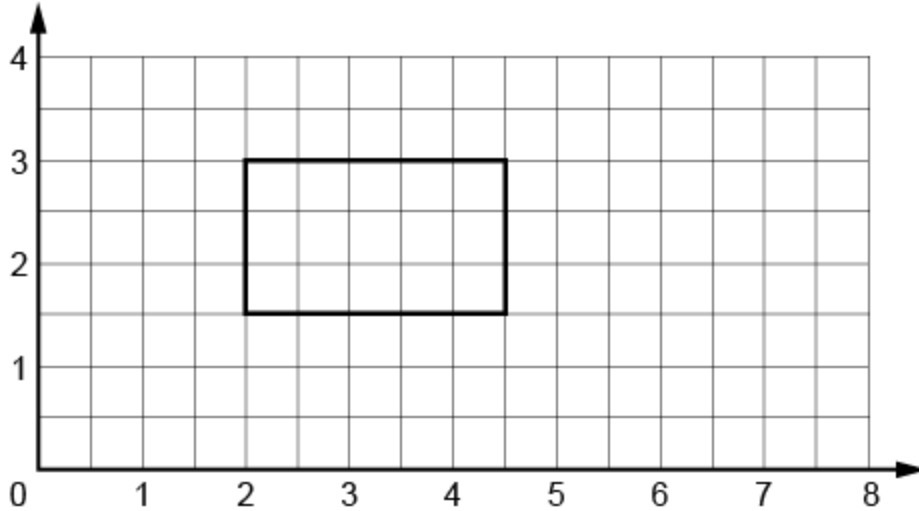

RESET

Part B

Complete the statement to show the multiplication fact modeled by the area of the rectangle that you drew in part A.

$$\frac{5}{2} \times \frac{3}{2} = \frac{\square}{\square}$$

Rubric

Exemplary Response

Part A

Part B

$$\frac{5}{2} \times \frac{3}{2} = \frac{\boxed{15}}{\boxed{4}}$$
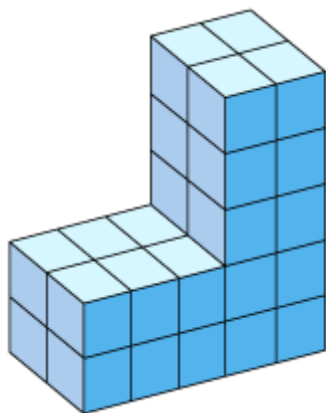
Points Assigned

- 1 point for the drawing of a rectangle that is $\frac{5}{2}$ by $\frac{3}{2}$
- 1 point for the correct equation that models the area of the rectangle

Scoring Rubric

Score	Description
2	2 points
1	1 point
0	The student's response is incorrect, incomplete, or blank.

UIN:	E15005		Subject:	Math	Grade:		5	Item Type:	CR

CCSS:	5.MD.5c	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Practice Standards:	6. Attend to precision. 7. Look for and make use of structure.

MC Key:	NA	Item Name:	Relating volume to multiplication and addition	Calculator:	NC	Est. Difficulty:	M	DOK	2

Points:	0–2	Accommodations:		Scoring Method:	AS

Passage Title(s):	
Source info:	

Use the figure to answer the question.

Part A

The L-shaped figure is made of unit cubes. Each cube measures 1 cubic inch. Enter numbers into the boxes to complete an expression that represents the volume of the figure.

$$(\Box \times \Box \times \Box) + (\Box \times \Box \times \Box)$$

Part B

What is the total volume of the figure?

Exemplary Response

Part A

$$(\boxed{2} \times \boxed{2} \times \boxed{3}) + (\boxed{2} \times \boxed{2} \times \boxed{5})$$

Part B

<div style="border:1px solid black; padding:10px;">
32 cubic inches
</div>

Points Assigned

- 1 point for the correct expression in part A
- 1 point for 32 cubic inches in part B

Note: The student must include "cubic inches" or an equivalent response in part B to receive 1 point.

Scoring Rubric

Score	Description
2	2 points
1	1 point
0	The student's response is incorrect or blank.