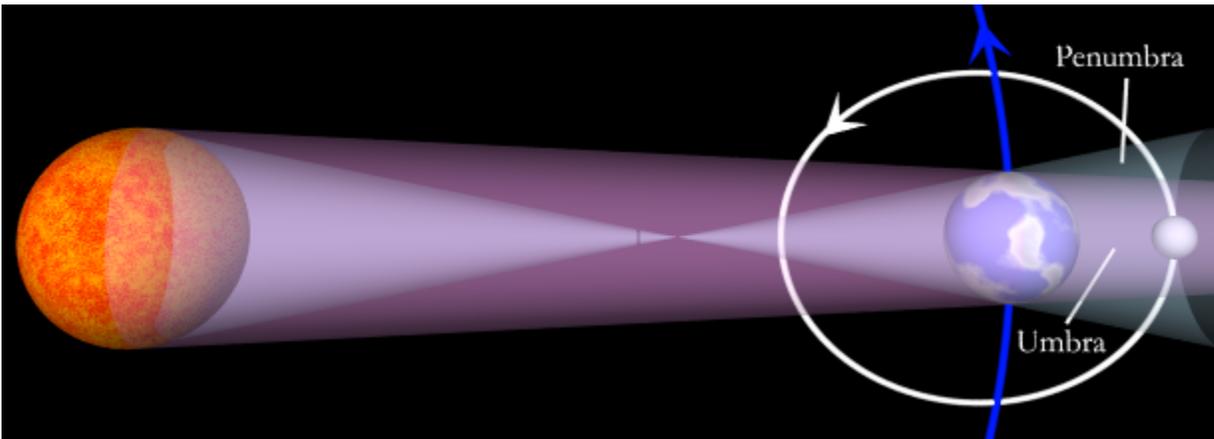


Lunar Eclipse

A *lunar eclipse* happens at a Full Moon. The Earth orbits around the Sun and Moon around the earth, so when the Earth comes between Moon and the Sun then Moon passes through the Earth's shadow, it is called a Lunar Eclipse. As most of us know that Moon is not self illuminated but it reflects Sunlight falling on it. During Lunar Eclipse light coming from the Sun is blocked by the Earth, and directly it does not reach up the Moon so, moon's brightness, reduced very much. Moon's brightness is not totally vanished because, some indirect light from earth's atmosphere reaches up to the Moon so it remains visible up to some extent.. Following diagram may explain this phenomena:

Lunar Eclipse Geometry

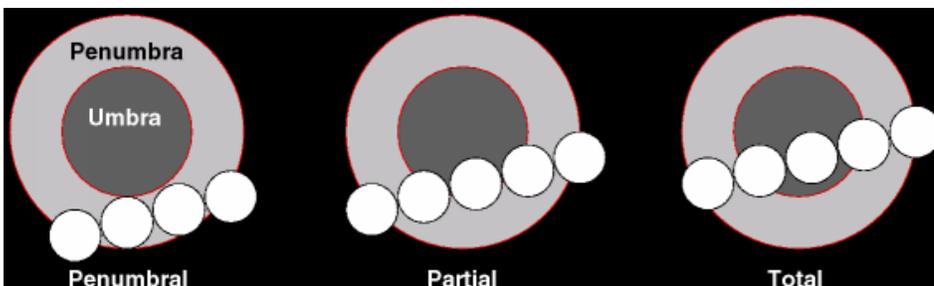


Shadow Zones:

The shadow cast by the Earth has two parts:

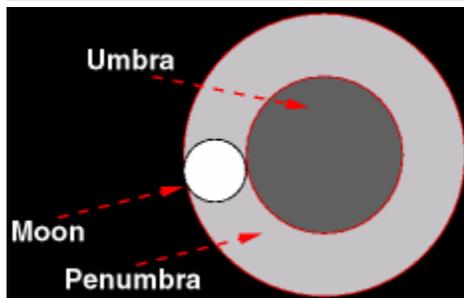
- In the **penumbra**, the light from the Sun is partly blocked by the Earth, but not completely, When the Moon passes through the penumbra we see it dimming due to the reduced light, although in practice this can be hard to see with the eye.
- In the **umbra**, the light from the Sun is completely blocked by the Earth, we see the Moon darkened, but glowing a dull red from light scattered by the Earth's atmosphere.

As seen from the Earth, the penumbra and umbra form 2 concentric circles, through which the Moon passes during an eclipse. The type of eclipse seen depends on how close the Moon passes to the center of the shadow, as shown here:



The diagrams below illustrate how this works during the different types of a lunar eclipse. As you can see above, a total eclipse is always preceded and followed by penumbral and partial stages; so the

descriptions below of the penumbral and partial eclipse apply to these stages of a total eclipse, too.



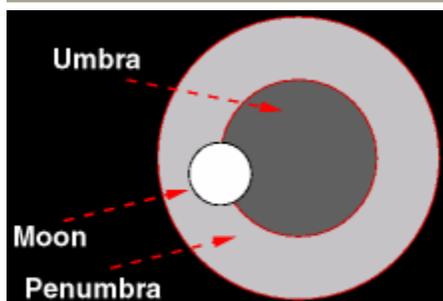
Penumbral Eclipse

In a **penumbral eclipse**, the Full Moon enters the Earth's penumbral shadow. The light from the Earth is partially blocked, and the Moon grows dimmer.



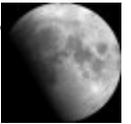
In principle, a penumbral eclipse can be a **partial penumbral eclipse** (with only part of the Moon in the penumbra) or a **total penumbral eclipse**, where the entire Moon is in the penumbra; however, most penumbral eclipses are partial, since the penumbral shadow of the Earth is only about as wide as the Moon, so it's rare for the Moon to fit entirely within the penumbra without entering the umbra (and hence making a partial umbral eclipse). Once in a while, though, it happens -- about 1.2% of all lunar eclipses are total penumbral eclipses.

Most penumbral eclipses are pretty uninteresting, since the Moon is still quite brightly lit, except in the most advanced stages. Still, in a deep penumbral eclipse, sharp-eyed observers should see a subtle but distinct shading across the Moon at maximum eclipse. This will be quite obvious in a total penumbral eclipse

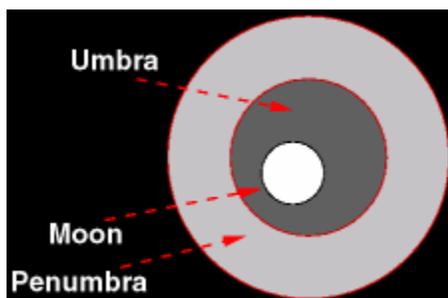


Partial Eclipse

In a *partial lunar eclipse*, part of the Moon is within the Earth's umbral shadow. From the Earth, we see the Moon partially in shadow, almost as if it wasn't full.



In the later stages of a partial eclipse, as the Moon darkens, red coloration may become visible on the shadowed side of the Moon,



Total Eclipse

A *total lunar eclipse* is when the Moon is completely shadowed by the Earth. The Moon passes through the Earth's umbra, and no direct light can reach it from the Sun. However, the Earth's atmosphere refracts -- or bends -- light, at the same time filtering it, so that it illuminates the Moon with a dark red colour. Depending on the prevailing condition of the Earth's atmosphere, in terms of cloud cover and dust from volcanic eruptions, the actual colour of the Moon at totality can vary from near black (particularly at mid-totality), to rust, brick red, or bright copper-red or even orange,



As with a solar eclipse, the distance between the Earth and the Moon depends on the position of the Moon within its elliptical orbit; however, due to the large size of the Earth's umbra, the only effect of this is upon the size of the umbra where the Moon passes through it, and therefore upon the duration of the total eclipse



Courtesy of hermit,org