



Seasons in a Spin

Different parts of the world may have only two seasons (wet and dry), while other parts of the world have four seasons (spring, summer, autumn, winter) through to eight seasons! However many seasons you have in your part of the world, the change in temperature and length of daylight is caused by the angle at which sunlight hits the Earth. Seasons are not caused by how close or far away the Earth is positioned from the Sun.

Earth is tilted on an axis and moves in orbit around the Sun once a year. This points the northern and southern halves (called the hemispheres) more directly towards or away from the Sun at different times of the year. This affects the angle at which sunlight hits the Earth's surface.

In June, the northern hemisphere is tilted towards the Sun, so the Sun is higher in the sky. The length of time that sunlight hits the northern hemisphere is also longer (the daytime increases). The angle of sunlight and longer days cause a greater heating effect on the ground, so temperatures rise, and the northern hemisphere has summer.

The southern hemisphere is tilted away from the Sun during June, so the Sun is lower in the sky. This means that sunlight hits the southern hemisphere at a sharper angle, so it spreads out and has less of a heating effect. The length of time that sunlight shines on the southern hemisphere is also much less, giving shorter days and less time for the ground to heat up. This causes the colder temperatures of winter.

In December, the Earth has moved in its orbit around the Sun and the southern hemisphere is now pointed towards the Sun and the northern hemisphere is pointed away from the Sun. This means the northern hemisphere receives sharply angled sunlight and shorter periods of sunlight, so they experience winter. At the same time, the southern hemisphere is pointed towards the Sun, so it receives sunlight directly overhead for longer periods of time which causes summer.

You may have heard of days known as 'solstice'. These days represent a rough 'mid-way' point for a season, where the shortest and longest days occur. Around 21 June, the southern hemisphere has its shortest period of sunlight (winter solstice) while the northern hemisphere has its longest period of sunlight (summer solstice). Then on 21 December, the Earth has moved in its orbit around the Sun and the situation is reversed, so the southern hemisphere has summer solstice, and the northern hemisphere has winter solstice.

The days known as 'equinox' represent days when the Sun is overhead at the equator and all parts of the Earth have a day and night of equal length. Neither the northern or southern hemispheres are tilted more directly toward the Sun and each hemisphere has sunlight for about 12 hours. Equinox days occur around 21 March and 22 September when the Earth has moved in its orbit around the Sun.

More Information

Bad Astronomy What Causes Seasons <http://www.badastronomy.com/bad/misc/seasons.html>

NASA Kids, Earth's Seasons <http://kids.msfc.nasa.gov/earth/seasons/EarthSeasons.asp>

Earth's Seasons, Equinoxes, Solstices, Perihelion, and Aphelion 1992-2020
<http://aa.usno.navy.mil/data/docs/EarthSeasons.html>