

# PROCESS OF NATURE, SOLAR AND LUNAR ECLIPSE, DAY AND NIGHT AND THEIR Variation

The words nature and natural are used for all the things that are normally not made by humans. Things like weather, organisms, landforms, celestial bodies and much more are part of nature. Scientists study the way the parts of nature work. ... Nature is often seen by humans as natural resources.

Natural processes are interactions among plants, animals, and the environment. These interactions, which include photosynthesis , pollination, decomposition , and others, help create and shape natural communities. Examples of natural processes:

- \*energy flow and nutrient cycles

(photosynthesis, food webs, decomposition webs)

- \*sediment transport and soil formation.

\*The water cycle.

\*reproduction mechanisms.

## .....WHAT ARE ECLIPSES.....?

Eclipses and transits are astronomical events where a celestial body partially or totally covers another celestial object.

\_\_\_\_\_TYPE OF ECLIPSE\_\_\_\_\_ From Earth, we can see 2 types of eclipses: eclipses of the Sun (solar eclipses), and eclipses of the Moon (lunar eclipses). These occur when the Sun, Earth, and the Moon align in a straight or almost straight configuration. Astronomers call this a syzygy, from the ancient Greek word syzygia, meaning to be yoked together or conjoined.

The term eclipse also finds its roots in ancient Greek – it comes from the word *ékleipsis*, meaning to fail or to abandon.

Eclipses, solar and lunar, have fascinated scientists and lay people for centuries. In ancient times, eclipses were seen as phenomena to be feared – many cultures came up with stories and myths to explain the temporary darkening of the Sun or the Moon. In recent centuries, eclipses have been sought after by scientists and astronomers who use the events to study and examine our natural world.

## \_\_\_\_SOLAR ECLIPSE\_\_\_\_



Solar eclipses can only occur during a New Moon when the Moon moves between Earth and the Sun and the 3 celestial bodies form a straight line: Earth–Moon–Sun.

There are 3 kinds of solar eclipses: total, partial, and annular. There is also a rare hybrid that is a combination of an annular and a total eclipse.

#### .....TOTAL SOLAR ECLIPSES.....

A total solar eclipse occurs when the Moon completely covers the Sun, as seen from Earth. Totality during such an eclipse can only be seen from a limited area, shaped like a narrow belt, usually about 160 km (100 mi) wide and 16,000 km (10,000 mi) long. Areas outside this track may be able to see a partial eclipse of the Sun.

Looking at a solar eclipse without any protective eyewear can severely harm your eyes. The only way to safely watch a solar eclipse is to wear protective eclipse glasses or to project an image of the eclipsed Sun using a DIY Pinhole Projector

#### .....PARTIAL SOLAR ECLIPSES.....

A partial solar eclipse happens when the Moon only partially covers the disk of the Sun.

#### .....ANNULAR SOLAR ECLIPSES.....

An annular solar eclipse occurs when the Moon appears smaller than the Sun as it passes centrally across the solar disk and a bright ring, or annulus, of sunlight remains visible during the eclipse.

.....HYBRID SOLAR ECLIPSES..... A hybrid solar eclipse is a rare form of solar eclipse, which changes from an annular to a total solar eclipse, and vice versa, along its axis

## \_\_\_\_LUNAR ECLIPSES\_\_\_\_

The Moon does not have its own light. It shines because its surface reflects the Sun's rays. A lunar eclipse occurs when Earth comes between the Sun and the Moon and blocks the Sun's rays from directly reaching the Moon. Lunar eclipses only happen at Full Moon.

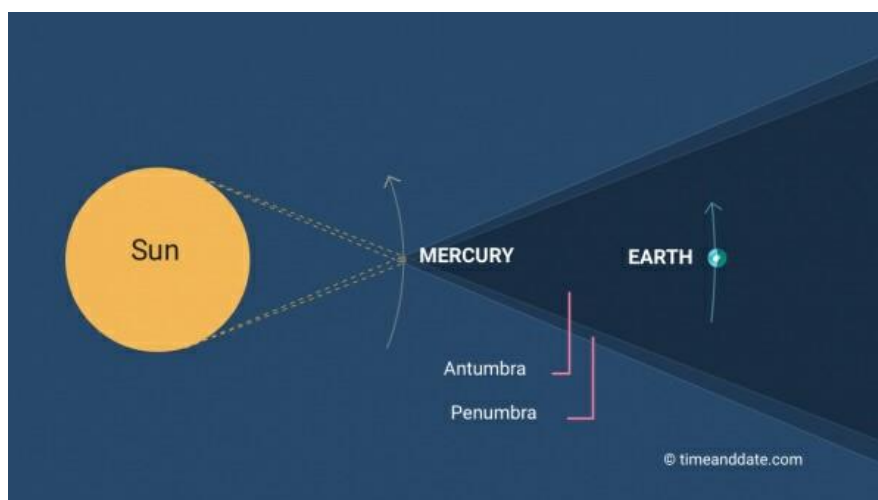


There are 3 kinds of lunar eclipses:  
total, partial, and penumbral.

....PARTIAL LUNAR ECLIPSE.... A partial lunar eclipse can be observed when only part of the Moon's surface is obscured by Earth's umbra.

. ....PENUMBRAL LUNAR Eclipses....

A penumbral lunar eclipse happens when the Moon travels through the faint penumbral portion of Earth's shadow.....



\_\_\_ DAY & NIGHT AND THEIR VARIATIONS \_\_\_

The change between day and night is caused by

the rotation of the Earth on its axis. If the Earth did not rotate as it does, the day/night cycle would be very different or possibly even nonexistent. The changing lengths of days and nights depends on where you are on Earth and the time of year. Also, daylight hours are affected by the tilt of the Earth's axis and its path around the sun.



.....LENGTH PFR A ROTATION..... A solar day, 24 hours, is the time it takes for the Earth to rotate exactly once so that the sun appears at the same place in the sky the next day. However, the Earth is also moving around the sun, and this movement makes measuring the day somewhat complicated.

The actual time of one Earth rotation is a little shorter – about 23 hours and 56 minutes.

Astronomers discovered this by observing the

time it took for a star to appear in the same place in the sky the following day, and they called this a sidereal day.

.....LONGER A SHORTER DAYS..... Although a solar day is 24 hours, not every day has 12 hours of daylight and 12 hours of night. Daytime is shorter in winter than in summer. This is because the Earth's imaginary axis isn't straight up and down, it is tilted 23.5 degrees. As the Earth moves around the sun during a year, the northern half of the Earth is tilted towards the sun in the summer, making daytime longer than night. In winter, this reverses; the earth tilts away from the sun and nighttime becomes longer. In the spring and fall, the tilt is neither toward or away from the sun but somewhere between, so day and night are more the same at these times of the year.

.....THE SOLSTICES.....

The solstices are the positions of the Earth's orbit that mark the longest and shortest days of the



year. The winter solstice in the Northern Hemisphere is the shortest day, after which daylight hours grow longer. The summer solstice in the Northern Hemisphere falls on the longest day, after which daylight hours become shorter. The solstices can also be named for the month in which they occur. For example, the June solstice is the point in the Earth's orbit where the North Pole faces the sun. In the Northern Hemisphere, the June solstice is the longest day of the year. In the Southern Hemisphere, the June solstice is the shortest day of the year.

#### .....POSITION ON EARTH.....

Your place on the Earth relative to the equator also affects the number of daylight hours you get in a solar day. For example, during summer in the Northern Hemisphere, daylight hours increase the farther north you go; at this time, the Arctic gets very little nighttime darkness. In the winter, daytime is shorter the farther north you go. The seasonal changes in daylight hours are small near

the equator and more extreme close to the poles.