

## Cooperative Learning Activity

For use with pages 488–496

**GOAL**

To use similar triangles to estimate the height of objects that would be difficult to measure directly

**Materials:** measuring tape or meter stick, mirror with cross hairs in center, paper and pencil to record data, masking tape

### Exploring Similar Triangles

Similar triangles can be used to find distances that are difficult to measure directly. Triangles that are similar have sides that are proportional in length. Similar triangles can be used to solve for an unknown distance. One technique measures distance using shadows. Another method takes advantage of the reflective properties of mirrors and similarity to find an unknown distance.

### Instructions

- 1 Locate a tall object that would be difficult to measure directly (flagpole, tree, school building, etc).
- 2 Measure the height of one member of the group. Have this observer stand so that the tip of his or her shadow coincides with the tip of the object's shadow.
- 3 Measure the distance from the observer to the object and the distance from the observer to the tip of the shadow.
- 4 Calculate the height of the object.
- 5 Repeat Steps 1–4 to calculate the height of another tall object.
- 6 Place the mirror flat on the ground between the observer and the object measured in Step 1. Move the observer back and forward until the observer sees the top of the object over the cross hairs of the mirror (the cross hairs are created by making two lines with tape intersecting at right angles in the center of the mirror).
- 7 Measure the distance from the observer to the mirror and the distance from the mirror to the base of the object.
- 8 Calculate the height of the object.
- 9 Repeat Steps 6–8 to calculate the height of the object measured in Step 5.

### Analyzing the Results

1. Are the calculated heights of the objects the same using each method? If not, which method do you think is most accurate?