

Grade 4 / Case Study 2

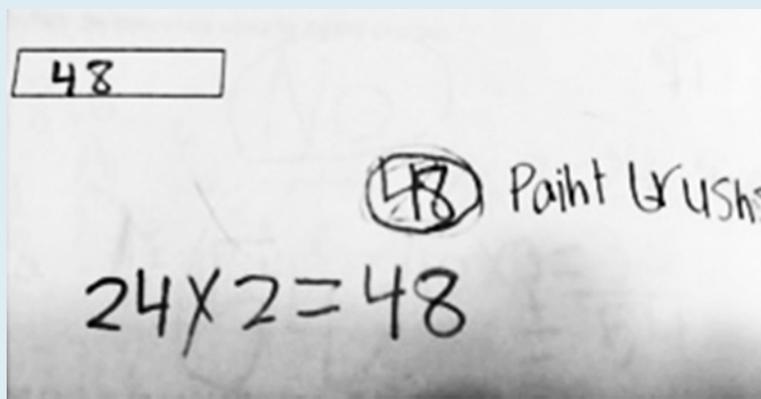
➔ MATH * SMARTER BALANCED PERFORMANCE TASK

ENGLISH LEARNER

Item 1

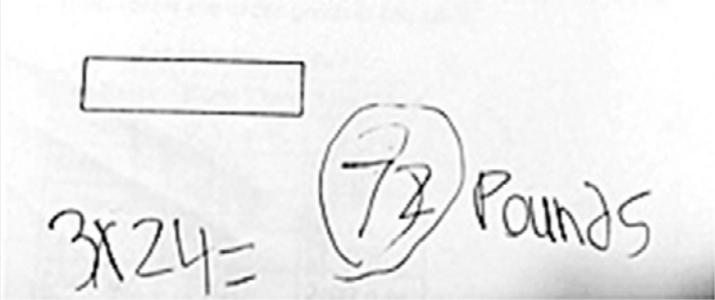
According to the supply list, how many paint brushes are needed for 24 students?

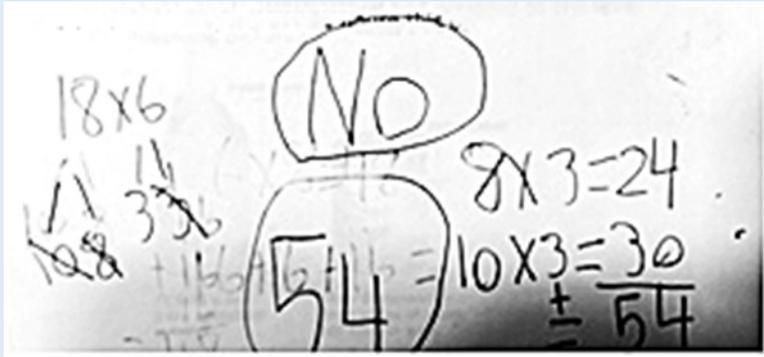
Student
Response
to Item 1



Analysis of
Response
to Item 1

This response earns a score of 1 out of 1 possible point. The student accurately calculated the total number of brushes needed using the parameters of 2 paint brushes for each student with 24 students needing paint brushes.

Item 2	According to the supply list, how many pounds of clay are needed for 24 students?
Student Response to Item 2	
Analysis of Response to Item 2	<p>This response earns a score of 1 out of 1 possible point. The student correctly indicated that 72 pounds of clay are needed. The student determined this number by multiplying 24—the number of students—by 3 pounds of clay needed per student.</p>

Item 3	<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>
Student Response to Item 3	 <p>The image shows handwritten student work on a whiteboard or paper. At the top center, the word "No" is circled in black. To the left of "No", there is a calculation: 18×6 followed by a vertical multiplication of 18 by 6, resulting in 108. Below this, there is another calculation: $54 = 10 \times 3 = 30$ followed by a vertical addition of 10 and 30, resulting in 40. To the right of "No", there is a calculation: $8 \times 3 = 24$. Below this, there is another calculation: $10 \times 3 = 30$ followed by a vertical addition of 10 and 30, resulting in 40. The number 54 is also circled in black.</p>
Analysis of Response to Item 3	<p>There is evidence in the response that the student had at least a partial understanding of the task. The student was able to make some calculations related to the prompt. However, the student did not accurately calculate how many pieces of chalk are available and did not compare the amount available to the amount needed. This response earns a score of 0 out of 2 possible points.</p>

Item 4

Your next task is to help plan the schedule for Art Day using the information from **Task 2: Schedule**.

Create a schedule for your class to follow on Art Day. You must follow the order given in the table.

Student Response to Item 4

Art Day Schedule*

Activity	Start Time	End Time
Painting	9:00 a.m.	9:30
Break	9:31	9:45
Pottery	9:42	11:2
Lunch	11:3	11:45
Chalk Art	11:46	2:00 p.m.

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30

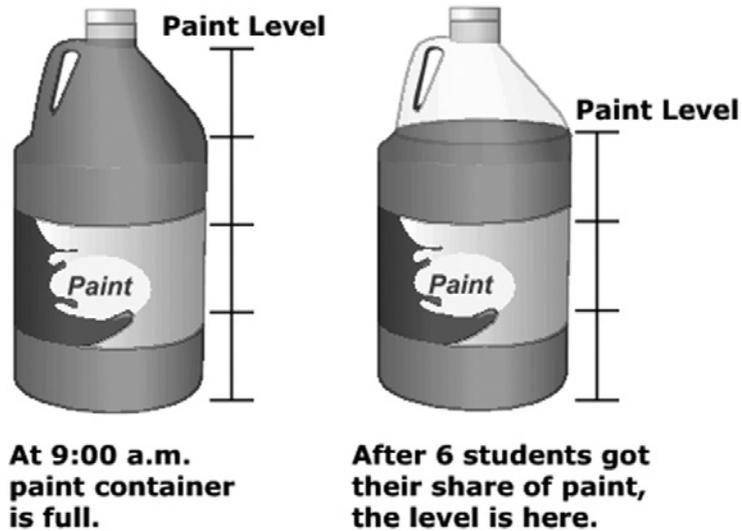
*Times must be given using a 12-hour clock.

Analysis of Response to Item 4

This response earns a score of 0 out of 1 possible point. The student met the requirements for the amount of time needed to be spent at each activity: 30 minutes for activity one, 90 minutes for activity two, and 2 hours and 14 minutes for activity three. However, the student only allotted 42 minutes for lunch and the break combined, which does not satisfy the requirement of 60 minutes combined.

Item 5

When the class went to the Painting Station at 9:00 a.m., the container of paint was completely full. After 6 of the 24 students got their share of paint, the paint level had dropped to the level shown in the following picture.



Katie thinks there is not enough paint for the rest of the students.

Do you agree with Katie? Explain why or why not. Use the information shown in your explanation.

Student Response to Item 5

(No) because there's exactly the amount they need.

Analysis of Response to Item 5

The response shows evidence that the student had at least a partial understanding of the prompt. However, the student did not provide mathematical evidence for the statement that there is enough paint. This response earns a score of 0 out of 1 possible point.

Overview of Student's Performance

The student demonstrated some understanding of the content standards for multiplying one-digit factors by two-digit factors. In two of the straight computation items (1 and 2), the student accurately calculated the product. Additionally, in item 4, the student accurately entered times into the schedule for Art Day. While solving the problem in item 4, the student also included transition times for each of the activities, which demonstrates an understanding that in real life, time is required to move from one activity to another.

Throughout the samples of the student's work, there is evidence that the student was engaging effectively in Mathematical Practice (MP) 1. The evidence of this is in items 1 and 2, in which the student accurately calculated the total number of brushes and pounds of clay necessary for each of the 24 students to participate in Art Day. There is also evidence of MPs 2, 4 and 5 in this student's work on item 4: the student is making sense of a more complex problem, using the context to reason about the amount of time needed to transition between stations, and using the information and tools provided to build a schedule, which is a kind of model.

Areas of growth for the student are working with MP 3, 4, 5, and 7, including describing how s/he thinks about a problem/solution and why this thinking is mathematically valid (MP 3). For example, in items 3 and 5 the student did not explain responses or support conclusions. Additionally, in item 5, the student did not use the scale on the side of the container as a tool to think about the problem and to come up with a mathematical conclusion or solution, indicating a need for experiences using measurement tools that build on prior experiences. I think if the student had more concrete experiences with amounts and materials, s/he would recognize that the response in item 3 does not make sense in the context of the problem. It may be that the worksheets and problem sets completed in class are not supporting this student's conceptual development of math. Providing real-world problems that the student engages in during school and everyday life would help move math out of abstraction and into something the student sees as meaningful in relation to concrete experiences. Opportunities for the student to engage with MP 4—Modeling with Mathematics—to gain experience with a variety of models and representations would support this student as well.

Next Steps

The student would benefit from some additions to current lesson activities. Specifically, this student should be provided with multiple opportunities to engage in larger problems and tasks in order to extend conceptual understanding. Beginning with MP 4, the student could look at a real-world problem and engage in collaborative discussions about the quantities that might be important in the context of the problem, what information would be needed to begin to solve the problem, and what mathematical representations and models might support solving the problem. Giving this student a range of models to work with that connect with a particular problem situation will give the student richer opportunities to communicate about his/her reasoning. With these added tools, the student would be better positioned to demonstrate an understanding of how to solve a problem and explain how s/he is thinking about the problem. The student would also benefit from peer questioning strategies to support his/her conceptual development and written communication skills.