

# Rational Number Project

## Level 1 / Lesson 19 / Overview

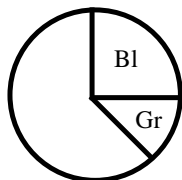
Students are introduced to fraction addition through familiar contexts and estimating reasonable answers (by comparing sum to  $1/2$  and  $1$ ).

## Materials

- Fraction Circles for students and teacher
- Student Page A

## Teaching Actions

1. Present this story to the students: William ate  $1/4$  of a pizza for dinner. The next morning he ate a piece that equaled  $1/8$  of the pizza. How much of a pizza did he eat?
2. Explain that you don't want the exact answer but just an estimate. Ask students to imagine  $1/4$  of a pizza and  $1/8$  of a pizza. Ask: did William eat more or less than  $1/2$  of a pizza? Ask students to explain their responses by referring to their mental images for  $1/4$  and  $1/8$ .
3. Show with fraction circles  $1/4 + 1/8$ :



4. Tell students that some people would say that  $1/8 + 1/4$  is  $2/12$ . Ask: Does that make sense? If you ate  $1/4$  and then  $1/8$  of a pizza would that be the same as  $2/12$ ? Show with circles  $1/4$ ,  $1/8$  and  $2/12$  of black circle.

## Comments

1. The time spent developing fraction concepts, ordering and equivalence ideas will enable students to approach fraction addition and subtraction in a meaningful way. Initial experience with  $+$ ,  $-$  operations will be through estimation.
2. Estimation skills depend on students' mental images for symbols as well as the context in which the operation is embedded.
3. Students' explanation of estimation may sound like this:  
(a) He ate less than  $1/2$ . You need 2-fourths to be  $1/2$  and  $1/8$  is less than  $1/4$ .  
(b)  $1/4$  of pizza is like the blue piece. The gray is  $1/8$  and it is smaller than the blue. Together they won't make  $1/2$ .

## Teaching Actions

## Comments

5. Repeat estimation process with the following story problems. In each case have students verbalize their reasoning. Point out when students use an ordering or equivalence idea previously learned.

(a) 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  $\frac{1}{3}$ . Together, how much did they eat?

(b) Martin was making playdough. He added  $\frac{3}{4}$  cup of flour to the bowl. Then he added another  $\frac{3}{6}$  cup. How much flour did he use? (In this case also ask if the sum is greater or less than one).

6. Provide added practice by estimating these sums. In each case, estimate as  $> \frac{1}{2}$  or  $< \frac{1}{2}$ , and  $> 1$  or  $< 1$ .

(a)  $\frac{1}{8} + \frac{1}{4}$

(b)  $\frac{3}{6} + \frac{1}{4}$

(c)  $\frac{3}{4} + \frac{2}{4}$

(d)  $\frac{4}{6} + \frac{1}{2}$

7. Student Page A provides practice. Assign in groups so students can share strategies for estimation. Provide opportunity for students to share in a large group.

4. Familiarity with context helps students reason about appropriateness of answers.

5. Students are asked to write out their explanations for estimating sums.

**Fraction Addition and Estimation**

1. Marty divided a candy bar into 12 equal parts. He ate 1-sixth of the candy bar before lunch. He ate 1-fourth of the candy bar after lunch. Did he eat more or less than 1-half of the candy bar? Did he eat the whole candybar? **Explain your reasoning.**

2. Terri ate  $\frac{5}{6}$  of a small pizza and  $\frac{11}{12}$  of another small pizza. Did she eat more than one whole pizza? **Explain your reasoning.**

3. Alex used  $\frac{1}{3}$  cup of flour in one recipe and  $\frac{1}{4}$  cup of flour in another recipe. Together did he use more than  $\frac{1}{2}$  cup of flour? **Explain your reasoning.**

4. Give a reasonable estimate for each sum. On the back of this sheet write out your reasoning for each problem.

$$\frac{1}{3} + \frac{2}{6}$$

$$\frac{1}{8} + \frac{9}{10}$$

$$\frac{7}{8} + \frac{1}{6}$$

$$\frac{1}{5} + \frac{3}{12}$$

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

## 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: