

# DAY AND NIGHT



## **BENCHMARK AND TASK**

**SC.E.1.1.2** The student knows that the appearance of sunrise and sunset is due to the rotation of Earth every 24 hours.

- The student creates a model to show:
  - the earth rotates on its axis.
  - the rotation of the earth on its axis causes night and day.
  - the sun can be seen only in the daytime because of the rotation of the earth on its axis.

## **KEY QUESTION**

How does the Earth's movement cause day and night?

## **BACKGROUND INFORMATION**

The earth spins around an axis that passes through the center of the globe. One complete rotation, which takes about 24 hours, is the passing of one day and night. The sun doesn't really move across the sky. The earth does the moving. It is really incorrect to talk about the sun "setting and rising". But, talking about sunrises and sunsets is practical because we look at the sun from the earth. Before clocks were invented, one way they told time was by watching shadows on sunny days. The length of shadows changes during the day; the shortest shadow is always found in the middle of the day (close to noon). While the earth spins on its axis, it orbits around the sun. Three hundred sixty five rotations make one year, the time it takes earth to orbit once around the sun.

## **MATERIALS**

### **Teacher**

table lamp or flashlight

globe

*Our Sun* (Benchmark Education Co.)

### **Per student**

crayons

## **TEACHING TIPS**

Rotation (earth spinning on its axis) and revolution (earth traveling around the sun) are not synonymous. Having students spin in place (rotation) and then walk around a central point (revolution) are good ways to differentiate the two concepts.

## **ENGAGE**

Explain that many years ago, as people watched the sun going by every day, they thought that the sun was going around the Earth. They believed the Earth was the center of the universe. Anyone who suggested otherwise was treated as a criminal or insane. After hundreds of years, people finally understood that the Earth was actually going around the sun. But, if this is true, why does the sun appear to be crossing the sky each day? Invite discussion about this to find out what your students already know.

## EXPLORE

1. Place a table lamp on a table in the middle of the room. Remove the lampshade and make sure that only one light bulb is burning to represent the sun. Tape the cord down so students won't trip. Turn off the ceiling lights.
2. Select a student to represent the earth. Say, "Show me what the earth does to make night and day." If the student doesn't understand, say, "Turn around and around slowly and tell us what the 'sun' appears to be doing from your (the earth's) viewpoint." You want the student to see that the sun seems to be going by, even though it is not moving. It is the Earth's rotation that makes the sun seem to move across the sky each day.
3. Say, "Your turning around slowly is called rotating." The earth rotates all the way around once every 24 hours. Have all students stand and spin in place. Ask: *What are you doing?* (rotating)
4. Now ask the student representing the earth to slowly walk around the sun one time. Say "your walk around the sun is like the earth's movement called 'revolving'. It takes one year for the earth to revolve around the sun.
5. Finally, select a student to represent the earth and walk (revolve) around the sun while spinning around (rotating). The student will move around the lamp while spinning.

## EXPLAIN

1. Have the person representing the earth hold a mounted world globe. Put a big masking tape X on the globe to show your location on the Earth.
2. This time, instead of having the student turn, have the student hold the globe by its base while turning the globe slowly with the other hand. As the X on the globe goes in and out of the light, have all students say "day" or "night".
3. Ask questions to confirm students' understanding of the concept of why day and night occur. The students may continue to use the lamp and globe to find the correct answers.  
Ask:  
*What do we call it when our X is in the light?* (daytime)  
*What do we call it when we are in the dark?* (nighttime)  
*Is it daytime for the whole world at the same time?* (no)  
*When it is daytime for us, where is it nighttime?* (on the other side of the Earth)  
*How long does it take the earth to make one rotation?* (24 hours)  
*What do we call the turning of the earth?* (rotation)  
*If the earth didn't also revolve around the sun, would rotation still cause day and night?* (yes)
4. Read and discuss *Our Sun*.

## **EXTEND/APPLY**

Draw a picture showing the Earth and the sun.  
Write “day” on the part of the Earth that is in daytime, color it light blue.  
Use your pencil to color the part of the Earth that is in nighttime, color it black.

## **EXTENSIONS**

Explore how the shape of the Earth affects its rotation by spinning the following: hard-boiled egg, rubber ball, a cone shaped top, a cylinder, and a wooden cube.

Ask:

*Which objects most closely show the rotation of the earth?*

## **ASSESSMENT**

Teacher assessment through observation should include the following criteria:

- Tasks have been completed by the student.
- Student answers to questions should show evidence of conceptual knowledge.
- Student gives an accurate response to “What is rotation?”
- Student questions should be probing, on task, or reflect the processing of an essential understanding.
- Correct responses to activity questions.
- Completion of drawing which accurately depicts the correct answers.