

Tennessee Comprehensive Assessment Program

TCAP/CRA 2013



3

Task 4

Donuts Task

Scoring Guide

4. Donuts Task Scoring Guide

The CCSS for Mathematical Content (2 points)

3.OA.1 Provides drawing(s) and/or equation(s) to indicate an understanding of multiplication as 15 equal groups of 8 or 9 objects. _____

(1 Point)

3.OA.5 Indicates how one person's total number of donuts can be used to determine the total number of donuts for the other person. _____

(1 Point)

Total Content Points _____

The CCSS for Mathematical Practice (2 points)

MP1 Shows that one problem can be solved and then used to determine the product of the second problem. _____

(1 Point)

(MP1: Make sense of problems and persevere in solving them.)

MP4 Provides a diagram or an equation indicating use of multiplication to determine one person's total number of donuts. _____

(1 Point)

(MP4: Model with mathematics.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Represent and solve problems involving multiplication and division.

- 3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7 .*

Understand properties of multiplication and the relationship between multiplication and division.

- 3.OA.5 Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

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 text indicates Mathematical Practices that are not addressed in this task.

Students' responses to a mathematical task provide evidence of what they understand and are able to do in relation to the standards and practices. Across tasks, this cumulative evidence shows students' understanding and abilities within a domain. When students do not respond completely to all parts of a task, they provide insufficient evidence of their mathematical understanding and abilities and therefore do not fully demonstrate the expectations of the standards and practices aligned with that task.

Task 4. Donuts Task


Tim has 15 boxes of donuts. He has 8 donuts in each box.
Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.

Tim $15 \times 8 = 120$

Meg $15 \times 9 = 135$

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.

 You can use Tim's total of donuts to figure out Meg's total of donuts by adding 15 to Tim's total of donuts.

Guide 1

Litho 384333

Total Content Points: 2 (3.OA.A.1, 3.OA.B.5)

Total Practice Points: 2 (MP1, MP4)

In Part A, the student's drawing correctly shows 15 equal groups of 8 objects, indicating an understanding of multiplication as representing the number of objects in x equal groups (3.OA.A.1). The student also provides an accurate equation ($15 \times 8 = 120$) for Tim's total number of donuts (MP4). In Part B, the student's explanation of how to use Tim's total to determine Meg's total number of donuts ("by adding 15 to Tim's total of donuts") is sufficient (MP1). The student's instruction to add one group of 15 indicates some understanding of the distributive property of multiplication (3.OA.B.5).

Total Awarded Points: 4 out of 4

Task 4. Donuts Task

Tim has 15 boxes of donuts. He has 8 donuts in each box.

Meg has 15 boxes of donuts. She has 9 donuts in each box.


- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.

The image shows a student's handwritten work for the donut task. At the top left, there is a small drawing of a hand holding a pencil. The student has written the following equations:

$$\text{Meg } 9 \times 15 = 135$$
$$\text{Tim } 8 \times 15 = 120$$

Below the equations, the student has drawn 15 rows of donuts. Each row contains 9 donuts, representing Meg's total. To the right of the donut drawings, there are some faint, illegible handwritten notes, including the word "COMMIT" and "Pep".

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.

 You can because that
Meg has more than
Tim so subtract 15 from
135 and you'll get 120 and
that will be Tim's number.

Guide 2

Litho 348148

Total Content Points: 2 (3.OA.A.1, 3.OA.B.5)

Total Practice Points: 2 (MP1, MP4)

In Part A, the student's drawing correctly shows 9 rows of 15 objects each, indicating an understanding of multiplication as representing the number of objects in x equal groups (3.OA.A.1). The student provides an accurate equation ($9 \times 15 = 135$) for Meg's total number of donuts (MP4). In Part B, the student explains how to use Meg's total to determine Tim's total number of donuts ("subtract 15 from 135 and you'll get 120") (MP1). The student's instruction to subtract one group of 15 indicates some understanding of the distributive property of multiplication (3.OA.B.5).

Total Awarded Points: 4 out of 4

Task 4. Donuts Task

Tim has 15 boxes of donuts. He has 8 donuts in each box.
 Meg has 15 boxes of donuts. She has 9 donuts in each box.


- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.

Meg

I did 15 groups of 9 donuts gets 153

$15 \times 9 = 153$ donuts

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.

 You subtract 15 because
Jim had 8 per box
Nat 4.

Guide 3

Litho 386400

Total Content Points: 2 (3.OA.A.1, 3.OA.B.5)

Total Practice Points: 1 (MP1)


In Part A, the student's drawing correctly shows 15 equal groups of 9 objects, indicating an understanding of multiplication as representing the number of objects in x equal groups (3.OA.A.1). However, the equation $15 \times 9 = 153$ is inaccurate (no credit for MP4). In Part B, the student explains a method for using Meg's total to determine Tim's total number of donuts ("You subtract 15 [because] Tim had 8 per box not 9") (MP1). The student's explanation indicates an understanding of the distributive property of multiplication by recognizing that the difference in the number of donuts in each box means that the total number of donuts is going to differ by the total number of boxes (3.OA.B.5).

Total Awarded Points: 3 out of 4

Task 4. Donuts Task

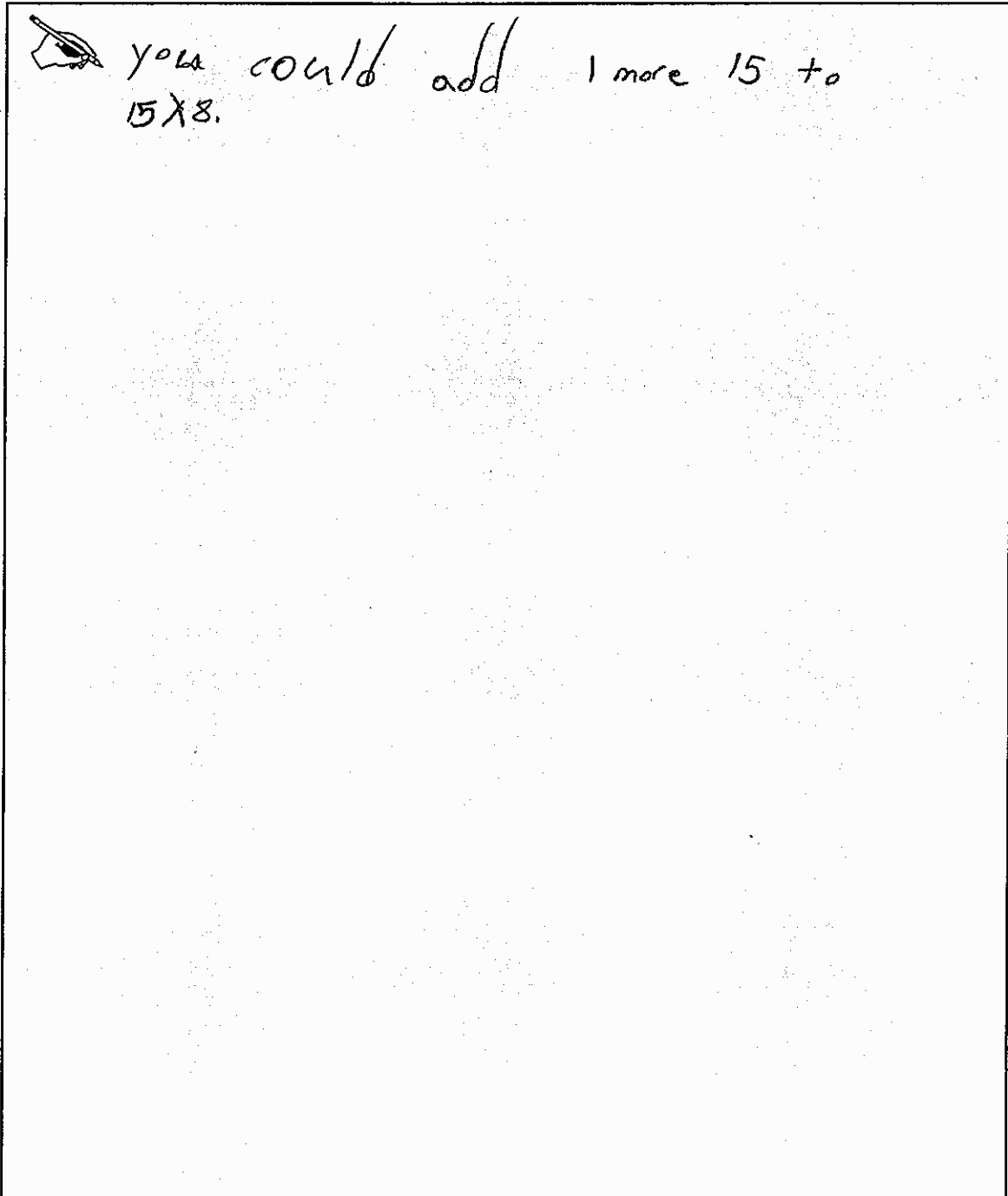
Tim has 15 boxes of donuts. He has 8 donuts in each box.
Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.



$15 \times 8 = 120$

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.



Guide 4

Litho 350689

Total Content Points: 1 (3.OA.B.5)

Total Practice Points: 2 (MP1, MP4)

In Part A, the student provides an accurate equation ($15 \times 8 = 120$) (MP4). However, the student neither provides a drawing of 15 equal groups of 8 or 9 objects nor correctly labels the appropriate numbers as “boxes” and “donuts” in the equation $15 \times 8 = 120$ (no credit for 3.OA.A.1). In Part B, the student explains how to use Tim’s total to determine Meg’s total number of donuts (“You could add 1 more 15 to 15×8 ”) (MP1). The student’s instruction to add one group of 15 indicates some understanding of the distributive property of multiplication (3.OA.B.5).


Total Awarded Points: 3 out of 4

Task 4. Donuts Task


Tim has 15 boxes of donuts. He has 8 donuts in each box.

Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.

 To Find Megs total number of donuts you have to do 15×9 because there are 15 boxes, and 9 donuts in each. So that would be $= 135$.

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.

 To find out Tim's donuts you have to do 15×8 because there's 15 boxes and 8 in each box. So that would = 127.

Guide 5

Litho 365726

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

Total Practice Points: 1 (MP4)

In Part A, the student indicates an understanding of a multiplication expression as representing the number of objects in x equal groups by identifying 15 as the number of boxes and 9 as the number of donuts in each, and then correctly determines Meg's total number of donuts as 135 (3.OA.A.1, MP4). In Part B, the student finds Tim's total number of donuts independently of Meg's total, and therefore does not indicate how one person's total number of donuts can be used to determine the other person's total (no credit for MP1). Even if the answer found had been correct, no credit would be awarded for MP1. The student does not apply the distributive property of multiplication in the response (no credit for 3.OA.B.5).

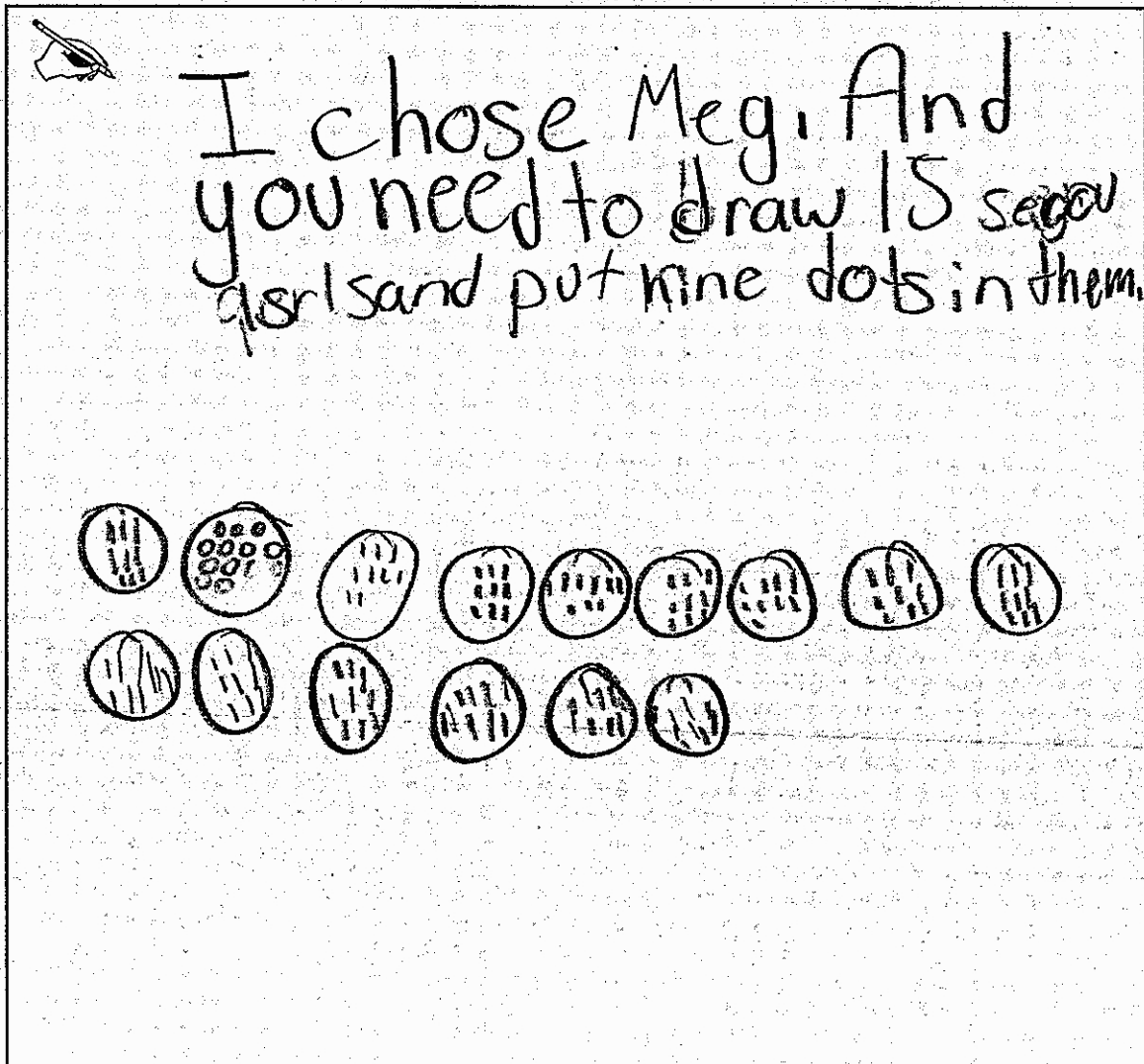
Total Awarded Points: 2 out of 4

Task 4. Donuts Task

Tim has 15 boxes of donuts. He has 8 donuts in each box.


Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.



A handwritten student response is shown within a rectangular border. In the top left corner, there is a small drawing of a hand holding a pencil. The text is written in cursive and reads: "I chose Meg. And you need to draw 15 ^{small} girls and put nine dots in them." Below the text, there are 15 hand-drawn circles, each representing a box. The first circle contains 9 small dots arranged in a 3x3 grid. The remaining 14 circles each contain 8 vertical lines, representing donuts. The circles are arranged in two rows: the first row has 8 circles and the second row has 7 circles.

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.



You can do the same steps but change nine to 8.

Guide 6

Litho 363068

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

Total Practice Points: 1 (MP4)


In Part A, the student's drawing correctly shows 15 equal groups of 9 objects to determine Meg's total number of donuts (3.OA.A.1, MP4). In Part B, the student's explanation ("You can do the same [steps] but [change] nine to 8") specifically references Meg's donuts, but does not use Meg's total to determine Tim's total number of donuts (no credit for MP1). Because the explanation suggests setting up a new multiplication expression to find Tim's total, the student has not applied the distributive property of multiplication in the response (no credit for 3.OA.B.5).

Total Awarded Points: 2 out of 4

Task 4. Donuts Task







Tim has 15 boxes of donuts. He has 8 donuts in each box.
 Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.


 Tim's donut total would be $15 \times 8 = 120$.

Meg's donut total would be $15 \times 9 = 135$.

Meg has more.

Meg	Tim
	
	
	

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.

 They both have 15 boxes but two different numbers of donuts in each box. So they can both multiply 15 times 8 and 15 times 9.

Guide 7

Litho 355803

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

Total Practice Points: 1 (MP4)

In Part A, the student's drawings correctly show 15 equal groups of 9 objects and 15 equal groups of 8 objects, indicating an understanding of a multiplication equation as representing the number of objects in x equal groups (3.OA.A.1). The student provides accurate equations ($15 \times 8 = 120$ and $15 \times 9 = 135$) for Tim's and Meg's total numbers of donuts (MP4). In Part B, the student's explanation ("they can both multiply 15 times 8 and 15 times 9") does not indicate how one person's total number of donuts can be used to determine the other person's total (no credit for MP1). The student does not apply the distributive property of multiplication in the response (no credit for 3.OA.B.5).

Total Awarded Points: 2 out of 4


Task 4. Donuts Task

Tim has 15 boxes of donuts. He has 8 donuts in each box.
 Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.

The student's work is contained within a rectangular box. At the top left, there is a drawing of a pencil writing on a notepad. To its right is the equation $8 \times 15 = 79$. Further right are six small rectangular boxes, each containing a grid of dots representing donuts. Below these are two more boxes, each with a grid of dots. In the middle of the page, the equation $9 \times 15 = 126$ is written. Below this equation are two rows of boxes. The first row contains eight boxes, each with the number '9' inside. The second row contains seven boxes, each with the number '9' inside.

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.

 YOU add it all up and count it and that's your answer

Guide 8

Litho 372337

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

Total Practice Points: 0

In Part A, the student's first drawing shows 8 equal groups of 15 objects and the second drawing shows 15 equal groups of 9 objects, indicating an understanding of multiplication as representing the number of objects in x equal groups (3.OA.A.1). However, both equations ($8 \times 15 = 79$ and $9 \times 15 = 126$) are inaccurate (no credit for MP4). In Part B, the student's explanation ("You add it all up and count it") does not indicate how one person's total number of donuts can be used to determine the other person's total (no credit for MP1). The student does not apply the distributive property of multiplication in the response (no credit for 3.OA.B.5).


Total Awarded Points: 1 out of 4

Task 4. Donuts Task

Tim has ⁴15 boxes of donuts. He has 8 donuts in each box.

Meg has ¹²⁰15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.

 Tim's:

$$15 \times 8 = 120$$

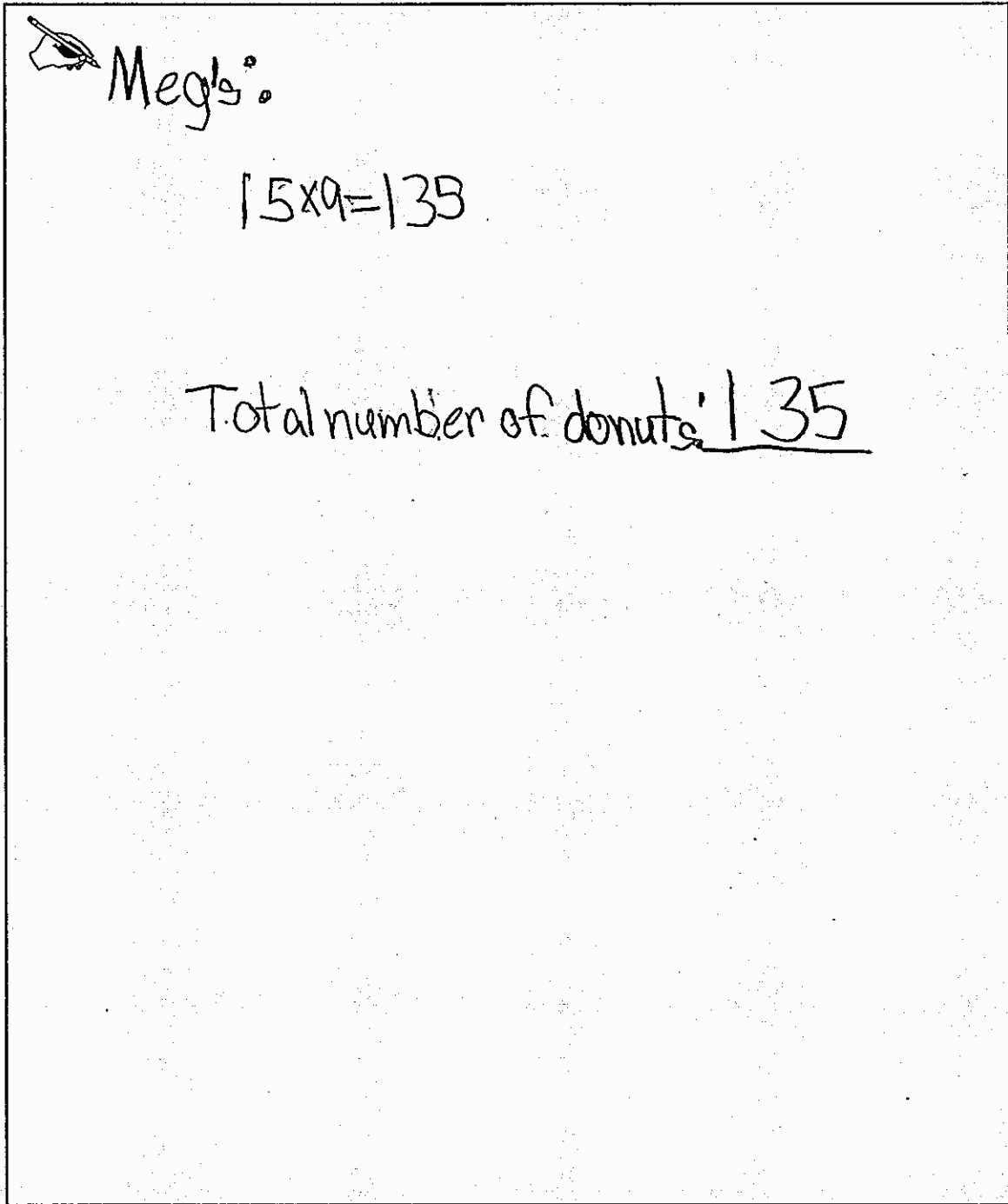
Total number of donuts: 120

Meg's:

$$15 \times 9 = 135$$

Total number of donuts: 135

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.



Meg's:

$$15 \times 9 = 135$$

Total number of donuts: 135

Total Content Points: 0

Total Practice Points: 1 (MP4)

In Part A, the student provides a correct equation ($15 \times 8 = 120$) for Tim's total number of donuts, and in Part B provides a correct equation ($15 \times 9 = 135$) for Meg's total number of donuts (MP4). However, the student does not label the appropriate numbers as "boxes" or "donuts" in either equation (no credit for 3.OA.A.1). In Part B, the student determines Meg's total number of donuts independently of Tim's total, and therefore does not indicate how one person's total number of donuts can be used to determine the other person's total (no credit for MP1). The student does not apply the distributive property of multiplication in the response (no credit for 3.OA.B.5).

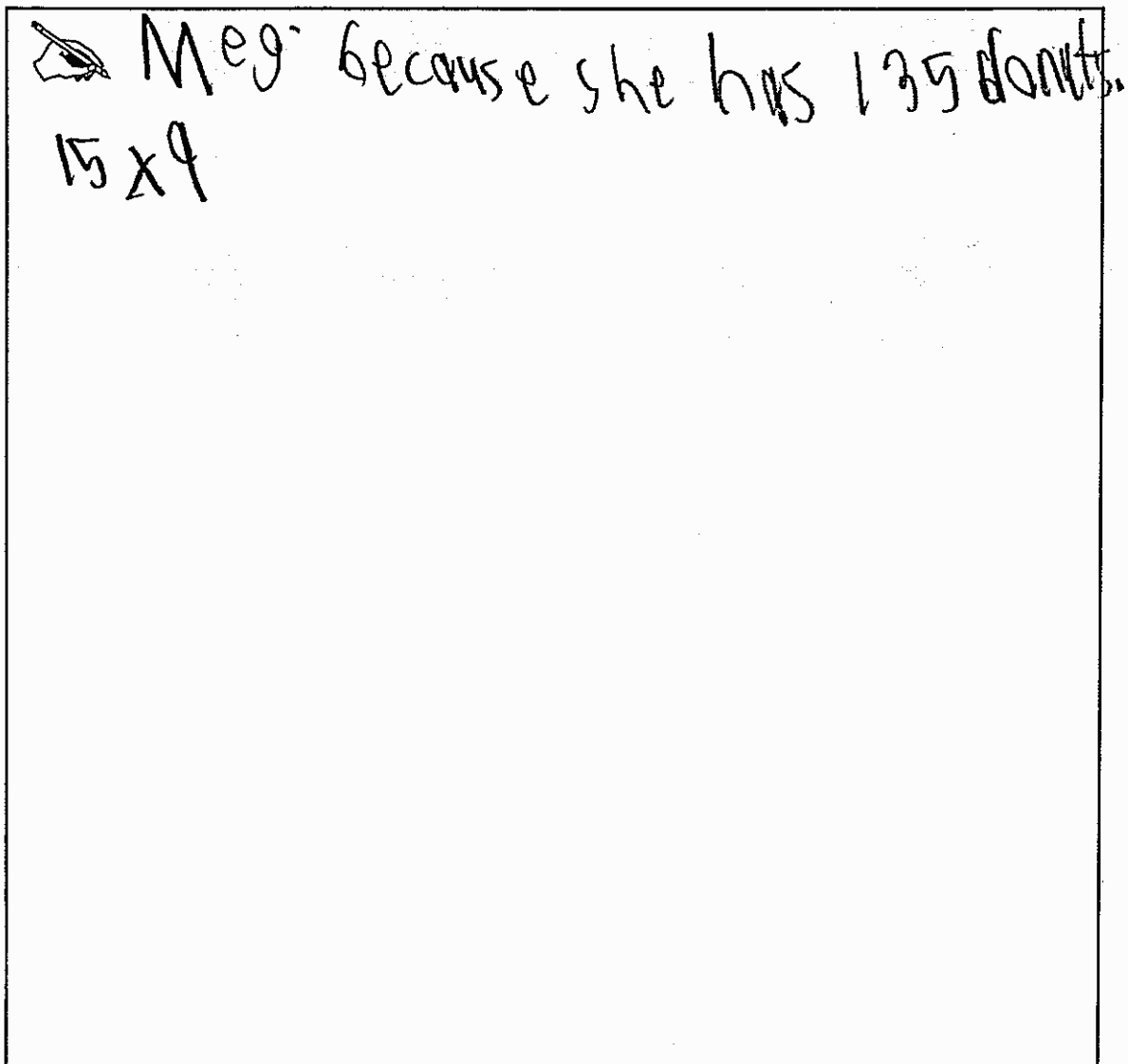
Total Awarded Points: 1 out of 4

Task 4. Donuts Task

Tim has 15 boxes of donuts. He has 8 donuts in each box.

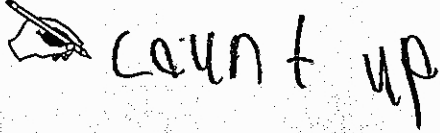
Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.



A handwritten student response in a rectangular box. On the left side, there is a simple drawing of a hand holding a pencil. To the right of the drawing, the text reads "Meg because she has 135 donuts." Below this text, the multiplication equation 15×9 is written.

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.



A hand-drawn response within a rectangular box. On the left side, there is a simple drawing of a hand with the index finger pointing to the right. To the right of the hand, the words "count up" are written in a cursive, handwritten style.

Total Content Points: 0

Total Practice Points: 1 (MP4)

In Part A, 15×9 and the correct product (135) represent an accurate equation for Meg's total number of donuts (MP4). However, the student does not label the appropriate numbers as "boxes" and "donuts," thereby not providing evidence of an understanding of multiplication as 15 equal groups of 9 objects (no credit for 3.OA.A.1). In Part B, the student's explanation ("count up") does not indicate how one person's total number of donuts can be used to determine the other person's total (no credit for MP1). The student does not apply the distributive property of multiplication in the response (no credit for 3.OA.B.5).

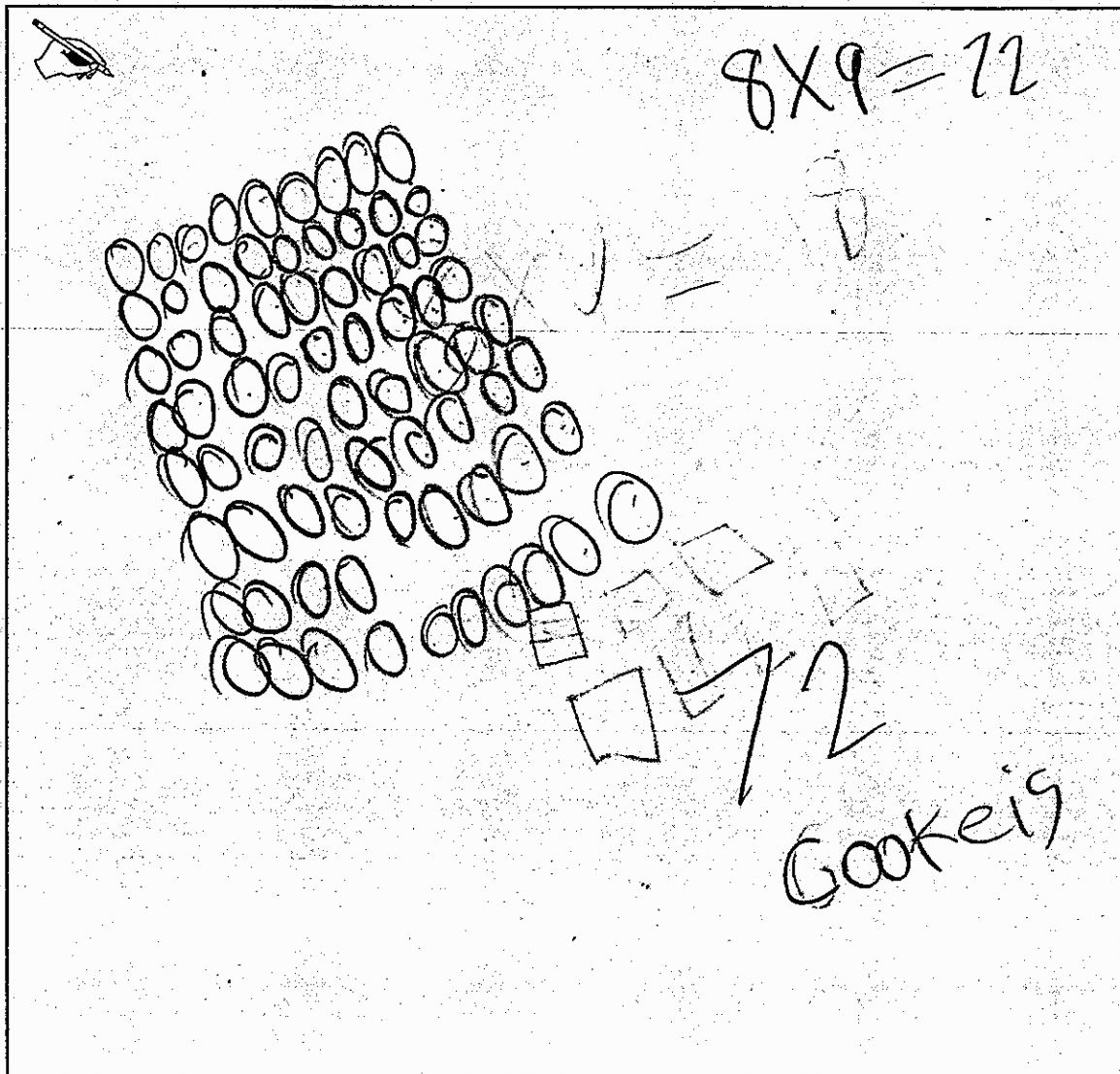
Total Awarded Points: 1 out of 4

Task 4. Donuts Task

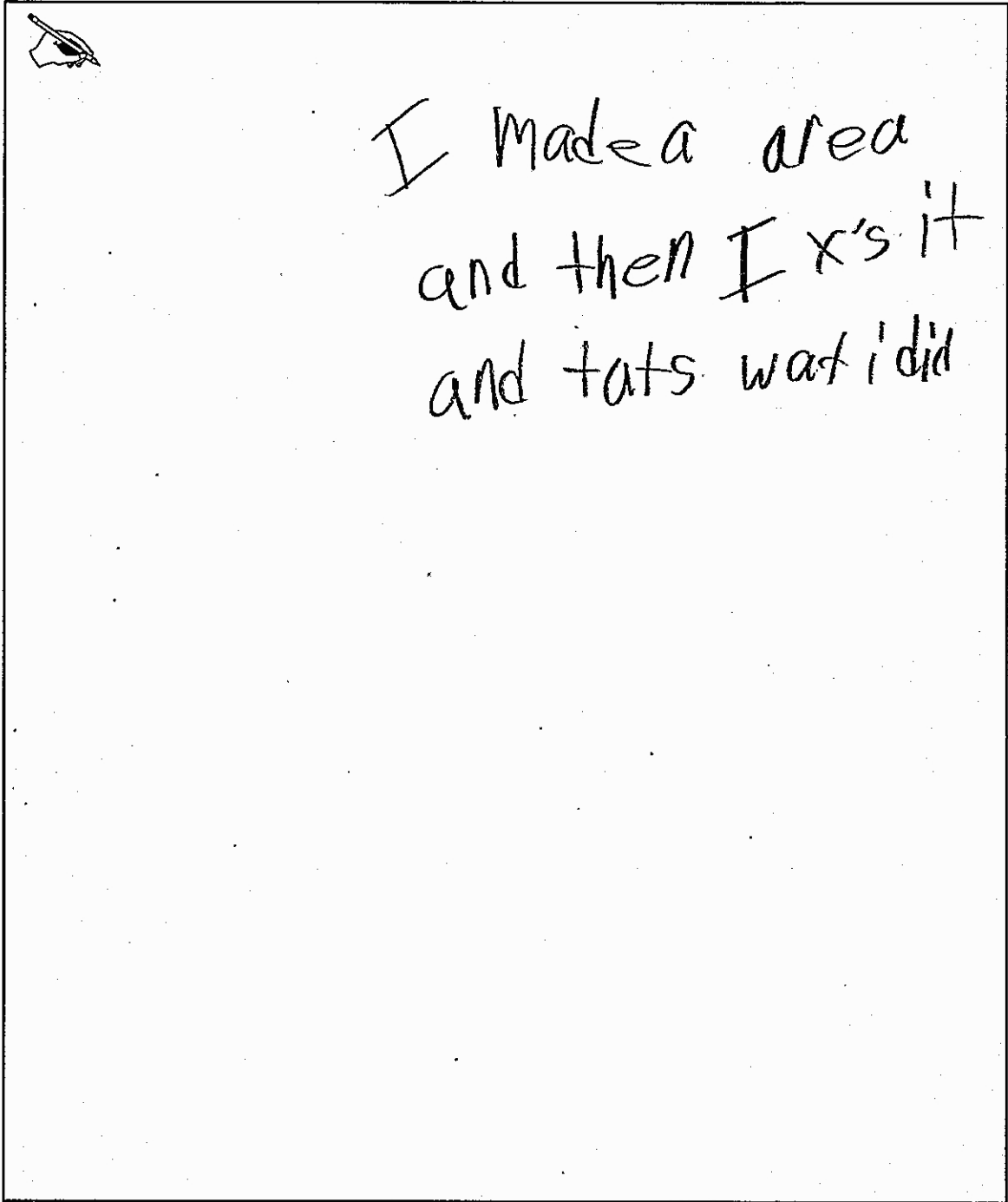
Tim has 15 boxes of donuts. He has 8 donuts in each box.

Meg has 15 boxes of donuts. She has 9 donuts in each box.

- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.



- b. Explain how you can use the information from part a to determine the other person's total number of donuts.



I made a area
and then I x's it
and tats wat i did

Total Content Points: 0

Total Practice Points: 0

In Part A, the student's drawing does not show 15 equal groups of 8 or 9 objects, thereby not showing an understanding of multiplication within the context of this task (no credit for 3.OA.A.1). The equation $8 \times 9 = 72$ does not accurately determine the total number of donuts for Tim or Meg (no credit for MP4). In Part B, the student does not indicate how one person's total number of donuts can be used to determine the other person's total (no credit for MP1). The student does not apply the distributive property of multiplication in the response (no credit for 3.OA.B.5).


Total Awarded Points: 0 out of 4

Task 4. Donuts Task

Tim has 15 boxes of donuts. He has 8 donuts in each box.

Meg has 15 boxes of donuts. She has 9 donuts in each box.


- a. Explain how to use multiplication to determine either Tim's total number of donuts or Meg's total number of donuts. Use words and a drawing or multiplication equation in your explanation.

 Meg has 1 more donut than Tim.

15 Boxes

15 Boxes

- b. Explain how you can use the information from part a to determine the other person's total number of donuts.

 Tim has 8 donuts
which is one less than Meg
so Meg has 9 donuts.

Total Content Points: 0

Total Practice Points: 0

In Part A, the student's drawing does not show 15 equal groups of 8 or 9 objects, thereby not indicating an understanding of multiplication as representing the number of objects in x equal groups (no credit for 3.OA.A.1). The student does not provide an adequate model of the situation (no credit for MP4). The student's explanation ("Meg has 1 more donut [than] Tim") is inaccurate and does not make sense of the problem (no credit for MP1). In Part B, the student does not apply the distributive property of multiplication (no credit for 3.OA.B.5).

Total Awarded Points: 0 out of 4