

Name _____ Period _____ Date _____

Round and Round We Go

In this activity, you will learn the difference between rotation and revolution by modeling the motions of the sun-Earth system.

Rotation refers to the motion of a planet, moon, star, or galaxy around a central axis. Earth makes one rotation on its axis once every 24 hours, or 1 day. When a planet, moon, or star moves around another object, it is said to be revolving. Earth revolves around the sun once every 365 days, or 1 year. Read FYI *Round and Round We Go*.

This activity will require teams of two.

Make a Claim: If the sun is overhead in North America, approximately what time of day, is it in Japan? Use a diagram to explain your answer.

Make a Claim: Would the same be true exactly 180 days later?

1. Find an open space so you can move in an orbit around a stationary sun (student 1).
2. Student 2 (Earth) should stand 2 meters away and face student 1. Student 2 should simulate a day on Earth by rotating 360 degrees in place.
3. Student 2 should now simulate a day on Earth as in step 2 and also revolve around the sun half a step. Since it takes Earth 365 days to complete one revolution, at this scale (4 meter diameter circle), Earth would only move 3.3 cm. Continue to rotate and revolve around the sun until you return to your original starting point. You don't have to make the full number of 365 rotations!
4. Now try revolving around the sun without rotating at all.
5. Try rotating on your axis at the same rate as you revolve around the sun.
6. Switch positions with your partner and repeat steps 1 – 5.

Revise your Claim: Based on the evidence you have gathered using your model, revise your claim about the time of day in Japan when the sun is overhead in North America, and whether the same would be true 180 days later.

Pause and Reflect

1. Describe your motion while you were revolving around the sun without rotating on your axis.
2. Describe the direction you had to face when revolving and rotating at the same rate.
3. List some objects other than planets and moons that rotate or revolve.