

Focus Standards and Claim	Claim 3 3.OA.A.3
Stimulus	<p><b>Art Day!</b></p> <p>You are helping your 4th grade class organize an Art Day.</p> <p>There will be three stations:</p> <ul style="list-style-type: none"><li>• Painting</li><li>• Pottery</li><li>• Chalk Art</li></ul> <p>You have two tasks. You will help create the supply list and the schedule for Art Day.</p> <p><b>Task 1: Supply List</b></p> <p>You need to make sure there are enough supplies at each station for everyone to participate. You will use the following information to create a list of art supplies for your class.</p> <ul style="list-style-type: none"><li>• There are 24 students in your class.</li><li>• Each student needs –<ul style="list-style-type: none"><li>– 2 paint brushes for the Painting Station.</li><li>– 3 pounds of clay for the Pottery Station.</li><li>– 5 pieces of chalk for the Chalk Art Station.</li></ul></li></ul> <p><b>Task 2: Schedule</b></p> <p>You also need to help plan the schedule for Art Day using the following information.</p> <ul style="list-style-type: none"><li>• The day starts at 9:00 a.m. and ends at 2:00 p.m.</li><li>• Your entire class will rotate through the three stations together.</li><li>• The Break has to be at least 10 minutes.</li><li>• The Break and Lunch together total 1 hour.</li><li>• The three stations (Painting, Pottery, and Chalk Art) do <b>not</b> need to be the same amount of time, but each one has to be 30 minutes or longer.</li></ul>
Item Prompt	<p>You need 120 pieces of chalk for Art Day. Your teacher has 6 boxes of chalk. Each box has 18 pieces of chalk. Is this enough chalk for Art Day?</p> <p>Explain the steps you used to figure this out.</p>

## Scoring Guide

SCORE	2 POINTS	1 POINT	0 POINTS
	Student develops an approach (compares the amount of chalk needed to the amount available) to determine whether more chalk is needed AND gives a justification for the result.	Student correctly calculates the amount of chalk available and determines that more chalk is needed, but does not provide a logical explanation why.	All other responses

## Sample Responses

### Student Sample A



What I did to figure this out was first I divided 18 into 10 and 8 and then divided the 8 into 4 and 4 to make it easier and multiplied 10, 4, and 4 to 60 and added them all up and did not get 120. Instead I got 108, so it is not enough.

$$6 \times 18 = 108$$

$$6 \times (10 + 8)$$

$$6 \times (10 + 4 + 4)$$

$$6 \times 10 = 60$$

$$6 \times 4 = 24$$

$$6 \times 4 = 24$$

$$\text{Added up} = 108$$

#### SCORE RATIONALE

The student used decomposition and the distributive property to accurately calculate the number of pieces of chalk in the 6 boxes that the teacher currently has. In addition, the student compared the amount available (108) to the total amount needed (120) to determine that there is not enough chalk available.

## Student Sample B



$$6 \times 18 = (6 \times 10 = 60) + (6 \times 8 = 48)$$

$$60 + 48 = 108 < 120$$

It is not enough. The teacher need to buy one more box of chalk, because there is only 108 pieces and 120 are needed.

**SCORE RATIONALE**

The student calculated  $6 \times 18$  by decomposing the factor 18 into one 10 and eight 1s, and multiplying each of these numbers by the factor 6. The student then added the products together to a sum of 108. The student compared the amount available (108 pieces) to what is needed (120 pieces), to conclude that the teacher needs to buy more chalk. The justification earns full credit for this response.

## Sample Response C



$$6 \text{ box: } 18 + 18 + 18 + 18 + 18 + 18$$

$$2 \times 18 =$$

$$2 \times 10 = 20$$

$$2 \times 8 = 16$$

$$36$$

$$2 \times 18 = 36$$

$$2 \times 18 = 36$$

$$36 + 36 + 36 =$$

$$30 + 30 + 30 = 90$$

$$6 + 6 + 6 = 18$$

$$108$$

There are only 108 pieces there is not enough for art day

Need 120 pieces of chalk

**SCORE RATIONALE**

The student developed an approach to calculating exactly how many pieces of chalk are currently available, using repeated multiplication and addition strategies to calculate the total number of pieces of chalk in 6 boxes. The student's written statements suggest a clear comparison between the amount of chalk needed and the total number of pieces available. The response provides an effective approach to determining that there is not enough chalk, and a justification based on the comparison suggested in the statements. The response earns full credit.

## Sample Response D



$$24=20+4$$

$$20 \times 5 = 100$$

$$5 \times 4 = 20$$

$$100+20 = 120$$

$$6=5 + 1$$

$$5 \times 8 = 40$$

$$1 \times 8 = 8$$

$$40 + 8 = 48$$

$$\text{Check} - 120$$

$$18 =10+8$$

$$6 \times 8 = 48$$

$$6 \times 10 = 60$$

$$48 + 60 = 108 \text{ (Not enough)}$$

**SCORE RATIONALE**

This response demonstrates an active use of decomposition and the distributive property, first to show exactly how much chalk is needed (5 pieces of chalk for 24 students). Next, the student calculated accurately how much chalk is available, again using decomposition of larger numbers and the distributive property. The response includes the word “Check,” suggesting a comparison between the “check” number of 120 and the derived amount available (108). However, the student did not explicitly state or explain the comparison that was made. The response consists of a collection of accurate and clear calculations, but does not include sufficient explanation to fully support Claim 3. The response earns partial credit of 1 point.

## Sample Response E



$$108 = 36 + 36 + 36 = (18 + 18) + (18 + 18) + (18 + 18).$$

**SCORE RATIONALE**

The student accurately calculated the amount of chalk in 6 boxes by using a repeated addition strategy. The student clearly showed how the total was calculated, but there is no evidence of attempting to complete the second part of the problem, which requires a decision about whether or not there is enough chalk for Art Day. There is no explanation, nor is there a completed answer to the question. The response receives partial credit of 1 point.

## Sample Response F



18 pieces

18 pieces

18 pieces

18 pices

18 pieces

18 pices

There are 10 pieces of chalk left

 $5 + 5 + 5 + 5 + 5$  $5 + 5 + 5 + 5 + 5$  $5 + 5 + 5 + 5 + 5$  $5 + 5 + 5 + 5 + 5$  $5 + 5 + 5 + 5$ **SCORE RATIONALE**

This response shows a partial, concrete understanding of the situation. The student attempted to set up the problem by showing twenty-four 5s added together. The student also represented 6 boxes of chalk with six 18s, but did not show any calculations to support finding either of the relevant total amounts of chalk (available chalk; needed chalk). The student stated, "There are 10 pieces of chalk left," but the response does not include an explanation of where this amount came from, or how it relates to whether or not there is enough chalk for Art Day. Without work or calculations to support this statement, the response receives 0 points.

## Sample Response G

 $120 + 18 + 6 = 144 + 134 = 278$ 

278

**SCORE RATIONALE**

This response suggests that the student did not have a clear understanding of the situation, or what is being asked in the problem. The student used the numbers supplied in the problem, added them up to get a sum of 144, and then added this sum to 134. The reasoning for these calculations is unclear. The student did not attempt to respond to the second part of the problem, which requires an explanation, and there is no attempt to provide an argument for whether or not there is enough chalk. The response earns 0 points.

## Sample Response H



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109 no becus we don't have enough

**SCORE RATIONALE**

Although this response includes the statement, "no becus we don't have enough," the student did not accurately calculate how much chalk was available, and did not provide an explanation as to how he/she figured out that there is not enough chalk. The grouping of 1s suggests some partially successful concrete reasoning about the boxes of 18 single pieces of chalk. The response earns 0 points..