Rational Number Project

Initial Fraction Ideas **Lesson 18: Overview**	Materials
Students look at the numerical relationship between the numerators and denominators of fractions equal to $\frac{1}{2}$. They use this number pattern to determine if a given fraction is less than or equal to $\frac{1}{2}$.	∞ Fraction Circles for students and teacher ∞ Student Page A ∞ Student Pages A and B from Lesson 11

Teaching Actions

Warm Up

Draw two pictures for each fraction to show its two different names.

$\frac{7}{4}$ $\frac{3}{2}$ $\frac{8}{3}$

Large Group Introduction

1. Ask students to take out the fraction circles and find several equivalences for $\frac{1}{2}$ (use the black circle as unit).

2. Record them on chart.

   Fractions equal to $\frac{1}{2}$ $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \frac{5}{10}, \frac{6}{12}$

3. Tell students that you can add to the list without using circles:

   $\frac{7}{14}, \frac{8}{16}, \frac{9}{18}, \frac{10}{20}, \frac{25}{50}, \frac{50}{100}, \frac{150}{300}$

4. Ask students to look at the numerator and denominator of each fraction equal to $\frac{1}{2}$ and ask them if they can see any pattern or relationship between numerator and denominator that's the same

Comments

Students with a quantitative sense of fractions use $\frac{1}{2}$ as a reference point to estimate fraction sums and differences.

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

"$\frac{3}{6}$ equals $\frac{1}{2}$, and $\frac{1}{3}$ is less than $\frac{1}{2}$, so the sum is greater than $\frac{1}{2}$ but less than 1."

Notice the role of fraction equivalence for $\frac{1}{2}$ in estimation as well as in the same numerator but different denominator strategy [Lessons 6 & 7]

At this point we won't look explicitly at examples like $\frac{2\frac{1}{2}}{5}$ but if students mention examples like this one acknowledge that it does equal $\frac{1}{2}$.

Teaching Actions

for each fraction.

5. Help students verbalize that in each case, the denominator is double (twice) the numerator.

6. Give students these fractions with parts missing and have them make them into fractions equal to $1\frac{1}{2}$

$$\frac{\quad}{24}, \frac{11}{\quad}, \frac{\quad}{30}, \frac{\quad}{28}, \frac{100}{\quad}$$

7. Ask students to show these fractions with their circular pieces.

$$\frac{1}{4} \quad \frac{2}{6} \quad \frac{3}{8} \quad \frac{4}{10} \quad \frac{5}{12}$$

Ask if they are greater or less than $\frac{1}{2}$. Have them tell you how far away from $\frac{1}{2}$ each amount is.

8. Without using the pieces, ask them to tell you numerators that would make each fraction greater than $\frac{1}{2}$.

9. Present these fractions to students. Ask them if they are $> \frac{1}{2}$, $< \frac{1}{2}$, or $= \frac{1}{2}$. Use fraction circles if needed. Have them verbalize their reasoning.

$$\frac{3}{10} \quad \frac{5}{12} \quad \frac{4}{6} \quad \frac{6}{10} \quad \frac{9}{20} \quad \frac{15}{18} \quad \frac{2}{4}$$

Small Group/Partner Work

10. Student Page A provides practice. You may want to use Student Pages A and B from Lesson 11 again. Now have students see if they can solve problems using number patterns for $\frac{1}{2}$.

Comments

Teaching Actions	Comments
Wrap Up 11. End the class with this problem. Ask students how they can use equivalence for ½ and other order ideas to estimate the following problem: $\frac{14}{30}+\frac{5}{10}$ Is $\frac{19}{40}$ a reasonable answer? Is the sum greater than 1 or less than 1?	

Translations

- ∞ Written symbols to verbal
- ∞ Real world to verbal

Draw two pictures for each fraction to show its two different names.

$\frac{7}{4}$ $\frac{2}{3}$ $\frac{8}{3}$

Comparing to 1-half

1. Margo and Jose shared a couple of large pizzas. Margo ate $\frac{5}{8}$ of a pizza. Jose ate $\frac{6}{16}$ of a pizza. Who ate more? Explain how you know.

2. Imagine that you shared your bag of mini doughnuts with your sister. You ate $\frac{3}{5}$ of the bag while your sister ate $\frac{4}{10}$ of the bag. Who ate more? Explain how you know.

3. Chou-Mei ran 2 and $\frac{7}{8}$ miles. Her sister ran 2 and $\frac{3}{10}$ miles. Who ran the shorter distance? Explain how you know.

4. Circle the larger fraction in each pair.

a)	$\frac{2}{3}$	$\frac{1}{5}$	b)	$\frac{9}{12}$	$\frac{6}{15}$	c)	$\frac{5}{9}$	$\frac{3}{7}$
d)	$\frac{1}{2}$	$\frac{3}{4}$	e)	$\frac{3}{5}$	$\frac{4}{9}$	f)	$\frac{11}{17}$	$\frac{3}{9}$
g)	$\frac{10}{22}$	$\frac{4}{5}$	h)	$\frac{3}{6}$	$\frac{2}{9}$	i)	$\frac{8}{13}$	$\frac{6}{16}$