

Preview of Common Core State Standards Sample EAGLE Items

Grade 7
Mathematics

July 11, 2012

A grayscale photograph of a classroom. A female teacher in a light-colored, button-down shirt is standing and looking towards the camera. Several students in the foreground have their hands raised, indicating an interactive learning environment. The background is slightly blurred, focusing attention on the teacher and the students' participation.

Louisiana Believes.

Grade 7

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 provides a set of design criteria without stating the specific tasks students need to perform, thus addressing MP.1 (making sense of problems). There is only one best answer, and students who recognize the solution method will be able to complete it quickly.

The second item is designed to assess students across several skill levels, from solving simple proportions to writing an equation for a proportional relationship.

The third item requires students to create a “tool” for determining the probability of a compound event by filling in a table of possible outcomes. Once the table is complete, students will find the next part much easier if they use the results from the table (MP.5). Finally, students are asked to use the probability they found to determine how many times that event most likely occurs in 180 trials.

The fourth item provides scaffolding for students to create an equation relating two angles in a simple diagram. It assesses both quantitative and abstract reasoning (MP.2). Students who extend the vertical line to divide angle c into two parts (MP.7) find that it makes writing the equation much easier.

The fifth item in this set provides a multistep, real-world financial problem. Like many real-world problems, it provides several pieces of information but does not guide students through the process of putting the information together to answer the question. Students are required to make sense of the problem, persevere through several calculations (MP.1) to find the number of months, and then report that number in a sensible way (MP.6).

UIN:	E17001	Subject:	Math	Grade:	7	Item Type:	CR		
CCSS:	7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.							
Practice Standard(s):	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 8. Look for and express regularity in repeated reasoning.								
MC Key:		Item Name:	knitting needles	Calc	C	Est. Difficulty:	M	DOK	3
Points:	2	Accommodations:				Scoring Method:	AS		
Passage Title(s):									
Source info:									

A company decides to create a new series of knitting needles in different lengths. They want as many types as possible, given the following rules.

- The shortest type of needle should be 18 centimeters.
- Each type of needle must be at least 20% longer than the previous type of needle.
- The length of each type of needle has to be a whole number of centimeters.
- The longest type of needle has to be less than or equal to 40 centimeters.

Complete the table with the length for each type of needle.

Type of Needle	1	2	3	4	5
Length (cm)	18				

Rubric

Exemplary Response

Type of Needle	1	2	3	4	5
Length (cm)	18	22	27	33	40

Points Assigned

- 1 point for 3 acceptable values (whole numbers less than or equal to 40, each at least 20% larger than the one before.)
- 1 point for the 4th value

Scoring Rubric

Score	Description
2	2 points
1	1 point or demonstrates minimal understanding of solving problems with percents
0	The student's response is incorrect, irrelevant, too brief to evaluate, or blank.

UIN:	P17003	Subject:	Math	Grade:	7	Item Type:	CR		
CCSS:	7.RP.2b-c	Recognize and represent proportional relationships between quantities. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. <i>For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</i>							
Practice Standard(s):	2. Reason abstractly and quantitatively.								
MC Key:		Item Name:	inches and millimeters	Calculator:	C	Est. Difficulty:	M	DOK	3
Points:	0–4	Accommodations:		Scoring Method:	AS				
Passage Title(s):									
Source info:									

Some rulers measure in both inches and millimeters. Looking at such a ruler, you can see that 12 inches is approximately the same as 300 millimeters.

Part A

What is the constant of proportionality (unit rate) for the relationship between inches and millimeters?

Part B

Fill in the empty cells in the table with the correct number of millimeters or inches.

Inches	0	3		8	
Millimeters			150		800

Part C

Write an equation that could be used to find the number of millimeters (m) for any number of inches (i). Start your equation with $m =$.

Rubric

Exemplary Response

Part A

$1/25$; 0.04 ;

Part B

Inches	0	3	6	8	32
Millimeters	0	75	150	200	800

Part C

$m = 25i$

Points Assigned

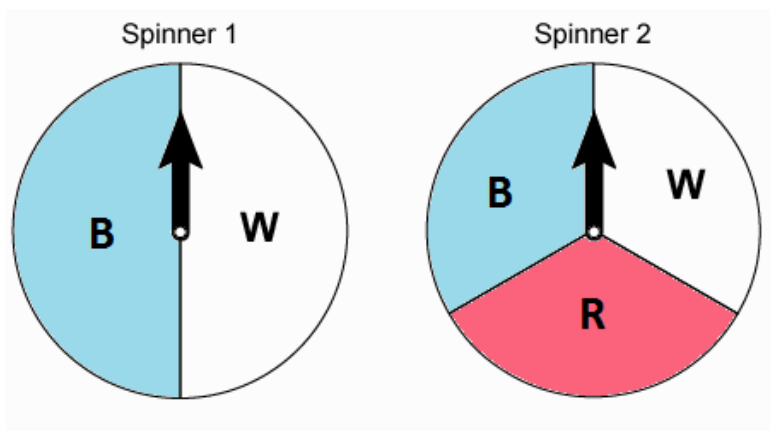
- Part A: 1 point for correct constant of proportionality
- Part B: 1 point for first three cells; 1 point for last two cells
- Part C: 1 point for correct equation

Scoring Rubric

Score	Description
4	4 points
3	3 points
2	2 points
1	1 point or demonstrates minimal understanding of proportional relationships
0	The student's response is incorrect, irrelevant, too brief to evaluate, or blank.

UIN:	P17005	Subject:	Math	Grade:	7	Item Type:	CR		
CCSS:	7.SP.8a,b	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.							
Practice Standard(s):	2. Reason abstractly and quantitatively. 5. Use appropriate tools strategically.								
MC Key:		Item Name:	David's spinners	Calc	NC	Est. Difficulty:	M	DOK	2
Points:	0–3	Accommodations:		Scoring Method:	AS				
Passage Title(s):									
Source info:									

David has these two spinners.



Spinner 1 is divided into two equal parts, and spinner 2 is divided into three equal parts.

Part A

Complete the table to show all possible outcomes of spinning the arrows on both spinners at the same time.

Use the pull-down menus to enter B, W, and R in the table. The first row shows one of the combinations.

Spinner 1	Spinner 2
B	R
	R
	W
	B

Part B

When spun at the same time, what is the probability the arrow on one spinner will land on blue (B) and the arrow on the other spinner will land on white (W)? Write your answer as a fraction.

Part C

If David spins both arrows together 180 times, about how many times will one arrow land on B and the other arrow land on W?

Rubric

Exemplary Response

Part A

Spinner 1	Spinner 2
B	R
B	B
B	W
W	R
W	B
W	W

Part B

$\frac{1}{3}$

Part C

60

Scoring Notes

In part B, $\frac{2}{6}$ is acceptable as well. If a student makes an error in Part A, the fraction in B should match the table.

The point for part C can be earned based on an incorrect fraction in part B.

Points Assigned

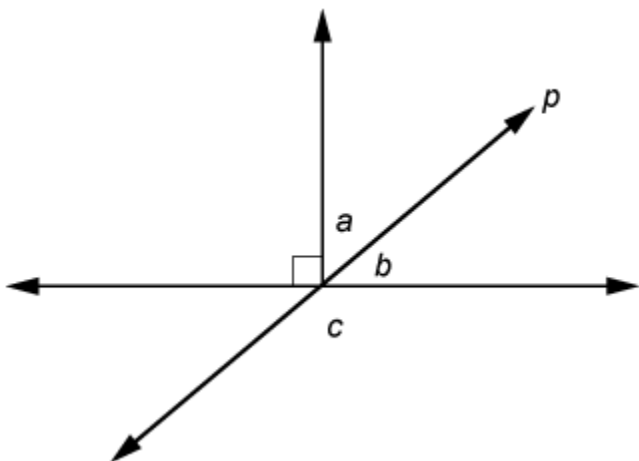
- Part A: 1 point for correctly showing all possible combinations
- Part B: 1 point for correct fraction
- Part C: 1 point for correct number of spins

Scoring Rubric

Score	Description
3	3 points
2	2 points
1	1 point or demonstrates minimal understanding of finding probabilities
0	The student's response is incorrect, irrelevant, too brief to evaluate, or blank.

UIN:	M17008	Subject:	Math	Grade:	7	Item Type:	CR		
CCSS:	7.G.05	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.							
Practice standard(s):	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 7. Look for and make use of structure.								
MC Key:		Item Name:	C is an obtuse angle	Calc	CN	Est. Difficulty:	M	DOK	2
Points:	0–3	Accommodations:				Scoring Method:	AS		
Passage Title(s):									
Source info:									

Use the diagram to answer the question.



Line p divides a right angle into two angles, a and b , and also creates angle c .

Part A

If the measure of angle $b = 42^\circ$, what is the measure of angle a ?

$a =$

Part B

Imagine how the angles a , b , and c will change if line p is rotated around the intersection point. Describe in words how angles b and c will change as line p rotates clockwise toward the horizontal line.

As angle a increases,

Part C

Write an equation that could be used to find the value of c if a is known. Use only the variables a and c in your equation. Start your equation with $c =$.

$c =$

Rubric

Exemplary Response

Part A

$$a = 48^\circ$$

Part B

As angle a increases, angle b decreases and angle c increases.

Part C

$$c = 90 + a$$

Scoring Notes

Other equations may be considered correct.

$$c = 180 - (90 - a), c - 90 = a$$

Points Assigned

- Part A: 1 point for 48 degrees (“degrees” is not required)
- Part B: 1 point for correctly describing what happens to angles b and c
- Part C: 1 point for a correct equation

Scoring Rubric

Score	Description
3	3 points
2	2 points
1	1 point or demonstrates minimal understanding of supplementary and complementary angles
0	The student’s response is incorrect, irrelevant, too brief to evaluate, or blank.

UIN:	M17006	Subject:	Math	Grade:	7	Item Type:	CR		
CCSS:	7.EE.03	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.							
Practice standard(s):	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 6. Attend to precision.								
MC Key:		Item Name:	Jolene's car	Calc	C	Est. Difficulty:	M	DOK	2
Points:	0–3	Accommodations:				Scoring Method:	Mixed		
Passage Title(s):									
Source info:									

Jolene decides to buy a car as soon as she has saved \$5,000.

Her income is \$1,200 per month, but she is due to receive a 20% raise after 3 months.

Jolene has \$450 in her savings account now and knows she can save \$300 per month on her current income. When she gets the raise, she plans to save $\frac{3}{4}$ of the increase in addition to the \$300 each month.

In how many months **from now** will Jolene have a total of \$5,000 saved?

Write your answer in the small box.

Show your work with a brief description of what you are trying to accomplish in each step.

Rubric

Exemplary Response

11 months

For the first 3 months, she saves \$300 per month for a total of \$900.
Her raise will be $\$1200 \times 20\% = \240 per month.
 $3/4$ of \$240 is \$180. So after 3 months she will be saving \$480 per month.
 $\$450 + \$900 + 480n = 5000$
 $480n = 3650$
 $n = 7.6$ months
Rounding up and adding in the initial 3 months = $8 + 3 = 11$ months.

Points Assigned

- 1 point for correct answer
- 0–2 points for work

Scoring Rubric

Score	Description
3	3 points
2	2 points
1	1 point or demonstrates minimal understanding of problem solving
0	The student's response is incorrect, irrelevant, too brief to evaluate, or blank.