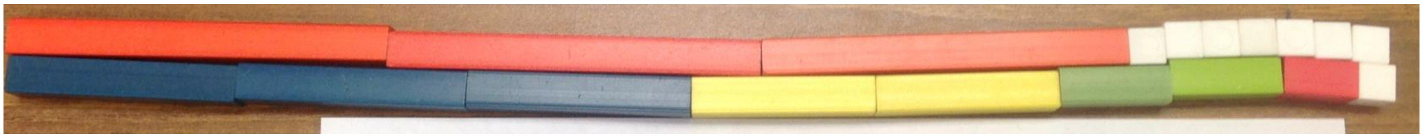
OP C

Add and subtract fractions with like denominators

Train Game

Description



Students randomly grab a handful of relational rods from a paper (opaque) bag. They build a linear train with all of the rods they have selected. Keeping a denominator of 10 (the length of the orange relational rod, which is the whole), they then determine the length of the train by adding up all the fractional quantities.

Mathematics

Using relational rods, students add various fractional quantities where the whole has a denominator of 10. This is an entry point to adding fractions with like denominators that pushes students to think about fractions larger than one whole. This task also supports later development of multiplication with fractions as repeated addition; for example, students may have 3 red lengths (each representing two-tenths) and can unitize to consider 3 x $\frac{2}{10}$ as equal to $\frac{6}{10}$.

Curriculum Connections

Students will:

- represent proper, improper and mixed numbers;
- solve problems involving fractions using a variety of computational strategies.

Instructional sequence

1. Place many relational rods of different lengths in paper bags, and distribute these to pairs of students, along with a recording chart (BLM 1).
2. Before beginning task, ask students to select an orange rod and 5 red rods. Prompt them to discuss with an elbow partner how they can express a single red rod as a fraction of the orange (i.e., each red rod is $\frac{2}{10}$).
3. Have students grab a handful of rods from the bag to build a train (join the rods end-to-end) and record each rod length as a fraction on their chart. Students add their fractional quantities using a number sentence to arrive at a sum. The sum should be expressed as an improper fraction and as a mixed fraction. Repeat to complete the recording chart.

Highlights of student thinking

Students may:

- notice that writing the addition sentence lends itself directly to recording the sum as an improper fraction;
- struggle with recording both the mixed fraction notation and the improper fraction notation as this requires thinking about the number of wholes and how much more;
- benefit from laying down orange 'wholes' to track each whole;
- use flexible addition strategies to determine the length of their train which is evidenced in their number sentences (eg. grouping like denominators, grouping numerators to reach friendly amounts, etc.);
- find writing out same fractions in addition statements tedious and quickly resort to multiplication strategies to more efficiently record their number sentences.

Key questions

1. (a) What did you use first – improper fraction notation or mixed fraction notation?
   (b) Which was easier and why?
   (c) If you start with an improper fraction, what could you do to change it to a mixed fraction?
2. Most of your number sentences involved repeated addition. Is there another way those number sentences could be written?

Materials

- Relational rods in paper bags~~,~~ BLM 1 (one recording sheet for each pair of students)