The Seasons: Combining Science and Art

This lesson can be used to teach elementary students (grades 2-4) about the four seasons. The lesson plan covers the science of why we have seasons and includes an art activity where students can paint or draw and write about one of the seasons. Ideas for accommodation and for evaluation are included at the end of this lesson plan.

After this lesson, students will be able to:

- Identify the names of each of the four seasons.
- Demonstrate with a partner how the sun moves (rotation and revolution) in the solar system.
- Tell how the angle of the earth determines the seasons.

Prior Knowledge: No extended prior knowledge is needed. Students should be familiar with weather (cold, hot, wet, dry) and have at least heard of the four seasons (winter, spring, summer, fall).

Materials:

- Collection of seasonal objects and pictures (see ENGAGE section below for more details)
- Construction paper in light colors
- Crayons or colored pencils
- Whiteboard and markers (or use a chalkboard, smart board, projector, etc.)
- Earth cross-section model (or use a ball with a line drawn around the middle to show the equator, and a globe to show north and south poles)
- Beach ball, or other large round object
- Modeling clay, enough for each pair of students to have a small amount (to make a 1/2 inch ball)
- Oranges, enough for each pair of students to have one
- Toothpicks, box of 100 (several toothpicks needed for each pair of students)

Lesson Model: 5Es

ENGAGE: Collect a variety of seasonal objects and pictures that show the four different seasons. Divide the objects into even piles—with one pile for each small group (3-4 students) in the class. You can put each pile in a box, basket, or bag. Each pile should have between 10-20 objects such as magazine pictures (beach scenes, snow scenes), fake fall leaves, winter hat, gloves, flower seeds, and whatever else you can think of! Have the class split into groups and give each group a pile of objects to sort. Tell them there are many ways to sort the objects, and they must decide as a group how to sort them. After each group is finished, talk with the class about the different ways the objects were sorted. Did any group choose to sort their items by the four seasons? Explain that they will be learning more about what each season is and why we have seasons.

EXPLORE: Write the word 'winter' on the board, and have students come up with words to describe it. Do the same for 'summer,' and then for spring and fall. Once there is a list of words describing each season, hand out pieces of construction paper to each student. Each student should choose a season, and draw a picture of what the weather looks like, using crayons or colored pencils. After they have finished their picture, have the students turn the construction paper over and write 2-3 sentences about the season they chose. Remind them to use descriptive words, like those written on the board.

EXPLAIN: Using the cross-section model of the earth, point out the equator line and the north and south poles. Tell the class that we live closer to the North Pole (you may wish to pass the ball around, and let students find North America for themselves). Explain that Earth spins around in a circle (called rotation) while making a path (also called an orbit) around the sun. One complete orbit around the sun is called a revolution. One revolution is a year. One rotation is a day. Display the worksheet on a

projector screen so everyone can see it. Explain that the earth actually revolves around the sun at a tilt, or angle. This is called its rotational axis. Hold the foam model; point out the equator again, then tilt the model so that it is at an angle (meaning the North Pole does not point straight up). Ask for a volunteer to come up and hold the beach ball. Explain that the beach ball represents the sun and the foam model is the earth. Still holding the foam model at an angle, slowly walk around the sun, completing one revolution. How does the rotational axis determine the seasons? When the North Pole is tilted away from the sun, it is winter in North America. When the South Pole is tilted away from the sun, it is summer! The in-between seasons (spring and fall) are when the earth gets just about the same amount of sunlight on the south and north poles. When it is summer on one part of the globe, it is winter on the other part. The equator is always the warmest part on earth because it is closest to the sun no matter what the angle of the earth is. After you verbally explain the reason we have seasons, hand out a worksheet for each child to color in (coloring can be done in class or at home, depending on the time that is available).

ELABORATE: Remind students how it looked when you held the earth model and walked around making a single revolution. Tell students that the sun always rotates while it is revolving. Take a small piece of clay (about half an inch in diameter) and insert a toothpick in the center, so you can spin it between your fingers. Spinning in a circle like this is what the earth is doing constantly! In order to make one rotation a day, the earth must move at speeds of 1,000 mph, while at the same time travel through space (orbiting the sun) at speeds of 67,000 mph! Have students get into pairs, and give each pair a piece of modeling clay, a few toothpicks, and an orange. Let them experience how the clay model of the earth is able to move around the orange (the sun) up close. Walk around making sure that each group understands that the earth moves at an angle, and they hold their toothpicks at an angle instead of straight up and down. If students understand this concept well, you may have them also spin the orange slowly, since our sun does rotate (though not at the same speed of earth).

EVALUATE: When students are finished creating their clay-and-orange model of the earth's movement around the sun, have each student get out their drawing of a season that they worked on before. On the back, have each student write one or two more sentences about what makes seasons and why the weather feels the way it does during the season they chose. Point out the words 'orbit,' 'revolution,' and 'rotational axis' on the board, to help students write their sentences. Each student should turn in their drawing when finished, so you can read what they wrote and check for understanding.

For Further Study: To extend this lesson, you can have students act out the solar system in a large open area, such as a gym. Pick volunteers to be the sun, moon, and earth. Remind students that the moon revolves around the earth, which rotates as it revolves around the sun, and the sun rotates, but only very slowly. Let students take turns acting the parts of the solar system. Take a look at our lesson on the Solar System: http://www.hometrainingtools.com/solar-system-size-lesson-plan/a/1812/!

Accommodations for Diversity: If students struggle with writing, they can have the teacher write their words for them as they dictate. There are a variety of visual and auditory cues meant to build learning in this lesson. If a student cannot see the board or the foam model of the earth, invite them to move closer. If a student has auditory discrimination problems, invite him or her to sit closer to the front, or have this student work with a partner who can repeat something the student may have missed the first time.

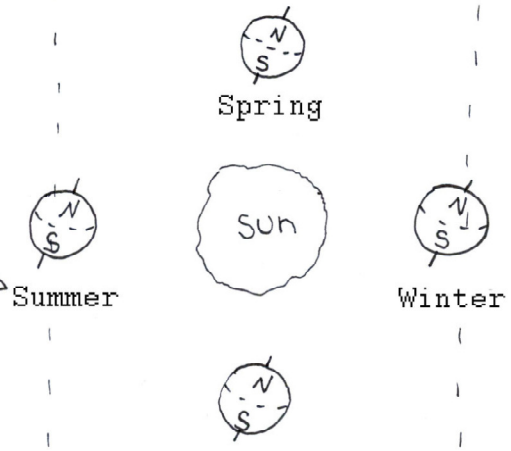
How does the earth move around the sun?

the path that earth follows around the Sun is called an **orbit**

The diameter of the Sun is **109** times that of Earth!

Note: earth and Sun are not drawn to scale.

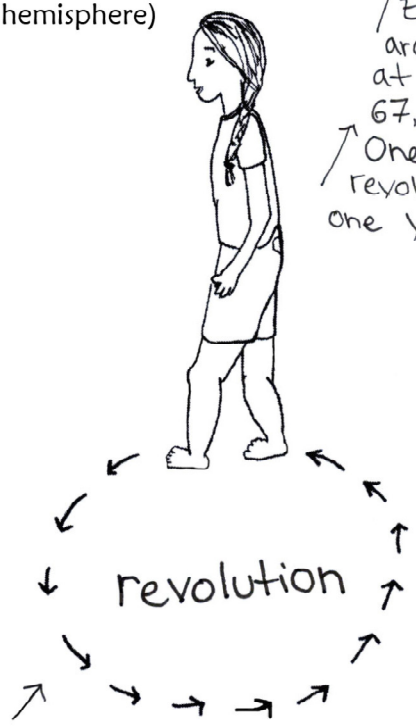
The Seasons:



(for the northern hemisphere)

Earth rotates at about 1,000 mph! One rotation takes 24 hours, or 1 day.

Earth revolves around the Sun at a speed of 67,000 mph!! One complete revolution takes one year (365 days).



Visit homesciencetools.com to learn more about the solar system!