What is the winter solstice?

By NASA.gov, adapted by Newsela staff on 12.20.17
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Image 1. For the Northern Hemisphere, the winter solstice is the shortest day of the year. Photo by: Pixabay/public domain

Humans have watched the stars and planets for thousands of years. We use events in the sky to mark time, like seasons.

On December 21 or 22 every year, the winter solstice happens. Many people celebrate holidays around this time, like Christmas, Hanukkah and Kwanzaa.

For the northern part of Earth, the winter solstice is the shortest day of the year.

Over a year, the days between June and December slowly grow shorter. The sun rises later and sets at an earlier time. Then, winter is dark. This pattern changes at the Winter Solstice. This is when the northern part of Earth is the furthest away from the sun.

After the solstice, the days begin to get longer.

But What Is The Solstice Exactly?

On maps, you might often see some imaginary lines drawn on Earth. These lines help people get around and measure time.

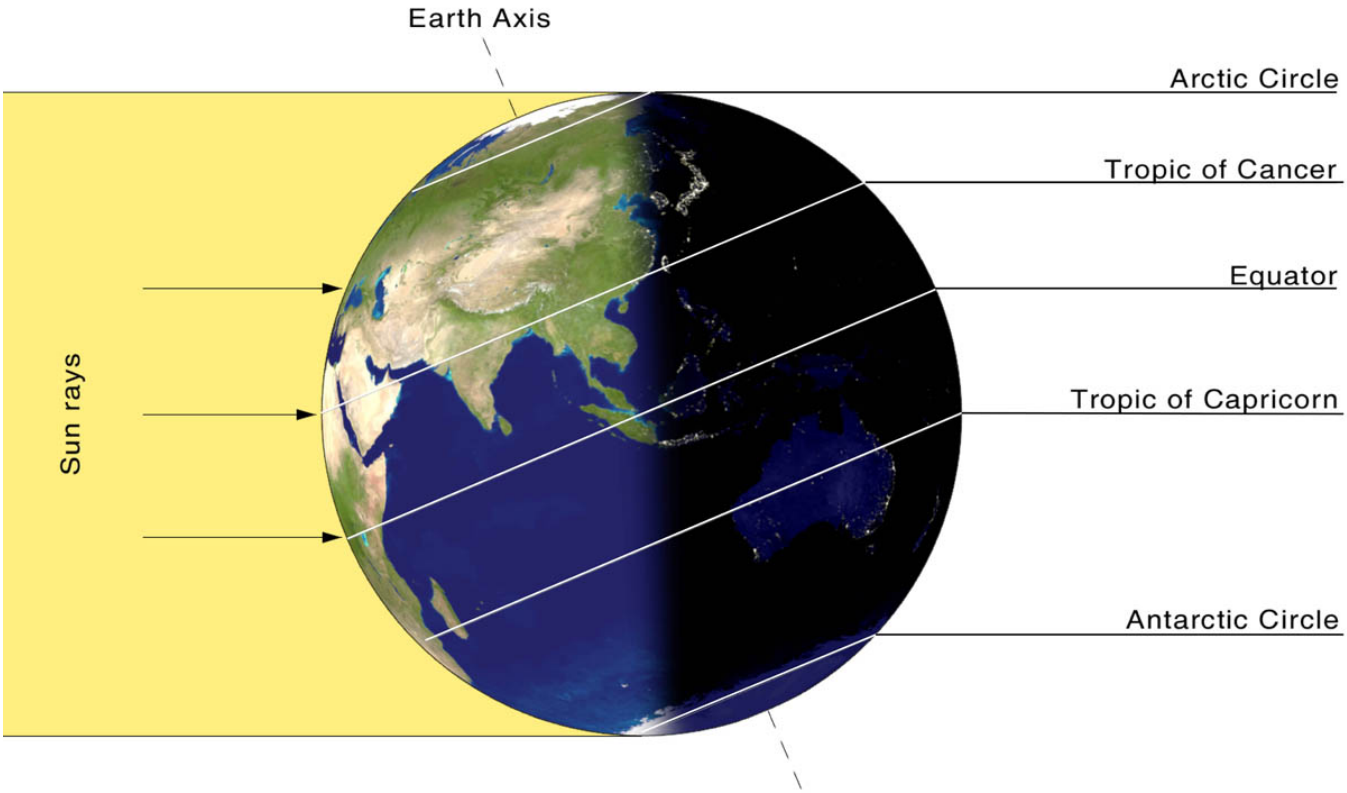
The equator is an imaginary line drawn right around Earth's middle. It looks like a belt. It divides Earth into the Northern Hemisphere and the Southern Hemisphere.

Another imaginary line drawn through Earth is its axis of rotation. The axis of rotation is a line that connects the North Pole to the South Pole.

This line is slightly tilted. As the Earth circles around the sun, the sun's light hits different places. This tilt causes Earth's changing seasons.

Other useful imaginary lines around Earth are called lines of latitude. They are numbered from 0 degrees to 90 degrees. The one at 0 degrees is the equator.

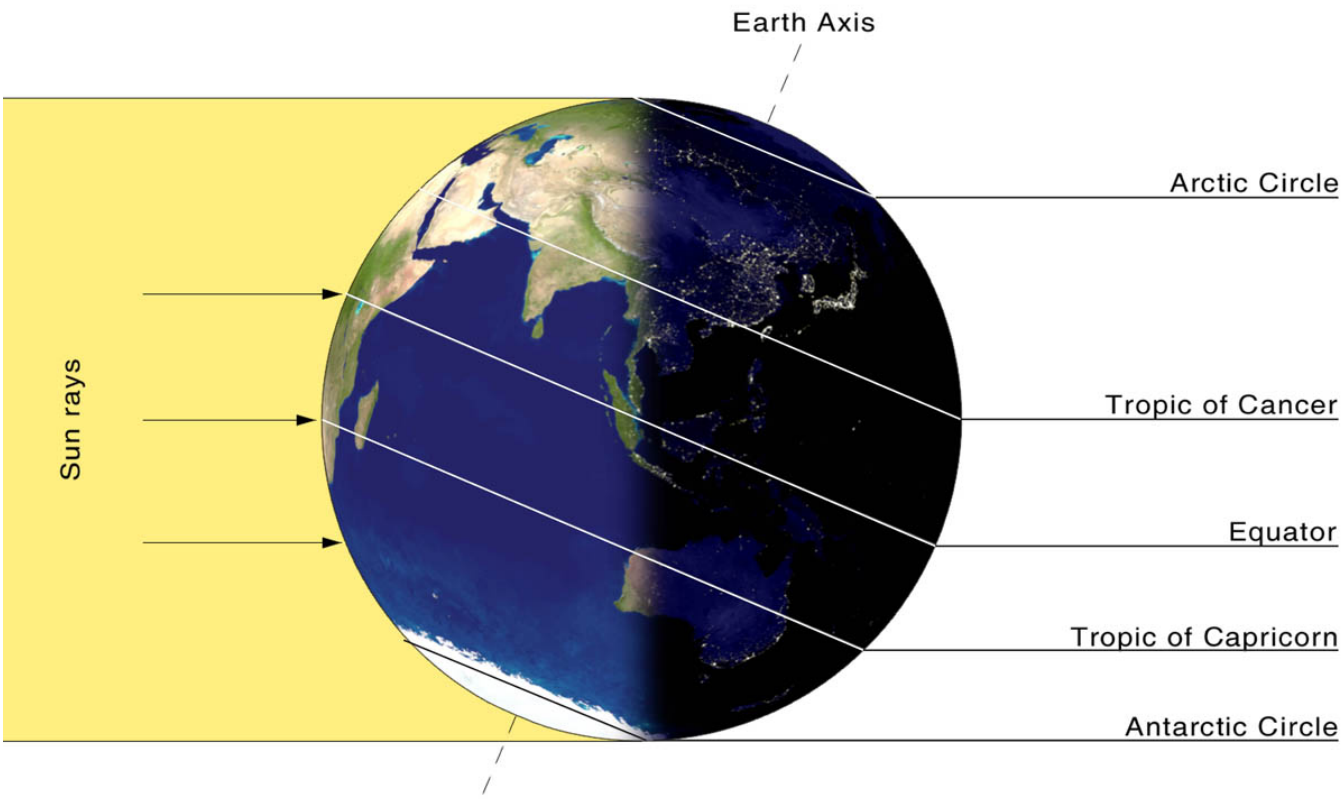
You may have noticed two special lines of latitude on a globe of the world: One in the Northern Hemisphere called the Tropic of Cancer. The other one in the Southern Hemisphere called the Tropic of Capricorn.



Once a year, at noon, the sun is directly overhead these latitudes. In the Northern Hemisphere, on Tropic of Cancer, that is the summer solstice. On the Tropic of Capricorn, that is the winter solstice.

The summer solstice has the most hours sunlight of any day. The winter solstice has the fewest.

Who Came Up With The Name Tropic of Cancer?

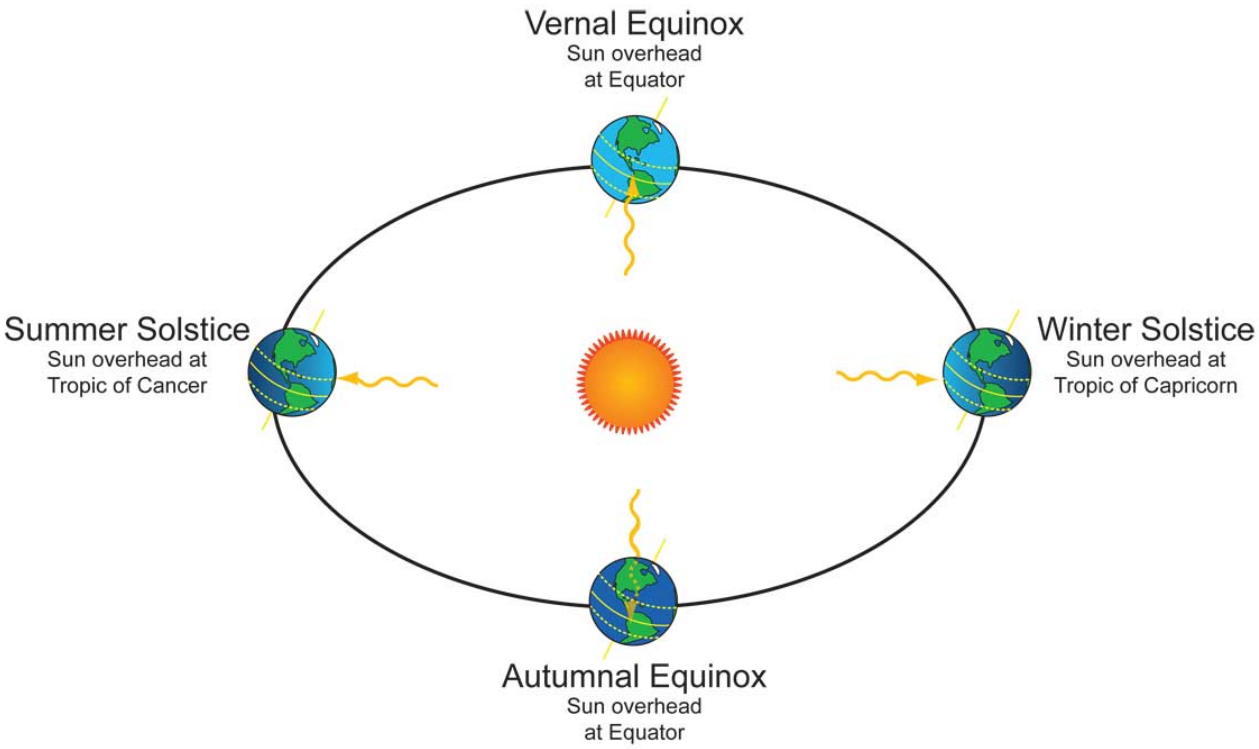


These names were thought up about 2,000 years ago. At that time, on the summer solstice, people noticed the sun was facing a group of stars called Cancer. However, the sun no longer points toward Cancer. Earth's axis wobbles a bit. It is always slowly changing the direction in which it points.

The word "tropic" itself comes from the Greek word *tropi*, meaning "turn." That's because the sun appears to "turn back" at the solstices.

When the Tropic of Capricorn was named, the sun was in a group of stars called Capricorn at the winter solstice.

Two other major lines of latitude are the Arctic Circle, around the North Pole, and the Antarctic Circle, around the South Pole.



On the Arctic Circle, the sun does not set at all on the summer solstice. On that one day, the sun traces a complete circle just above the horizon as the Earth rotates. On the Antarctic Circle, the sun does not set at all on the winter solstice.

Is The Summer Solstice Also The Hottest Day Of The Year?

The summer solstice is the longest day of the year in the Northern Hemisphere. That part of Earth receives more sunlight than on any other day. Then shouldn't that day be the hottest?

Actually, the hottest days are usually in July and August. The Northern Hemisphere is absorbing lots of sunlight on the summer solstice. It goes into the air and water. It just takes a few weeks for that energy to release.

Quiz

1 Read the following paragraph from the section "Who Came Up With The Name Tropic of Cancer?"

> *In the Arctic Circle, the sun does not set at all on the summer solstice. On that one day, the sun traces a complete circle just above the horizon as the Earth rotates. On the Antarctic Circle, the sun does not set at all on the winter solstice.*

What conclusion can be drawn from the paragraph?

(A) The sun does not set in the winter in the Antarctic Circle.

(B) The sun only shines on the Arctic Circle during the summer.

(C) The same event happens on the summer and winter solstices but in different locations.

(D) The entire Earth receives more sunlight in the summer because of the rotation of the Earth.

2 Which sentence from the section "But What Is The Solstice Exactly?" BEST helps the reader understand what causes the solstices?

(A) The equator is an imaginary line drawn right around Earth’s middle.

(B) As the Earth circles around the sun, the sun's light hits different places.

(C) This tilt causes Earth’s changing seasons.

(D) Once per year, at noon, the sun is directly overhead these latitudes.

3 Examine Image 2 and read the caption.

Based on the image and caption, which of the following is MOST likely true?

(A) Stonehenge was built before people knew about the winter solstice.

(B) People first discovered the summer solstice after they built Stonehenge.

(C) Stonehenge was carefully planned and built to line up with the sun on the summer solstice.

(D) People planned and built Stonehenge in order to understand the summer and winter solstices.

4 Look at Images 3 and 4.

What do these two graphics show?

(A) the relationship between the Earth and the sun during the solstices

(B) the two times each year that the sun is directly above the equator

(C) the way the Earth's latitudes change based on the direction of the sun

(D) the length of days at the Tropic of Capricorn compared to the Tropic of Cancer