

# SUN, EARTH, AND ANTARCTICA

## Materials

For each group of students:

Part I. Seasons

- globe
- flashlight
- paper and pencil

Part II. Angle of Sun

- 2 boxes of soil
- 2 thermometers
- 2 heat lamps

## National Standards

A: Science as Inquiry

B: Physical Science

C: Earth and Space Science

## Source

Adapted from

[www.classroomantarctica.aad.gov.au](http://www.classroomantarctica.aad.gov.au)

*These activities explain how the angle of the Earth on its axis and the location of the Sun affect the temperature and seasons we observe on Earth.*

## Background

The seasons are influenced by the tilt of the Earth's axis, which is tilted 23.5 degrees from the axis of rotation. Since the axis is tilted, different parts of the globe are oriented towards the Sun at different times of the year. For instance, summer is warmer than winter because the Sun's rays hit the Earth at a more direct angle during summer than the winter. The temperature is also affected by the length of the day. The days are longer in the summer and shorter in the winter.

When the sun is low in the sky, its rays must heat up more of the atmosphere and a larger area of the ground than when it is higher in the sky. This is one of the reasons why areas located around the equator are warmer than Antarctica. This is also a good time to mention the importance of sea ice on Antarctica and the Earth's albedo.

## Part I. Seasons

### Procedure

1. Students will get in small groups and first measure the angle of tilt of the globe.
2. They will then use the flashlight and shine it on the globe (the flashlight representing the sun).

3. This first step is used to demonstrate that the Earth has a light side and a dark side, representing day and night.
4. Next, they will understand what effect the tilt of the Earth has on the climate in Antarctica.
5. They will learn that Antarctica receives 24 hours of daylight when the Earth is tilted away from the sun and 24 hours of near-darkness when it is tilted towards the sun.
6. Have them draw what they see.

## Part II. Angle of Sun

### Procedure

1. Fill two open boxes with identical amounts of soil.
2. Place one heat lamp so that its 'rays' shine directly onto the soil and place the other lamp so that it hits the soil at an angle.
3. Place a thermometer in each box in the same location relative to

