Developing Fraction Understanding

A Big Idea Module

BIM FOCUS

Describe the methods you used to solve each of the 3 problems below.

1. Four friends have three bags of popcorn to share. What part of a bag will each one get?

2. Samantha brought 4 pizzas home to freeze, but before she could freeze them, Sarah, Coby, Ben and Olivia ate 3/16 of the pies. How much will Samantha have left to freeze?
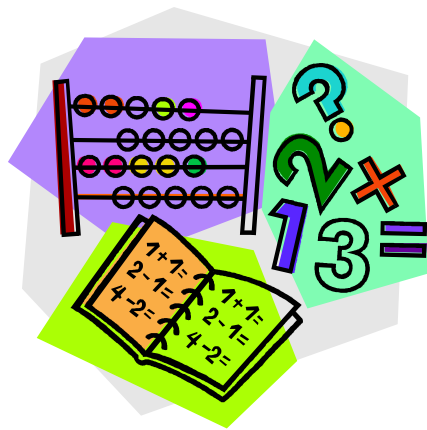
3. Gabriel painted a mural of a huge bowl of fruit. For every 3 green apples, there were 4 red apples. If there were 57 green apples, how many red apples were there?

What critical big idea is evident as a result of doing all three of the above problems?

Early Elementary Grades

Peanut Butter Sandwiches

FOCUS: What does half mean?

EXPLORE: How many ways different ways can you cut the sandwich exactly in half?

Gabriel likes to eat a peanut butter and jelly sandwich every day, but he insists that it not be cut in the same way every day.

Use the geoboard to represent Gabriel's sandwich. Work with a partner to see how many ways you can cut them in half. Record your information on the Geodot papers. Check for duplicates and compare with your group.

REFLECT: What is the key concept of this lesson?

APPLY: What would be true of the parts of the sandwich if the sandwich were divided into fourths? How does this connect to the key concept above?
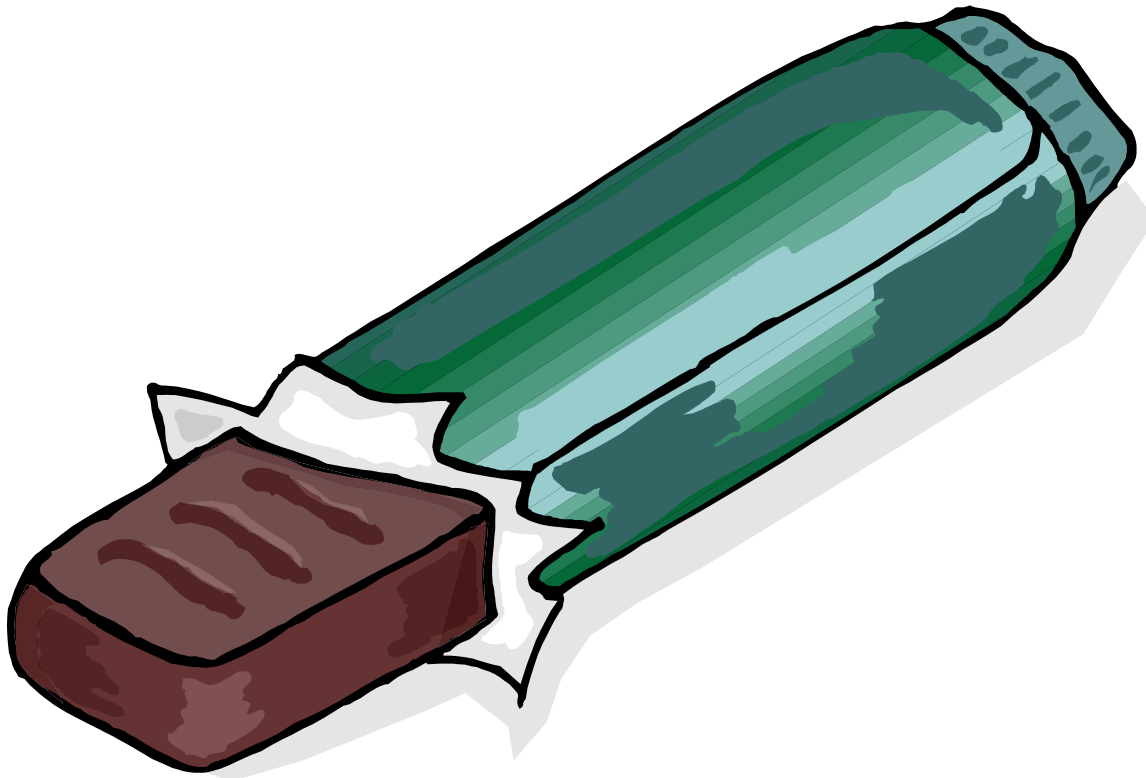
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Insert 2 copies of geodot paper here, which can be found at the link below:
http://www.aug.edu/~lcrawford/Tools/geodotpaper.pdf

Candy Problems

FOCUS: What are some of the different meanings for a fraction?

EXPLORE:

- Gabriel has a $1\,^5/_8$ pound bar of candy. Gabriel gave Ben $^1/_2$ of his candy. How much candy does Gabriel have left?

- Coby has a $1^5/_8$ pound bar of candy. Coby gave Olivia $^1/_2$ pound of his candy. How much candy does Coby have left after giving Olivia ½ pound of his candy?

1. Draw a picture or use a manipulative material that can be used to solve each of the problems. Using ONLY your picture or model, figure out the solutions.
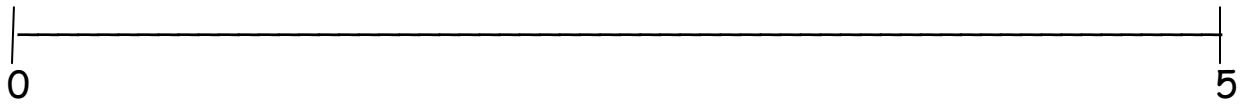
2. Explain *in detail* how you used *only* the representation to solve each problem.

1) What different meanings of fractions are represented in these problems?

2) How do the representations help students avoid the most common misconceptions in these problems?

APPLY: Put the number 1/2 on the following number line:

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HOLIDAY BOWS

FOCUS: What different kinds of representations can be used to solve problems with fractions?

EXPLORE:

(1)   Pink ribbon comes packaged in 6 meter lengths;

(2)   Gold ribbon comes packaged in 3 meter lengths;

(3)   Blue ribbon comes packaged in 2 meter lengths; and

(4)   White ribbon comes packaged in 1 meter lengths.

Your job is to find out how many bows of particular lengths can be made from the packaged lengths for each color ribbon.

I. White Ribbon	Ribbon Length of Bow	Number of Bows
1 meter	1/2 meter	
1 meter	1/3 meter	
1 meter	1/4 meter	
II. Blue Ribbon	**Ribbon Length of Bow**	**Number of Bows**
2 meters	1/2 meter	
2 meters	1/3 meter	
2 meters	2/3 meter	
III. Gold Ribbon	**Ribbon Length of Bow**	**Number of Bows**
3 meters	1/3 meter	
3 meters	2/3 meter	
3 meters	3/4 meter	
IV. Red Ribbon	**Ribbon Length of Bow**	**Number of Bows**
6 meters	1/2 meter	
6 meters	1/3 meter	
6 meters	2/3 meter	
6 meters	3/4 meter	

REFLECT: Can you use what you have done above to give you any ideas about a rule for division of fractions? Explain your thinking.

APPLY:

1) Read the problem below and solve it.

TUNA SANDWICHES

Mr. Tastee's restaurant serves four different kinds of sandwiches. A junior sandwich contains 1/4 lb of tuna; a regular sandwich contains 1/3 lb of tuna; a large sandwich contains 1/2 lb of tuna and a hero sandwich contains 2/3 lb of tuna. Tuna comes in cans that are 1lb, 2 lb, 3lb and 5 lb. How many of each type of sandwich can you make from each size can? Find a clear way to record your information. You will need to write a letter to the restaurant owner, Mr. Tastee, and give him your findings.

2) A. Compare and contrast this problem to Holiday Bows. How are they alike?
       How are they different?

B. Were you able to use anything you learned while doing the Holidays Bows problem to help you solve the Tuna Sandwiches problem? Explain your thinking.

BIM REFLECTION

1. What Big Ideas developed throughout the module? Explain this in detail.

2. How were the ideas in each problem developed throughout the module helpful in solving the focus problem? Explain in detail.