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# Rational Number Project

## Level 1 / Lesson 22 / Overview

Students explore fraction subtraction within difference and how many more contexts. Students estimate and solve story problems with fraction circles.

## Materials

- Fraction Circles for students and teacher

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## Teaching Actions

1. Continue with the difference story problems. Students act out the problem in a group with fraction circles.  

Joe and Renata each receive the same allowance. Joe spent  $\frac{1}{2}$  on records. Renata spent  $\frac{1}{8}$  on repairing her bicycle. How much more did Joe spend?
2. Ask for estimates. Is it reasonable to expect the answer to be less than  $\frac{1}{2}$ ? Greater or less than  $\frac{1}{4}$ ?
3. As you monitor their group work consider these hints:
  - a) How can you show Joe and Renata's amounts with fraction circles?
  - b) Is  $\frac{1}{8}$  greater or less than  $\frac{1}{2}$ ?
  - c) How many 8ths equal  $\frac{1}{2}$ ?
4. Again have students share solutions, emphasizing the group's thinking rather than the exact answer.

## Comments

1. You may want to spend more than one day on this lesson.

## Teaching Actions

5. Present these two problems. Ask students to act out both problems and explain how they are different.
  - a) José ate  $\frac{3}{4}$  of a pizza. Mara ate  $\frac{5}{8}$ . Who ate more and how much more?
  - b) A movie costs Josie  $\frac{1}{2}$  of her allowance. If she only had  $\frac{3}{4}$  of her allowance left before the movie, how much of her allowance did she have left after the movie?

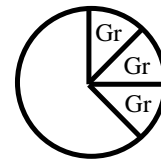
6. Present this "how many more" problem and ask students to act it out.

Marcia agreed to mow about  $\frac{1}{2}$  of the lawn before dinner. At 3:00 she finished about  $\frac{3}{8}$  of the lawn. How much of the job does she have left?

7. As you monitor group work consider these questions:
  - a) Can you show how much she completed by 3:00?
  - b) Even if you can reason the answer in your head, can you show how to do it with circles?
  - c) If she has completed  $\frac{3}{8}$ , how much more to  $\frac{1}{2}$ ?
8. Share responses and actions on circles. Discuss how this problem is different from previous ones.
9. Talk about how all 3 problem types are subtraction. Pick any 3 examples and substitute whole numbers in for fractions. Ask students to solve with whole numbers. Note that in each case they wrote a subtraction problem. Now write the fraction problems symbolically. Explain that they first solved these problems with their fractions circles. They will learn how to solve them symbolically in the next level.

## Comments

1. The movie problem is a "take away" problem. The pizza problem models subtraction as "finding a difference".
2. Expect students to act out this story differently from the others. Students may start with  $\frac{3}{8}$  (amount completed).



They will try to fill in space left to make  $\frac{1}{2}$  ( $\frac{1}{8}$  more).

3. Even though actions in story problems are different, they are all subtraction problems. Symbolically, all will use "-" (minus sign). It's important for students to see that these are subtraction contexts.

## Teaching Actions

10. In groups ask students to create a story problem for each subtraction category and one addition problem. Ask them to solve the problems using their fraction circles, recording steps symbolically if you think they are ready to do so.

Then have students exchange their set of problems with another group.

Spend the time in large group for sharing these stories and the strategies for solving them.

11. Provide symbolic problems for students to act out with the fraction circles. They can use any of the three ways shown. Many might choose the take-away model.

Examples:

$$\frac{2}{3} - \frac{1}{3}$$

$$\frac{4}{5} - \frac{1}{10}$$

$$\frac{1}{2} - \frac{3}{8}$$

$$\frac{7}{12} - \frac{1}{2}$$

$$\frac{6}{9} - \frac{1}{3}$$

## Comments

4. You decide whether students are ready to record their work symbolically.

Their symbol records may not look like the "standard algorithm" but reflect each step they act out with the fraction symbols.

For example, for the lawn problem, the students might record as follows:

$$\frac{3}{8}$$

$$\frac{1}{2} = \frac{4}{8}$$

$$\frac{4}{8} - \frac{3}{8} = \frac{1}{8}$$

## Post Lesson Reflection

Lesson \_\_\_\_\_

1) Number of class periods allocated to this lesson: \_\_\_\_\_

2) Student pages used: \_\_\_\_\_

3) Adaptations made in lesson development part:  
[For example: added extra problems, eliminated problems, changed fractions used]

4) Adaptations made on Student pages:

5) To improve lesson, next time I should: