Grade 5 / Scored Student Samples ITEM #3

SMARTER BALANCED PERFORMANCE TASK

Focus Standards and Claim

Claim 4

4.NF.B.4c

Stimulus

Clay Pottery

Lizzie and Zela are interested in making pottery. The following chart shows how much clay is needed to make different projects.

Project	Pounds of Clay Needed
 Small Plate	$2\frac{1}{2}$
 Small Bowl	$1\frac{1}{2}$
 Large Bowl	$3\frac{1}{4}$
 Dinner Plate	$4\frac{1}{2}$
 Mug	$\frac{3}{4}$

Item Prompt

Zela wants to make a set of 6 mugs. The clay **only** comes in 1-pound blocks.

What is the **least** number of blocks of clay Zela will need to make 6 mugs?

Explain how you figured out your answer.

Note: Zela knows that leftover clay from each block can be squished together and used.

Scoring Guide

SCORE	2 POINTS	1 POINT	0 POINTS
	Student **develops** an approach to determine the number of pounds of clay needed to make 6 mugs AND provides an **explanation** as to why 5 blocks are needed.	Student correctly calculates the amount of clay needed, but does not provide an explanation why. Or, student provides the correct answer but with a flawed justification.	All other responses

Sample Responses

Student Sample A

2 POINTS

23 x 6 =18/4

18/4= 6 mugs

Do not add demonaters!

Only 1 pound blocks.

Question: How many 4s in 18?

4 x 4 = 16

18/4 - 4/4 = 14/4

14/4 - 4/4 = 10/4

10/4-4/4 = 6/4

6/4-4/4-2/4

About leftover = 2/4

So you will need 5 pounds.

Zela will need 5 pounds. I know this because I subtracted 18/4 by 4/4 and so on. After that 2/4 were left and without the 2/4 will be 4 pounds. But Zela needs that 2/4 so she will actually need 5 pounds.

SCORE RATIONALE

The student applied multiplication of fractions to determine that 18/4 pounds of clay would be needed to make 6 mugs. The student then used repeated subtraction to determine how many 4s are in 18, successively subtracting 4/4 from 18/4. Finally, the student accurately concluded that Zela would need an extra 2/4 pounds of clay, beyond 4 pounds of clay, in order to make all of the mugs, which means that Zela would need 5 pounds of clay.

Student Sample B

2 POINTS

3/4 + 3/4 + 3/4 + 3/4 + 3/4 + 3/4

4/4 = 1

18/4 ÷ 4 = 14/4 ÷ 4 = 10/4 ÷ 4 = 6/4÷ 4 = 2/4

Zela will need at least 5 pound for 6 mugs. She will need 5 pounds because Zela will need an extra half pound to make 6 mugs.

SCORE RATIONALE

Using repeated addition of fractions, the student calculated that 6 mugs would require 18/4 pounds of clay. The student then used repeated subtraction (although notated as division) to determine how many whole pounds of clay are contained within the 18/4 pounds. The student's calculations indicate that 4 and 2/4 pounds would be needed. The final statement of the response indicates that the student accurately interpreted the need to purchase an additional pound of clay in order to have enough clay to make 6 mugs.

Student Sample C

2 POINTS

3/4 + 3/4 = 1 1/2

3/4 + 3/4 = 1 1/2

3/4 + 3/4 = 1 1/2

1 1/2 + 1 1/2 = 3

3 + 1 1/2 = 4 1/2

4 1/2 + 1/2 = 5 (extra 1/2 is to make a whole pound)

The least number of blocks of clay Zela could get is 5.

SCORE RATIONALE

The student used an adding-on strategy to determine that 4 1/2 pounds of clay would be needed to make 6 mugs. The student then added an extra 1/2 pound to reach 5 whole pounds of clay as the least number of blocks of clay that Zela could get in order to make 6 mugs.

Student Sample D

1 POINT

1 mug 3/4 +2 mugs 3/4 + 3 mugs 3/4 = 9/4

4 mugs 3/4 + 5 mugs 3/4 +6 mugs 3/4 = 9/4

9/4+9/4=18/4

She will need 18/4 of clay to make six mug because 1 mug is 3/4. for you can get your answer add all of them.

SCORE RATIONALE

This response indicates a clear understanding of how much clay is needed to make 6 mugs. However, the response does not provide evidence of considering the fact that the clay only comes in 1-pound blocks. The student explained how he/she determined the total amount of clay needed ("1 mug is 3/4," and then "add all of them"), but did not give the correct number of blocks of clay that Zela needs. The response receives partial credit of 1 point.

Student Sample E

1 POINT

3/4 + 3/4 + 3/4 + 3/4 + 3/4 + 3/4 = 18/4

1 = 4/4 = 14/4 - 4/4 = 10/4 - 4/4 = 6/4 - 4/4 = 2/4

The least number is 5.

SCORE RATIONALE

The student used repeated addition to successfully determine that 18/4 is the sum of 3/4 added 6 times. The next set of calculations indicate a use of repeated subtraction of 4/4. However, the response does not earn full credit because the concluding statement, though correct, does not connect the calculations with a justification of why Zela would need to purchase 5 pounds of clay.

Student Sample F

1 POINT

wants to make 6 mugs

clay only comes in 1-pound

least number of blocks of clay zela will need

3/4 3/4 3/4 3/4 3/4 3/4

18/4

4 5

Zela will need 5 pounds to make 6 mugs because I wrote 3 /4 6 times and added all the numerators and got 18 and multiplyed 4 x 4 = 16 and got 5 and 4 then I knew it was 5.

SCORE RATIONALE

The student's response indicates an understanding that 6 mugs would require 18/4 pounds of clay, and that this fractional amount is between 4 and 5 whole pounds of clay. However, the student's justification is only partially complete in detailing how the determination of 5 pounds was made. The response receives partial credit of 1 point.

Student Sample G

1 POINT

1 clay block = 1.25 mugs

1.25 + 1.25 + 1.25 + 1.25 + 1.25 = 6.25

It will take Zela 5 blocks of clay to make 6 mugs. I figured out my answer by knowing that there will be 1/4 left from each clay block.

SCORE RATIONALE

The student began by reasoning that 1 clay block would make 1.25 mugs. Although this value is incorrect (1 clay block is enough to make 1 and 1/3 mugs), the reasoning is promising. The student then added 1.25 five times (perhaps representing the number of mugs that could be made from 5 blocks of clay), and correctly indicated that the sum is 6.25. The student stated that "by knowing that there will be 1/4 left from each clay block," he/she was able to figure out that Zela needs 5 pounds of clay. However, the connection between these ideas is fuzzy, and the calculations do not clearly support the statement. The response lacks a logical justification and earns partial credit.

Student Sample H

0 POINTS

75 + 75 = 150

150 + 150 = 300

300 + 300 = 600

I doubled 75 3 times and got 600 which is equal to 6 pounds of clay.

SCORE RATIONALE

The student incorrectly determined that 6 pounds of clay would be needed to make 6 mugs. The student provided three calculations that are correct, but do not fit the situation, and then incorrectly interpreted what the calculations mean. The student concluded by stating that he/she doubled 75 three times, which would yield a numeric value of 450 (4.50 in decimal form), not 600 (6.00 in decimal form), as is stated in the response. The response receives 0 points.

Student Sample I

0 POINTS

4 mugs

SCORE RATIONALE

The student's response suggests a limited understanding of the problem. The response earns 0 points.