

SOLAR SYSTEM

REVOLVE! ROTATE!

RECOMMENDED GRADES: 1-8



TIME NEEDED: 30-40 MINUTES

Description

Students model the difference between revolution and rotation as they travel around the sun like planets and play a game to check for understanding.

Learning Objectives

Students will:

- demonstrate rotation and revolution
- model how various planets orbit around the sun

Materials

- 8–12 inch diameter balls (4, more optional)
- Diving rings (15)

Preparation

None

Rules



Have students remove shoes before walking on the map.

DIRECTIONS

1. Instruct students to walk around the map and to look at the paths of the planets drawn around the sun at the map's center. Explain that students are going to learn about how planets move around the sun and then play a fun game to demonstrate.
2. Explain that planets revolve around the sun. Remind students that the definition of revolution is the orbit, or complete journey of an object around a more massive object, and that the verb "revolve" means to orbit around something. Ask students: *Which direction do the planets revolve around the sun?* Tell students that planets revolve counterclockwise, as seen when looking down on it from above the solar system.

REVOLVE! ROTATE!

3. Stand on the sun in the center of the orbital paths. Have students walk around you, the sun, counterclockwise. Make it clear that they are “revolving” by asking students to state what they are doing.
4. Divide students into four groups by asking them to count off until all students have a number. Ask each group to stand in a different corner of the map. Explain to students that they are going to demonstrate rotation. Rotation is defined as an object’s complete turn around its own axis. Ask: *Which direction do planets rotate?* (The planets rotate in a counterclockwise direction except Venus. Explain to students that Venus’s rotation is the opposite of other planets. Explain that Uranus’s axis is at 98 degrees and revolves around the sun with the axis pointing in the same direction. The north pole gets half the Uranus year in full sun and then half the year in full darkness). Demonstrate rotation for students.
5. Place a diving ring on the map in the middle so all groups can see and place a ball in the ring. Spin the ball counterclockwise looking from above. Explain to students that this models the rotation of a planet, spinning around its axis. Give each of the four groups a ball and a ring and ask them to practice so each person has a chance to try to spin the ball in the ring.
6. Once the students are comfortable spinning the ball counterclockwise in the ring, invite them to join you at the center of the map. Have each group pick an orbital path of an outer planet, or exoplanet. Ask them to spin the ball in the ring on their chosen path. As the ball is spinning, they should push the ring around the sun counterclockwise along the orbital path. Explain to students that they are now modeling both rotation and revolution.
7. Have students take turns by switching group members each time the ball stops spinning, or use additional balls and rings from the trunk. After completing the model, have students stand along a selected planet’s orbital path.
8. Have them form a single file line and walk counterclockwise along the path. Then ask them to spin and try to walk at the same time. Explain that when the students are spinning, they are rotating, but when they spin and walk, they are revolving and rotating.
9. Play a Red-Light-Green-Light-type game to check for student understanding about the difference between revolution and rotation. Have students line up on the timeline side of the map, facing the map. Explain that you are going to play a game of “Revolve! Rotate!” Students will either “revolve” or “rotate” to travel to the other side of the map. The first student to arrive at the other side of the map is the winner. Remind students that there is no running on the map. This game has the similar rules to Red-Light-Green-Light. When you say “revolve,” students should walk slowly forward. When you say “rotate,” they should spin in place. When you say “both,” they should move forward and spin at the same time. When you say “stop,” students should freeze. Explain that students who do not make the correct movement will be out. Play as many games as you wish!