

Divide and Conquer!

Activity 4

1. Ms. Philips brought jars of jellybeans to be shared by members of the student groups winning each game at a Family Math Night. How much of a pound of candy will each student get when:

Situation	Think About It (in your own words)	Picture It	Write In Symbols	Process It (What do you actually do?)	Solve It
a. the jellybeans weigh $\frac{1}{2}$ pound and there are 4 students on the winning team?					
b. the jellybeans weigh $\frac{1}{4}$ pound and there are 3 students on the winning team?					
c. the jellybeans weigh $\frac{1}{3}$ pound and there are 3 students on the winning team?					
d. the jellybeans weigh $\frac{1}{5}$ pound and there are 2 students on the winning team?					



Divide and Conquer!
Activity 4 (continued)

1. A candy store in town donated very long chocolate bars that were used for prizes in a team completion. What fraction of a long bar did each team member get when:

Situation	Think About It (in your own words)	Picture It	Write In Symbols	Process It (What do you actually do?)	Solve It
a. a two-person team won $\frac{3}{4}$ of a bar as a prize and shared it equally?					
b. a four-person team won $\frac{7}{8}$ of a bar as a prize and shared it equally?					
c. a four-person team won $1\frac{1}{2}$ bars as a prize and shared it equally?					



Divide and Conquer!
Activity 4 (continued)

3. Use ideas from your work on the questions about jellybeans and chocolate bars to complete the following calculations.

a. $1/2 \div 4$	b. $3/2 \div 2$
c. $2/5 \div 3$	d. $4/5 \div 4$
e. $7/10 \div 2$	f. $9/5 \div 3$

4. Describe a procedure that seems to make sense for dividing any fraction by any whole number.
5. Write a story problem that can be solved by the division $8/3 \div 4$. Explain why the calculation matches the story.



Teacher notes for

Activity 4

This activity is intended to build on the experiences students have had with the problems calling for division of a whole number by a fraction in Activity 3. In Activity 4, students will be dealing with contexts in which division of a fraction by a whole number is encountered. The problems are organized to develop a pattern that will lead to an algorithm for division of fractions if either the dividend or the divisor is a whole number. Problems 1 and 2 give situations with several subparts. In problem 1, all of the problems are situation where a unit fraction is divided by a whole number. Problem 2 deals with situations where a non-unit fraction is divided by a whole number. Remind students to use the chart to organize their thinking.

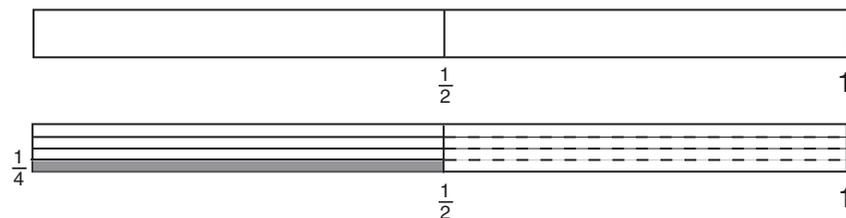
- How are the situations in problems 1 and 2 different from the problems in Activity 3?

The student might answer: “In Activity 3, problems 1 and 2, we divided a whole number by a fraction, but in Activity 4 we are dividing a fraction by a whole number.”

- What are the numbers in the problem and what do they represent? What do you need to find? What does the answer tell you? Are the problems grouping or sharing problems?

The student might answer: “These are sharing problems because we know the whole amount (pounds of jellybeans, length of chocolate bar) and the number of groups (students who will share the jellybeans or chocolate bar), but we don’t know the size of the share each student will receive.”

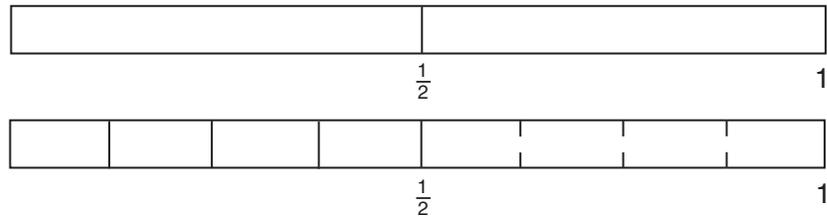
- What does the answer tell you? Show me a diagram for problem 1a and explain how it answers the question. A student might draw the following diagram:



The student might reason: “I drew a fraction strip to show $\frac{1}{2}$. Then I needed to divide this amount into four parts. This lets me find $\frac{1}{4}$ of the amount because that is what each will get. Then I had to name the small part that shows $\frac{1}{4}$ of $\frac{1}{2}$. The picture shows that $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$, since we have eight equal parts in the whole. So each person gets $\frac{1}{8}$ of a pound of jellybeans.”



This diagram shows that $1/2 \div 4$ is the same as $1/2 \times 1/4$ which is $1/8$. Here is another possible diagram a student might draw:



The student might reason: “First I made a drawing of $1/2$. Then I divided $1/2$ into four parts because there are four people to share. Now I can see that each person gets $1/8$ th of a pound of jellybeans. So $1/2 \div 4 = 1/8$. This makes sense because you will have smaller pieces than the original $1/2$ and they will be four times smaller or $1/4$ as large. I guess we could do this by seeing that $1/2 \div 4 = 1/2 \times 1/4 = 1/8$.”

