
Rational Number Project

Level 1 / Lesson 11 / Overview

Students use fraction circles to order 2 fractions by comparing them to one-half.

Materials

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

Teaching Actions

1. Ask students to take out the black circle and to cover one-half of the circle with 1 yellow.
2. Show at overhead that 3 blues, which is $\frac{3}{4}$ of the black, is greater than 1 yellow ($\frac{1}{2}$ of the black).
3. Record: 3 blues $>$ 1 yellow
 $\frac{3}{4} > \frac{1}{2}$
4. Ask students to find 4 other fractions greater than $\frac{1}{2}$. Model and record their responses at overhead.
5. Now ask them to imagine fraction pieces greater than 1 yellow or $\frac{1}{2}$ of circle. Have them write down at least 3 estimates for amounts greater than $\frac{1}{2}$.
6. Ask students to share their estimates and to explain what they thought of or pictured.

Ex: A child may say, "I can see that 3 pinks are the same as 1 yellow, so 5 pinks must be greater than $\frac{1}{2}$."

Comments

1. Students need many experiences with concrete materials to develop mental images of fractions so they can develop a quantitative notion of fraction. Comparing to $\frac{1}{2}$ is a powerful strategy for judging the relative size of fractions and is a characteristic of having a quantitative notion of fraction.
2. Looking at specific numerical relationships between numerator and denominator to determine if fractions are greater or less than $\frac{1}{2}$ is delayed until level 2, although some students may implicitly understand this.

Teaching Actions

7. Have students verify each guess with their circles and record results with fraction notation.
8. Student page A provides independent practice with circles comparing fractions to $\frac{1}{2}$.
9. Student page B provides more practice with ordering and equivalence ideas developed so far.
10. End class by presenting these problems for discussion. Emphasize student verbalization of their thinking as they order these fractions. They may or may not use the circles.

Which is bigger or are they equal?

Examples: $\frac{1}{3}$ $\frac{3}{4}$

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

$$\frac{6}{7} \qquad \frac{3}{7}$$

$$\frac{4}{100} \qquad \frac{4}{70}$$

$$\frac{6}{8} \qquad \frac{4}{6}$$

$$\frac{4}{12} \qquad \frac{2}{4}$$

$$\frac{4}{6} \qquad \frac{2}{3}$$

Comments

3. Mastery at the symbolic level is not expected at level 1, but you can use this last set of problems to evaluate to what extent students can order fractions symbolically (using, of course, mental images of fraction circles, not any Least Common Denominator rule).

4. A common error students make is to look only at the denominator to make an order decision. For example, when comparing $\frac{1}{3}$ vs $\frac{3}{4}$, a student may say $\frac{1}{3}$ is the bigger fraction since thirds are larger than fourths.

Encourage students to reflect on the numerator and denominator to determine the fraction's relative size.

Exploring $\frac{1}{2}$ With Fraction Circles

Use the whole circle as your unit. Make the fraction $\frac{2}{5}$ with the fraction circles. Decide if $\frac{2}{5}$ is greater or less than $\frac{1}{2}$.

Record your response in the box:

$$\frac{2}{5} \boxed{\text{is less than}} \frac{1}{2}$$

Complete the problems below. Use these choices: is less than, is greater than or is equal to.

$$\frac{2}{3} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{1}{4} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{5}{12} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{8}{10} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{3}{4} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{1}{5} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{2}{8} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{4}{6} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{7}{12} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

$$\frac{9}{15} \boxed{\phantom{\text{is less than}}} \frac{1}{2}$$

USING FRACTION CIRCLES TO ORDER FRACTIONS

Use fraction circles to show each fraction. Compare the fractions.
Circle the largest fraction. If the fractions are equivalent, circle both.

(1) $\frac{3}{4}$ $\frac{1}{2}$

(2) $\frac{1}{3}$ $\frac{8}{12}$

(3) $\frac{4}{6}$ $\frac{2}{3}$

(4) $\frac{4}{12}$ $\frac{2}{4}$

(5) $\frac{9}{12}$ $\frac{2}{6}$

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

(7) $\frac{4}{8}$ $\frac{1}{2}$

(8) $\frac{3}{4}$ $\frac{6}{8}$

(9) $\frac{1}{8}$ $\frac{1}{12}$

(10) $\frac{4}{8}$ $\frac{5}{8}$

(11) $\frac{2}{4}$ $\frac{3}{6}$

(12) $\frac{2}{6}$ $\frac{2}{12}$

(13) $\frac{3}{6}$ $\frac{5}{6}$

(14) $\frac{6}{8}$ $\frac{8}{8}$

(15) $\frac{4}{8}$ $\frac{6}{12}$

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: