Comparison E

Compare fractions with unlike numerators and unlike denominators using models and symbols

Pretty Powerful Paper Folding

Description

Students fold colourful paper strips into equal parts that represent unit fractions, and label the folded regions using symbolic notation. These strips are powerful visual tools that allow students to see the relative size of fractional regions, which allows them to compare familiar fractional quantities.

Mathematics

Current educational and classroom research strongly highlights the importance of developing a sense of a fraction as a size as well as a quantity. Creating fraction strips through paper folding provides students with the opportunity to visualize fractional size, and once stacked, allows students to see equivalency as a way of naming the same area using a different number of units(e.g., the size of $\frac{2}{4}$ is the same as the size of $\frac{1}{2}$ but the units are different).

Curriculum Connections

Students will:

- demonstrate and explain the concept of equivalent fractions, using concrete materials (e.g., use fraction strips to show that is equal to $\frac{3}{4}$ is equal to $\frac{9}{12}$);
- explain equivalence of fractions and compare fractions by reasoning about their size;
- understand two fractions as equivalent if they are the same size or fractional region of the whole;
- develop an understanding of the relative size of unit fractions based on the digit in the denominator.

Instructional Sequence

1. If necessary, demonstrate how to fold a paper strip by aligning the edges precisely.
2. Distribute materials to pairs of students and post the fractional units that the strips are to be partitioned into.
3. Allow students time to fold their strips into the various fractional units. Encourage discussion about patterns students are seeing, how they are folding etc. Once they are happy with the folds they have created, they should label the fractional units onto their strips
4. Once all strips have been folded, discuss as a whole group what went well and what didn't go well.
5. Have some students stand side-by-side and hold different strips that show equivalency.
6. Have students organize and then glue their paper folded strips into a vertical sequence.

Highlights of Student Thinking

Students may:

- fold in one direction or in two directions;
- use repeated halving by folding in half and then again in half;
- struggle to equi-partition for fractional units like thirds and fifths;
- articulate that as they are folding more pieces the pieces are getting smaller;
- notice that the number of folds is one less than the number of total pieces being constructed for folds in the same direction;
- need to make several attempts at accurately folding the strips.
- fold without attention to equi–partitioning;
- label each partition as one of the unit they are writing (e.g. $\frac{1}{3}, \frac{1}{3}, \frac{1}{3}$) or as a count (e.g., $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}$).

Key Questions

1. Can you visualize what your strip is going to look like when done, before you fold it?
2. What do you notice about your strip when you open it back up after folding it?
3. Do you see any patterns in your action and your results?
4. What fractional pieces are the easiest to fold and create?
5. Do you see any equivalent-sized folds (regions)?

Materials

Eight different coloured strips per student, with extras for errors

Post: To be folded as follows: 1 whole, halves, thirds, fourths, fifths, sixths, eighths and tenths.