Investigation Four – Heat Energy and Water

Standard I
Students will understand that the shape of Earth and the moon are spherical and that Earth rotates on its axis to produce the appearance of the sun and moon moving through the sky.

Objective 2
Describe the movement of Earth and the moon and the apparent movement of other bodies through the sky.

Intended Learning Outcomes
1. Use science process and thinking skills
2. Manifest scientific concepts and principles
3. Understand science concepts and principles
4. Communicate effectively using science language and reasoning

STANDARD I

Objective 2

Background Information

The rotation of Earth's axis produces the night and day cycle. Earth makes one complete rotation on its axis each day or every 24 hours. During this rotation, half of Earth is facing the sun and is experiencing day. At the same time, Earth's other half is away from the sun, experiencing night. The rotation of Earth seems to make the sun move across the sky during daylight and seems to make the stars move across the sky during night time. Earth also revolves around the sun about every 365 days or one year. The path that it takes around the sun is called an orbit.

Pre-Assessment/Invitation to Learn

Have students answer the first question on page 6 in their moon books about how we get day and night. Discuss with the class what they wrote in their journals.

Instructional Procedure

Activity 1 – Day and Night Cycle

Materials
- Globe
- Flashlight
- Sticker
- My Moon Book
- Pieces of paper (3x5)

1. Have the students answer the first question on page 6.
2. Put the sticker on the globe to indicate where you live.
3. Place the globe on a table, then turn the lights off.
4. Have a student shine the flashlight on the globe where the sticker is.
5. Ask students if it is day or night where the sticker is located.
6. Turn the globe counterclockwise until the sticker is away from you
7. Shine the light on the other side. Students will notice the sticker is now on the dark side, which represents night time.
8. Have the students complete the second question on page 6.

Activity 2 – Earth, Moon, and Sun

Materials

- Sun, moon, Earth cards for each group

Help students visualize how Earth and the moon travel together in space around the sun with this enactment. Review what orbit means: the path an object in space follows as it revolves around another object. Review what revolve means: to circle around an object.

1. Divide the class into groups of three.
2. Give each group three cards and have them write "Sun", "Moon", and "Earth", on the cards. Students can also draw a picture of the word they wrote.
3. Take the class outside or to a large open area.
4. Have one group come to the middle and position the sun performer. Explain that, like the real sun, he will not move. Have the child acting as Earth, revolving very slowly around the sun. Have the moon performer revolve around the moving Earth. Explain that while it takes the Earth about 365 days to orbit the sun, it takes the moon only about 28 days to orbit Earth.
5. Have the remaining students form groups and enact the cycle.
6. After students come back to the classroom, pass out the activity "Earth, Moon Orbits," students color, cut out, and assemble.

Curriculum Extensions

Art –

- *Day/Night Clock (Standard III, Objective 1)*

1. Hand out paper plates to the students.
2. Have them draw clock faces on both sides.
3. Ask students to draw what they do at night on one side of the clock.
4. Ask students to draw what they do during the day on the other side of the clock.
5. Tell students to draw several activities on each side of the clock.

Science –

- Ask students if they think animals have things they do during the day and other things they do at night. (*ILO 3*)
- Ask students what activities happen as a year goes by. (*ILO 3*)

Language Arts –

- *Story Telling*
  1. Start telling a story about a child playing in a park or starting the day preparing to go to school.
  2. The story begins as the day is beginning.
  3. Go around the circle with each student adding something imaginary that the child is doing.
  4. Encourage the story line to go in chronological order from day into night.
  5. Write responses to make a class book.
  6. Have students illustrate their response. (*Standard I, Objective 1*)

Assessment Suggestions

- Have students illustrate their moon book pg. 6 how we get day and night.
- Why do we have a year?
- Write down the definitions in their journals.
- Check for accuracy on page 6 of their journals.

Resources

Web sites:

- www.NASA.org
- www.earthysky.com
- www.sciencecourt.com
- www.askjeeves.com

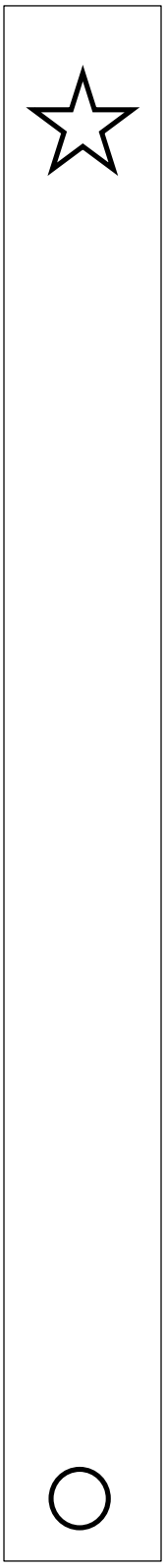
Books:

- *Magic School Bus Inside the Earth* by Joanna Cole. Scholastic Inc. 1989
- *On the Day You Were Born* by Debra Fraiser. Harcourt Brace & Co. 1991
- *Our Planet Earth* by Claire Llewellyn. Scholastic Inc. 1997
- *You're Abroad Spaceship Earth* by Patricia Lauber. Harper Trophy 1996

Homework & Family Connections

- Conduct the same experiment at home with their families.
- Read books about the moon and Earth.
- Send home a list of Web sites and encourage students to look them up with their families. Share with their family the "Earth, Moon Orbits" activity.

Earth, Moon Orbits



1. Color the Earth, the moon, and the sun.
2. Cut out the pictures.
3. Punch a hole in each strip at the star and the circle.
4. Push a brad through the circle in the center of the Earth picture and through the hole in the moon strip. Open brad.
5. Push a brad through the star in the center of the sun pattern and through the hole in the Earth strip. Open brad.
6. Show the orbits of the moon and the Earth by moving the patterns around the sun.