

Rational Number Project

Level 1 / Lesson 20 / Overview

Students use fraction circles to obtain exact answers to fraction addition.

Materials

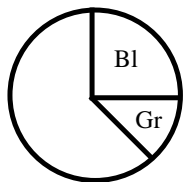
- Fraction Circles for students and teacher
- Student Pages A, B, C

Teaching Actions

1. Present this story from Lesson 19.

William ate $\frac{1}{4}$ of a pizza for dinner. The next morning he ate a piece that equaled $\frac{1}{8}$ of the pizza. How much of a pizza did he eat?

2. Remind students that they already estimated the sum to be less than $\frac{1}{2}$. Explain that to find the exact sum they are to use their fraction circles. Model the problem and ask students to do the same with their materials.



Say: This blue represents $\frac{1}{4}$ of the pizza. This gray represents $\frac{1}{8}$ of the pizza.

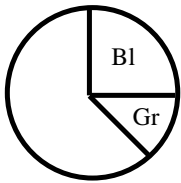
3. Say that from this picture they can see William ate less than $\frac{1}{2}$ of the pizza. Ask: exactly how much pizza did William eat? Is there a way to express the amount of circle covered using one fraction name? For example, is $\frac{3}{4}$ covered? $\frac{2}{12}$?

Comments

1. Addition of fractions with unlike denominators is introduced right from the start. Students are led to solve the problem of naming the amount of the circle covered using one fraction name.
2. At this point you are trying to develop an implicit understanding of the symbolic procedure.

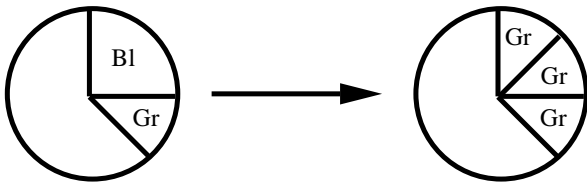
Teaching Actions

4. Ask students to try to find a way to cover $\frac{1}{4}$ and $\frac{1}{8}$ of the circle using only one color.
5. Give clues if needed: (1) Think about what you know about equivalent fractions; (2) How many grays equal one blue?
6. Model the problem, verbalizing each step.



"I can tell how much of the whole circle is covered if I can cover the amount with pieces of the same color"

"I know 2 grays cover the same amount as 1 blue so I am going to exchange 1 blue for 2 grays."



7. Ask: what fraction of the circle is covered? How much pizza did William eat? Is $\frac{3}{8}$ less than $\frac{1}{2}$?
8. Repeat with the chocolate chip cookie problem from Activity 20:

Maria received a chocolate chip cookie as big as a birthday cake for a present. She cut it into 6ths and shared the cookie with her friend LeAnna. Maria ate $\frac{3}{6}$ of the cookie, LeAnna ate $\frac{2}{6}$. Together, how much did they eat?

9. Ask students if they have to exchange circle pieces in this example to determine the amount of circle covered.

Comments

3. Same denominator means, concretely, using the same color pieces to show each fraction.

4. You may choose to record your actions with circles with symbols:

$$\frac{1}{4} + \frac{1}{8} = \frac{2}{8} + \frac{1}{8} = \frac{3}{8}$$

Please don't record until students can easily verbalize what was done concretely.

5. Important for children to internalize that sometimes you need to find equivalent fractions and sometimes this step is not needed.

Teaching Actions

10. Repeat for these problems. Encourage children to verbalize each step with materials. Have them attend to the decision of whether or not an exchange is needed. (Don't forget to estimate!)
 - (a) $1/2 + 1/4$
 - (b) $2/4 + 1/8$
 - (c) $2/3 + 1/3$
 - (d) $2/3 + 2/3$
11. Student Pages A and B provide added practice. Student Page C provides challenges.
12. Have groups create their own story problem for addition of fractions to share with the class. You can collect them and present to students as practice.

Comments

6. In all exercises so far only 1 of the fractions (or none) need to be changed. In level 2 this work with addition of fractions is extended to where both fractions need to be renamed. [Student Page C does provide problems like those for students who need a challenge].
7. You will want to extend this lesson over 2-3 days.
8. Mastery of the addition of fractions is not a major goal of the Level 1 materials. You are providing experience that will be extended in the Level 2 materials.

Name _____

Fraction Addition and Estimation: Finding the Exact Answer

1. Marty ate some candy. He ate 1-half of a candy bar before lunch. He ate 1-fourth of the candy bar after lunch. About how much of one candy bar did he eat? With your fraction circles, find out the exact amount of a candy bar he ate. Draw pictures to show what you did with the circles. Estimate first !!

Estimate: _____

2. Terri ate $\frac{1}{2}$ of a small pizza and $\frac{5}{12}$ of another small pizza. About how much of one whole pizza did she eat? With your fraction circles, find out the exact amount. Draw pictures to show what you did with the fraction circles.

Estimate first!

Estimate _____

3. Allie rode her bicycle $\frac{7}{8}$ mile to school. Then she rode another $\frac{1}{4}$ mile to her friend's house. About how far did she ride altogether? With your fraction circles, find out the exact amount. Draw pictures to show what you did.

Estimate: _____

Fraction Addition Continued

4. Because of a rainstorm, the water level in a swimming pool rose $\frac{2}{3}$ of an inch. The following day it rained again. The pool rose another $\frac{11}{12}$ of an inch. About how high did the water level increase? With your fraction circles, find out the exact amount.

Estimate _____

5. Alex used $\frac{1}{4}$ cup of flour in one recipe and $\frac{3}{8}$ cup of flour in another recipe. Together about how much flour did he use? With your fraction circles, find out the exact amount.

Estimate _____

4. With your fraction circles, find the exact answers.

$$\frac{1}{3} + \frac{1}{6}$$

$$\frac{1}{8} + \frac{3}{4}$$

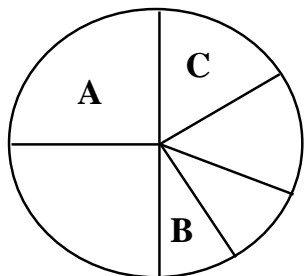
$$\frac{4}{10} + \frac{1}{5}$$

$$\frac{1}{6} + \frac{3}{12}$$

$$\frac{1}{2} + \frac{3}{4}$$

Challenges

1.



Shade Parts A, B and C

- How much of the circle are Parts A and B together ?
- How much of the circle are Parts A and C together ?
- How much of the circle are Parts B and C together ?

2. Describe how you solved the problems.

3. Estimate a sum for each problem. Then find the exact answer using your fraction circles. Explain how these problems are different from the others you solved.

$$\frac{1}{4} + \frac{1}{3}$$

$$\frac{1}{2} + \frac{2}{5}$$

$$\frac{2}{4} + \frac{5}{6}$$

$$\frac{1}{2} + \frac{5}{6}$$

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: