

# Revolution: Year

## Background Information

This activity provides students with a concrete model of the Sun and Earth and their motion. Students observe and manipulate a 3-D model of the Sun and Earth.

## Objectives

By the end of this activity, students will be able to:

- recognize that the Sun is at the center of the solar system.
- explain that Sun rotates or spins on its axis and the Earth rotates or spins on its axis.
- demonstrate that the Earth rotates and revolves around the Sun.

## Instruction time

45 Minutes

## Paper Model

### Materials

- Astronomer Journal page 17
- Construction paper
- Crayons
- Glue
- Scissors
- Supply of brads
- 1" x 8" poster board strips, hole punched on each end

### Procedure

1. Students should color the small circle on page 17 of the Astronomer Journal to represent the earth.
2. Students should color the large circle in the Astronomer Journal to represent the Sun.
3. Students should cut out the circles, along with the "Fact Boxes".
4. Students should glue the fact boxes to the Sun pattern, but do not cover the "X".
5. Students should use the brads to fasten the cutouts to the ends of a poster board strip.
6. Students can read the "Rotate" fact and move the earth to make it rotate.  
Students can read the "Revolve" fact and move the earth to make it revolve around the sun.

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## 3-D Model

### Materials

- Styrofoam balls: (6-inch ball for the Sun, 3-inch ball for Earth)
- Styrofoam disk: (8-inch round x 2-inch thick) for base to hold Sun ball (Note: The relative sizes and distances of materials used in this model are not the actual scale of the Sun-Earth system).
- 2 bamboo skewers (12–14 inches)
- Optional: Lamp with 200 watt bulb with shade removed to serve as the Sun.
- Optional: Extension cord for lamp

### Procedure

1. Choose a location in the classroom with ample room (approximately 10'x10') to demonstrate the Sun-Earth model. Students may want to sit in a circle or semi-circle with the model in the middle.
2. If not using the lamp, insert one end of one skewer into one 6 inch ball and the other end of the skewer into the Styrofoam disk to elevate and secure the ball (see example). Place Styrofoam 6-inch ball (or lamp) where all students can see it.
3. Explain that the large ball or lamp represents the Sun. Ask students what they know about the Sun and write answers on the board or KWL chart. Possible points to elicit – The Sun:
  - a. is our closest star
  - b. is at the center of the solar system
  - c. spins slowly compared to the Earth
  - d. spins counterclockwise when seen from above with North being up
  - e. is very hot
  - f. is huge (much bigger than Earth!)
  - g. is our light source
  - h. shines everyday – always
4. Review that the Sun spins in the center of the solar system and that the planets are always orbiting around it. The Sun's position is like the hub of a bicycle wheel, with planets spinning around it counterclockwise. Note: If using a lamp, turn it on and turn the classroom lights off to create a light emitting "Sun."
5. Place a 3" ball on a bamboo skewer to represent the Earth. Hold the skewer vertically so that the Earth can be held from above and rotated (see example). Explain that the Earth spins counterclockwise, and that it is smaller than the Sun. Note: Stress to students that the Sun-Earth model is not to correct scale. Explain that distances in space are vast, but that this is a model to help see the big picture.
6. Demonstrate the Earth orbiting around the Sun. Start by walking counterclockwise in a circle around the Sun (approximately 4 feet away from the Sun ball or lamp at the center). Turn the skewer counterclockwise to demonstrate the Earth's spin,

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- while orbiting the Sun. Ask students to identify both kinds of motion: rotation and revolution.
7. Ask students how long it takes for the Earth to revolve all the way around the Sun. To make this concept easier to grasp, choose a point on the Earth's line of orbit. Explain that if the Sun were at this point on the first day of this school year, it would take the entire year—fall, winter, spring, summer and back to fall when the next school year starts—for the Earth to complete its long trip around the Sun!
  8. Ask a student when his/her birthday is and how old he/she is. Model a complete orbit of the Earth and ask how old he/she would be after the Earth revolves around the Sun. Ask several students in your class how many times the Earth has revolved around the Sun since they were born?

### **Expected Results & Explanation**

Upon completions of this activity, ask the students to model the movement of the Earth around the Sun for the whole class.