



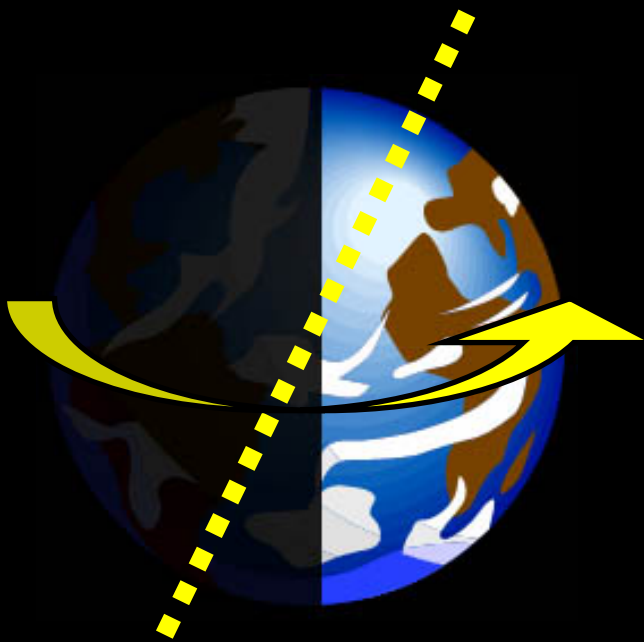
# **Astronomy**

## ***Earth In Space***

# Day and Night

Earth's rotation causes day and night.

Earth rotates on a tilted axis: an imaginary line running through the middle of it.



Earth rotates on its axis once every 24 hours, which is 1 day.

At any given time, half of Earth is in daylight, the other in night.

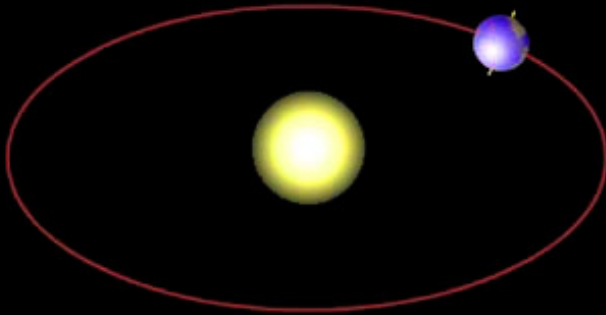
# Day and Night



# Earth's Orbit

Earth moves around the Sun.

This is called a revolution. Earth completes one revolution every year (365 ¼ days)



Earth's path around the Sun is called its orbit.

The shape of Earth's orbit is a stretched oval, called an ellipse.

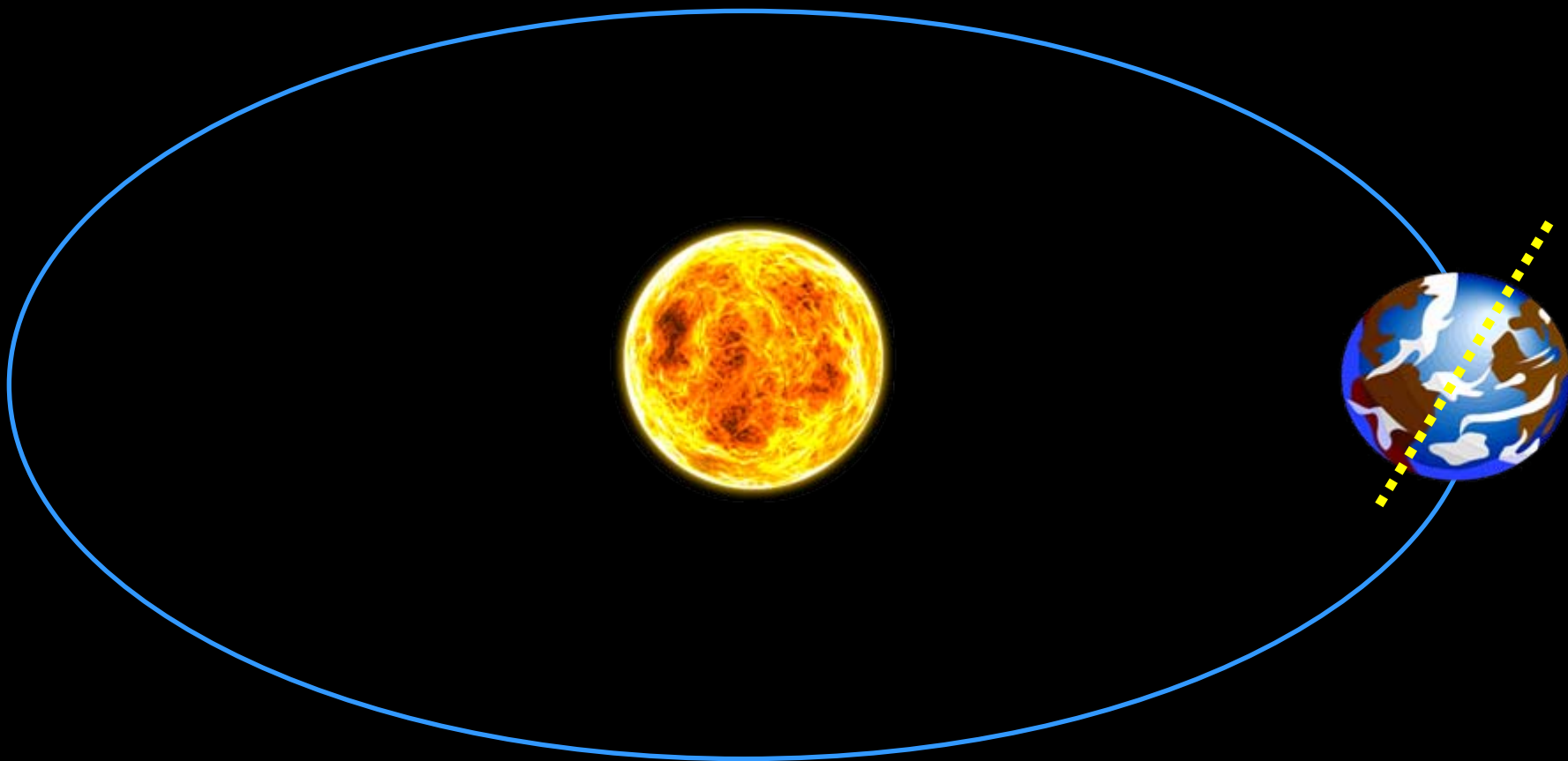
# Seasons

Earth's tilted axis causes the seasons.



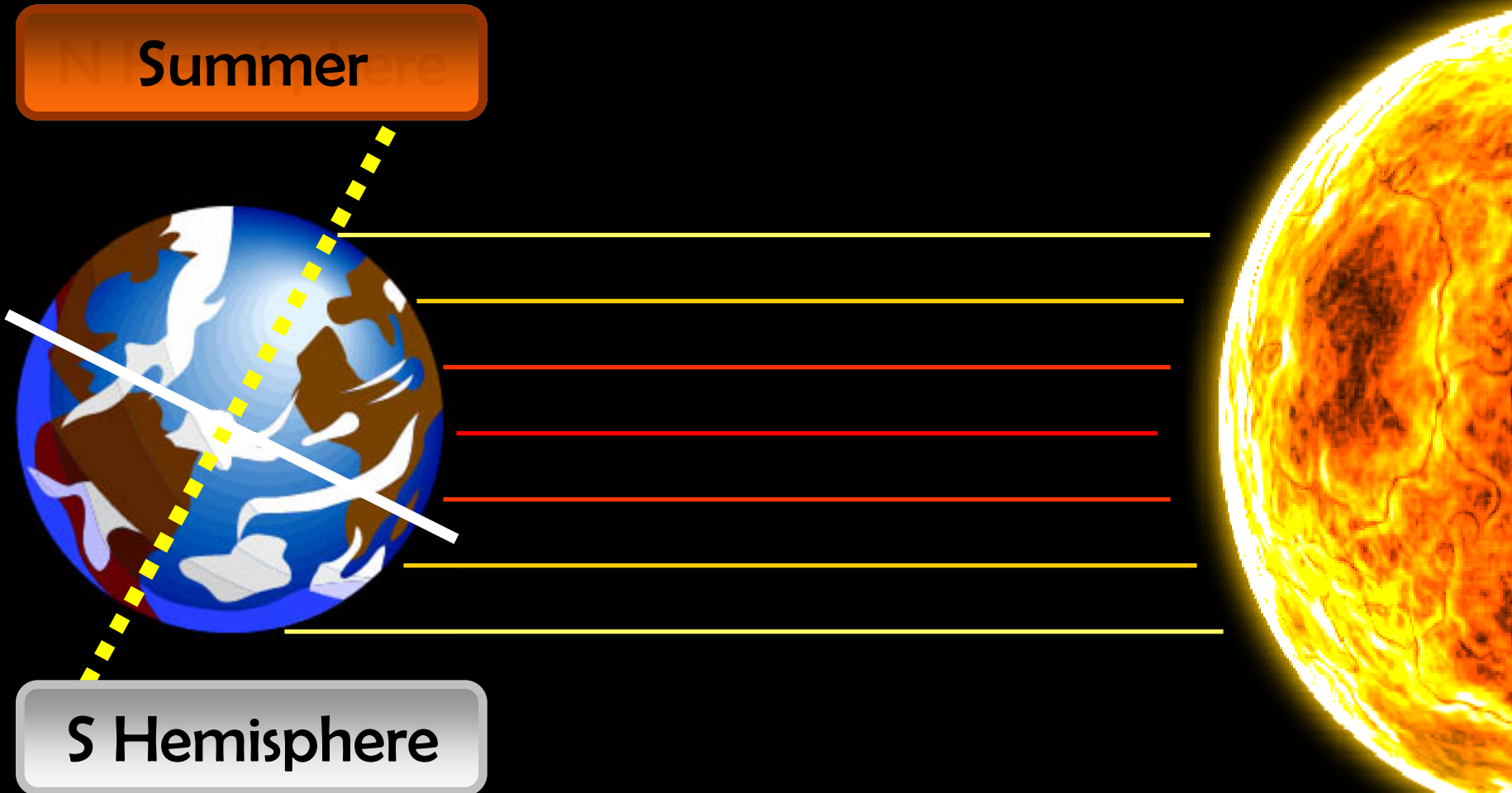
Earth's axis is tilted at an angle of 23.5°

Earth's axis always points in the **same direction** as it moves around the Sun



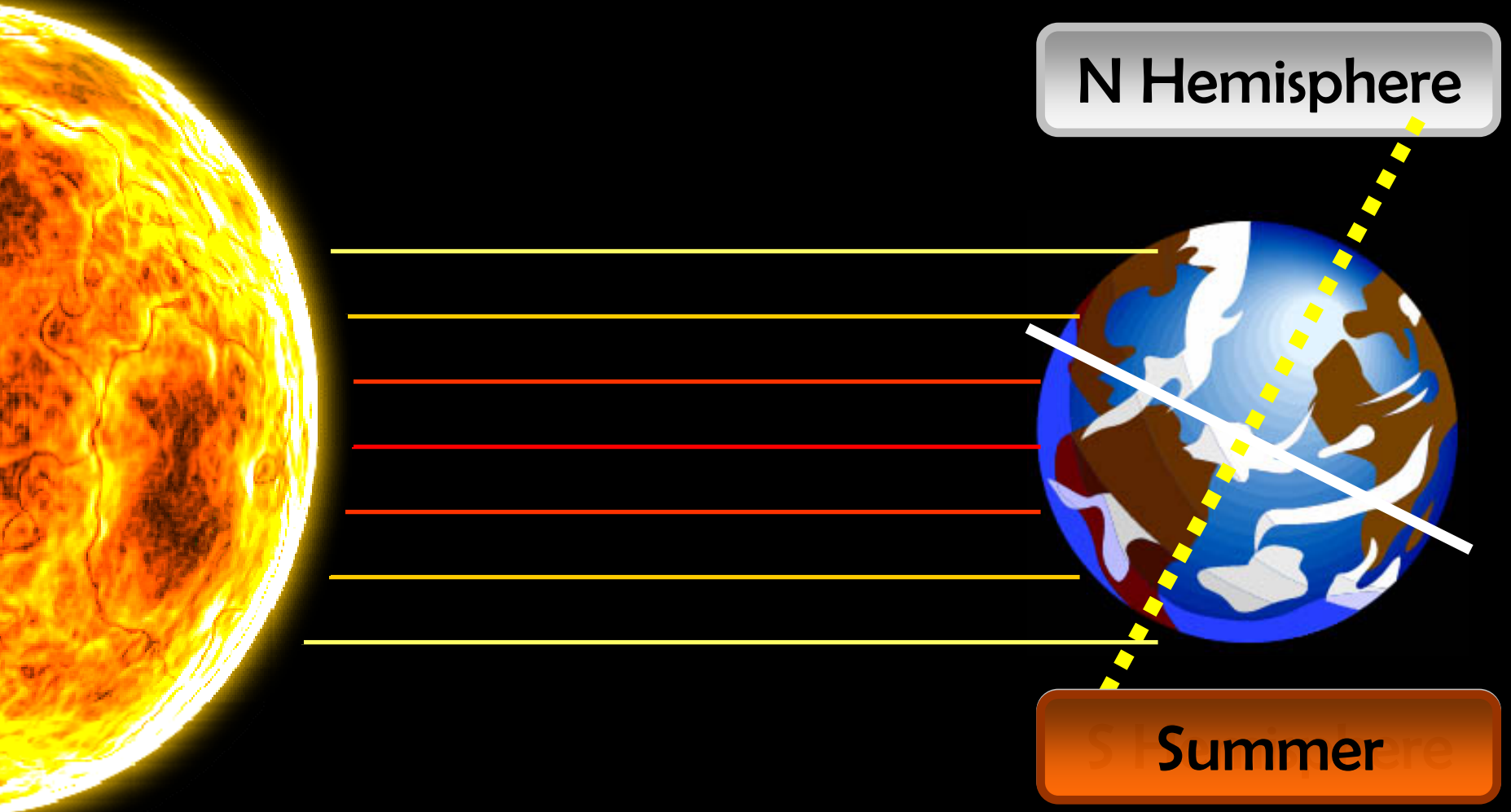
# Seasons

The tilt affects how much Sun each hemisphere gets.

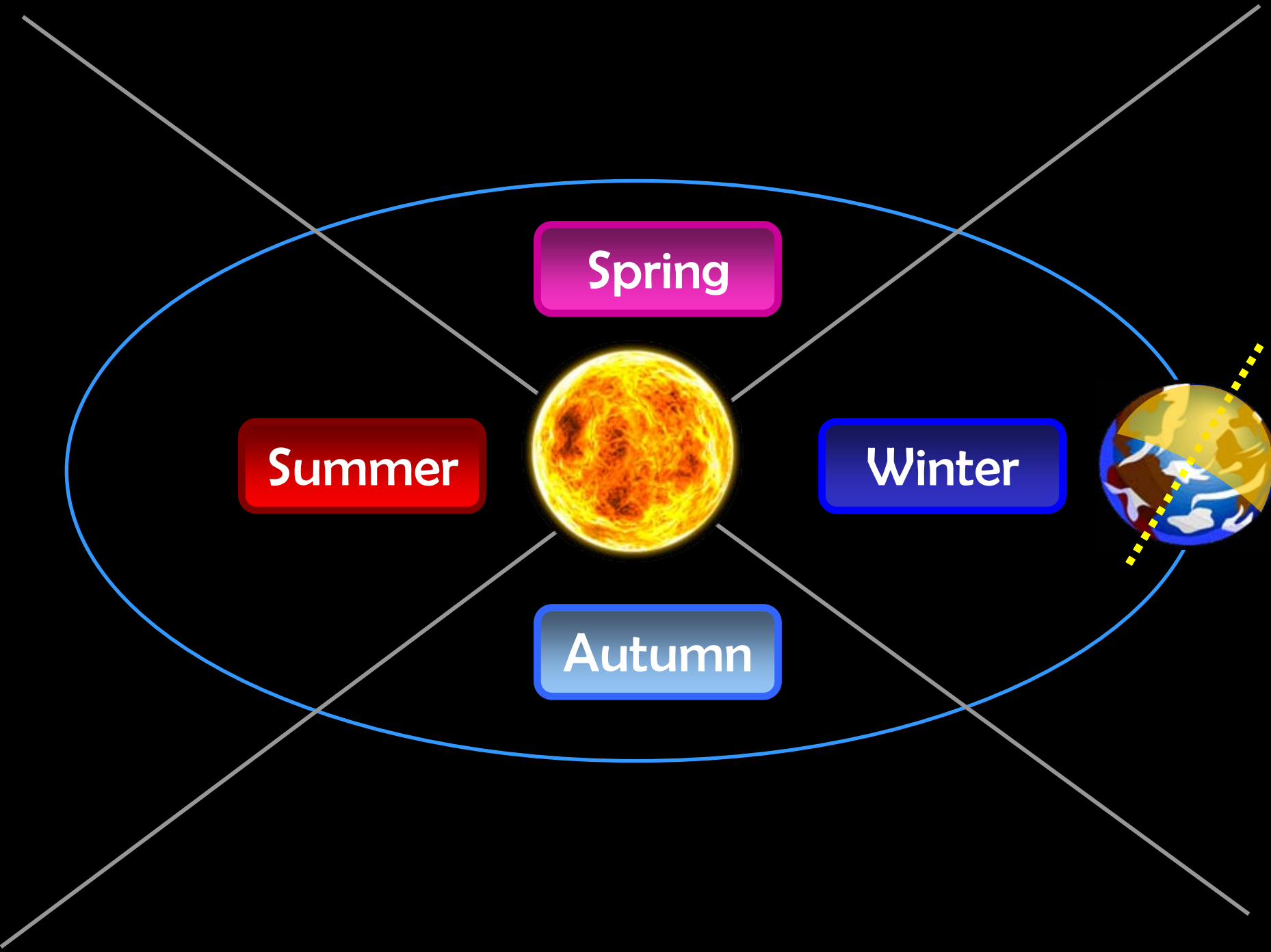


# Seasons

The tilt affects how much Sun each hemisphere gets.







Spring

Summer

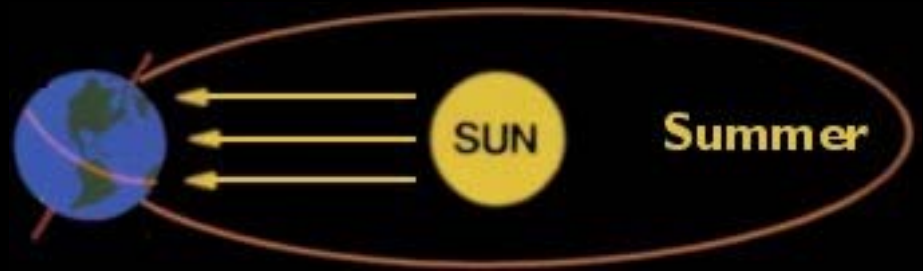
Winter

Autumn

# Seasons

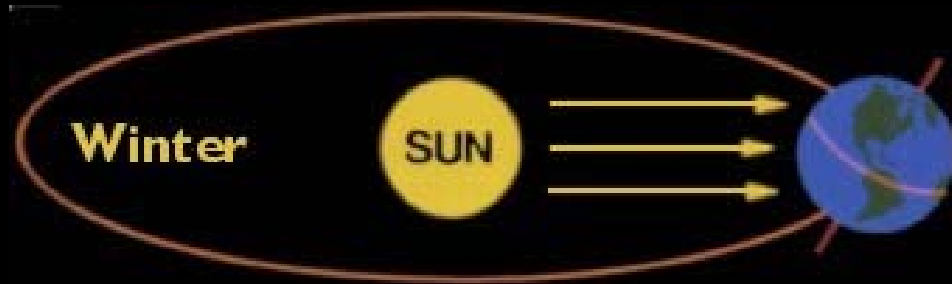
## Summer

N. Hemisphere points towards the Sun – most direct sunlight



## Winter

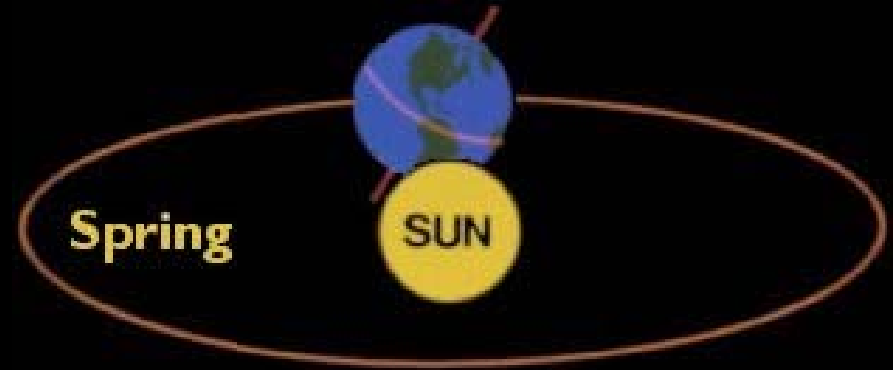
N. Hemisphere points away from the Sun – least direct sunlight



# Seasons

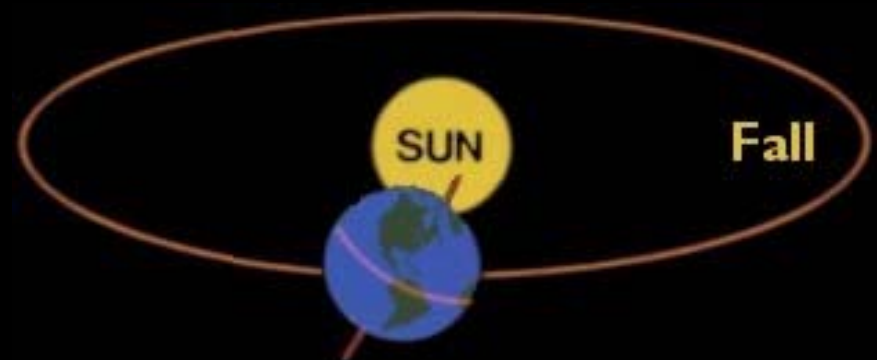
## Spring

N. And S. Hemispheres receive equal sunlight – days growing longer



## Fall

N. And S. Hemispheres receive equal sunlight – days growing shorter





# **Astronomy**

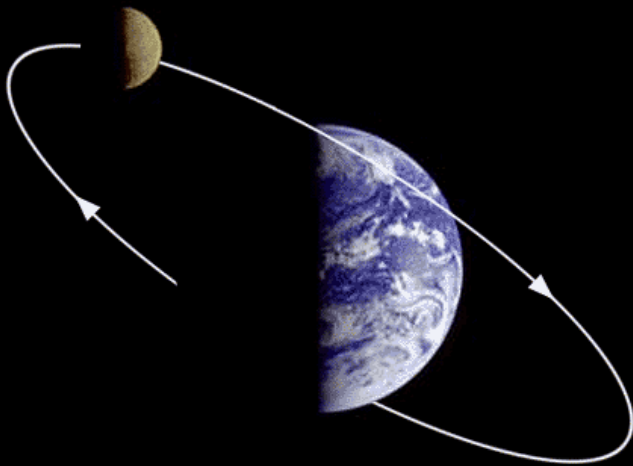
## ***The Moon***



# The Moon

The Moon is Earth's natural satellite.

The Moon revolves around Earth every 27.3 days.  
It rotates on its axis every 27.3 days, too!



This means that we always see the **same side** of the Moon.

We see the Moon because it **reflects light** from the Sun.

# The Moon



# Moon Phases

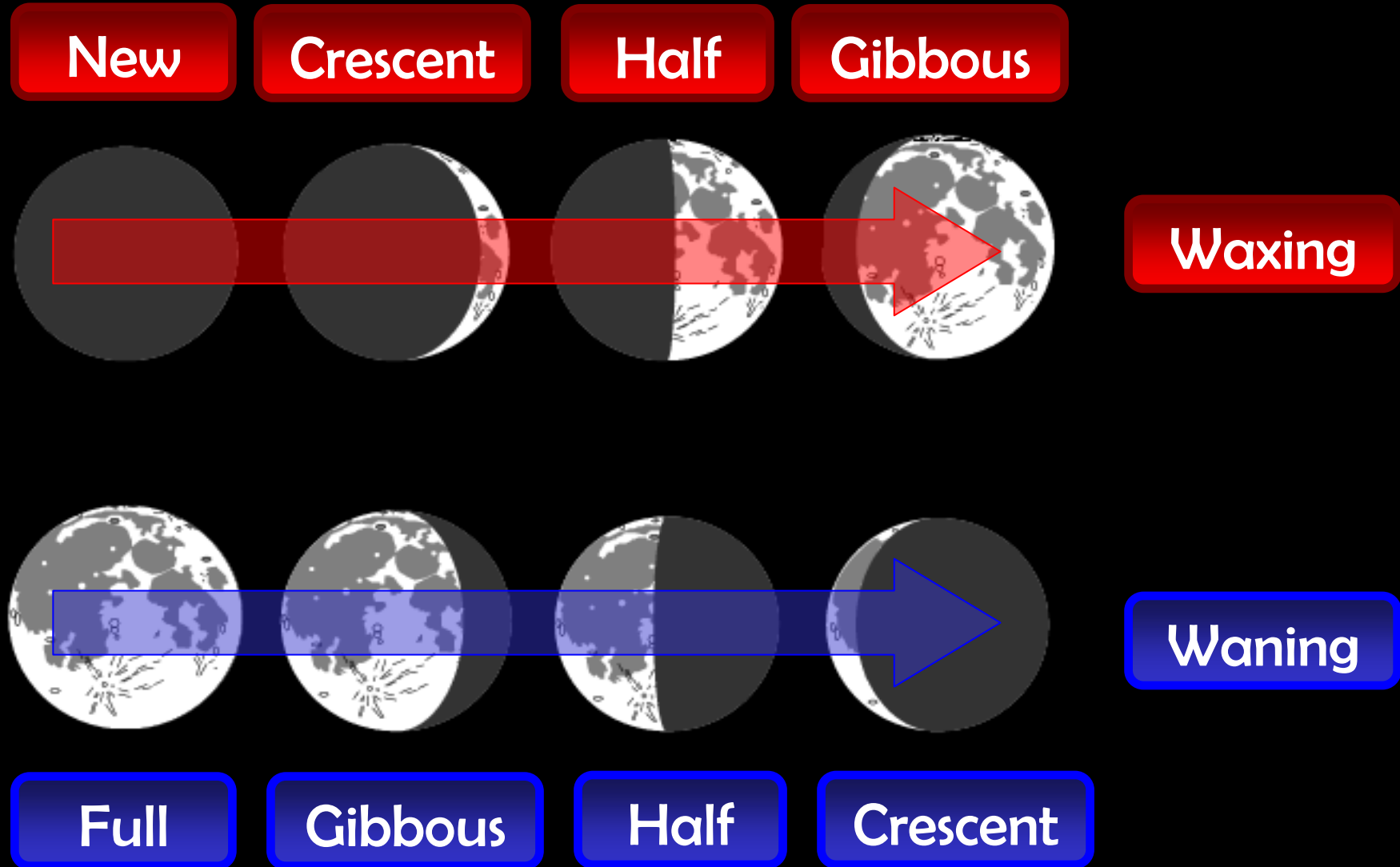
Each month, the Moon changes in appearance.

These changes are called phases of the Moon.

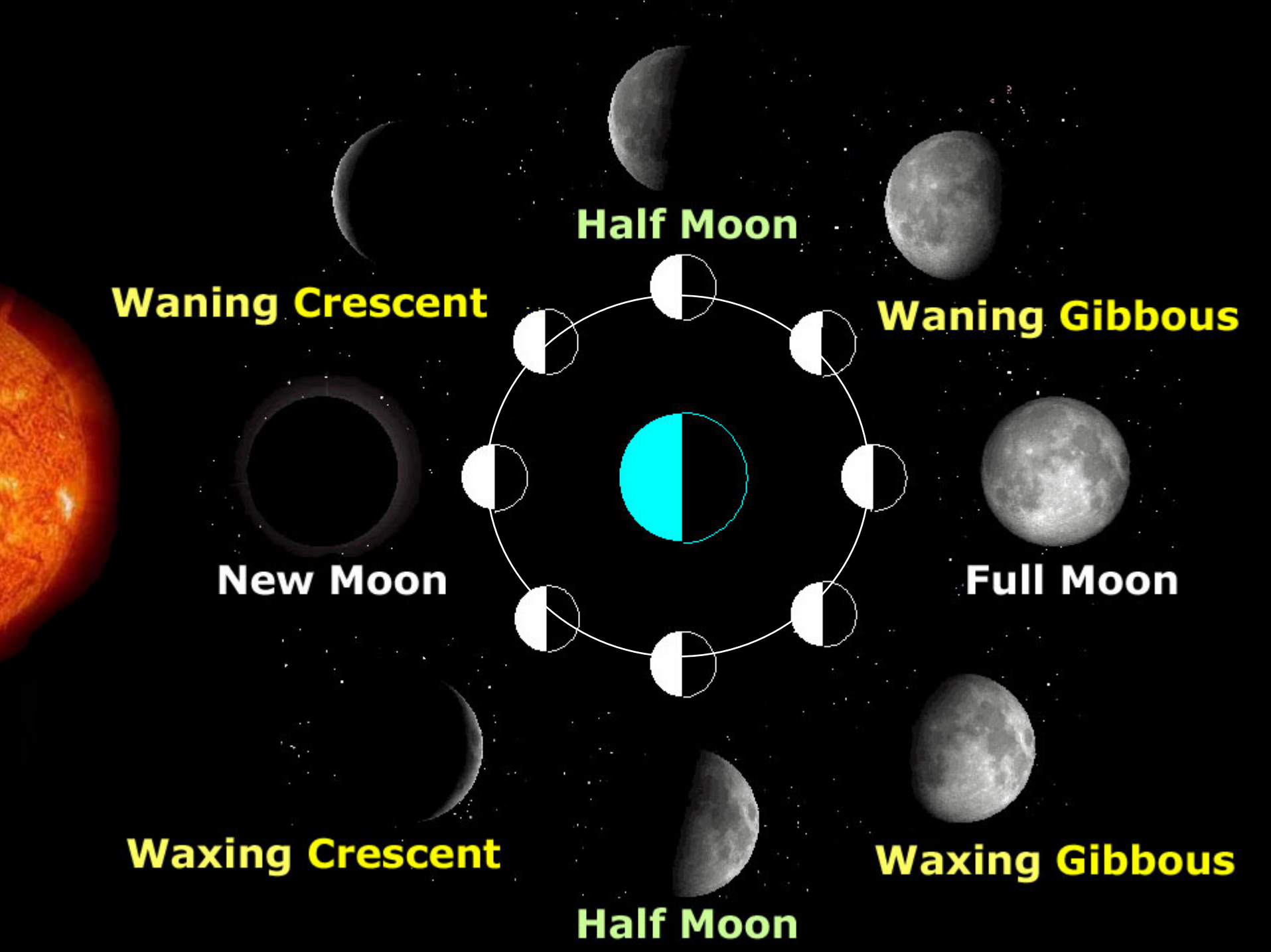
The phase of the Moon you see depends on how much of the **sunlit side** of the Moon faces us.



# Moon Phases







**Waning Crescent**

**Half Moon**

**Waning Gibbous**

**New Moon**

**Full Moon**

**Waxing Crescent**

**Half Moon**

**Waxing Gibbous**

# Eclipses

An eclipse is simply a shadow cast in space.

**An eclipse can occur in 2 ways:**

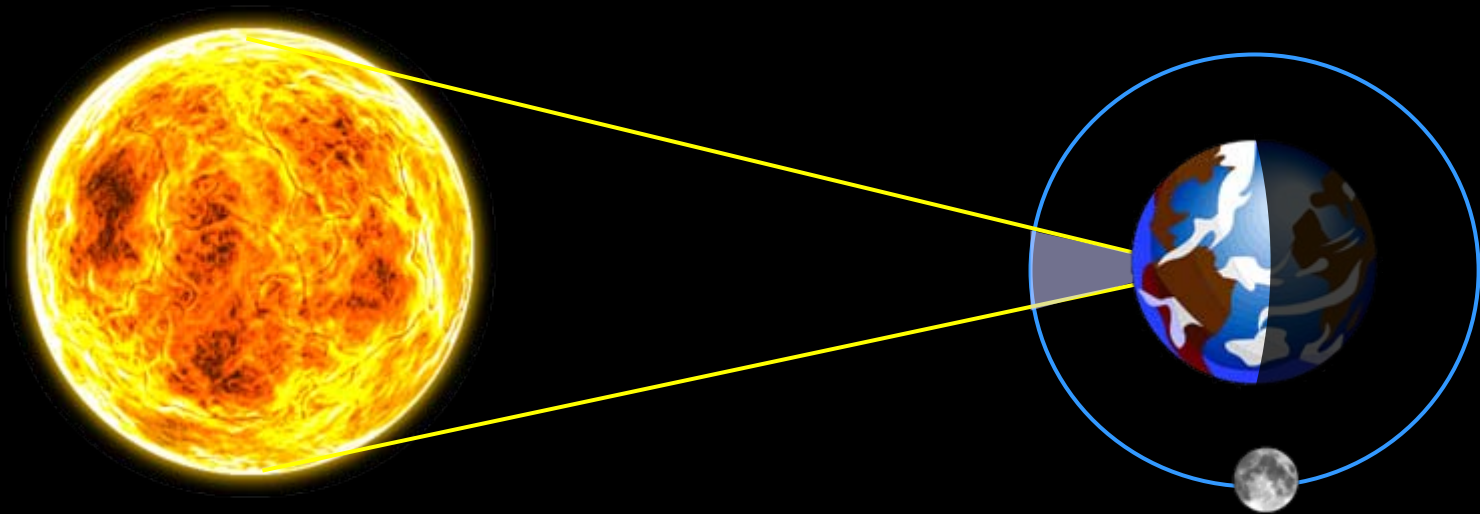
When the Moon's shadow hits the Earth.

When the Earth's shadow hits the Moon.



# Solar Eclipses

A solar eclipse occurs when the Moon comes in a direct line between the Sun and Earth.



# Solar Eclipses





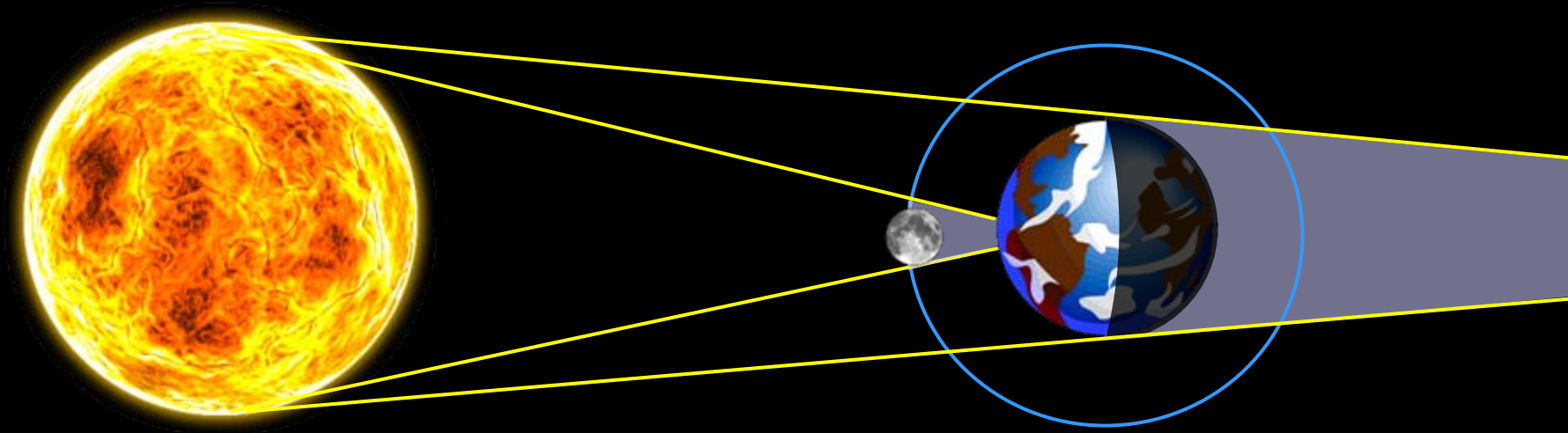
The image shows a view of Earth from space, with the shadow cast by the Earth onto the Moon. The shadow is divided into two regions: the umbra, which is the inner, darker part where the Sun is completely obscured, and the penumbra, which is the outer, lighter part where the Sun is partially obscured. The Earth's surface is visible, showing the continents of Africa and Europe, and the surrounding oceans. The background is the blackness of space with some stars visible.

**Penumbra**

**Umbra**

# Lunar Eclipses

An lunar eclipse occurs when the Earth comes in a direct line between the Sun and the Moon.



# Lunar Eclipses



# Tides

The Moon also creates tides on Earth.

Tides are the regular rise and fall of the ocean's water every 12.5 hours or so.

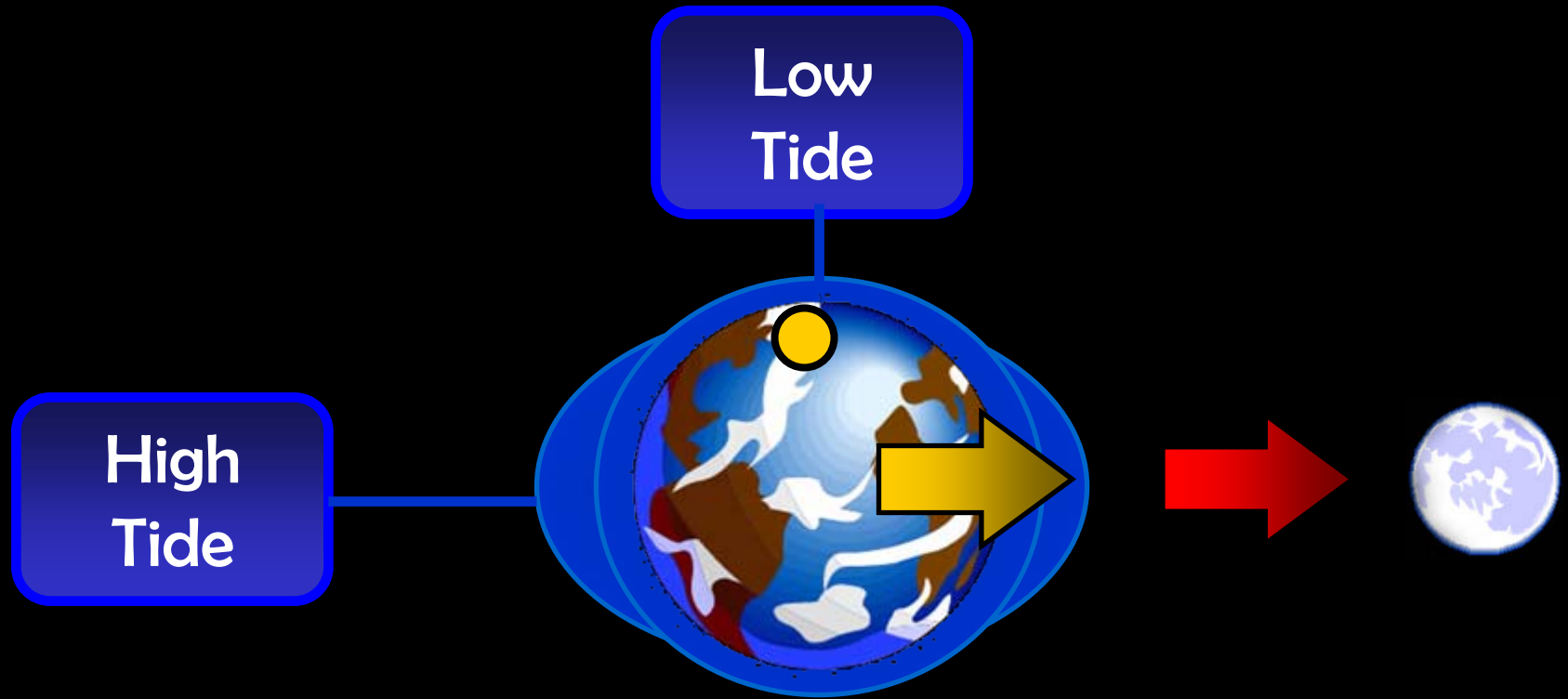
As the Earth rotates, the Moon's gravity pulls on water on the side of the Earth closest to it.

The Moon's gravity pulls least on the side furthest away.





# Tides

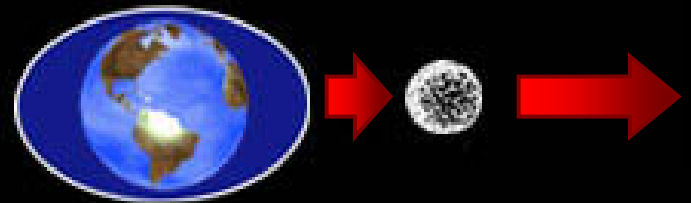


# Spring and Neap Tides

Twice a month, the Moon, Earth and the Sun are all in a straight line.

The combined forces of gravity of the Moon AND the Sun produce a very high tide

This is called a Spring Tide



# Spring and Neap Tides

And twice a month, the opposite is true.

The gravity of the Moon is at right angles to the Sun's gravity, producing a very low tide

This is called a Neap Tide





**Any Questions?**