Why We Have Seasons

Near the equator it remains hot all year round. At the North and South Poles it is always cold. But in most parts of the world there are four seasons every year. Why?”

With your marker draw an ellipse about 10 inches in diameter on a piece of cardboard to represent the earth’s oval orbit. Mark the four quarter points north, south, east and west.

Place the lighted lamp in the center of the cardboard to stand in for the sun.
1. Holding the needle straight up and down, move the orange in turn to each of the four positions. Observed which part of the orange is lit up.
2. Now tilt the orange so that the axis is slanted about 23.5 degrees away from the vertical. Place the orange in turn at each one of the four positions, keeping the needle tilted in the same direction. Look at the lighted section of the orange in each position. Observe which part received the direct rays and which the slanting rays of light.

**What happens:**
1. When the needle is straight up and down, the same section is lit no matter where the orange is in relation to the light.
2. When the needle is at the 23.5 degree angle, the amount of light depends on whether the orange is tilted toward or away from the light.

**Why:** if the earths axis were vertical, like the orange in the first experiment, there would be no seasons. But the axis of the earth points to the North Star at a 23.5 degree slant. It is this slant that makes the seasons change as the earth revolves around the sun.

When the side of the earth we live on is tilted toward the sun, we have summer because we receive the direct rays of the sun. Six months later our part of the earth is tilted away from the sun---it is winter because we receive the sun’s rays at a slant and so get less of the sun’s heat.

At the equator, the sun’s rays are always direct. There are no seasons. At the poles, the sun’s rays always strike at a slant.

This experiment shows that the seasons are not caused by the distance from the sun. Actually, in January, the Northern Hemisphere is closer to the sun than it is in June.