

# BUILDING FLAGS

**OPERATION D** Add and subtract fractions with friendly but unlike denominators (e.g., 2 and 10), using models and symbols

## STUDENT ACTIONS AND THINKING

## POSSIBLE TEACHER RESPONSES

Students (especially younger students) may initially struggle to cover the area and to rotate the shapes to fit.

Give time for students to explore the materials. Multiple attempts might be required, so make extra white paper available. Gluing the pieces down might also help students with fine motor/dexterity issues, or when the flag colours keep shifting around.

Some students may initially treat this as a set model. For example, a student who sees this as a set model will say that  $\frac{2}{6}$  of the following flag is red:



If a student says  $\frac{2}{6}$  is red, he or she is counting the individual pieces – 2 out of 6 pieces are red – and ignoring the attribute of area. (When considering the flag as an area model as the task intends, the red area of the flag would be  $\frac{2}{8}$  or  $\frac{1}{4}$ .)

Suggest the student consider the flag to be an area model.

A helpful question at this time might be:

*Can you show, by using your hands, what  $\frac{1}{2}$  or  $\frac{3}{4}$  of your flag looks like? (Hint card #3)*

Watch for students that make non-symmetrical flags. They will likely have more difficulty seeing the fourths and then therefore seeing the eighths. Two examples of asymmetrical flag designs:



“Seeing” how the flag could be potentially divided into fourths makes it easier to further partition into eighths (determine the unit fraction). A helpful question at this time could be:

*Could you rearrange your flag so you can better recognize the fractional amount? (Hint card #2)*

Note: Students should be encouraged to retain asymmetrical flags as they wish.

Some students may struggle to find the unit fraction and to see that the flag can be divided into fourths and eighths.

Helpful questions at this time:

*Can you tile the area of the entire flag with the one piece you chose? (Hint card #1)*

*Choose one shape to help you determine how many parts in the whole. (Hint card #4)*