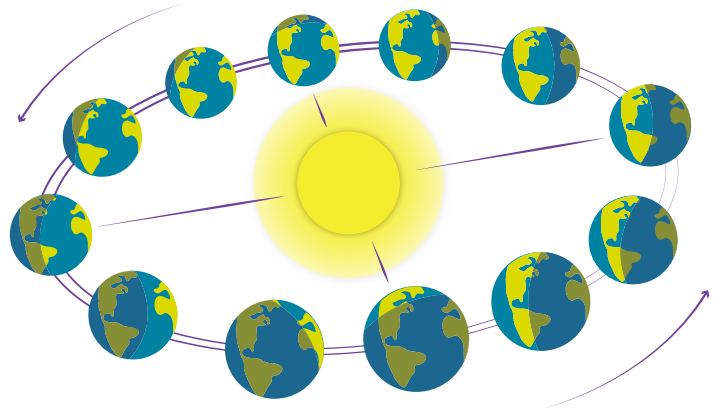


Seasonal Science

Celebrate the first day of winter and learn how the tilt of the Earth affects our changing seasons.

Collect

- Flat piece of cardboard, or paper plate
- Flashlight
- Two different colored markers
- A dark room
- Thick book



Make a model

1. Place a thick book on the table or floor. Lay a flashlight on top of the book and turn it on. The flashlight will represent the Sun.
2. Hold the cardboard or paper plate in front of the beam of light. The board will represent the Earth.
3. Move the Earth until it is about one foot away from the flashlight. Raise or lower the flashlight by adding or subtracting a book until the beam of light hits the center of the cardboard.

Let the Sun shine

4. Observe how bright the light is (intensity) and use one of the markers to outline where the light is hitting the board.

Change the tilt

5. Without changing the distance between the cardboard or the flashlight, carefully tilt the top of the cardboard away from the flashlight.
6. Observe any changes to the light's intensity and then use the second marker to outline where the light is now hitting the board.

What makes a season?

A common misconception is that winter is cooler because the Earth is farther away from the Sun during that part of its elliptical orbit. While the distance between the Earth and the Sun changes slightly as the Earth orbits, the change in seasons is actually due to the tilt of the Earth. As the Earth revolves around the Sun, it is tilted on its axis at approximately 23.5 degrees. This tilt causes the sunlight to hit some places more directly during some parts of the year, and less directly during other parts.

During winter in Maryland, we are on the part of the Earth that is tilted away from the Sun. We receive less direct sunlight, so we have fewer hours of daylight and temperatures are cooler on average.

FUN FACT: During winter in the Northern Hemisphere where Maryland is, the Earth is actually closer to the Sun (147,200,000 km) than it is during summer (152,000,000 km)!