Tennessee Comprehensive Assessment Program / Mathematics

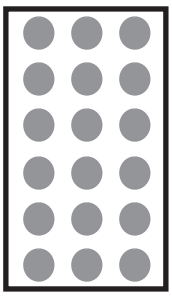
TCAP/CRA PILOT 2012

Task 2 : The Box of Candies

Scoring Guide

Task 2. The Box of Candies Task

Juan claims that he knows the number of candies in the box shown below. He wrote the equations 3 × 6 and 6 × 3 and he claims that he can write either expression. Do you agree or disagree with Juan, and why?



3 × 6 = 6 × 3

2. Box of Candies Task Scoring Guide

The CCSS for Mathematical Content (1 point)

3.OA.5 Explanation indicates a reason why 3 x 6 and 6 x 3 are equivalent. May: _____

- indicate that the same figure exists but is rotated to present a different view of the figure; may say that three rows of 6 is now 6 rows of three.
- note that both equations equal 18 candies and there are 18 candies on the tray; says that 3 groups of 6 is the same as 6 candies three times.
- note that both equations equal 18 candies and there are 18 candies on the tray; says that 3 groups of 6 is the same as 6 candies three times.

Total Content Points _____

The CCSS for Mathematical Practices (1 point)

MP3 Convinces the reader that 3 x 6 = 6 x 3 because the figure is rotated to present a different perspective or that the product remains the same for both expressions. _____

(MP3: Construct viable arguments and critique the reasoning of others.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

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 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)*

The CCSS for Mathematical Practices*

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 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 2. The Box of Candies Task

Guide 1

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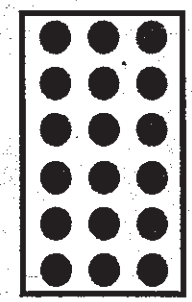
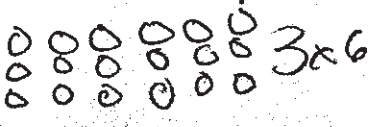


3 × 6 = 6 × 3

I agree with Juan because I know you can do either array just by turning them.



Guide 1 Litho 30016

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

Total Practice Points: 1 (MP3)

This response indicates that Juan can use either expression because the array models for 6×3 and 3×6 are the same figure, although one is rotated to give a different view (3.OA.5). As an explanation, the student shows the original figure and the same figure rotated to indicate a different view of the same array (MP3).

Total Awarded Points: 2 out of 2

Guide 2

Task 2. The Box of Candies Task

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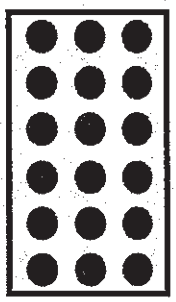


3 × 6 = 6 × 3

I agree with, Juan, Justin because there switched around doesn't mean there not the same. 6x3=3x6=18

Litho#: 30188

Guide 2 Litho 30188

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

Total Practice Points: 1 (MP3)

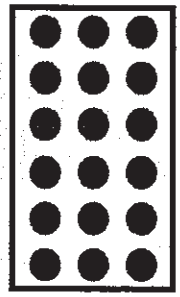
This response indicates that Juan can use either expression because both have the same product (3.OA.5). As an explanation, the student gives an equation showing that both expressions equal the same number (MP3).

Total Awarded Points: 2 out of 2

Task 2. The Box of Candies Task

Guide 3

Juan claims that he knows the number of candies in the box shown below. He wrote the equations 3 × 6 and 6 × 3 and he claims that he can write either expression. Do you agree or disagree with Juan, and why?



3 × 6 = 6 × 3

I agree because 3x6 is the same as 6x3 it shows the comuinitive property. so Juan can use both times tables.

Litho#: 30105

Guide 3 Litho 30105

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

Total Practice Points: 1 (MP3)

This response indicates that Juan can use either expression and uses the commutative property of multiplication as the justification (3.OA.5). The definition of the commutative property is precise enough to serve as a full justification for the response's agreement with the premise, and demonstrates a convincing argument (MP3).

Total Awarded Points: 2 out of 2

Guide 4

Task 2. The Box of Candies Task

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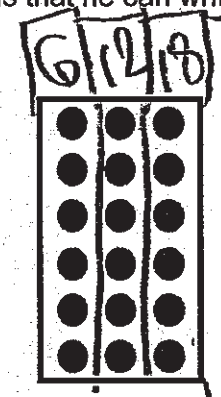
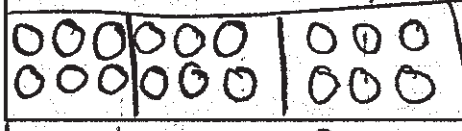
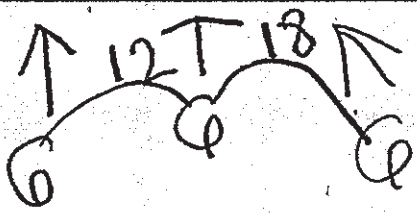


3x6
6x3
18÷3
18÷6

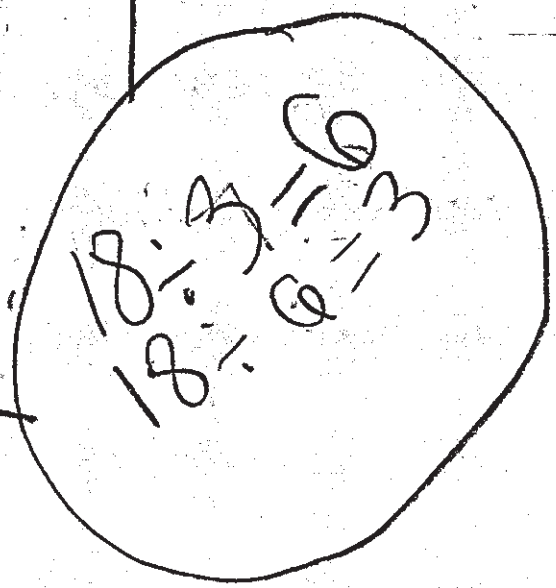
if Juan know 6x2=12 than 6.

I do agree with Juan because when he find out that 3x6 and 6x3 what they eqal he can write 18÷3=6 and 18÷6=3.





Now Count



Litho#: 30251

Guide 4 Litho 30251

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

Total Practice Points: 1 (MP3)

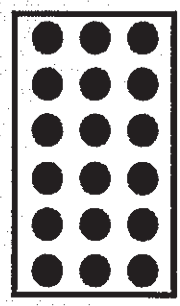
The student indicates that Juan can use either expression and justifies that agreement by showing that the two expressions have the same product (3.OA.5). The work shown clearly demonstrates that the student knows this to be true, both by showing that three rows of six equal eighteen and by showing the division of eighteen by six and three to demonstrate a fact family grouping (MP3).

Total Awarded Points: 2 out of 2

Task 2. The Box of Candies Task

Guide 5

Juan claims that he knows the number of candies in the box shown below. He wrote the equations 3 × 6 and 6 × 3 and he claims that he can write either expression. Do you agree or disagree with Juan, and why?



3 × 6 = 6 × 3

I agree with Juan because all you have to do to get 6x3 into 3x6 is turn it from going upward to sideways.

Litho#: 30018

Guide 5 Litho 30018

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

Total Practice Points: 0

Although this response agrees with Juan that the two expressions are interchangeable, the explanation provided is not clear enough to convince the reader of that position. The student indicates understanding that the difference results from the orientation of the figure (3.OA.5), but the explanation is not clear as to what must be turned "from going upward to sideways" or what that would mean (no credit for MP3).

Total Awarded Points: 1 out of 2

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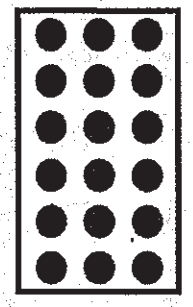

$3 \times 6 = 6 \times 3$

I agree because 3X6 and 6X3 is going to equale the same number because They are the same number.

Litho#: 30158

Guide 6 Litho 30158

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

Total Practice Points: 0

This response indicates that the two expressions are interchangeable because they result in the same product (3.OA.5), but without doing the calculation or otherwise showing what the product would be, the explanation given remains too general (no credit for MP3).

Total Awarded Points: 1 out of 2

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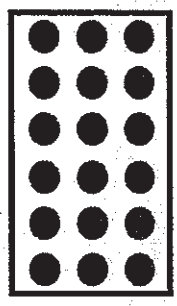

3 × 6 = 6 × 3

I agree because she used comootutiv property. It swwhar you do a Ading, subtracting, duvidingord Motuplying and you pout a eagl sine and you swich the 2 numders.

Litho#: 30249

Guide 7 Litho 30249

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

Total Practice Points: 0

This response indicates that either expression could be used because of the commutative property of multiplication (3.OA.5). Although the commutative property is a logical argument for agreeing with the statement given in the item, the explanation provided is confusing and shows a lack of complete understanding of the property (no credit for MP3).

Total Awarded Points: 1 out of 2

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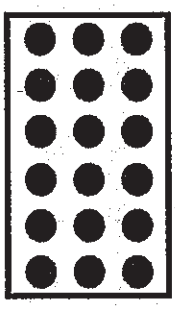
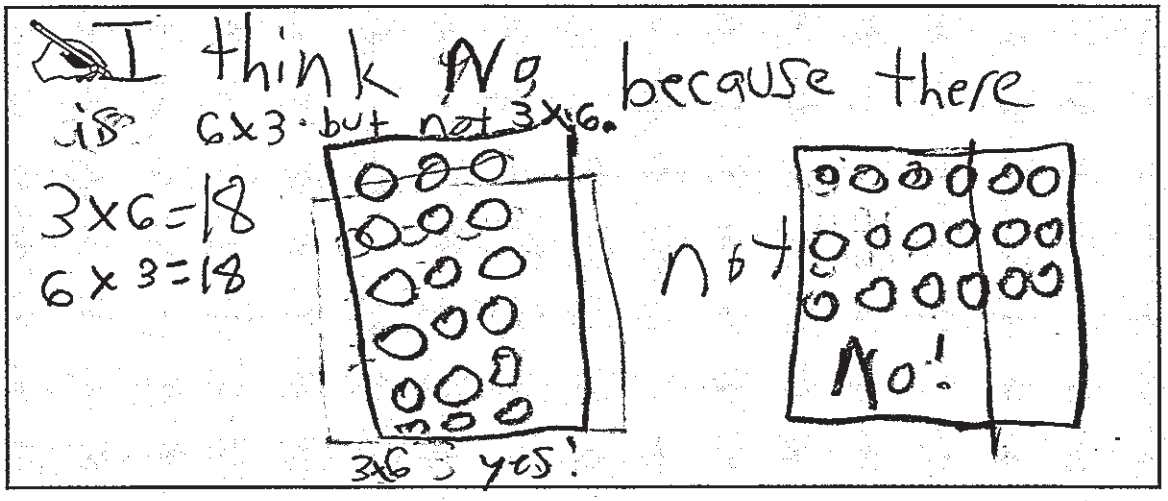


$3 \times 6 = 6 \times 3$



Litho#: 30257

Guide 8 Litho 30257

Total Content Points: 0

Total Practice Points: 0

This response disagrees with the statement given in the item (no credit for 3.OA.5), despite the fact that the student has indicated that both expressions share the same product of 18. The fact that the explanation focuses on the appearance of the two arrays and ignores the common product displays a lack of understanding of the relationship of arrays to multiplication (no credit for MP3).

Total Awarded Points: 0 out of 2

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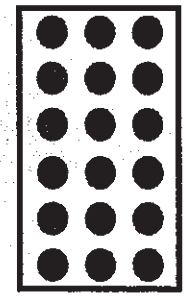

3 × 6 = 6 × 3

I agree because there is 3 on top and 6, going down

Guide 9 Litho 30279

Total Content Points: 0

Total Practice Points: 0

This response indicates that the two expressions are interchangeable, but does not provide a clear or sufficient explanation (no credit for 3.OA.5). Although “there is 3 on top and 6, going down” is a true description of the figure shown, it is not connected to further explanation or to the two expressions being considered (no credit for MP3). A fuller explanation would be needed to justify the correct answer given.

Total Awarded Points: 0 out of 2

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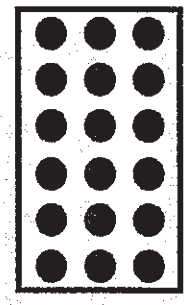
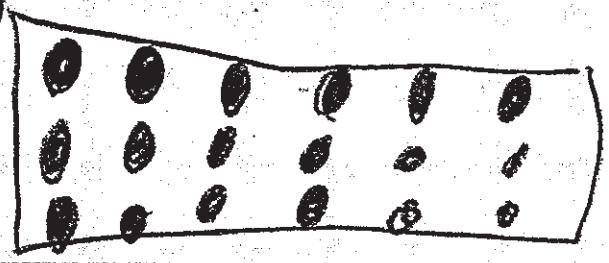


3 × 6 = 6 × 3

I disagree because I think it is only 6 × 3 = 18. 3 × 6 would be



Litho#: 30054

Guide 10 Litho 30054

Total Content Points: 0

Total Practice Points: 0

This response disagrees with the statement given in the item, and the explanation does not demonstrate understanding of multiplication and its relationship to array models (no credit for 3.OA.5). No understanding of the fact that the figures contain the same number of objects is shown (no credit for MP3).

Total Awarded Points: 0 out of 2