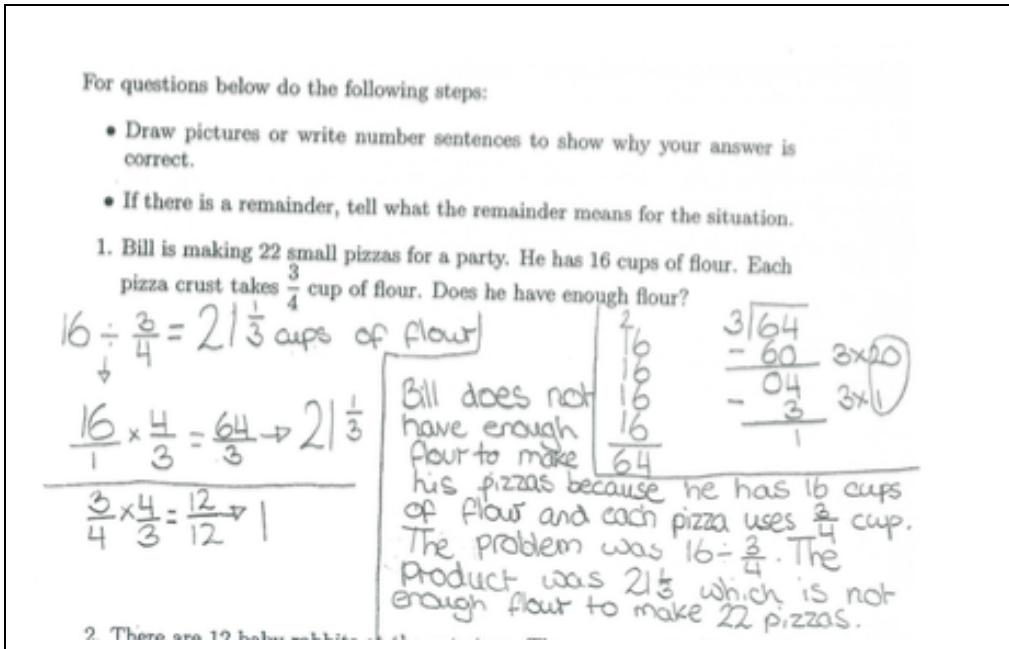
Using Student Work to Assess Understanding

Facilitator's Guide

Sample Student Work Problem	Facilitator Notes
6th Grade Fraction Division For questions below do the following steps: • Draw pictures or write number sentences to show why your answer is correct. • If there is a remainder, tell what the remainder means for the situation. 1. Bill is making 22 small pizzas for a party. He has 16 cups of flour. Each pizza crust takes $\frac{3}{4}$ cup of flour. Does he have enough flour?	1. Give problem to teachers 2. Teacher solves problem 3. Show twor or more examples of student work 4. Make a small group list of possible student errors, large group discuss 5. Make a small group list of next tasks for possible errors, large group discuss 6. Display student work and discuss errors ie: did the errors students made make it on our list. 7. Discuss next tasks based on student mistakes. Possible student errors: ● Student dividing 16 cups by ¾ incorrectly comparing to 22 pizzas (student example 1) ● Multiply 22 pizzas by ¾ and incorrectly compare to 16 cups



For questions below do the following steps:

- Draw pictures or write number sentences to show why your answer is correct.
- If there is a remainder, tell what the remainder means for the situation.

1. Bill is making 22 small pizzas for a party. He has 16 cups of flour. Each pizza crust takes $\frac{3}{4}$ cup of flour. Does he have enough flour?

$16 \div \frac{3}{4} = 21\frac{1}{3}$ cups of flour

$\frac{16}{1} \times \frac{4}{3} = \frac{64}{3} \rightarrow 21\frac{1}{3}$

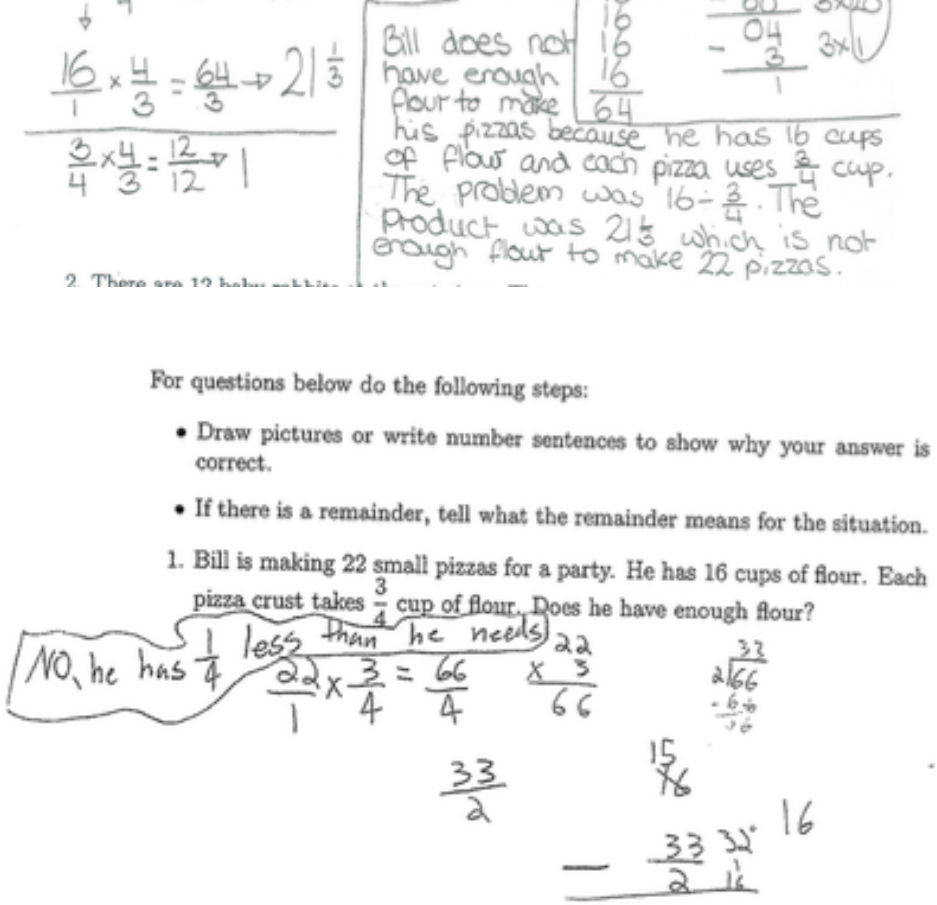
$\frac{3}{4} \times \frac{4}{3} = \frac{12}{12} \rightarrow 1$

16
16
16
16
64

$3\overline{)64}$ 3×20, 3×1

Bill does not have enough flour to make his pizzas because he has 16 cups of flour and each pizza uses $\frac{3}{4}$ cup. The problem was $16 \div \frac{3}{4}$. The product was $21\frac{1}{3}$ which is not enough flour to make 22 pizzas.

2. There are 12 baby rabbits of the ...



For questions below do the following steps:

- Draw pictures or write number sentences to show why your answer is correct.
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1. Bill is making 22 small pizzas for a party. He has 16 cups of flour. Each pizza crust takes $\frac{3}{4}$ cup of flour. Does he have enough flour?

NO, he has $\frac{1}{4}$ less than he needs

$\frac{22}{1} \times \frac{3}{4} = \frac{66}{4}$

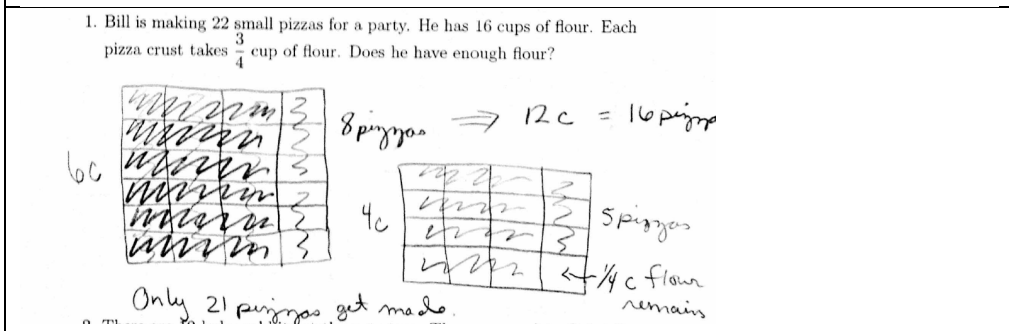
22 × 3 = 66

$\frac{33}{2}$

$\frac{33}{2}$ − 16

Possible next tasks:

- Ask how many whole pizzas can be made?
- Have student draw a diagram to show how 16 cups can be divided into pizzas.
- Ask how many cups would be needed for 22 pizzas and compare to how much Bill has.



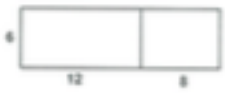
1. Bill is making 22 small pizzas for a party. He has 16 cups of flour. Each pizza crust takes $\frac{3}{4}$ cup of flour. Does he have enough flour?

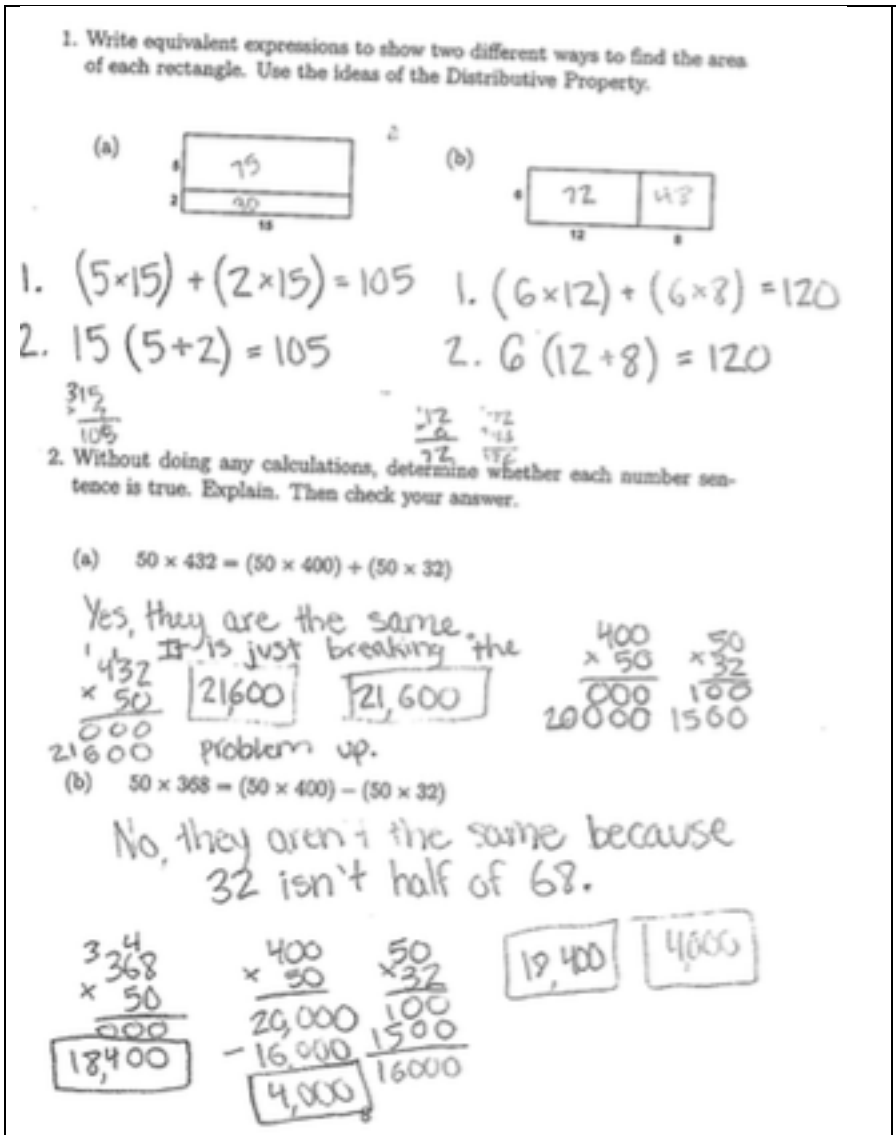
6c 8 pizzas ⇒ 12c = 16 pizzas

4c 5 pizzas

¼ c flour remains

Only 21 pizzas get made.

Sample Student Work Problem	Facilitator Notes
8th Grade Equiv. Exp 1. Write equivalent expressions to show two different ways to find the area of each rectangle. Use the ideas of the Distributive Property. (a) (b)  2. Without doing any calculations, determine whether each number sentence is true. Explain. Then check your answer. (a) $50 \times 432 = (50 \times 400) + (50 \times 32)$ (b) $50 \times 368 = (50 \times 400) - (50 \times 32)$	1. Each participant completes this before looking at the student work and discusses in the group possible errors that students might make. Some of these might include: a) multiplying the left side by an unknown to obtain the length of the rectangle. b) not recognizing the "rectangle" is comprised of two parts and each added together is the area of the "rectangle." and c) that the distributive property holds over both addition and subtraction.



1. Write equivalent expressions to show two different ways to find the area of each rectangle. Use the ideas of the Distributive Property.

(a) (b)

1. $(5\times15)+(2\times15)=105$
2. $15(5+2)=105$

1. $(6\times12)+(6\times8)=120$
2. $6(12+8)=120$

2. Without doing any calculations, determine whether each number sentence is true. Explain. Then check your answer.

(a) $50 \times 432 = (50 \times 400) + (50 \times 32)$

Yes, they are the same. It is just breaking the problem up.

$432 \times 50 = 21600$ $\boxed{21,600}$

$400 \times 50 = 20000$ $50 \times 32 = 1600$

(b) $50 \times 368 = (50 \times 400) - (50 \times 32)$

No, they aren't the same because 32 isn't half of 68.

$368 \times 50 = \boxed{18400}$

$400 \times 50 = 20,000$ $50 \times 32 = 1600$

$20,000 - 16,000 = \boxed{4,000}$

$\boxed{19,400}$ $\boxed{4,000}$

In #1, the student demonstrates they understand the concept of the distributive property.

In #2b, it appears the student's understanding is not as deep as hoped, as the multiplication error with 50 x 32 led to 16000 rather than 1600. Discuss: Reasonable answers (50*400 was 20,000, so, is it reasonable that 50*32 is 16,000?) How do you get a student to step back and ask what might be problematic?

One strategy might be to cover the student solution to 2b and ask, "does this student understand the distributive property?" The logical answer is yes, but then uncovering the work shows they were not concerned with the concept. 400-32 is 368, so the distributive property should hold and what the "32 isn't half of 68" has to do with this

	is most curious. These discussions encourage teachers to take this approach back to their classrooms, where students solve rich math tasks using either document cameras or white boards, share their thinking/reasoning orally as well, and when problematic situations arise, discuss them together, convincing themselves and others of sound mathematical reasoning.