

# Why do we have seasons?



**21<sup>st</sup> March - Spring (Vernal) Equinox**

# Why do we have seasons?

rotation

revolve

tilt

axis

Hemisphere

Equinox



orbit

solstice

# Earth's Movement

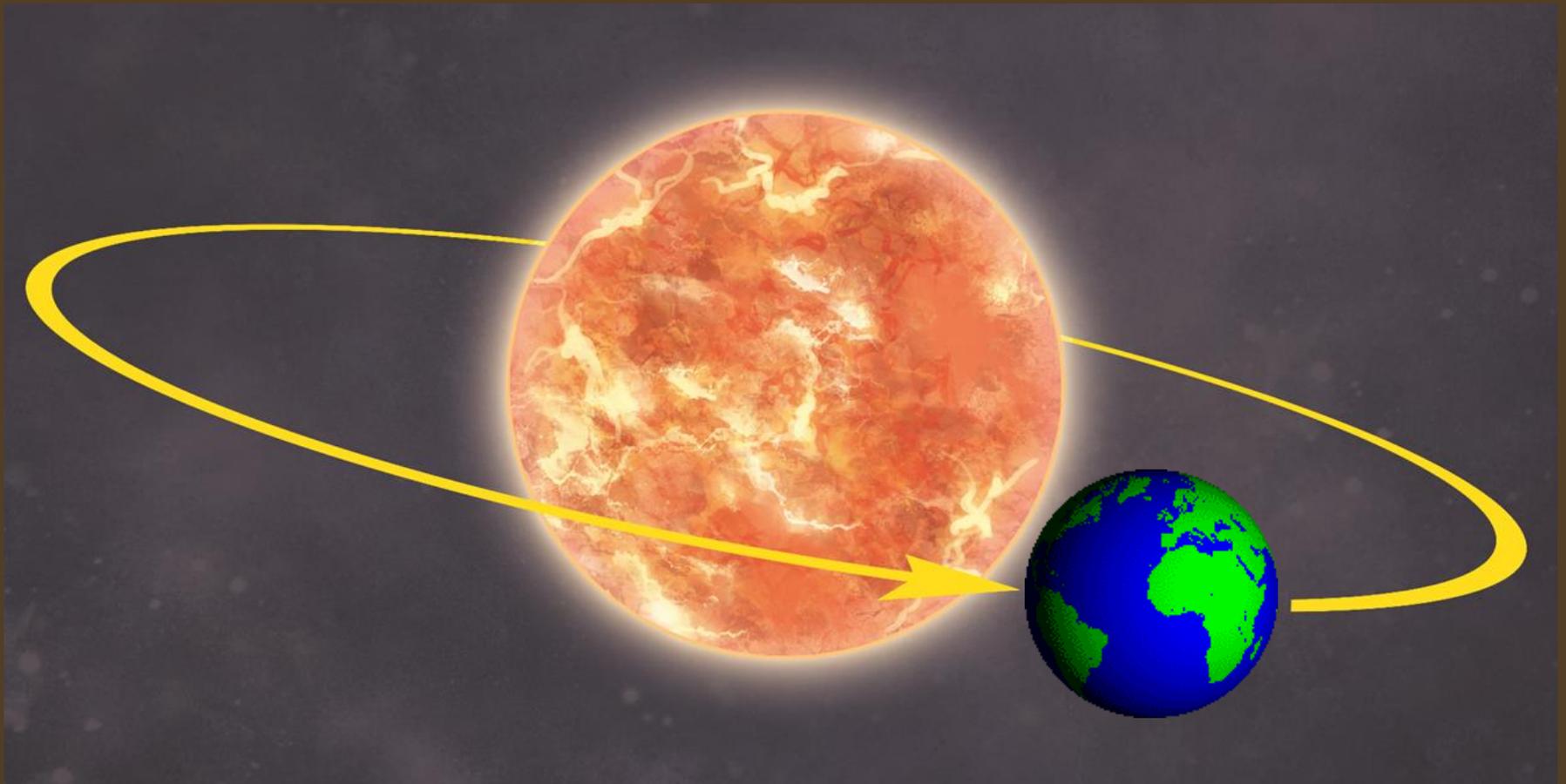
The Earth moves in two different ways in space.



# Earth's Movement

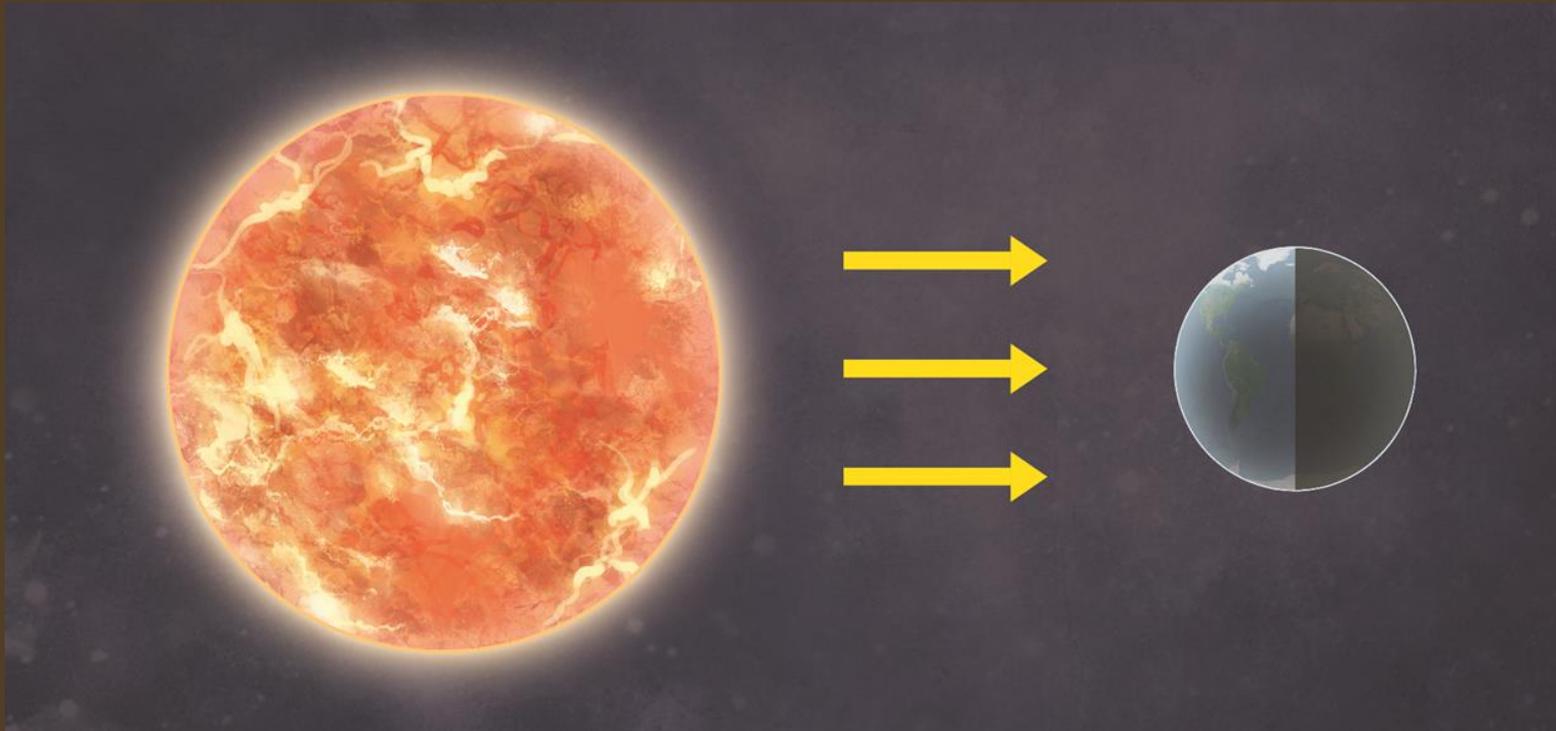
The Earth moves in two different ways in space.

The Earth **rotates** and **revolves**.



# Earth's Rotation

It takes the Earth 24 hours, or 1 day, to complete one rotation on its **axis.**



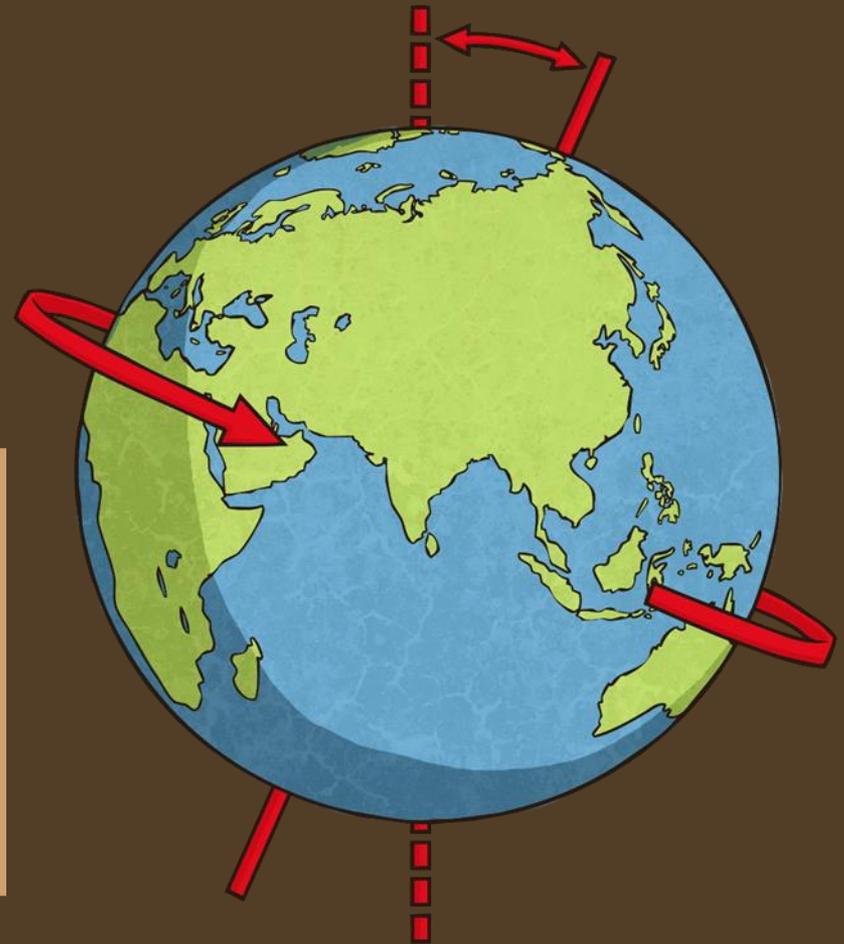
Earth's axis is an imaginary pole going right through the centre of Earth from "top" to "bottom." Earth spins around this pole, making one complete turn each day. That is why we have day and night.

# Why do we have seasons?

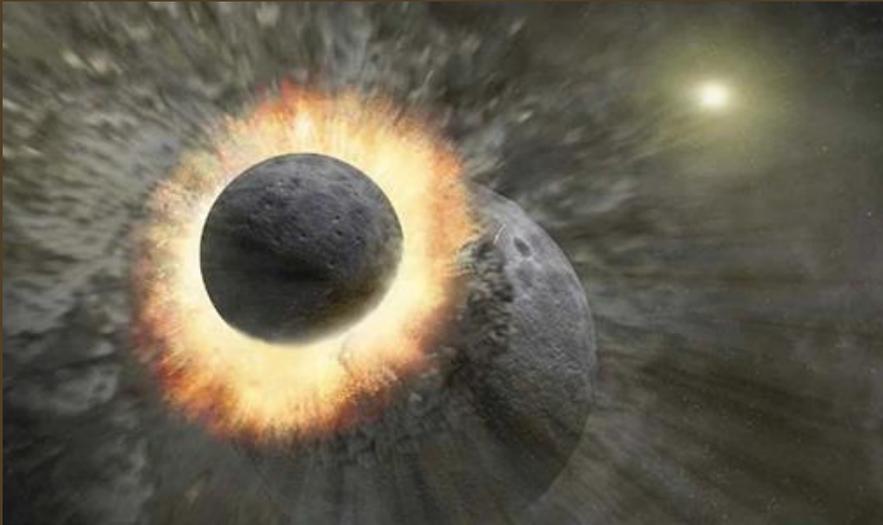
The axis extends from north to south.

The axis is at a tilt of 23.5 degrees.

- Seasons are the result of the tilt of the Earth's axis.
- But what caused Earth to tilt??

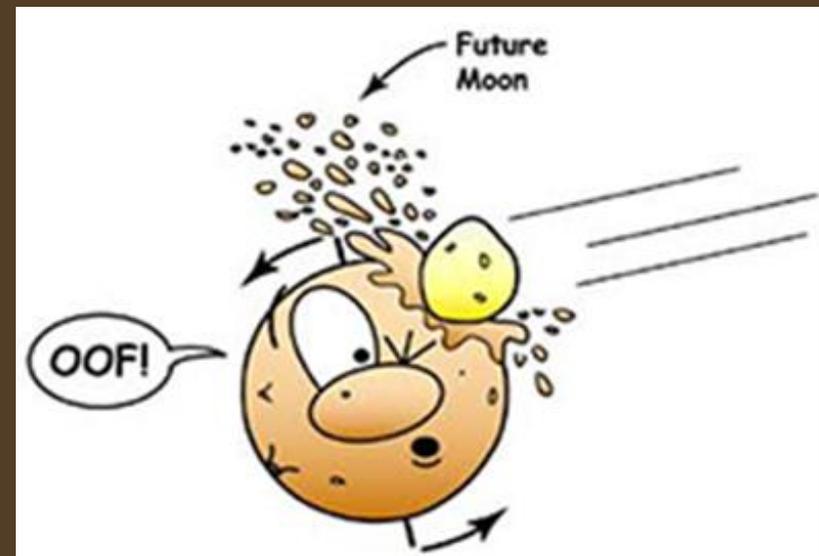


# The Tilting...



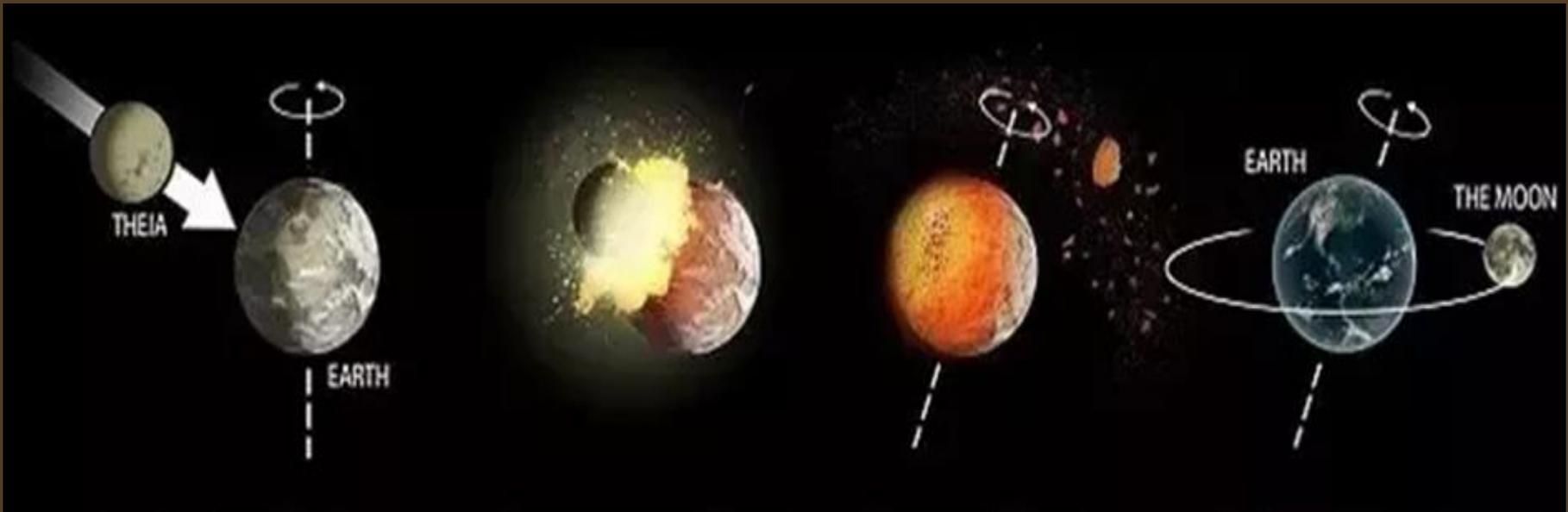
Long, long ago, (4.5 billion years ago) when Earth was a young planet...

a small planet or a very large asteroid (Theia) hit the Earth and threw it off balance. So instead of rotating with its axis straight up Earth leans over a bit.



# The Tilting...

- Seasons are the result of the tilt of the Earth's axis.



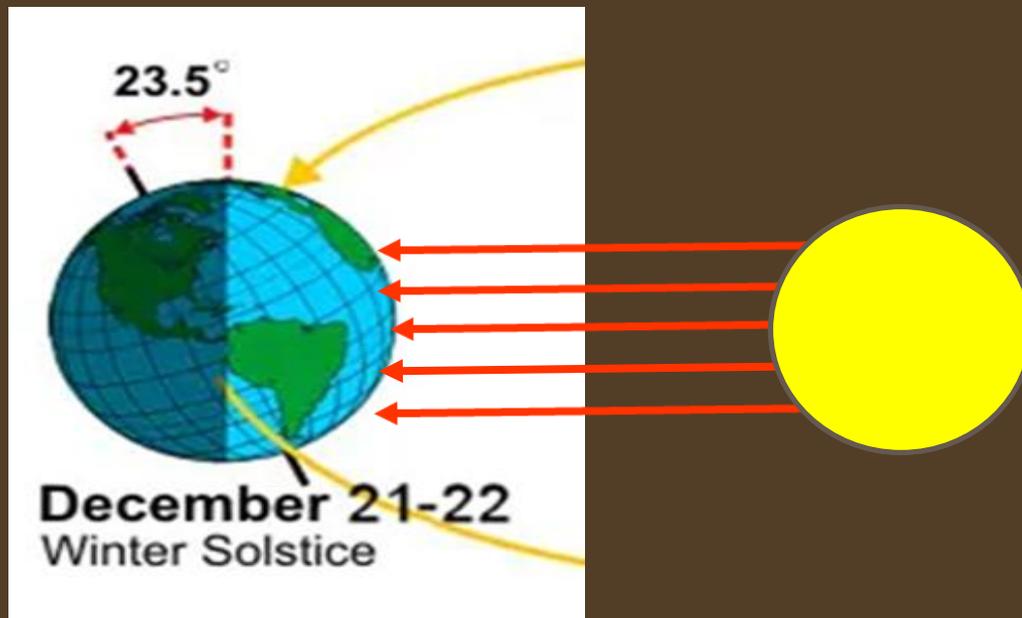
# Solstices and Equinox

- The Earth's axis always points the same direction, so as the planet makes its way around the sun, each hemisphere sees varying amounts of sunlight.



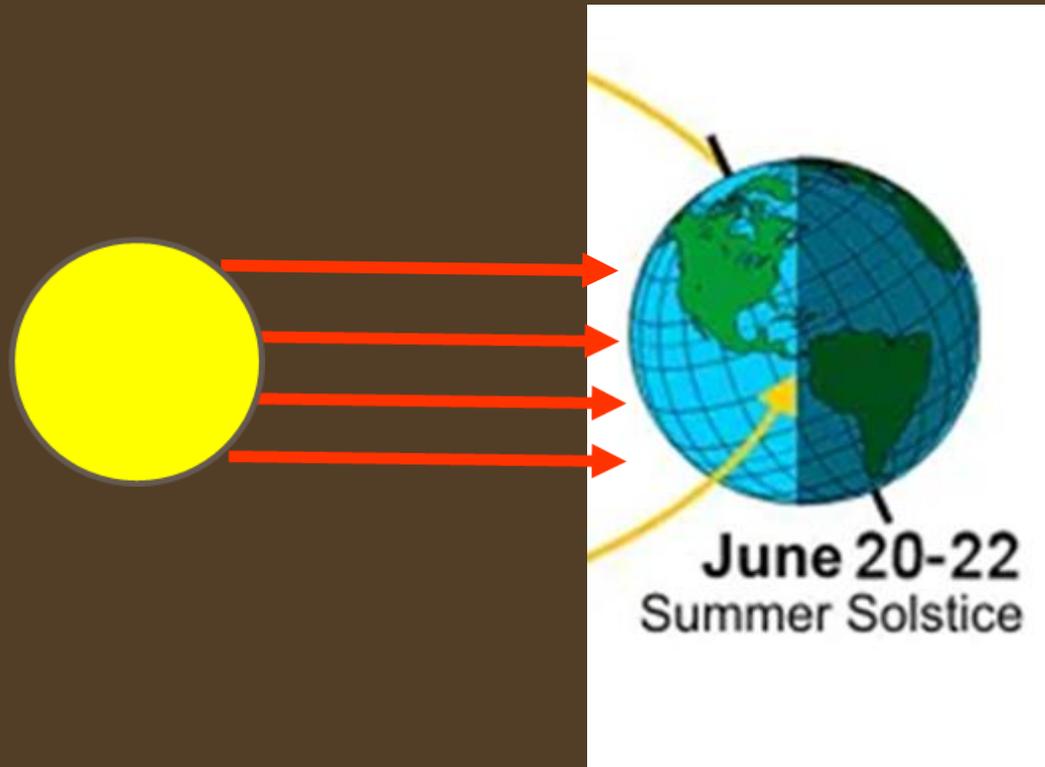
# Winter Solstice

- For part of the year, the Northern Hemisphere leans away from the sun's light. Days grow short, and temperatures drop. This is winter.
- **Winter Solstice** in the Northern Hemisphere is the day when the North Pole is the furthest away from the sun.



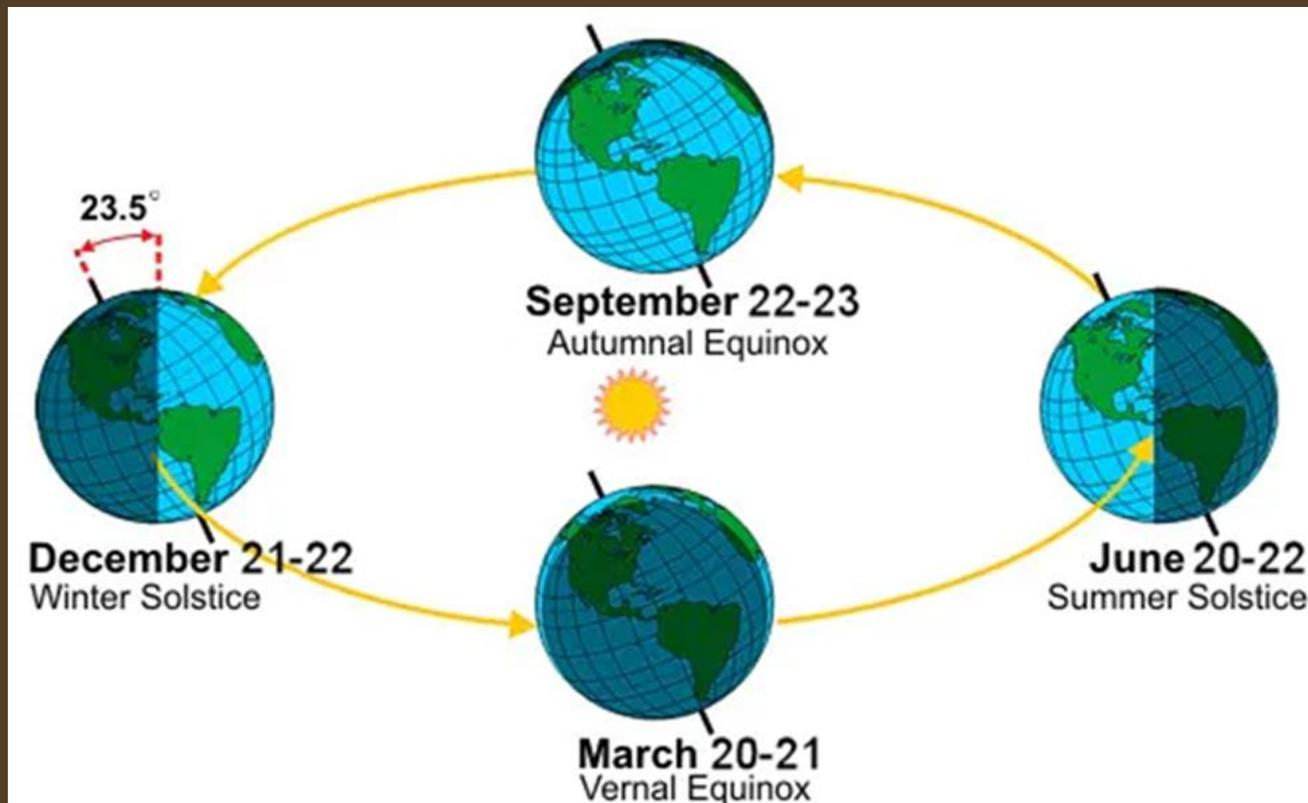
# Summer Solstice

- Eventually, the Earth crosses over to the other side of the sun, where the Northern Hemisphere leans toward the light. Days grow long, and weather warms. This is summer.
- The **summer solstice** is the day in the Northern Hemisphere when the North Pole is most tilted towards the sun.



# Equinox

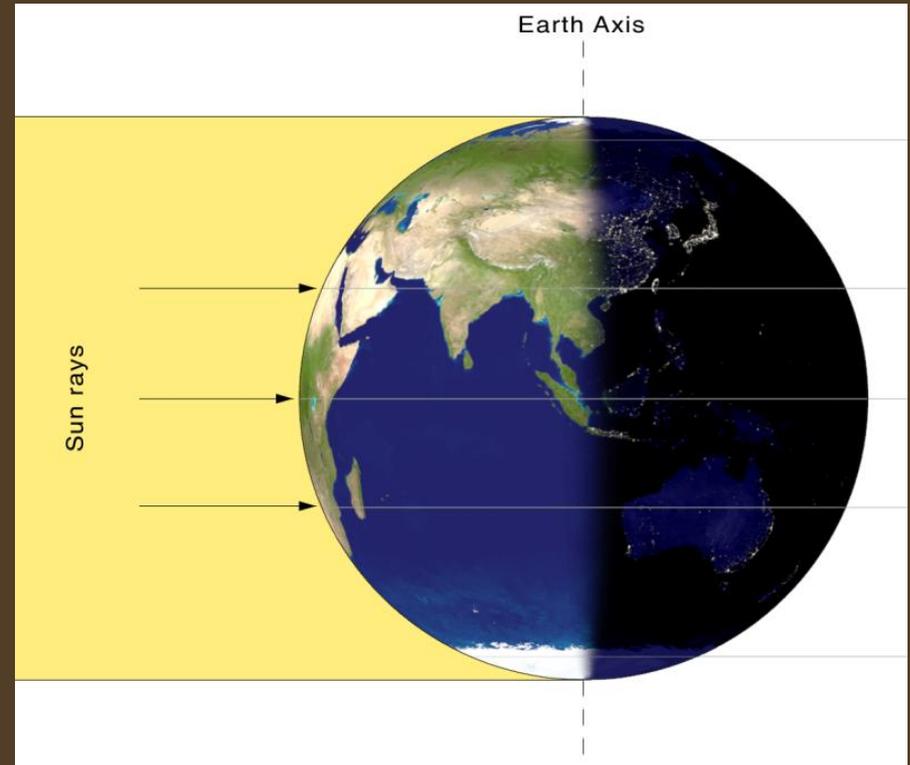
- Halfway between each solstice, daylight and night time are equal. This is called the **equinox**.
- There is one for spring (**vernal equinox**) and one for autumn (**autumnal equinox**).



# Equinox

[https://www.youtube.com/watch?v=WgHmqv\\_-UbQ](https://www.youtube.com/watch?v=WgHmqv_-UbQ)

- **Equinox literally means "equal night".**
- Sunlight strikes the earth most directly at the equator.
- **The vernal (spring) equinox occurs March 21.**
- The autumnal (fall) equinox occurs September 21.



# Life without seasons?

<https://www.youtube.com/watch?v=2-DWC2miVHE&t=138s>

