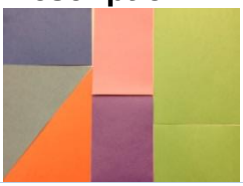
Operation B

Use models to compose and decompose fractions with like denominators as a form of adding and subtracting fractions

Building Flags

Description



Students use their spatial reasoning and creative thinking to design a flag given a variety of pre-cut and coloured shapes. Students investigate and determine what fraction of the whole flag the coloured shapes represent.

Mathematics

The flag task helps students understand that a whole can be decomposed in many ways. For example, by overlaying 2 one-eighth shapes onto a one-fourth shape, the concept of decomposing or equivalence is made concrete. This lays the foundation for addition, and can also encourage students to find a common unit. Finding a common unit enables simple addition.

Curriculum Connections

Students will:

- decompose the whole to discover that the large rectangle is $\frac{1}{4}$ and that all the other pieces are $\frac{1}{8}$;
- use area models to explore equivalent fractions;
- create number sentences to connect symbolic notation to an area representation;
- discover how the whole is a sum of many smaller fractions.

Instructional Sequence

1. Partner students. Post Hint Cards in an easily accessible location.
2. Distribute BLM 1. Direct students to use the variety of pre-cut flag pieces as well as white paper to construct their flags as stipulated on BLM 1.
3. Provide students with time to complete the task. Allow students to explore and possibly struggle to cover the flag with the coloured pieces as this allows them to gain insight into the relationships between the pieces. Remind them that the Hint Cards are available for their use.
5. Once flag is constructed, have students work on the investigation questions (BLM 1).
6. Consolidate using the key questions.

Highlights of Student Thinking

Students may:

- experiment with location and orientation of the shapes (give students time to do so);
- easily identify the large rectangle as one-fourth of the whole region and easily identify the smaller rectangles as one-half of one-half;
- find it difficult to see/name the $\frac{1}{8}$ regions, especially the triangular ones (encourage overlaying, folding and cutting);
- see this as a set model. If so, clarify that the flag is an area model;
- make non-symmetrical flags.

Key Questions

1. How did you determine the fractional amount of each piece?
2. What strategies did you use to see equivalent fractions?
3. How did you use the shapes to decide on your number sentence?

Materials

BLM 1 (one copy/student) BLM 2 (One set of hint cards) glue sticks
Pre-cut coloured shapes (approx. 2 times as many coloured sheets as flags) (see BLM 2)
White paper for the whole (ensure that it is the same size as the coloured paper which is cut for the flag pieces) (one piece per student or pair of students)