

## Fun Facts About the Moon

**Size:** With a diameter of 2,159 miles (3,475 kilometers), the Moon is just 1/4 the size of Earth.

**Distance from Earth:** The Moon's average distance from Earth is 238,000 miles (383,500 km).

**Orbit around Earth:** It takes the Moon 27.3 Earth days to revolve around our planet one time.

**Rotation:** The Moon spins on its axis once every 27.3 Earth days.

**Surface:** The Moon's surface is covered with craters, mountain ranges, rilles (long narrow channels), and lava plains. The vast, dark regions we see on the Moon's surface are called maria, or seas. They are actually very large, smooth lava beds. The bright, light areas on the Moon's surface are called highlands.

The Moon is covered with a solid, rocky crust about 500 miles (800 km) thick. Underneath the crust, scientists think there is a partially molten zone that leads to a small core of iron. Craters on the Moon come in a wide variety of sizes. The largest crater measures 1,600 miles (2,575 km) across, while the smallest is the size of a pinprick.

**Atmosphere:** The Moon has no long-lasting, significant atmosphere, so the footprints left by Apollo astronauts will last a long time.

**Temperature:** The mean daytime temperature is 225°F (107°C), while the mean nighttime temperature is -243° (-153° C).

**Escape velocity:** To escape the Moon's gravity, you need to travel 5,200 miles (8,400 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity. Earth's gravity is six times greater than the Moon's.

**Other information:** Roughly 842 pounds (382 kilograms) of Moon rock and soil were brought back to Earth aboard the Apollo spacecraft.

## Brief Explanation of the Moon Phases

The Sun always illuminates the half of the Moon facing the Sun (except during lunar eclipses, when the Moon passes through the Earth's shadow). When the Sun and Moon are on opposite sides of the Earth, the Moon appears "full" to us, a bright, round disk. When the Moon is between the Earth and the Sun, it appears dark, a "new" Moon. In between, the moon's illuminated surface appears to grow (wax) to full, then decreases (waning) to the next new Moon. The edge of the shadow (the terminator) is always curved, being an oblique view of a circle, giving the Moon its familiar crescent shape.



New Moon

Waxing Crescent

First Quarter

Waxing Gibbous

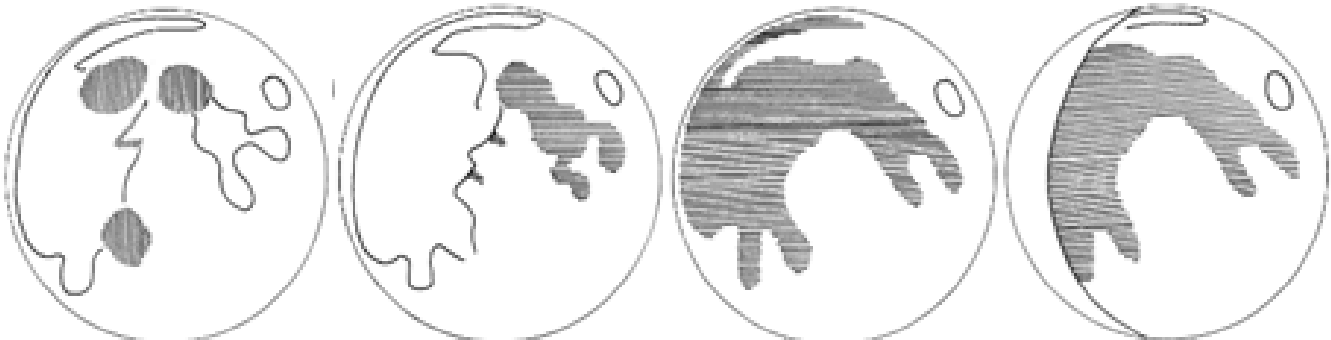
Full Moon

Waning Gibbous

Last Quarter

Waning Crescent

## Have you seen these lunar features?



Man in the Moon.

Woman in the Moon

Rabbit in the Moon

Cow Jumps over Moon

## Cool Lunar Facts

**NUMBER 1 Bye-bye Moon**-As you read this, the Moon is moving away from us. Each year, the Moon steals some of Earth's rotational energy, and uses it to propel itself about 3.8 centimeters higher in its orbit. Researchers say that when it formed, the Moon was about 14,000 miles (22,530 kilometers) from Earth. It's now more than 280,000 miles, or 450,000 kilometers away.

**NUMBER 2 Ocean tug**-Tides on Earth are caused mostly by the Moon, the Sun to a lesser degree.

The Moon's gravity pulls on Earth's oceans. High tide aligns with the Moon as Earth spins underneath. Another high tide occurs on the opposite side of the planet because gravity pulls Earth toward the Moon more than it pulls the water.

At full Moon and new Moon, the Sun, Earth and Moon are lined up, producing the higher than normal tides (called *spring tides*, for the way they spring up). When the Moon is at first or last quarter, smaller *neap tides* form. The Moon's 29.5-day orbit around Earth is not quite circular. When the Moon is closest to Earth (called its perigee), spring tides are even higher, and called perigean spring tides.

All this tugging has another interesting effect: Some of Earth's rotational energy is stolen by the Moon, causing our planet to slow down by about 1.5 milliseconds every century.

**NUMBER 3 The Moon is a planet?**-Our Moon is bigger than Pluto. And at roughly one-fourth the diameter of Earth, some scientists think the Moon is more like a planet. They refer to the Earth-Moon system as a "double planet." Pluto and its moon Charon are also called a dwarf double-planet system by some.

**NUMBER 4 Moonquakes**-Apollo astronauts used seismometers during their visits to the Moon and discovered that the gray orb isn't a totally dead place, geologically speaking. Small moonquakes, originating several miles (kilometers) below the surface, are thought to be caused by the gravitational pull of Earth. Sometimes tiny fractures appear at the surface, and gas escapes.

Scientists say they think the Moon probably has a core that is hot and perhaps partially molten, as is Earth's core. But data from NASA's Lunar Prospector spacecraft showed in 1999 that the Moon's core is small -- probably between 2 percent and 4 percent of its mass. This is tiny compared with Earth, in which the iron core makes up about 30 percent of the planet's mass.

**NUMBER 5 Egghead**-The Moon is not round (or spherical). Instead, it's shaped like an egg. If you go outside and look up, one of the small ends is pointing right at you. And the Moon's center of mass is not at the geometric center of the satellite; it's about 1.2 miles (2 kilometers) off-center.

**NUMBER 6 Sister moons**-The Moon is Earth's only natural satellite. Right? Maybe not. In 1999, scientists found that a 3-mile- (5-kilometer-) wide asteroid may be caught in Earth's gravitational grip, thereby becoming a satellite of our planet.

Cruithne, as it is called, takes 770 years to complete a horseshoe-shaped orbit around Earth, the scientists say, and it will remain in a suspended state around Earth for at least 5,000 years.

**NUMBER 7 Punching bag**-The Moon's heavily cratered surface is the result of intense pummeling by space rocks between 4.1 billion and 3.8 billion years ago.

The scars of this war, seen as craters, have not eroded much for two main reasons: The Moon is not geologically very active, so earthquakes, volcanoes and mountain-building don't destroy the landscape as they do on Earth; and with virtually no atmosphere there is no wind or rain, so very little surface erosion occurs.

**NUMBER 8 Moon trees**-More than 400 trees on Earth came from the Moon. Well, okay: They came from lunar orbit. Okay, the truth: In 1971, Apollo 14 astronaut Stuart Roosa took a bunch of seeds with him and, while Alan Shepard and Edgar Mitchell were busy sauntering around on the surface, Roosa guarded his seeds.

Later, the seeds were germinated on Earth, planted at various sites around the country, and came to be called the Moon trees. Most of them are doing just fine.

**NUMBER 9 Locked in orbit**-Perhaps the coolest thing about the Moon is that it always shows us the same face. Since both the Earth and Moon are rotating *and* orbiting, how can this be?

Long ago, the Earth's gravitational effects slowed the Moon's rotation about its axis. Once the Moon's rotation slowed enough to match its orbital period (the time it takes the Moon to go around Earth) the effect stabilized. Many of the moons around other planets behave similarly.

**NUMBER 10 Making of the Moon**-The Moon was created when a rock the size of Mars slammed into Earth, shortly after the solar system began forming about 4.5 billion years ago, according to the leading theory.

**NUMBER 11 Eclipses**- A lunar eclipse happens when the Full Moon enters the shadow of the Earth. The Moon's orbit is slightly inclined to the orbit of the Earth so this doesn't happen every month. A solar eclipse happens when the Moon moves in front of the Sun, from the viewpoint of someone on Earth, during New Moon. The angular size of the Sun and the Moon are very nearly the same, ½ degree. The Moon is smaller, but much closer, so this spectacular phenomenon can occur. The next solar eclipse over the US is 8/21/2017.