

Rational Number Project

Initial Fraction Ideas Lesson 7: Overview	Materials
This lesson reinforces the idea that as the number of parts the unit is divided into increases, the size of the parts decreases.	<ul style="list-style-type: none"> ∞ 8.5" X 1" strips of paper for each student and teacher ∞ Student Pages A, B, C

Teaching Actions	Comments
<p>Warm Up</p> <p>Order these fraction pairs. Write an explanation for each pair (use pictures in your explanation).</p> $\frac{3}{4} \frac{3}{10} \quad \frac{5}{7} \frac{3}{7} \quad \frac{1}{9} \frac{1}{4}$ <p>Large Group Introduction</p> <ol style="list-style-type: none"> Ask children to fold a strip of paper into 4 equal parts. Using the same strip of paper ask them how they can <u>increase</u> the number of equal parts to 8. Have them do so, but before they open up the strip of paper to show eighths ask: Before you open up the strip, can you tell me if the size of the equal parts will be larger or smaller than fourths? Why? Repeat for: <ul style="list-style-type: none"> ∞ 3rds changed to 6ths ∞ Then to 12ths ∞ 4ths changed to 12ths Now ask students to fold, shade, and label these fractions with paper folding: $\frac{1}{3} \quad \frac{1}{4}$ $\frac{2}{3} \quad \frac{2}{4}$ $\frac{3}{3} \quad \frac{6}{6}$ $\frac{3}{4} \quad \frac{1}{4}$ <p>[Do more if needed]</p> 	<p>Children need opportunities to use new ideas in order to ensure they internalize them.</p> <p>Many experiences with physical models are needed to overcome the influence of children's whole number thinking.</p> <p>In this lesson students use paper folding to reexamine the relationship between size of piece and number of pieces the whole is divided into.</p> <p>Encourage children to explain their ordering. Don't let them refer to only one part of the fraction, as for example: $\frac{1}{3}$ vs. $\frac{1}{4}$ "thirds are bigger". Thirds may be bigger, but that information is enough to order 2 fractions only if the numerators are the same. "Thirds are bigger so 1 of a larger piece is greater than 1 of a smaller pieces." By talking like this children are coordinating numerator and denominator to approximate the size of the fraction. You want to build the notion of a fraction as a single entity!</p> <p>Students may over generalize and think bigger is always more. Check for this.</p>

Teaching Actions	Comments
<p>4. You may want to refer back to the pizza problem from lesson 6. Model with paper folding or pictures the answer to the question in that story.</p>	<p>Some children may be able to compare without manipulatives</p> $\frac{1}{3} \text{ vs. } \frac{1}{5}; \frac{2}{10} \text{ vs. } \frac{2}{20}$
<p>Small Group/Partner Work</p> <p>5. Put students in pairs and assign Student Page A. Student 1 will make fraction 1 with paper folding; student 2 will make fraction 2. They will then compare and circle the larger fraction.</p> <p>6. Student Pages B and C offer extra practice.</p>	<p>but there is no need to push abstraction at this level.</p> <p>Some students may try to compare fractions without the manipulatives and make errors. Encourage them to use paper folding at least to verify their guesses.</p>
<p>Wrap Up</p> <p>7. Conclude the lesson by first asking children to create their own context for comparing 2 fractions.</p> <p>Examples:</p> <p>Mary had $\frac{2}{4}$ of large pizza; Joan had $\frac{2}{4}$ of large pizza. Who ate more?</p> <p>Lianna ate $\frac{4}{8}$ parts of a candy bar Rodrigo ate $\frac{4}{7}$ of same-sized candy bar. Who ate more?</p> <p>8. Now ask students this question: Jose and Mara both ate $\frac{1}{2}$ of a pizza. Jose said he ate more than Mara. Mara said they ate the same amount. Could Jose be correct?</p>	<p>Challenge Student Page B: The problem here is that the two units are not the same. $\frac{1}{5} < \frac{1}{2}$ only if the two units are the same. Comparing fractions assumes equal units.</p> <p>This problem is similar to a NAEP item given to 4th graders. Only 24% were able to explain that if Jose's pizza was larger than Mara's then his $\frac{1}{2}$ would be more.</p>

Translations

- ∞ Written symbols to manipulative to verbal

Order these fraction pairs. Write an explanation for each pair (use pictures in your explanation).

$$\frac{3}{4} \quad \frac{3}{10}$$

$$\frac{5}{7} \quad \frac{3}{7}$$

$$\frac{1}{9} \quad \frac{1}{4}$$

Directions:

Circle the larger fraction. Use your paper strips to determine the answers.

$$\frac{1}{2}$$

$$\frac{1}{3}$$

$$\frac{2}{6}$$

$$\frac{2}{12}$$

$$\frac{2}{4}$$

$$\frac{2}{6}$$

$$\frac{1}{3}$$

$$\frac{2}{3}$$

$$\frac{3}{4}$$

$$\frac{1}{4}$$

$$\frac{3}{9}$$

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

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

$$\frac{3}{4}$$

$$\frac{5}{6}$$

$$\frac{4}{6}$$

$$\frac{1}{3}$$

$$\frac{1}{12}$$

$$\frac{5}{12}$$

$$\frac{5}{8}$$

$$\frac{1}{2}$$

$$\frac{1}{12}$$

Without your paper strips,
circle the larger fractions.

$$\frac{1}{100}$$

$$\frac{1}{99}$$

$$\frac{5}{12}$$

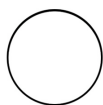
$$\frac{8}{12}$$

$$\frac{3}{40}$$

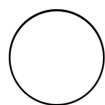
$$\frac{3}{50}$$

$$\frac{2}{10}$$

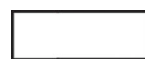
$$\frac{4}{10}$$

Directions:Shade each picture to show the fraction. Circle the SMALLER fraction.

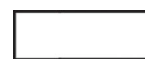
$$\frac{1}{2}$$



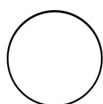
$$\frac{1}{4}$$



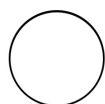
$$\frac{1}{4}$$



$$\frac{1}{3}$$



$$\frac{2}{3}$$



$$\frac{2}{6}$$



$$\frac{2}{3}$$



$$\frac{2}{4}$$

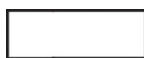


$$\frac{1}{8}$$

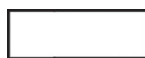


$$\frac{1}{4}$$

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Challenge

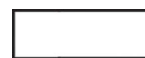
$$\frac{1}{8}$$



$$\frac{1}{4}$$



$$\frac{1}{5}$$



$$\frac{1}{2}$$



$$\frac{2}{4}$$



$$\frac{2}{3}$$

What's wrong with this picture?

Directions

A friend has been out of school for two days and missed the math lessons dealing with comparing fractions. Write your friend a letter explaining how to compare fractions like the ones you have been working with. [You may want to draw pictures.]