

Tennessee Comprehensive Assessment Program

TCAP/CRA 2013



1

Anchor Set

Grade 1 – Bead Necklaces Task

SECURE MATERIAL - Reader Name: _____

Tennessee Comprehensive Assessment Program

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Grade 1 — 2013–14, Phase 1
 Part 2: Constructed Response Task Section

Bead Necklaces Task

Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

A large rectangular box for writing an equation. In the top-left corner, there is a small icon of a hand holding a pencil, indicating where to start writing.

- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.

A large rectangular box for writing an explanation. In the top-left corner, there is a small icon of a hand holding a pencil, indicating where to start writing.

Grade 1 — 2013–14, Phase 1
 Part 2: Constructed Response Task Section

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.



Scoring Guide

The CCSS for Mathematical Content (3 points)

- 1.OA.1 Solves the “putting together” situational word problem (Part A) where the whole is unknown. _____
(1 Point)
- 1.OA.2 Solves the three-addend situational word problem (Part D) where the whole is unknown _____
(1 Point)
- 1.OA.3 Indicates an understanding of the commutative property of addition (Part B) by: _____
– stating that the set of 9 beads and 7 beads remain the same in both expressions so the whole will also be the same; or
– creating a diagram that shows the whole remains the same regardless but the 9 beads and the 7 beads appear in different order*.
(*Calculation errors of the sums may exist.)
(1 Point)

The CCSS for Mathematical Practice (4 points)

- MP1 Makes decisions and choices on how to approach the problem. Shows evidence of making sense of the task by representing beads on the string, writing equations, or an explanation. _____
(1 Point)
(MP1: Make sense of problems and persevere in solving them.)
- MP2 Writes equations and makes connections with arrows to the visual diagram or describes the beads on the necklace. **(1 Point)** _____
(MP2: Reason abstractly and quantitatively.)
- MP4 Constructs diagrams or expressions that accurately describe the beads. **(1 Point)** _____
(MP4: Model with mathematics.)
- MP6 Shows accurate calculations and diagrams. **(1 Point)** _____
(MP6: Attend to precision.)

TOTAL POINTS: 7

The CCSS for Mathematical Content Addressed In This Task

Represent and solve problems involving addition and subtraction.

- 1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- 1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

- 1.OA.3 Apply properties of operations as strategies to add and subtract. *Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)*

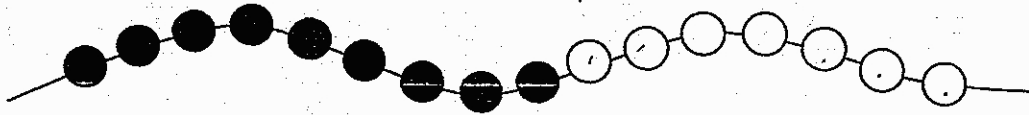
The CCSS for Mathematical Practice*

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.


* Gray type indicates Mathematical Practices not addressed in this assessment.

3. Bead Necklaces Task


Here is Jill's necklace:

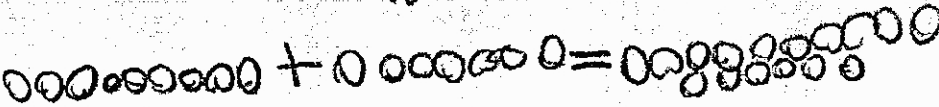



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

 9 Black beads + 7 white beads = 16 beads in all

- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.

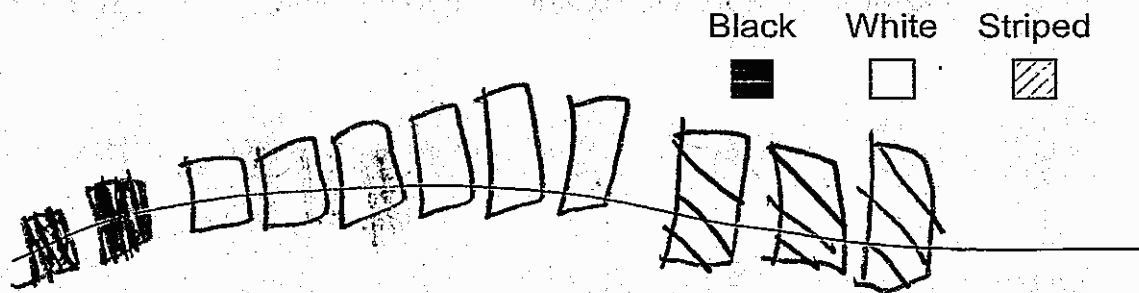
 $9 + 7 = 16$ $7 + 9 = 16$






A - 1b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.

 $5 + 6 = 11$

because 3 striped beads + 2 Black
= 5 and all those 6 = 11 beads

Anchor 1

Litho 0076

Total Content Points: 3 (1.OA.A.1, 1.OA.A.2, 1.OA.A.3)

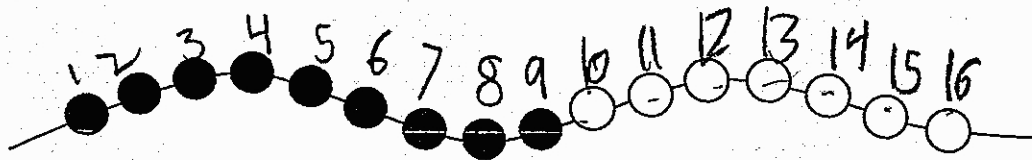
Total Practice Points: 4 (MP1, MP2, MP4, MP6)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with an addition expression ($9 + 7$) in order to find an unknown whole (1.OA.A.1). In Part D, the student solves the three addend situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). In Part B, the student demonstrates an understanding of the commutative property of addition by drawing diagrams that show the whole remains the same regardless of the 9 beads and 7 beads appearing in different order (1.OA.A.3). The student shows evidence of making sense of the task by correctly representing beads on the string in Part C and writing equations in Parts A and D (MP1). The student writes an equation in Part A and makes a connection to the visual diagram by describing the beads on the necklace (9 black beads + 7 white beads = 16 beads in all) (MP2). The student constructs diagrams and expressions that accurately represent the beads (MP4). The student shows accurate calculations and diagrams (MP6).


Total Awarded Points: 7 out of 7

3. Bead Necklaces Task

Here is Jill's necklace:




- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.



$$9 + 7 = 16$$

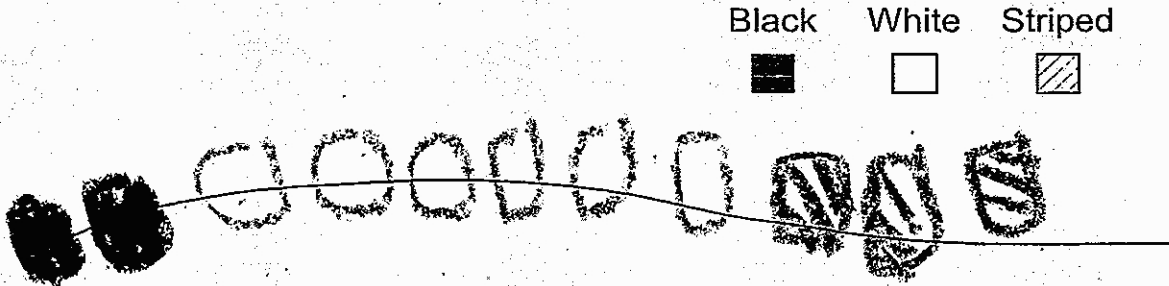
- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.



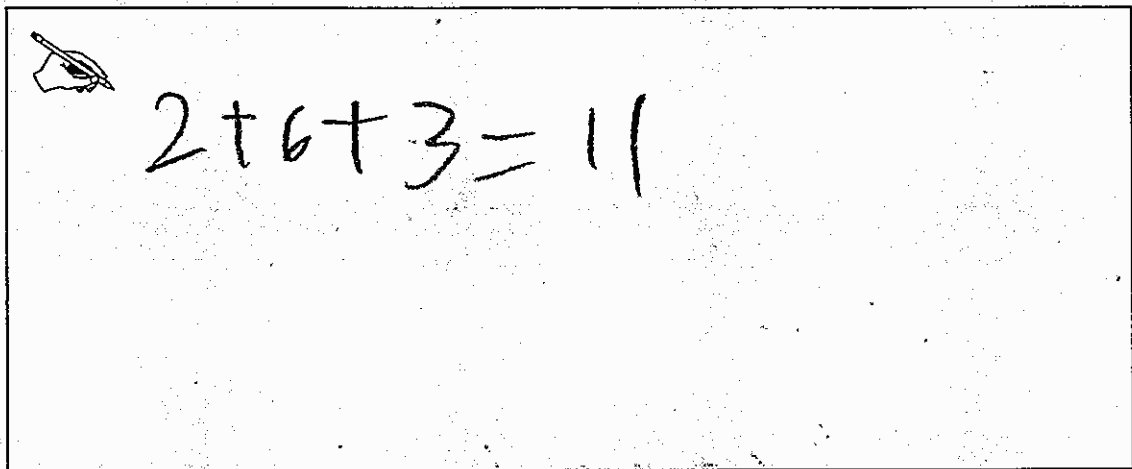
$$9 + 7 = 16 \quad 7 + 9 = 16$$

A - 2b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.



A rectangular box containing a hand-drawn equation. On the left side of the box, there is a small drawing of a hand holding a pencil. The equation written in the center is $2 + 6 + 3 = 11$.

Anchor 2

Litho 0088

Total Content Points: 3 (1.OA.A.1, 1.OA.A.2, 1.OA.A.3)

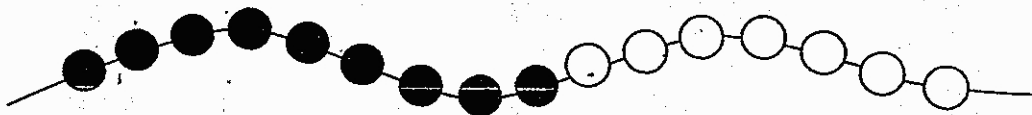
Total Practice Points: 3 (MP1, MP4, MP6)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with an addition expression ($9 + 7$) in order to find an unknown whole (1.OA.A.1). In Part D, the student solves the three addend situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). In Part B, the student demonstrates an understanding of the commutative property of addition by drawing diagrams that show the whole remains the same regardless of the 9 beads and 7 beads appearing in different order (1.OA.A.3). The student shows evidence of making sense of the task by correctly representing the beads on the string in Part C and writing equations in Parts A and D (MP1). By not representing the parts and the unknown whole when numbering the beads, the student does not make a clear connection to the visual diagram (no credit for MP2). The student constructs diagrams and expressions that accurately represent the beads (MP4). The student shows accurate calculations and diagrams (MP6).

Total Awarded Points: 6 out of 7

3. Bead Necklaces Task

Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

Handwritten student work for part a:

$9 + 7 = 16$ $7 + 9 = 16$

$16 - 9 = 7$ $16 - 7 = 9$

16

- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.

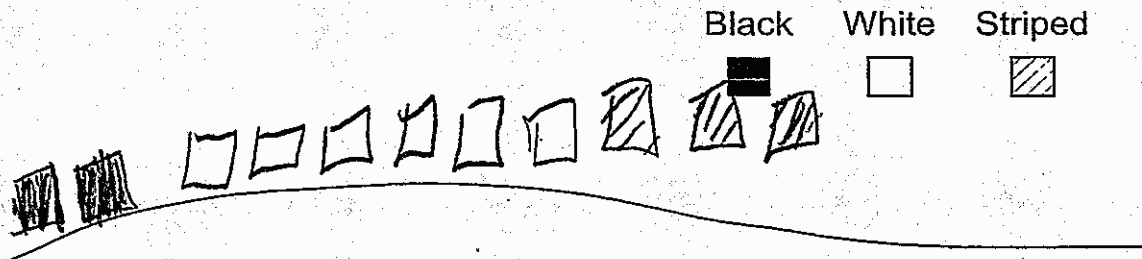
Handwritten student work for part b using tally marks:

$9 + 7 = 16$


$7 + 9 = 16$

A - 3b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.


$$2 + 6 + 3 = 11$$

Anchor 3

Litho 0075

Total Content Points: 3 (1.OA.A.1, 1.OA.A.2, 1.OA.A.3)

Total Practice Points: 2 (MP1, MP4)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with an addition expression ($9 + 7$) in order to find an unknown whole (1.OA.A.1). In Part D, the student solves the three-addend situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). In Part B, the student demonstrates an understanding of the commutative property of addition by drawing diagrams that show the whole remains the same regardless of the 9 beads and 7 beads appearing in different order (1.OA.A.3). However, the sums are inaccurately calculated ($9 + 7 = 26$ and $7 + 9 = 26$) (no credit for MP6). The student shows evidence of making sense of the task by correctly representing beads on the string in Part C and writing equations in Parts A and D (MP1). The student does not describe the beads or make a connection to the visual diagram (no credit for MP2). The student constructs diagrams and expressions that accurately represent the beads (MP4).

Total Awarded Points: 5 out of 7

3. Bead Necklaces Task

Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

✓

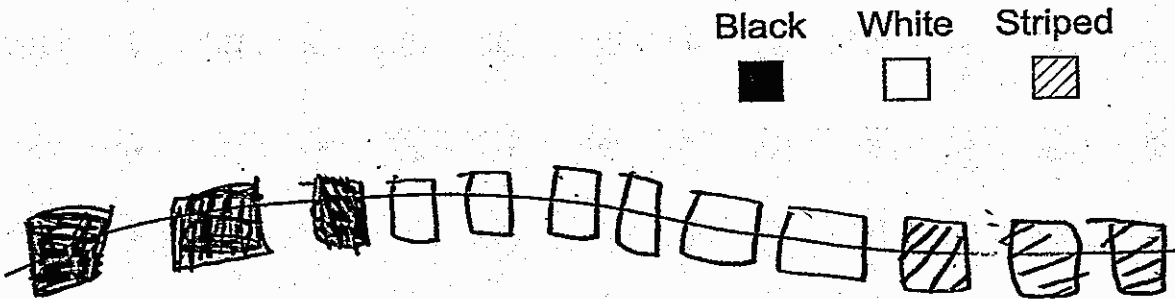
Handwritten student work for part a. On the left, there is a small drawing of a pencil. To its right, the equation $9 + 7 = 16$ is written. Below the equation, there are two groups of tally marks: the first group has 9 vertical lines with a diagonal slash through them, and the second group has 7 vertical lines with a diagonal slash through them. The total number of beads is written as 16.

- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.

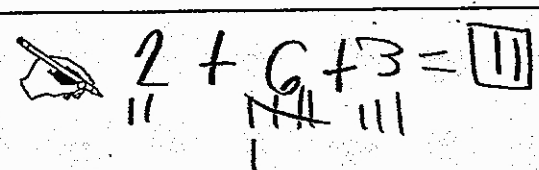
Handwritten student work for part b. On the left, there is a small drawing of a pencil. To its right, the equation $9 + 7 = \square$ is written. Below the equation, there are two groups of small circles representing beads: the first group has 9 circles and the second group has 7 circles. To the right of the circles, the text "The commutative property" is written. A dashed line is drawn across the bottom of the work area, and a squiggly line is drawn below it.

A - 4b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.



$$2 + 6 + 3 = 11$$

Anchor 4

Litho 0127

Total Content Points: 3 (1.OA.A.1, 1.OA.A.2, 1.OA.A.3)

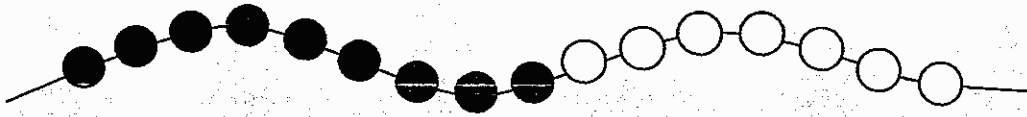
Total Practice Points: 2 (MP1, MP4)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with an addition expression ($9 + 7$) in order to find an unknown whole (1.OA.A.1). However, the sum is inaccurately calculated ($9 + 7 = 21$) and the diagram in Part C is inaccurate (no credit for MP6). In Part D, the student solves the three addend situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). In Part B, the student demonstrates an understanding of the commutative property of addition by writing an explanation (The commutative property) (1.OA.A.3). The student shows evidence of making sense of the task by representing beads on the string in Part C, writing equations in Parts A and D, and providing an explanation in Part B (MP1). The student does not describe the beads or make a connection to the visual diagram (no credit for MP2). The student constructs diagrams and expressions that accurately represent the beads (MP4).

Total Awarded Points: 5 out of 7

3. Bead Necklaces Task

Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

$$\begin{array}{r} 9 \\ + 7 \\ \hline 16 \end{array}$$

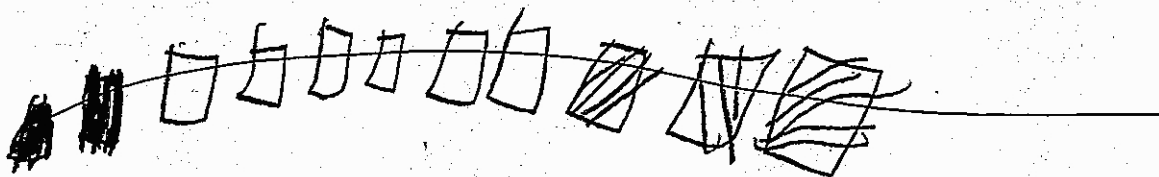
- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.

9 and 7 both = 16 because it's the same equation but it's just flipped around

A - 5b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.

Black White Striped



- d. Write an equation that tells about the total number of square beads on her new string.

$$\begin{array}{r}
 \text{6} \\
 + 2 = \\
 \hline
 8 + 2 = 10 + 1 = 11
 \end{array}$$

Anchor 5

Litho 0086

Total content Points: 3 (1.OA.A.1, 1.OA.A.2, 1.OA.A.3)

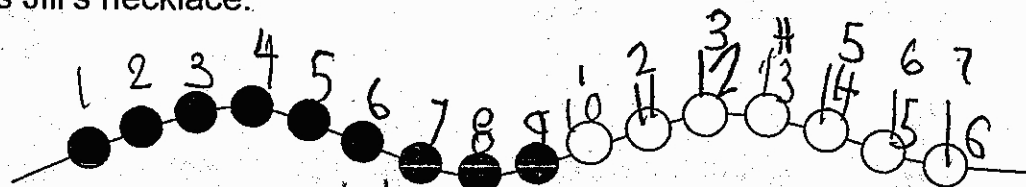
Total Practice Points: 2 (MP1, MP4)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with an addition expression ($9 + 7$) in order to find an unknown whole (1.OA.A.1). In Part D, the student solves the situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). However, the sum is inaccurately calculated ($8 + 2 = 10 + 1 = 13$) (no credit for MP6). In Part B, the student demonstrates an understanding of the commutative property of addition by writing an explanation (9 and 7 both = 16 because it’s the same equation but it’s just flipped around) (1.OA.A.3). The student shows evidence of making sense of the task by representing beads on the string in Part C, writing equations in Parts A and D, and providing an explanation in Part B (MP1). The student does not describe the beads or make a connection to the visual diagram (no credit for MP2). The student constructs diagrams and expressions that accurately represent the beads (MP4).

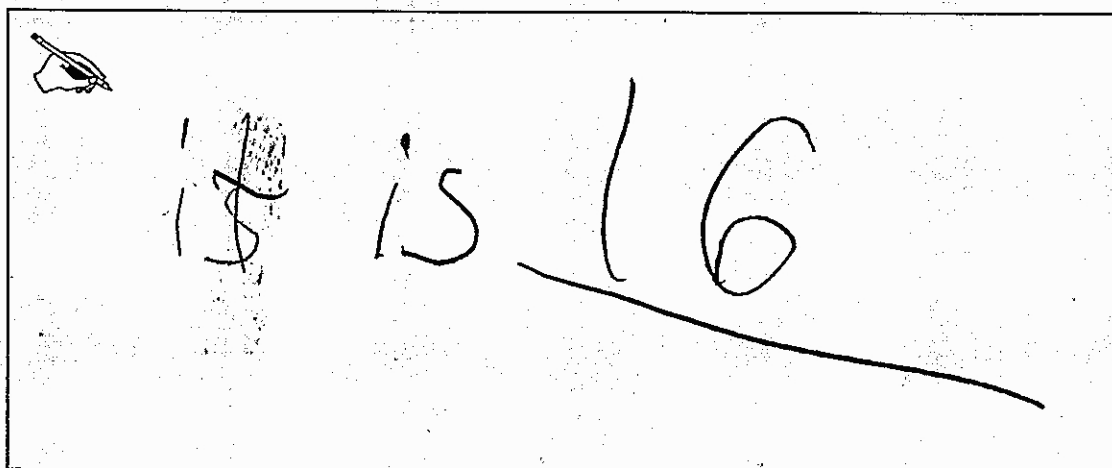
Total Awarded Points: 5 out of 7

3. Bead Necklaces Task

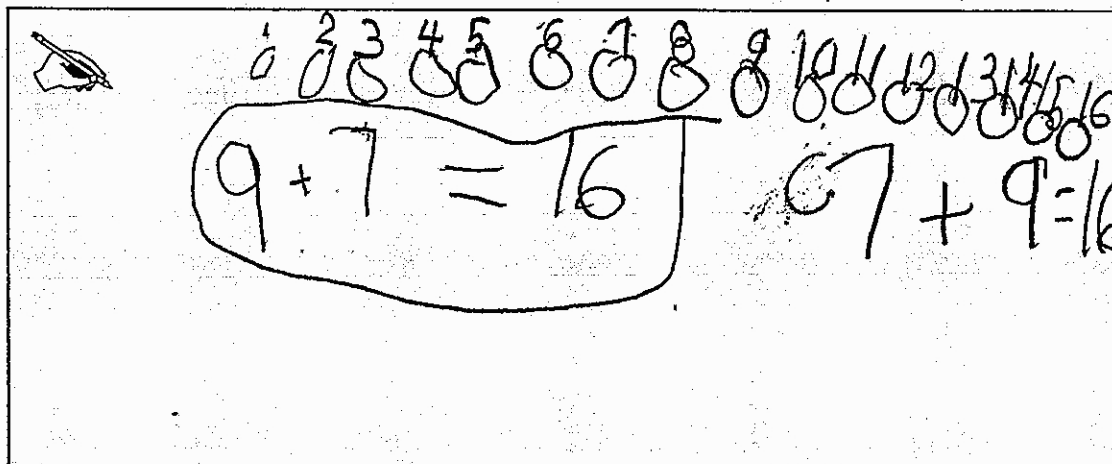
Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

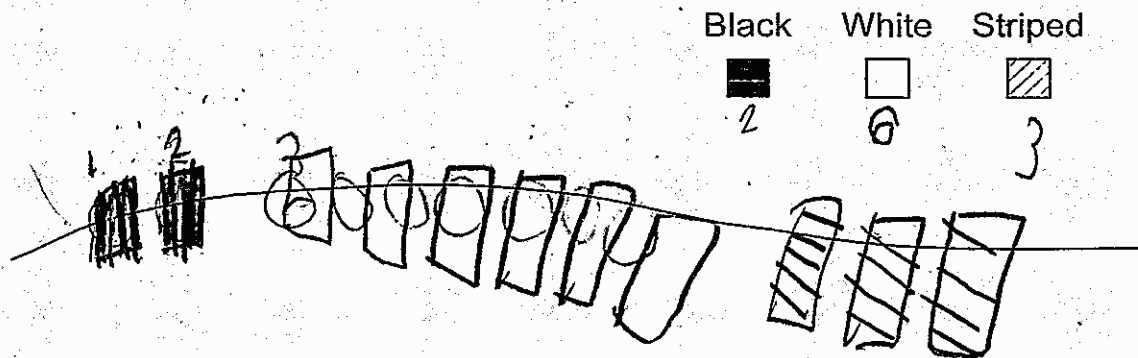


- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.



A - 6b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.

The image shows a rectangular box containing a handwritten equation. On the left side of the box, there is a small drawing of a hand holding a pencil. The equation written in the center of the box is $2 + 6 + 3 = 11$.

Anchor 6

Litho 0064

Total Content Points: 1 (1.OA.A.2)

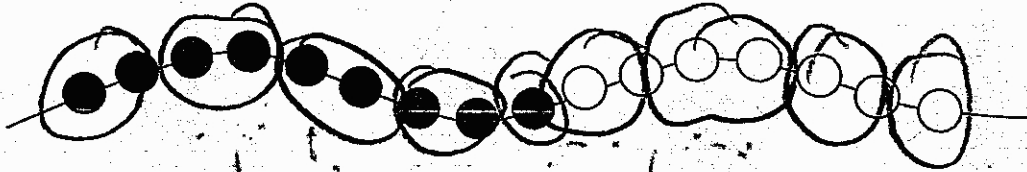
Total Practice Points: 4 (MP1, MP2, MP4, MP6)

In Part A, the student provides a correct answer (“it is 16”) but does not solve the “putting together” situational problem by writing an expression (no credit for 1.OA.A.1). In Part D, the student solves the three addend situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). In Part B, the student writes two correct equations ($9 + 7 = 16$ and $7 + 9 = 16$) and a diagram representing the total number of beads, but does not demonstrate an understanding of the commutative property by providing either an explanation or a diagram that shows the whole remains the same regardless of the 9 beads and 7 beads appearing in different order (no credit for 1.OA.A.3). The student shows evidence of making sense of the task by representing beads on the string in Part C and writing an equation in Part D (MP1). The student makes a connection to the visual diagram by numbering the beads (1 – 9 and 1 - 7) to represent the parts and (1 – 16) to represent the unknown whole (MP2). The student constructs diagrams and expressions that accurately represent the beads (MP4). Despite the absence of an equation in Part A, the answer given and all other calculations and diagrams are accurate (MP6).


Total Awarded Points: 5 out of 7

3. Bead Necklaces Task

Here is Jill's necklace:




- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.



$$9 + 7 = 16$$

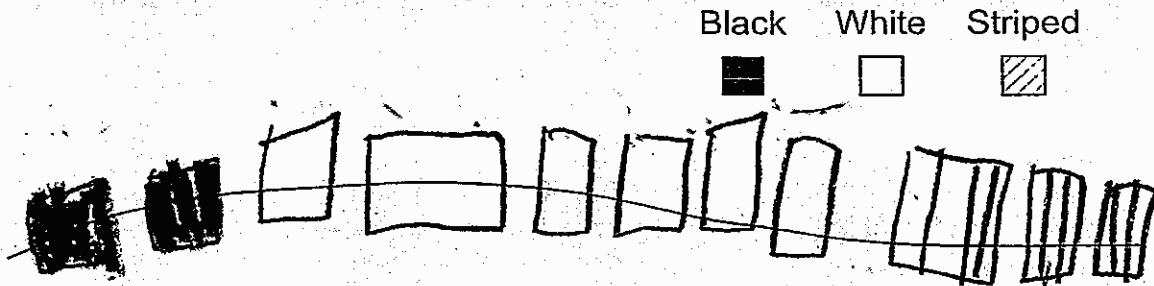
- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.



I did both equations.
Then I took away
one from the 7
the nine is now ten.
Then I did $10 + 7$ to get 16.

A - 7b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.

A hand-drawn equation inside a rectangular box: $2 + 6 + 3 = 11$. In the top left corner of the box, there is a small drawing of a hand holding a pencil.

Anchor 7

Litho 0097

Total Content Points: 2 (1.OA.A.1, 1.OA.A.2)

Total Practice Points: 2 (MP1, MP4)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with an addition expression ($9 + 7$) in order to find an unknown whole (1.OA.A.1). In Part D, the student solves the three-addend situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). In Part B, the student’s explanation details how the student solved the equations but does not demonstrate an understanding of the commutative property of addition (no credit for 1.OA.A.3). The student shows evidence of making sense of the task by representing beads on the string in Part C and writing equations in Parts A and D (MP1). The student does not describe the beads or make a connection to the visual diagram (no credit for MP2). The student constructs diagrams and expressions that accurately represent the beads (MP4). A computation error in the student’s explanation (“Then I did ten + 7 to get 16.”) is inaccurate (no credit for MP6).

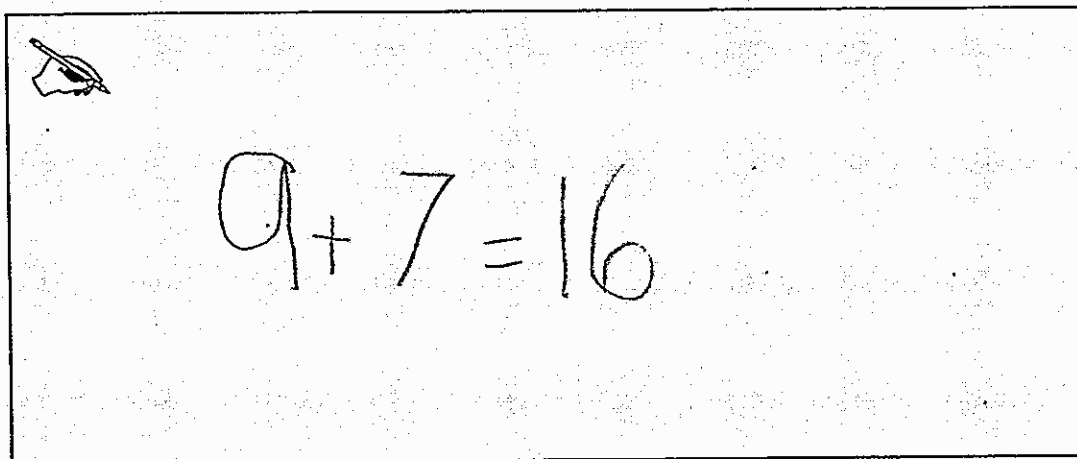
Total Awarded Points: 4 out of 7

3. Bead Necklaces Task

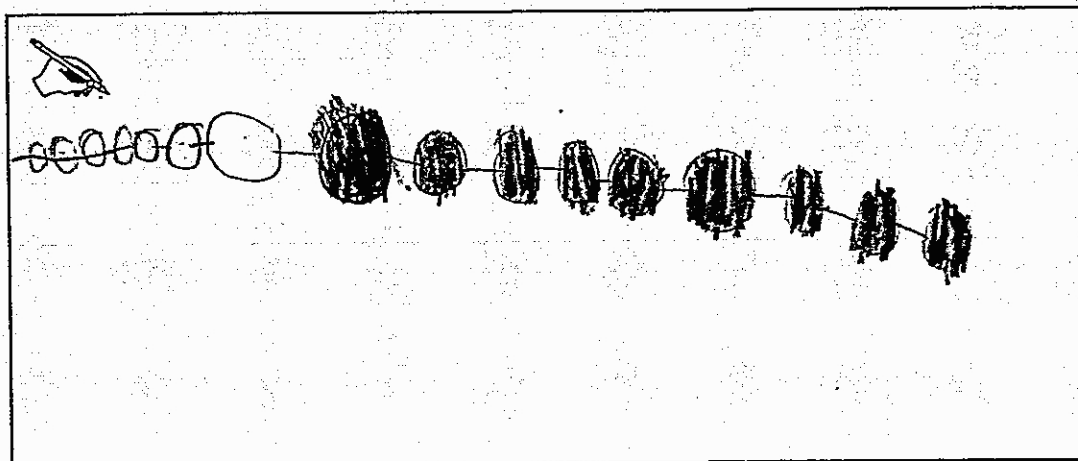
Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

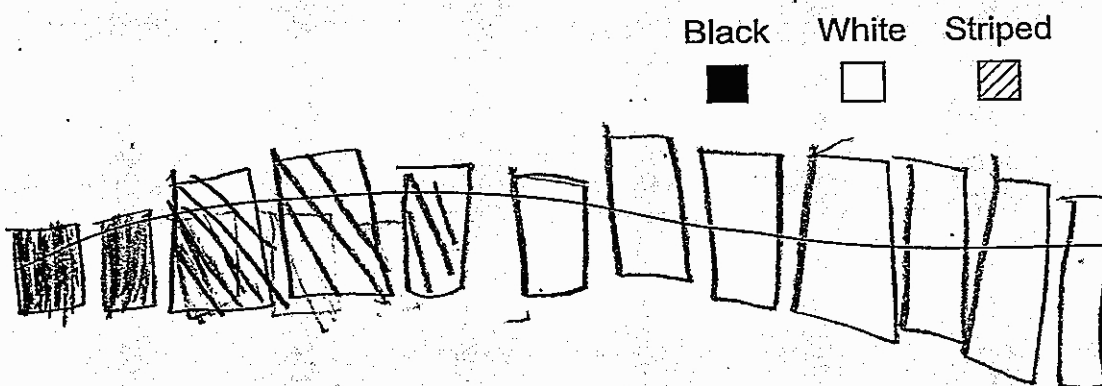


- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.




A - 8b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.


$$2 + 3 + 6 = 11$$

Anchor 8

Litho 0001

Total Content Points: 2 (1.OA.A.1, 1.OA.A.2)

Total Practice Points: 2 (MP1, MP4)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with an addition expression ($9 + 7$) in order to find an unknown whole (1.OA.A.1). In Part D, the student solves the three-addend situational problem by adding the three known numbers to find an unknown whole (1.OA.A.2). In Part B, the student demonstrates a lack of understanding of the commutative property of addition by drawing a picture that accurately represents the 7 white beads and 9 black beads on the necklace but does not show the whole remains the same regardless of the 7 beads and 9 beads appearing in different order (no credit for 1.OA.A.3). The student shows evidence of attempting to make sense of the task by writing equations in parts A and D (MP1). The student does not describe the beads or make a connection to the visual diagram (no credit for MP2). The student writes expressions that accurately represent the beads (MP4). The diagram in Part C is inaccurate (no credit for MP6).

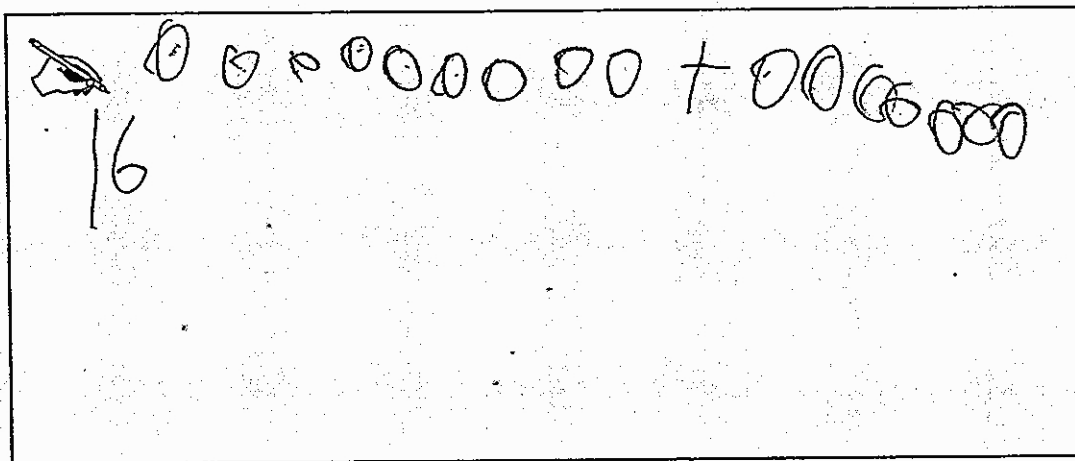
Total Awarded Points: 4 out of 7

3. Bead Necklaces Task

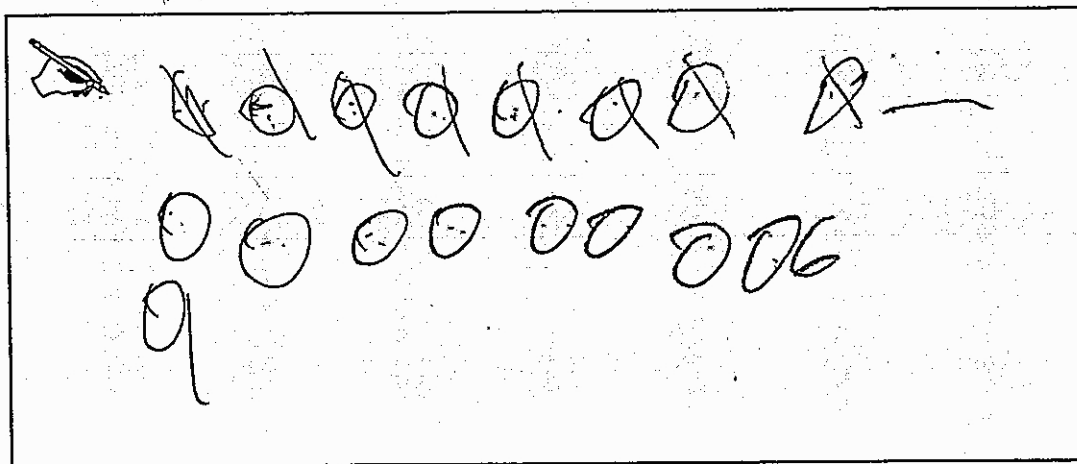
Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

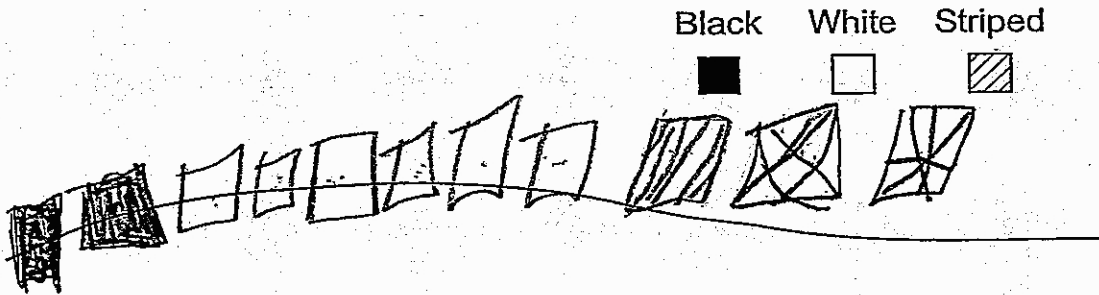


- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.



A - 9b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.

A large rectangular box for writing an equation. Inside the box, there is a drawing of a hand holding a pencil and two vertical lines.

Anchor 9

Litho 0057

Total Content Points: 1 (1.OA.A.1)

Total Practice Points: 2 (MP1, MP4)

In Part A, the student solves the “putting together” situational problem by correctly representing the beads on the string with a diagram of 9 circles and 7 circles in order to find an unknown whole (1.OA.A.1). In Part D, the student provides a correct answer but does not write an equation to solve the three-addend situational problem (no credit for 1.OA.A.2). In Part B, the student demonstrates a lack of understanding of the commutative property of addition by drawing a picture that incorrectly represents the beads on the necklace and does not show the whole remains the same regardless of the 9 beads and 7 beads appearing in different order (no credit for 1.OA.A.3). The student shows evidence of attempting to make sense of the task by representing beads on the string in Part C and drawing a representation of an equation in Part A (MP1). The student does not describe the beads or make a connection to the visual diagram (no credit for MP2). The student constructs a diagram and an expression that accurately represent the beads (MP4). Despite the absence of an equation in Part D, calculations are correct, but a representation of the beads in Part B is inaccurate (no credit for MP6).

Total Awarded Points: 3 out of 7

3. Bead Necklaces Task

Here is Jill's necklace:



- a. Write an equation that tells about the total number of black and white beads on Jill's necklace.

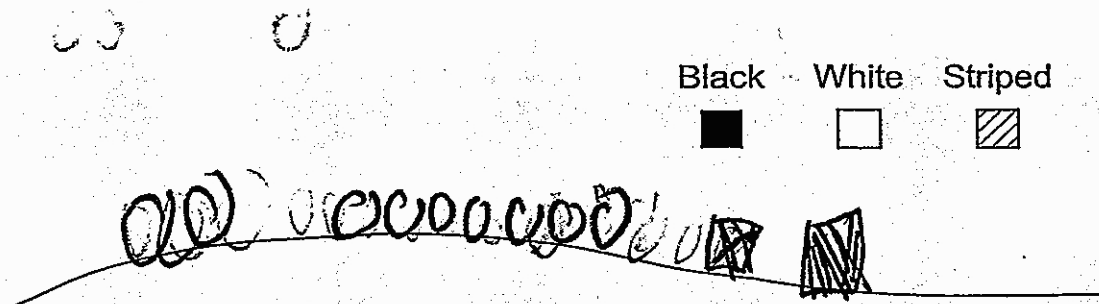
Handwritten student work for part a. On the left, there is a small drawing of a hand holding a pencil. Next to it is the equation $9 + 7 = 16$. To the right of the equation are two rows of beads: the top row has 9 black beads and 7 white beads, and the bottom row has 7 white beads.

- b. Solve $9 + 7$ and $7 + 9$. Explain using words or diagrams how both $9 + 7$ and $7 + 9$ can be used to find the total number of black and white beads.

Handwritten student work for part b. At the top, there is a row of 16 beads (9 black and 7 white). Below this, there is a small drawing of a hand holding a pencil. Next to it are two equations: $9 + 7 = 16$ and $7 + 9 = 16$.

A - 10b

- c. Jill wants 2 square black beads, 6 square white beads, and 3 square striped beads on the string below. Draw the beads on the string.



- d. Write an equation that tells about the total number of square beads on her new string.

The image shows a rectangular box containing a handwritten equation. The equation is $2 + 3 = 5$. The number 5 is written with a small '000' above it. To the left of the equation, there is a small drawing of a hand holding a pencil.

Anchor 10

Litho 0061

Total Content Points: 0

Total Practice Points: 0

In Part A, the student does not solve the “putting together” situational problem by incorrectly representing the beads on the string with a subtraction expression (no credit for 1.OA.A.1). In Part D, the student does not solve the three-addend situational problem by incorrectly representing the beads with a subtraction expression (no credit for 1.OA.A.2). In Part B, the student writes equations ($9 + 7 = 8$ and $7 + 9 = 8$) that represent the commutative property of addition but does not provide an explanation or diagram to demonstrate the necessary understanding (no credit for 1.OA.A.3). The student shows evidence of not making sense of the task by incorrectly representing beads on the string in Part C and by writing inaccurate equations in Parts A and D (no credit for MP1). The student does not make a connection to the visual diagram (no credit for MP2). The student does not construct any accurate diagrams or expressions that describe the beads (no credit for MP4). The student does not show accurate calculations or diagrams (no credit for MP6).

Total Awarded Points: 0 out of 7