Unit Rods

Description

Students use unit fractions to compose and decompose fractions with relational rods. Using different rods to represent the whole, students are asked to name the unit fractions they can find.

Mathematics

This task encourages students to think flexibly about the concept of a whole, recognizing that a whole can be any length, and that when representing fractions visually (e.g., on a number line or in an area model) each partition must be of equal size.

Curriculum Connections

Students will:

- determine, through investigation, the relationships among fractions;
- divide whole objects into equal parts and identify the equal parts using fractional names.

Instructional Sequence

1. Give each student a set of relational rods. Tell students to take out one of the orange rods. Inform them that one orange rod represents one whole.
2. Ask students to:
   a. use different rods of the same colour to build a whole, which is equivalent to the orange;
   b. name the unit fractions of the new wholes they created (i.e., 10 one-tenths, 5 one-fifths, or 2 one-halves).
3. Reinforce with students that when the orange rod is the whole, they should be able to represent and name halves (yellow), fifths (red) and tenths (white).
4. Repeat steps 1 through 3 using the blue rod as the whole.
5. Repeat with other rods as the whole to consolidate student thinking and encourage flexibility with wholes and units.

Highlights of Student Thinking

Students may:

- wonder what to do when rods show more than the whole;
- identify fractions that can't be constructed by the relational rods (e.g., no rods show thirds with orange as whole);
- try to use multiple colours to compare to the whole;
- use whole numbers (e.g., 1, 2, 3…to count unit fractions rather than attending to the unit of 1 one-fifth, 2 one-fifths…);
- explore other wholes and related unit fractions intuitively.

Key Questions

1. Which rods can *only* be composed using all white rods?
2. Why does the white rod represent $\frac{1}{10}$ when orange is the whole, but $\frac{1}{9}$ when blue is the whole? How does the whole change the names of the unit fractions?
3. If blue represents 1 whole, what do 4 green rods represent?
4. When is purple $\frac{1}{2}$ compared to the whole? Is $\frac{1}{2}$ always the same size with different length wholes?

Materials

- Relational rods