



## FIRST GRADE- SEASONS

### OBJECTIVES:

- Discussing what creates seasons.
- Analyzing evidence that the Earth rotates.

### VOCABULARY:

- axis
- east
- north
- season
- south
- tilt
- west

### MATERIALS:

- Model of Earth and Sun
- 1 Inflatable globe
- 11 Mini globes
- 30 Bags (1 pompom, 3 wood)
- 30 copies of Astronomical Seasons worksheets and a shoe lace
- Slideshow on Universe (portions of planets rotating and revolving)

### BACKGROUND:

A season is one of the four periods of the year including spring, summer, autumn, and winter. Seasons are defined in two ways. Climatic seasons reflect changes in temperature, weather, and the length of daylight. The length of climatic seasons varies, for example at high northern latitudes winter is relatively long and summer is relatively short.

Astronomical seasons are defined by the position of the Sun with respect to the Earth. Because the Earth's rotational axis is tilted  $23.5^{\circ}$ , the overhead position of the Sun changes throughout the year. The Sun appears to migrate more overhead in summer, and less so in winter. For the Northern hemisphere, the astronomical



Summer in the Southern Hemisphere, winter in the Northern Hemisphere

summer begins on the summer solstice, which is the day the Sun reaches its most northern, most overhead position. As the Sun moves back south, it comes directly over the equator. This marks the autumnal equinox, or the start of astronomical autumn. When the Sun reaches its southernmost point below the equator, it is the winter solstice, or the start of the winter season. Finally, as the Sun moves back north, it again crosses the equator. This is the vernal equinox, and the start of spring.

The climatic seasons correspond to the astronomical seasons because the Northern hemisphere is warmed when it is close to the summer solstice, because the Sun is more directly overhead. Likewise, the Northern Hemisphere grows cool as the Sun moves south, and the season's transition through fall and into winter.

## PROCEDURE:

1. Most children do not understand that seasons are associated with the way the Earth revolves around the Sun. So stress the importance to students that it is not the weather that causes the seasons. The weather is caused by many other factors that are more regional. However, all continents have summer, winter, spring, and fall. Note that different hemispheres will have a different season. For example it may be summer in northern hemisphere, but in southern hemisphere it is winter.

A season is a subdivision of the [year](#), marked by changes in [weather](#), [ecology](#), and hours of [daylight](#). Seasons result from the yearly revolution of the [Earth](#) around the [Sun](#) and the [tilt of the Earth's axis](#) relative to the plane of revolution.

2. Show the inflatable globe to the class. The globe shows the oceans and land masses. Have them find the general area where they live.

Point out that the globe is tilted, and explain that this is because the Earth is tilted on its axis relative to the Sun. Explain how this causes the seasons. Some students may notice that when the northern hemisphere tilts away from the Sun, the southern hemisphere tilts toward the Sun. Explain that our summer season is the winter season in the southern hemisphere.

3. Put out the placemats and point out the Sun and Earth. Notice how the Earth is positioned. Also point out the other planets also rotate on an axis. Remind them that the planets “Revolve” around the Sun.
4. Pass out the plastic bags and make sure you have the students open the bags correctly.

Ask them to take out the Apple. Tell them that the apple stem is the axis, and ask them to rotate the apple around the stem. This is rotation.

Have them take out the wooden oval and ball. Have them hold them on their axis. Note there is a dot where their fingers should hold them. Ask them which one is more like the Earth. We are more spherical than oval, but point out that we are not a perfect sphere (we are oblate).

Hand out the Astronomical Season. Have them put the “Sun” (the pom pom) on picture of the sun. Then have them put the Earth on winter with the axis (dots) pointing away from the Sun.

Go over the picture with the students, realizing they are only first graders. Words to go over are weather seasons and astronomical seasons; revolve around the Sun; spinning of an axis, June solstice, December solstice; autumnal equinox, and vernal equinox. The main point is for the students to be introduced to the terms.

**Next Generation Science Standards**

1 Physical Sciences Waves Light and Sound

1 PS 4-2 Evidence based account that objects are illuminated.

1 Earth and Space Sciences – Patterns and Cycle

1 ESS1.A 1-ESS1-2: ESS1.B