

### **Answers from the Sun and Shade activity**

- The sun!
- When an object like a tree or a building is in-between the sun and the ground, it not only creates a shadow, it absorbs the heat from the sunlight so it doesn't strike the ground.

### **Background information about the effects of sunlight and shade**

On a hot summer day, a patch of shade is a welcome sight! Shade not only cools the person standing in it, but also the soil and the air temperature above the ground which helps to stabilize the entire area. A city street lined with trees has sidewalks that are much cooler than a city street without trees, and because of this, people are more likely to show signs of heat stress in a city where there are few trees and shade.

When a temperature is reported on the news it is an official reading taken at a weather observing station. At these stations, thermometers are shielded from sunshine inside specially constructed shelters that allow air in but not direct sunlight. This is necessary if you want to measure the temperature of air. A thermometer in sunlight absorbs infrared radiation which is a component of sunlight. Infrared radiation is "heat" radiation. It is what makes you feel warmer when you stand in sunlight compared to standing in the shade. In addition, the thermometer absorbs some visible light, a portion of which is converted to heat by the thermometer material. The thermometer is "feeling" the same effect that you do when standing in sunlight compared to standing in shade. On a sunny day that could be about 30 degrees higher than the actual air temperature.

### **Related books for young students**

- *Sun* by Steve M. Tomecek (National Geographic Society, 2001)