The Pennsylvania System of School Assessment

Mathematics
Item and Scoring Sampler

SUPPLEMENT

2009–2010
Grade 3

TABLE OF CONTENTS

INTRODUCTION

The 2009–2010 Mathematics Item and Scoring Sampler Supplement displays released items from the 2009 PSSA operational test. The sampler supplement is to be used in conjunction with the previous year's item sampler. The 2008–2009 Mathematics Item and Scoring Sampler can be found on the Pennsylvania Department of Education website at http://www.pde.state.pa.us/. Select the "Pre K–12 Schools" tab at the top of the page. Then select "Assessment" in the "Learn About" column to the left. Select "Resource Materials" in the "Learn About" column of the next page, and then scroll down to find the appropriate sampler. Alternately, you may type in or click this link to reach the location of the item samplers: http://www.pde.state.pa.us/a_and_t/cwp/view.asp?a=108&Q=73314&a_and_tNav=|680|&a_and_tNav=|

This item and scoring sampler supplement contains 16 mathematics multiple-choice items and 1 open-ended item. Each item is preceded by the Assessment Anchor and Eligible Content coding. The majority of multiple-choice answer options are followed by a brief analysis or rationale. The correct answer is indicated by an asterisk. The table following each multiple-choice item displays the percentages of students who chose each answer option. In the tables, A represents the first answer choice, B represents the second answer choice, C represents the third answer choice, and D represents the fourth answer choice. The correct answer is also shaded in these tables. The table following the open-ended item indicates the students' performance for each scorepoint. Sample student responses for each of the scoring levels are also included for the open-ended item.

Since students are not permitted to use a calculator on the grade 3 PSSA, it is intended that the items on the grade 3 sampler supplement be solved without the use of a calculator.

GRADE 3 RULER

The ruler shown below is not intended to be used to measure. It has been included as a representation of the rulers that will be provided for students when they take the test. Due to differences in printers, etc., the ruler may not accurately reproduce to scale.

MATHEMATICS
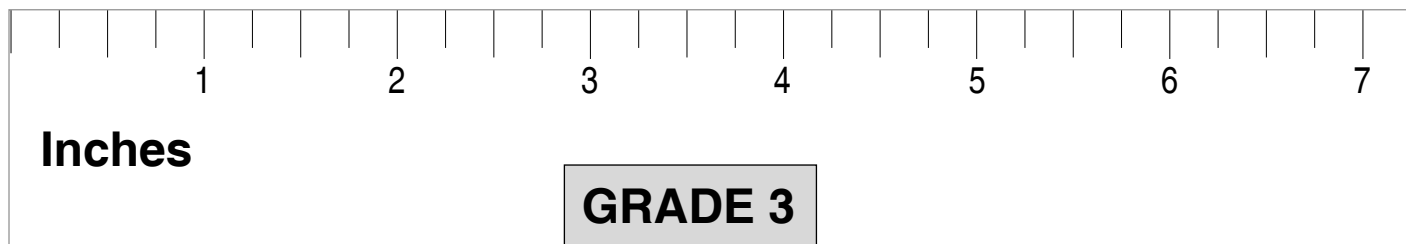
MULTIPLE-CHOICE ITEMS

> **Note: All percentages listed in the tables below the items have been rounded.**

A.1.1.1

1 There are 4,092 people in a town.

Which shows the number of people in the town?

○ four and ninety-two

> *ignored 0 and place value of 4*

○ four hundred ninety-two

> *confused thousands place with hundreds place*

○ four thousand, ninety-two
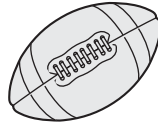
  *

○ four thousand, nine hundred two

> *confused tens place with hundreds place*

A	B	C	D
3%	5%	87%	5%

A.1.2.2

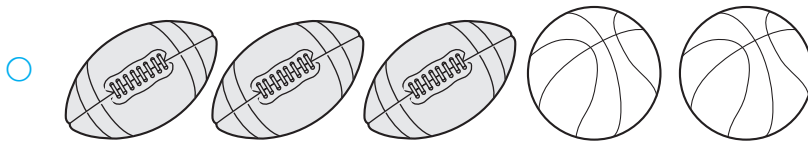**2**   A football is shown below.

Which shows $\frac{3}{5}$ of the balls as footballs?

○   *

○   3/5 are basketballs

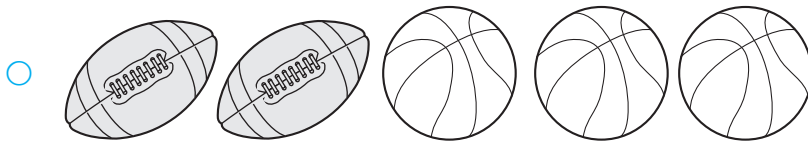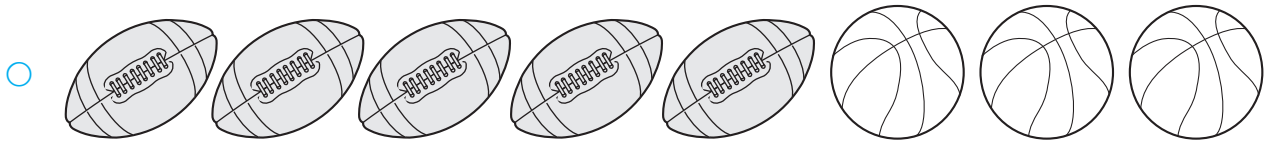○   3 basketballs, 5 footballs
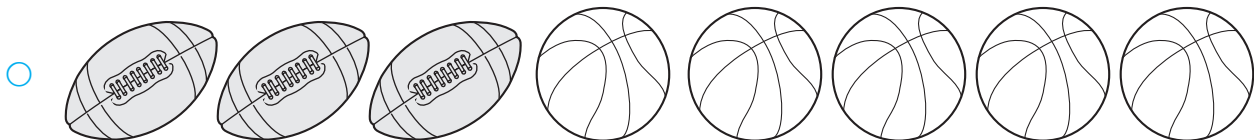
○   3 footballs, 5 basketballs

A	B	C	D
88%	2%	3%	6%

A.1.3.2

3 Grace has 1 quarter, 2 dimes, and 1 nickel. Which is **more** money than Grace has?

○　*thought pennies were dimes;*
0.75 > 0.50

○　*

○　*thought pennies were dimes;*
0.80 > 0.50

○　*thought nickels were quarters;*
0.95 > 0.50

A	B	C	D
2%	88%	8%	3%

MATHEMATICS

A.1.3.3

4 Alicia bought a bag of oranges that cost $2.25. She paid with $3.00. Which coins **could be** Alicia's correct change?

○   *thought nickels were quarters*

○   *

○   *mixed up values of nickels and dimes*

○   *counted one nickel as a quarter*

A	B	C	D
4%	79%	11%	6%

A.2.1.2

5 A classroom has 12 desks. Students are sitting at 7 desks.

Danica found the number of empty desks by subtracting:

$$12 - 7 = 5$$

Which can be used to check her work?

○ $5 + 2 = 7$ *not in same fact family*

○ $5 + 7 = 12$ *

○ $5 + 12 = 17$ *not in same fact family*

○ $12 + 7 = 19$ *not in same fact family*

A	B	C	D
4%	88%	3%	5%

MATHEMATICS

A.3.1.3

6   Find the difference:

$$759$$
$$-214$$

○   445   *thought 7 − 2 was 4*

○   544   *thought 9 − 4 was 4*

○   545   *

○   973   *added instead of subtracted*

A	B	C	D
3%	4%	91%	3%

B.1.1.2

7   Jack started cleaning his room at 9:50.

He finished at 10:05.

How long did it take Jack to clean his room?

○   15 minutes   *

○   45 minutes   *9:05 to 9:50*

○   1 hour and 15 minutes
      :50 to :05 is 15 min. and 9 to 10 is 1 hour

○   1 hour and 45 minutes
      9:05 to 10:50

A	B	C	D
67%	8%	16%	8%

B.2.2.1

8   Amber has a spoon in her lunchbox.

Which is **most likely** the length of her spoon?

○   1 inch   *too short*

○   6 inches   *

○   1 foot   *too long*

○   6 feet   *too long*

A	B	C	D
6%	89%	3%	1%

C.1.1.1

9 Margo cut some photos into shapes and put them on a scrapbook page, as shown below.
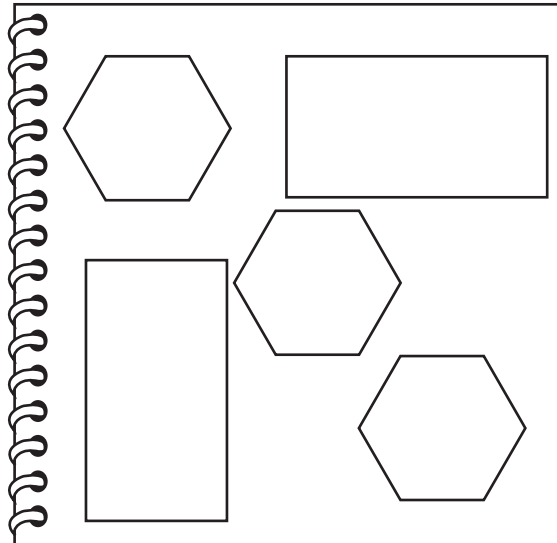
What shapes are Margo's photos?

○ rectangles and pentagons   *pentagons have 5 sides, not 6*

○ rectangles and hexagons   *

○ squares and hexagons   *squares have 4 sides of equal length*

○ rectangles and octagons   *octagons have 8 sides, not 6*

A	B	C	D
11%	78%	2%	9%

MATHEMATICS

C.2.1.2

10 Which snowman drawing has symmetry?

○ *arms and scarf not symmetrical*

○ *scarf not symmetrical*

○ *arms not symmetrical*

○ *
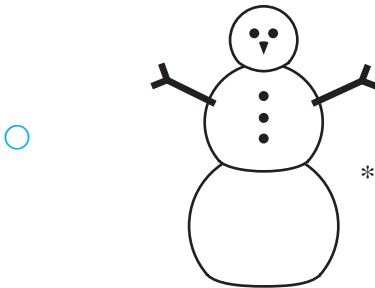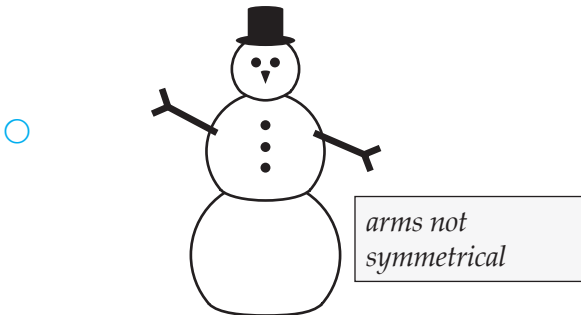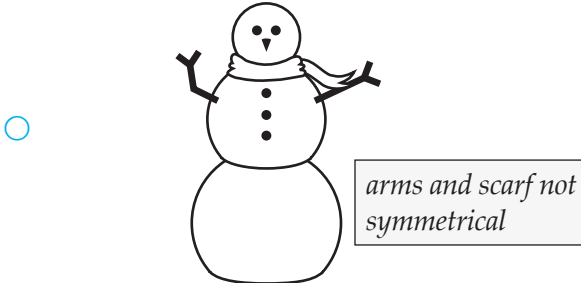
A	B	C	D
1%	7%	3%	88%

D.1.1.1

11 Camilla made the number pattern below.

3, 6, 9, 12, _____ , 18

What number is missing in Camilla's pattern?

○ 13   *13 is between 12 and 18*

○ 14   *14 is between 12 and 18*

○ 15   *

○ 16   *16 is between 12 and 18*

A	B	C	D
1%	2%	94%	3%

D.1.1.2

12 Bruce wrote the pattern shown below.

72, 62, 52, 42

What is the rule for the pattern?

○ subtract 1 from each number

> *subtracted one from tens place*

○ multiply each number by 2

> *each number ends in two*

○ divide each number by 10

> *confused subtraction with division*

○ subtract 10 from each number   *

A	B	C	D
3%	7%	4%	86%

D.2.1.2

13 There were 13 turtles swimming in a pond.

Then 7 of the turtles climbed onto a log.

Which number sentence shows how many turtles stayed in the pond?

○ $7 - 6 = 1$

> *subtracted difference from 7*

○ $13 + 7 = 20$

> *added instead of subtracted*

○ $13 + 6 = 19$

> *added difference to 13*

○ $13 - 7 = 6$
    *

A	B	C	D
1%	8%	1%	90%

E.1.1.1

14 The table below shows the weights of 4 horses.

Horse Weights

Horse	Weight in Pounds
Misty	688
Clyde	721
King	693
Star	701

Which horse weighs the **most**?

○ Misty | greatest value in ones place |

○ Clyde *

○ King | greatest value in tens place |

○ Star | didn't notice other number with 7 in hundreds place |

A	B	C	D
2%	93%	3%	2%

E.1.1.2

15 The table below shows the heights of 4 students' plants.

Plant Heights

Student	Height (inches)
Carrie	4
Dale	3
Erin	1
Farah	8

What is the height, in inches, of Erin's plant?

○ 1 *

○ 3 | Dale's plant |

○ 4 | Carrie's plant |

○ 8 | Farah's plant |

A	B	C	D
93%	1%	1%	5%

MATHEMATICS

E.1.2.2

16 Mr. McWall's class worked in 4 groups.

The table below shows how many questions each group asked.

Group Work

Group	Number of Questions
A	12
B	13
C	18
D	7

Which tally chart has the same information as the table?

Group Work

Group	Number of Questions
A	卌 II
B	卌 III
C	卌 IIII IIII
D	IIII III

○

Option A: Rows A, B, and C are missing 5 tallies

Group Work

Group	Number of Questions
A	卌 卌 卌
B	卌 卌 卌 I
C	卌 卌 卌 卌 II
D	卌 III

○

Option B: doesn't match table

Group Work

Group	Number of Questions
A	卌 卌 II
B	卌 卌 III
C	卌 卌 III
D	卌 II

○

Option C: Row C is missing 5 tallies

Group Work

Group	Number of Questions
A	卌 卌 II
B	卌 卌 III
C	卌 卌 卌 III
D	卌 II

○ *

A	B	C	D
2%	1%	4%	93%

OPEN-ENDED ITEM

A.1

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

> **WRITE** Abby's score using only numbers.
>
> _____

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

> **WRITE** a number in the blank that could be Darren's score that makes the number sentence true.
>
> 2,908 < _____

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

Part C

Luke's score is an even number with 3 digits.

WRITE a number that could be Luke's score.

PUT your answer in the **ANSWER BOX**.

EXPLAIN what makes it an even number.

ANSWER BOX:

Score Point 4	Score Point 3	Score Point 2	Score Point 1	Score Point 0
37%	38%	17%	6%	2%

MATHEMATICS

ITEM-SPECIFIC SCORING GUIDELINE

Item #17

This item is reported under Category A, Numbers and Operations

Assessment Anchor:

A.1–Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

Specific Eligible Content addressed by this item:

A.1.1.1–Match the word name with the appropriate whole number (up through 9,999).

A.1.1.2–Differentiate between and/or give examples of even and odd numbers (limit to 3 digits).

A.1.1.3–Compare two whole numbers using greater than (>), less than (<), or equal to (=)(up through 9,999).

Scoring Guide:

Score	In response to this item, the student—
4	demonstrates a *thorough* understanding of matching word name with appropriate whole number, differentiating between even and odd numbers and comparing whole numbers by correctly solving problems and clearly explaining procedures.
3	demonstrates a *general* understanding of matching word name with appropriate whole number, differentiating between even and odd numbers and comparing whole numbers by clearly explaining procedures with only minor errors or omissions.
2	demonstrates a *partial* understanding of matching word name with appropriate whole number, differentiating between even and odd numbers and comparing whole numbers by correctly performing a significant portion of the required task.
1	demonstrates *minimal* understanding of matching word name with appropriate whole number, differentiating between even and odd numbers and comparing whole numbers.
0	The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-scorable	BLK – Blank, entirely erased, or written refusal to respond OT – Off task IL – Illegible LOE – Response in a language other than English

MATHEMATICS

Item #17

Top Scoring Response:

Part A Answer
4029 or 4,029

(1 score point)

      1 point for correct answer

Part B Answer
Any number > 2,908

(1 score point)

      1 point for correct answer

Part C Answer	Explanation
Any even number with 3 digits	Even numbers end in 2, 4, 6, and 8 (and may or may not see the 0) **OR** 2, 4, 6, 8 (and may or may not see 0) are in the ones place **OR** equivalent (may see "even numbers are divisible by 2" or "are multiples of 2", etc.)

(2 score points)

      1 point for correct answer
      1 point for complete explanation

MATHEMATICS

OPEN-ENDED ITEM RESPONSES

A.1   Response Score: 4

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

> **WRITE** Abby's score using only numbers.
>
> _4,029_____

The student has given a correct answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

> **WRITE** a number in the blank that could be Darren's score that makes the number sentence true.
>
> 2,908 < _3,985_____

The student has given a correct answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

Part C

Luke's score is an even number with 3 digits.

WRITE a number that could be Luke's score.

PUT your answer in the **ANSWER BOX**.

EXPLAIN what makes it an even number.

932 is an even number because all you have to do is look in the ones place. If you can divied That number equally, it is even. A even number in the ones place makes the whole number even.

ANSWER BOX:

932

The student has given a correct answer.
The student has given a complete explanation.

MATHEMATICS

A.1   Response Score: 3

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

> **WRITE** Abby's score using only numbers.
>
> 4,029

The student has given a correct answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

> **WRITE** a number in the blank that could be Darren's score that makes the number sentence true.
>
> 2,908 < 2909

The student has given a correct answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

Part C

Luke's score is an even number with 3 digits.

WRITE a number that could be Luke's score.

PUT your answer in the **ANSWER BOX**.

EXPLAIN what makes it an even number.

It is a even number because there is a two in the middel and two is a even number.

ANSWER BOX:

428

The student has given a correct answer.
The student has given an incorrect explanation.

MATHEMATICS

A.1   Response Score: 3

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

WRITE Abby's score using only numbers.

4,029

The student has given a correct answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

WRITE a number in the blank that could be Darren's score that makes the number sentence true.

$2{,}908 <$ 3,509

The student has given a correct answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

Part C

Luke's score is an even number with 3 digits.

> **WRITE** a number that could be Luke's score.
>
> **PUT** your answer in the **ANSWER BOX**.
>
> **EXPLAIN** what makes it an even number.
>
> _4,962_, is an even number because the digit in the ones place, (2) can be divided equally among 2 people.
>
> **ANSWER BOX:**
>
> 4,962

The student has given an incorrect answer.
The student has given a complete explanation.

A.1   Response Score: 2

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

> **WRITE** Abby's score using only numbers.
>
> 4,029

> The student has given a correct answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

> **WRITE** a number in the blank that could be Darren's score that makes the number sentence true.
>
> 2,908 < two thousand 9 hundred and 8

> The student has given an incorrect answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

Part C

Luke's score is an even number with 3 digits.

WRITE a number that could be Luke's score.

PUT your answer in the **ANSWER BOX**.

EXPLAIN what makes it an even number.

200 Cause, It is an even number and it has 3 digits.

ANSWER BOX:

_200_

The student has given a correct answer.
The student has given an incorrect explanation.

A.1   Response Score: 2

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

> **WRITE** Abby's score using only numbers.
>
> 4,29 _____

The student has given an incorrect answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

> **WRITE** a number in the blank that could be Darren's score that makes the number sentence true.
>
> 2,908 < 2,980 _____

The student has given a correct answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

Part C

Luke's score is an even number with 3 digits.

WRITE a number that could be Luke's score.

PUT your answer in the **ANSWER BOX**.

EXPLAIN what makes it an even number.

Because 2 is even 8 is even and 0 is even put it all Together you get an even nuber

ANSWER BOX:

2 80

The student has given a correct answer.
The student has given an incorrect explanation.

A.1   Response Score: 1

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

WRITE Abby's score using only numbers.

four thousand tweny nine

The student has given an incorrect answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

WRITE a number in the blank that could be Darren's score that makes the number sentence true.

2,908 < 2,908

The student has given an incorrect answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

Part C

Luke's score is an even number with 3 digits.

WRITE a number that could be Luke's score.

PUT your answer in the **ANSWER BOX**.

EXPLAIN what makes it an even number.

it makes a even number 246 is a three digit number.

ANSWER BOX:

246

The student has given a correct answer.
The student has given an incorrect explanation.

A.1   Response Score: 1

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

> **WRITE** Abby's score using only numbers.
>
> 4,029 _____

The student has given a correct answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

> **WRITE** a number in the blank that could be Darren's score that makes the number sentence true.
>
> 2,908 < 1,000 _____

The student has given an incorrect answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

Part C

Luke's score is an even number with 3 digits.

WRITE a number that could be Luke's score.

PUT your answer in the **ANSWER BOX**.

EXPLAIN what makes it an even number.

It's 137 because those are
even numbers & 3 digits.

ANSWER BOX:

137

The student has given an incorrect answer.
The student has given an incorrect explanation.

A.1   Response Score: 0

17   Abby, Tony, Darren, and Luke played a computer game.

Part A

Abby's score was four thousand twenty-nine.

WRITE Abby's score using only numbers.

4,29 _____

The student has given an incorrect answer.

Part B

Tony's score was 2,908. Tony wrote a number sentence to compare his score to Darren's score.

WRITE a number in the blank that could be Darren's score that makes the number sentence true.

$2{,}908 <$ 4,29 _____

The student has given an incorrect answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

Part C

Luke's score is an even number with 3 digits.

> **WRITE** a number that could be Luke's score.
>
> **PUT** your answer in the **ANSWER BOX**.
>
> **EXPLAIN** what makes it an even number.
>
> _because it is a even number._
>
> **ANSWER BOX:**
>
> _3,439_

The student has given an incorrect answer.
The student has given an incorrect explanation.

MATHEMATICS

SUMMATIVE DATA TABLE

Multiple-Choice Items

Sampler Sequence	A	B	C	D
1	3%	5%	87%	5%
2	88%	2%	3%	6%
3	2%	88%	8%	3%
4	4%	79%	11%	6%
5	4%	88%	3%	5%
6	3%	4%	91%	3%
7	67%	8%	16%	8%
8	6%	89%	3%	1%
9	11%	78%	2%	9%
10	1%	7%	3%	88%
11	1%	2%	94%	3%
12	3%	7%	4%	86%
13	1%	8%	1%	90%
14	2%	93%	3%	2%
15	93%	1%	1%	5%
16	2%	1%	4%	93%

Open-Ended Item

Sampler Sequence	Score Point 4	Score Point 3	Score Point 2	Score Point 1	Score Point 0
17	37%	38%	17%	6%	2%

Mathematics
Grade 3
Item and Scoring Sampler Supplement