

The Moon

- The moon surface reflects the sun's light
- Earth's Satellite (a body that orbits a larger body)
- Earth's gravitational pull keeps the moon in orbit around the Earth
- Sun's gravitational pull keeps the Earth-moon system in orbit around the Sun
- Moon is approximately 383,000 km away from the Earth (100x's the distance between LA and NY)
- The moon takes 27.3 days to orbit Earth once causing the lunar phases

Lunar Phases

- As moon revolves around Earth, the portion of the moon that reflects sunlight back to Earth changes, causing the moon to appear differently at times

1. New Moon – all 3 lined up so near side of moon is unlit

2. Waxing – begin to see sunlight as it orbits (right side)

➤ Crescent -- becomes thicker as the moon waxes (grows)

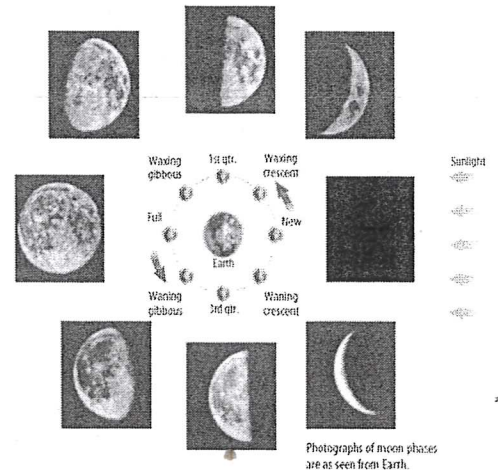
➤ Gibbous – near side is more than half lit

3. Full – when the moon is halfway through its cycle, the entire near side is lit

4. Waning – amount of sunlight on near side is decreasing (left side)

➤ Gibbous– more than half of the moon is still lit but it seems to be shrinking

➤ Crescent– more and more of the moon seems to be shrinking until the moon is unlit and you have a new moon again (cycle starts over)

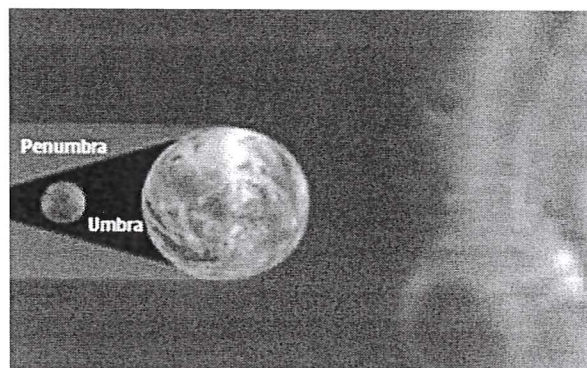


Eclipses

- An event when one Object in space casts a shadow onto another
- Lunar Eclipse – when the moon moves through Earth's shadow
- Solar Eclipse – when the moon is directly between the sun and Earth
 - Umbra: darkest part of a shadow
 - Penumbra: spreading cone of lighter shadow around the umbra

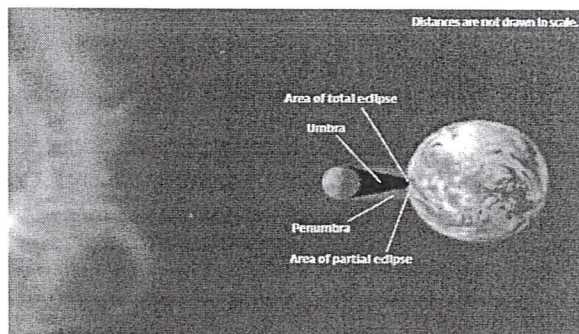
Lunar Eclipse

- Sun streaming past Earth produces a full moon.
- Then the moon moves into Earth's penumbra and becomes less bright.
- As the moon moves into the umbra, Earth's dark shadow begins to cover the moon.
- After an hour or so, the moon slowly moves back into the sunlight.



Solar Eclipse

- Moon is directly between sun and Earth and shadow of moon falls on a part of Earth
- Umbra of moon is too small to make a large shadow, so a total eclipse of the sun covers only a small part of Earth and only seen by people in that path
- Lasts about 1-2 minutes in any location
- Total eclipse happens every 1-2 years somewhere on Earth



Why don't we see solar and lunar eclipses every month??

- Moon's orbit around Earth is tilted (5 degrees) which is enough to keep the moon out of Earth's shadow for most full moons and Earth out of the moon's shadow for most new moons.