

Camp Eberhart Astronomy Program

AstroCamp Lunar Award

The Earth travels through space with a close companion, the Moon. Diana (also known as Luna, the Latin word for moon) was the Roman goddess of the Moon. She was the twin sister of Apollo, the Sun god.

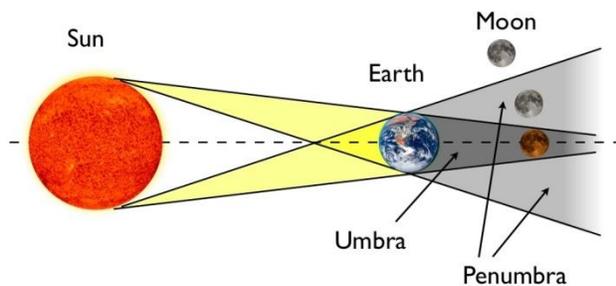
With a diameter of 2,155 miles (3,448 km), the Moon is more than 1/4 the size of Earth. The average distance from the Earth is 238,328 miles (381,325 km). If you could walk to the Moon it would take 11 years without stopping. Driving a car at 75mph would take almost 19 weeks (4.5 months) and flying at 500mph would take 20 days to reach the Moon. It's gravity is 1/6 of the Earth so a 100 pound person (45 kg) would weigh only 17 pounds (7.5kg) and it has no breathable atmosphere.

Just like the Earth revolves around the Sun in 365 1/4 days, the Moon orbits the Earth every 27 1/3 days. Since the Moon rotates on its axis in the same time, we only ever see the same side of the Moon from the Earth. The Moon is covered with a solid, rocky crust about 500 mi (800km) thick. Under the crust, scientists think there is a partially molten mantle and a small core of iron.

The major geographic features of the Moon are mountains, craters, rills (long narrow channels), and lava plains. These plains are called seas because that's what early astronomers thought they looked like through a telescope. The bright, light areas on the Moon's surface are called highlands. The tallest mountain on the Moon is over 2.5mi (4km) tall. The largest crater is 1,600mi (2,560km) across while the smallest is the size of a pinprick.

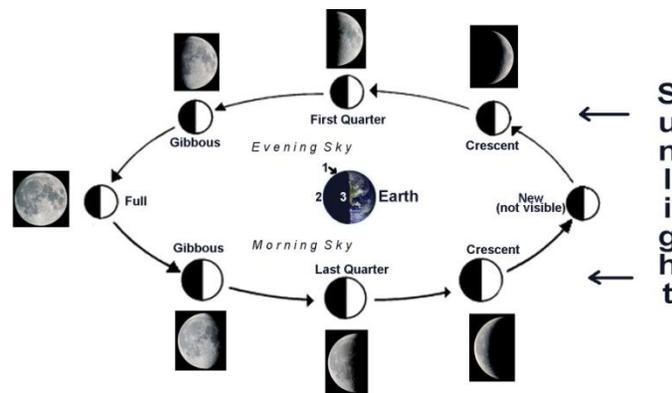
Lunar Eclipse

When the Moon's orbit puts it in a line with the Sun and the Earth, the light from the Sun is blocked from hitting what we should see as the full moon. The Earth eclipses the lunar light as it comes between the Sun and the Moon.



Phases of the Moon

The Moon orbits the Earth and reflects light from the Sun. This light is what allows us to see the Moon in the Sky. As the Moon orbits the Earth the pattern of light that reflects toward the Earth changes shape, these are called the **phases of the Moon**. The phases begin with a **New Moon**, when no moon is visible. The next phase is a **Crescent Moon**; it looks like a banana shape. The **Quarter Moon** shows half the face of the Moon, A **Gibbous Moon** shows 3/4 of the Moon's surface. A **Full Moon** means that you can see the full face of the Moon. The term for the Moon going from new phase to full phase is **waxing**; the return from full to new is called **waning**.



Tides

Ocean tides are caused by the gravitational pulls of the Moon and the Sun on the solid body of the Earth and its oceans. Because the Moon is so much closer to the Earth than the Sun, it has a very strong gravitational pull for its size. The Moon pulls strongest on the water directly beneath it on the Earth's surface because it is closest, causing a tidal bulge. The Earth, being a little farther from the Moon, is pulled less. The water on the far side of the Earth is pulled least and is left behind, causing another tidal bulge on the far side of the Earth. A **Neap Tide** occurs when the Sun and the Moon are at right angles to the Earth during first and last quarter phase. During a Neap tide the Sun's and Moon's gravity works against each other causing smaller tides. When the Sun and Moon are in line with the Earth, as during a New and Full moons, their gravity combines causing a larger **Spring Tide**.

