Task 7

On one side of a balanced scale is a full bar of soap. On the other side is 3/4 of a bar of the same kind of soap and a 3/4–ounce weight. Find the weight of the bar of soap.[1]

[1] Source for all tasks: http://mathpractices.edc.org/

Standards for Mathematical Practice

Which of the eight CCSS Standards for Mathematical Practice did you use while solving this problem?

- ☐ 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.

Student Dialogue and Teacher Reflection

What evidence do you see of students engaging in the Standards for Mathematical Practice?

Related Mathematics Tasks

1. On one side of a balanced scale is $\frac{3}{4}$ of a bar of soap. On the other side is $\frac{1}{2}$ of a bar of the same kind of soap and a $\frac{3}{4}$–ounce weight. How much does the bar of soap weigh?

2. On one side of a balanced scale is $1\frac{1}{2}$ bars of soap. On the other side is $\frac{5}{8}$ of a bar of the same soap and a $\frac{1}{2}$–ounce weight. How much does the bar of soap weigh?

3. Given the task in the dialogue and questions 1 and 2, describe the process you used to find the weight of one bar of soap. Then write an equation that describes that process.

4. A 2–pound block of cheese is on one side of a scale while on the other side sits $1\frac{1}{2}$ pounds of rice and $\frac{1}{2}$ of a block of the same cheese. Is the scale balanced?

Task 8

A big party is being planned and everyone will sit at hexagon–shaped tables. The tables will be put together in one long line as shown below.

If there are 57 tables and each side of the table fits only one person, how many guests can be seated? Write an expression to represent the number of guests that can be seated at 57 tables.

Standards for Mathematical Practice

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Student Dialogue and Teacher Reflection

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Related Mathematics Tasks

1. If there were 83 tables, how many could be seated?
2. If there were 101 tables, how many could be seated?
3. There are 154 guests seated at hexagonal tables, and no seats are empty. How many tables are there?
4. What if the tables were octagon–shaped? If there were 57 tables, how many could be seated?
5. What if the tables were arranged in different ways other than in a line? What other ways could the hexagon tables be arranged and how many could be seated?

Task 11

Suppose the post office only sold five–cent stamps and seven–cent stamps. Some amounts of postage can be made with just those two kinds of stamps. For example, 1 five–cent and 2 seven–cent stamps make 19 cents in postage, and 2 five–cent stamps makes 10 cents in postage. Which amounts of postage is it impossible to make using only five–cent and seven–cent stamps?

Standards for Mathematical Practice

Which of the eight CCSS Standards for Mathematical Practice did you use while solving this problem?

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- ☐ 3 Construct viable arguments and critique the reasoning of others.
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Student Dialogue and Teacher Reflection

What evidence do you see of students engaging in the Standards for Mathematical Practice?

Related Mathematics Tasks

1. Find two different combinations of five–cent and seven–cent stamps that can be used to make 111 cents of postage.

2. Solve the problem Sam poses at the end: Suppose the post office only sold six–cent and seven–cent stamps. What amounts of postage can be made? Explain what process you used to solve this problem.

3. Suppose the post office only sold four–cent and nine–cent stamps. What amounts of postage can be made?

4. Suppose the post office only sold six–cent and nine–cent stamps. What amount of postage can be made?

5. Suppose the post office only sold m–cent stamps and n–cent stamps. Suppose also that, above some amount of postage, all amounts of postage can be made. What can you say about m and n?

6. Suppose the post office only sold two stamp denominations that are multiples of 5. What can you say about the postage that can and can't be made? What if both stamps are multiples of n?

Task 18

Given three vertices of a parallelogram at *A(1, 2)*, *B(4, 1)*, and *C(5, 3)*, where can the fourth vertex be located.

Standards for Mathematical Practice

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Student Dialogue and Teacher Reflection

What evidence do you see of students engaging in the Standards for Mathematical Practice?

Related Mathematics Tasks

1. Find the coordinates of all other possible fourth vertices of the parallelogram described in the problem.
2. How do you know you have found all the possible fourth vertices? Justify your answer.
3. Given points $(2,1)$, $(6,1)$, and $(2,-2)$, how many parallelograms can you make? How many rectangles? Justify your answer.
4. Name three points that cannot be the vertices of a parallelogram, no matter where the fourth point is. What must be true about these three points?
5. Four keys are required to open a treasure vault. Your ripped map shows the location of three of the keys. You know the four keys are located at the corners of a parallelogram. Where could the fourth key be?

Task 20

What does $\frac{2}{5}$ plus $\frac{1}{2}$ equal?

Standards for Mathematical Practice

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- ☐ 3 Construct viable arguments and critique the reasoning of others.
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Student Dialogue and Teacher Reflection

What evidence do you see of students engaging in the Standards for Mathematical Practice?

Related Mathematics Tasks

1. Consider the following example:

   A. What is 2 quarts plus 1 cup? James claims he can add these together to get 3 quarts of milk. Is this true? Why or why not?

   B. If 4 cups are in 1 quart, how many cups are in 2 quarts? What is 2 quarts plus 1 cup?

   C. Why could you add 2 quarts and 1 cup in part B but not in part A?

2. Consider the following example (Note: allons, bobbers, and coffs are made–up words):

   A. What is 3 allons plus 5 bobbers? Can you add the two numbers together, why or why not?

   B. If there are 5 coffs in an allon and 10 coffs in a bobber, what is 3 allons plus 5 bobbers?

   C. Why could you add 3 allons plus 5 bobbers in part B but not in part A?

3. Consider the following example:

   A. Is 2 fifths plus 1 half equal to 3 sevenths? Why or why not?

   B. If there are 2 tenths in 1 fifth and 5 tenths in 1 half, what is 2 fifths and 1 half?

   C. What did you do in part B that made it easier to add 2 fifths and 1 half?

   D. Write a word problem that would require you to add 2 fifths and 1 half and explain how you would solve the problem.

   E. Rewrite all the conversions and work you did in part B using fraction notation.