

Who Knows Where the Sun Goes?

Purpose

Students will observe and describe the apparent motion of the sun over a time span of one day and recognize that the sun can only be seen during the daytime.

Materials

For each student: science journal, pencil

For the class: globe, bright flashlight, long straight stick, rocks or other markers, access to a flat area outdoors, watch

Activity

A. Pre-Activity Preparation

1. Go outside and find a flat, open area that is free of other shadows.
2. Create a sun stick by placing the long straight stick in the ground in the middle of the open area.
3. Create markers by labeling three different rocks with the times "9 a.m.," "12 noon," and "2 p.m."

B. As the World Turns

1. Put a globe in the center of the room. (The globe should be tilted at an angle to represent the orientation of the Earth.)
2. Have students gather around the globe.
3. Invite students to locate their state on the globe and identify it with a small piece of tape.
4. Explain that the flashlight will represent the sun and the darkness in the room will represent the darkness of the sky surrounding the Earth. Turn out the lights.
5. With the lights out, shine the flashlight on the globe, pointing at your state. Tell students that "the sun" is shining on your state. Ask them: "Is it daytime or nighttime?"
6. Slowly turn the globe without moving the light source. Point out to students how the sunlight falls on different areas of the Earth at different times.
7. When the flashlight is pointing to the side of the globe opposite your state, tell students: "It is nighttime in our state." Ask them: "Is there sunlight shining on our state? Can we see the sun at night?"

(continued)



INCORPORATING TECHNOLOGY

Have students look at the NASA Web site (earth.jsc.nasa.gov) to see how the sun is actually illuminating the Earth at the particular time of observation.



connecting across the curriculum

English/ Language Arts

Have students write poetry about the night sky or about the brilliance of the sun on a sunny day.

Standards Links
3.1.3, 3.1.4, 3.6.4

Activity (continued)


C. The Sun Mark


1. Ask students: “Is the sun always in the same place in the sky? Does the sun seem to be moving?”
2. Tell students to think about the globe and flashlight demonstration. Ask them: “Did the flashlight move? Did the light always shine on the same part of the globe?”
3. Say to students: “Explain how the light’s position changed while the flashlight stayed in the same spot.”
4. Clarify that it is the Earth’s rotation which causes the sun to appear to rise and set.
5. Tell students that you are now going to track the movement of the sun outside.
6. Take students outside at 9 a.m. to the spot of your sun stick and have them bring their science journals. Remind students never to look directly at the sun when making observations of it, as it can damage their eyesight.
7. Have a student, or group of students, place the 9 a.m. marker where the shadow of the stick falls.
8. Discuss with students why the shadow is being marked and how it relates to the movement of the Earth. Have students record the shadow position in their science journals.
9. Return to the same spot at 12 noon and 2 p.m. and have the students mark the shadow of the stick at each time.
10. Have students observe the movement of the shadow as the sun appears to change position in the sky.
11. After students have made three observations and written about them in their journals, discuss what they have observed.


Questions for Review


Basic Concepts and Processes


At the end of the activity, assess students’ understanding of the motion and visibility of the sun by asking:

 Does the sun move in the sky?

 How do you know?

 During what part of the day can you see the sun?

 Are there other people in the world who can see the sun when it is not visible to you?

 How do you know?