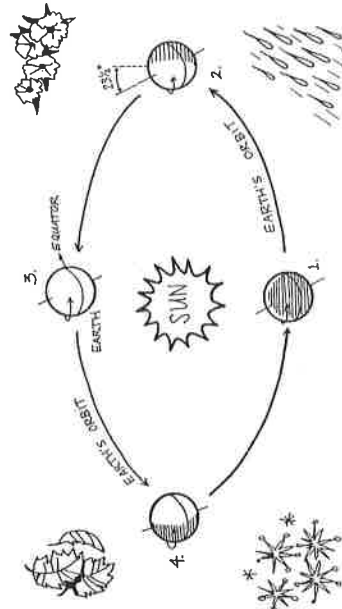


REASONS FOR SEASONS

What's with the seasons? How do they know when to come and go? It all has to do with the movements of Earth in relation to the sun. Here are some reasons. You fill in the blanks to tell what the reason explains.

- Reason for _____
Because Earth is tilted $23\frac{1}{2}^\circ$ from a line perpendicular to its orbit, the length of daylight varies and because of the angle at which the sun's energy strikes a given location through the year.
- Reason for _____ in the Northern Hemisphere:
Because the Northern Hemisphere is tilted toward the sun for a few months.
- Reason for _____ in the Northern Hemisphere and _____ in the Southern Hemisphere: Because Earth's tilt is sideways to the sun, and hours of daylight and darkness are the same in both hemispheres on about September 22.
- Reason for _____ in the Northern Hemisphere:
Because the North Pole is tilted almost directly toward the sun on about June 21.
- Reason for _____ in the Southern Hemisphere:
Because the South Pole is tilted away from the sun on about June 21.
- Reason for _____ in the Southern Hemisphere:
Because the Southern Hemisphere is tilted toward the sun for a few months.
- Reason for _____ in the Northern Hemisphere:
Because the South Pole is tilted almost directly toward the sun on about December 21.
- Reason for _____ in the Northern Hemisphere and _____ in the Southern Hemisphere: Because Earth's tilt is sideways to the sun and hours of daylight and darkness are the same in both hemispheres on about March 20.
- Reason for _____ in the Southern Hemisphere:
Because the South Pole is tilted almost directly toward the sun on about December 21.
- Reason for _____ hours of daylight at the South Pole:
Because the South Pole is tilted directly toward the sun on about December 21.

On the diagram at the right, label winter solstice, summer solstice, fall equinox, and spring equinox for the Northern Hemisphere.



Name _____

"The Story of the Seasons"

The Earth takes 365 and 1/4 days to complete one revolution around the sun and this amount of time is called a "year." Every four years, 1/4 of a day will add up to 24-hour day, and we add an extra day (February 29th) to the calendar. This is why we have a "leap year" with one extra day every four years. The Earth's orbit is nearly circular (or slightly elliptical) and Earth is actually closer to the sun during the northern hemisphere's winter months.

Summer

On the first day of **summer, June 20 or 21st**, the Earth's Northern Hemisphere is tilted 23.5° toward the sun. The day is known as the **summer solstice**. On this day the sun is at its highest point in the Northern Hemisphere sky at noon and directly over the Tropic of Cancer (the 23.5° N parallel of latitude). Solstice means "sun stop" in Latin. When the Northern Hemisphere is tilted toward the sun, that part of the Earth receives more direct rays of sunlight during the daytime than the Southern Hemisphere does. The Southern Hemisphere is tilted away from the sun and therefore, receives the sun's rays at an angle. As a result, it is summer in the Northern Hemisphere and winter in the Southern Hemisphere. Conversely, during our winter months when the Northern Hemisphere is tilted away from the sun, it is summer in the Southern Hemisphere.

During the summer, the land, oceans, and atmosphere in the Northern Hemisphere receive more direct rays of sunlight. The hemisphere of the Earth that is tilted toward the sun receives more direct rays of sunlight and also has longer days than the hemisphere that is tilted away from the sun. We call this combination of more direct sunlight and longer days the summer season. Summer begins in the Northern Hemisphere on June 20 or 21 when the North Pole is tilted a full 23.5° toward the sun. On this day, the Northern Hemisphere has the most hours of daylight, while the Southern Hemisphere has the least hours of daylight. The North Pole has 24 hours of daylight on this day, while the South Pole has 24 hours of darkness.

Fall or Autumn

The Earth continues on its trip around the sun keeping the same 23.5° tilt of its axis through each season. **Fall or autumn** in the Northern Hemisphere begins on **September 22 or 23** when the Earth is **not tilted** toward or away from the sun. On this day, the length of day and night are equal (12 hours each) all over the Earth. This day is known as the **equinox**, which means "equal night" in Latin. In the Southern Hemisphere, spring begins on this day.

Winter

Winter in the Northern Hemisphere begins **December 21 or 22**, when the North Pole is tilted a full 23.5° away from the sun. This day is known as the **winter solstice**. The angle of the sun is the lowest and the Northern Hemisphere has the least amount of daylight. In the Southern Hemisphere, this is the day with the longest amount of daylight and the beginning of the summer season. The sun is directly over the Tropic of Capricorn (the 23.5° S parallel of latitude). The North Pole has 24 hours of darkness on this day, while the South Pole has 24 hours of daylight.

Spring

Spring in the Northern Hemisphere begins **March 20 or 21** when again the Earth is **not tilted** toward or away from the sun. There are 12 hours of daylight and 12 hours of darkness on this day. In the Southern Hemisphere, fall begins on this day.