

### Skills and Strategies

- Questioning and Predicting
- Planning and Conducting
- Processing and Analyzing
- Evaluating
- Communicating

### Safety



- Never shine a light directly into someone's eyes.
- Do not touch the bulb of the light source. It may be extremely hot.

### What You Need

- light source
- books and boxes
- ruler
- pencil
- paper

## Shadow City

Create a city skyline and explore the ray model of light by changing the size and shape of its shadow.

### Question

How can you use shadows to demonstrate how light travels?

### Procedure

1. In a small group, use books and boxes to create a city skyline. Place a light source about 50 cm in front of the skyline. Place a screen about 50 cm behind the skyline.
2. Measure the distance from the light source to the skyline, the distance from the skyline to the screen, and the height of the tallest “building” in the skyline. Record your measurements.
3. Draw a ray diagram showing your skyline, the light source, and the screen. Use **Figure 3.9** as a guide. Because you are viewing your skyline from the side, you can draw it as a simple box that is as tall as your tallest building. The diagram should be to scale. For example, 1 mm on your drawing could represent 1 cm on your skyline.
4. Draw several more ray diagrams. Try to make your shadows taller, shorter, larger, or smaller.
5. Your teacher will turn off the overhead light. Turn on your light source. Take turns changing the height and size of the shadow.

### Process and Analyze

1. a) Did your observations support your ray diagrams?  
b) If not, try to account for any differences.

