

Similar Figures and Indirect Measurement

Name: _____ Date: _____

LEARNING OBJECTIVE

Student will be able to use similar triangles (shadow method) to indirectly measure the height of a tall object.

MATERIALS NEEDED

- A meter stick or yardstick
- measuring tape
- paper
- pencil
- calculator
- sunny day or a strong flashlight

HANDS-ON ACTIVITY

1. On a sunny day (or using a flashlight as a fixed light source), stand your meter stick upright outside and measure the length of its shadow.
2. Choose a tall object nearby (a tree, flagpole, or house corner) and measure the length of its shadow at the same time using your measuring tape.
3. Set up a proportion: $(\text{stick height} / \text{stick shadow}) = (\text{object height} / \text{object shadow})$, using your two known values and the object's unknown height as a variable.
4. Cross-multiply and solve the proportion to calculate the object's height.
5. Sketch a labeled diagram of the two similar triangles formed by the stick and the object with their shadows.

QUESTIONS

1. What were your measurements: stick height, stick shadow, and object shadow?
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2. Show your proportion and solve for the object's height.
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3. Why does this method work — what makes the two triangles similar?
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4. What could cause an error in your measurement, and how would it affect your answer?
