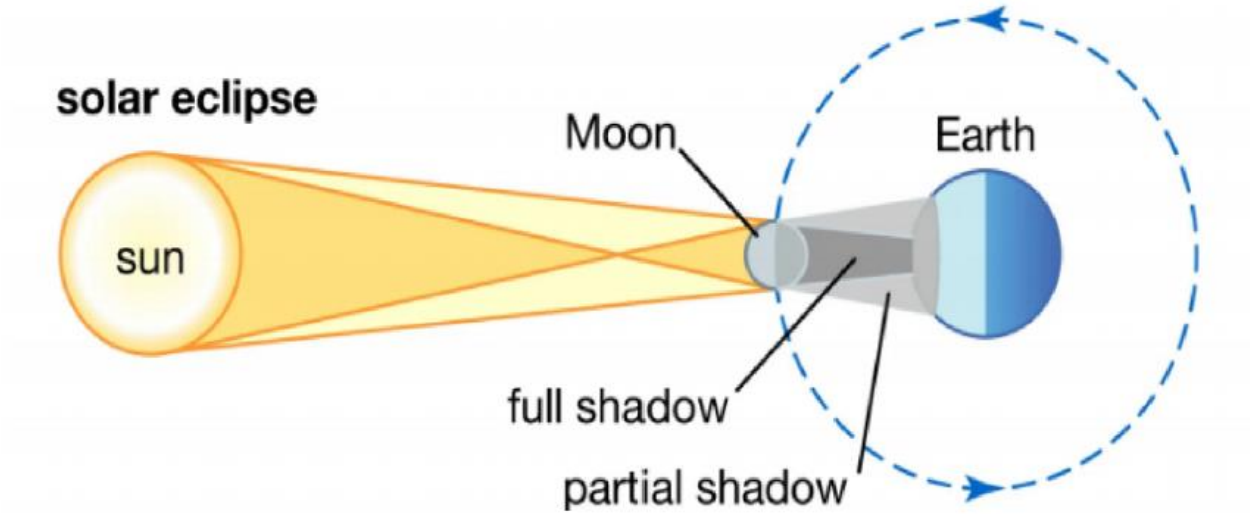
What is a solar eclipse—and how often do they happen?

A solar eclipse occurs when a new moon aligns perfectly between Earth and the sun and briefly casts a shadow on our planet, called an umbra. The moon's diameter and distance from Earth make its relative size just big enough to cover the sun's disk—either partially or fully, depending on the distances between the three celestial bodies.



A total eclipse, when the moon blocks out the entire sun, occurs every one or two years on average. Partial solar eclipses, where the moon covers only part of the sun, are slightly more frequent.

Other types include annular, or ring of fire, eclipses, when a ring of light is visible around the moon, and the rare hybrid eclipses, when an eclipse progresses from annular to total. Annular eclipses occur because the moon’s orbit around the Earth is not a perfect circle, so its distance changes with each orbital cycle.

Why are Solar Eclipses Not Seen Everywhere on Earth?

A solar eclipse occurs when the Moon comes between Earth and the Sun. In this process, the moon casts a shadow over Earth. The moon moves over the sun during the day and it becomes dark as the sunlight gets blocked.

Astronomical events have always fascinated humans. Some occur every year, while others take place after a long time. One such celestial event is solar eclipse. The interesting part about this eclipse is that it is not visible everywhere on Earth. So, what is the reason behind this?

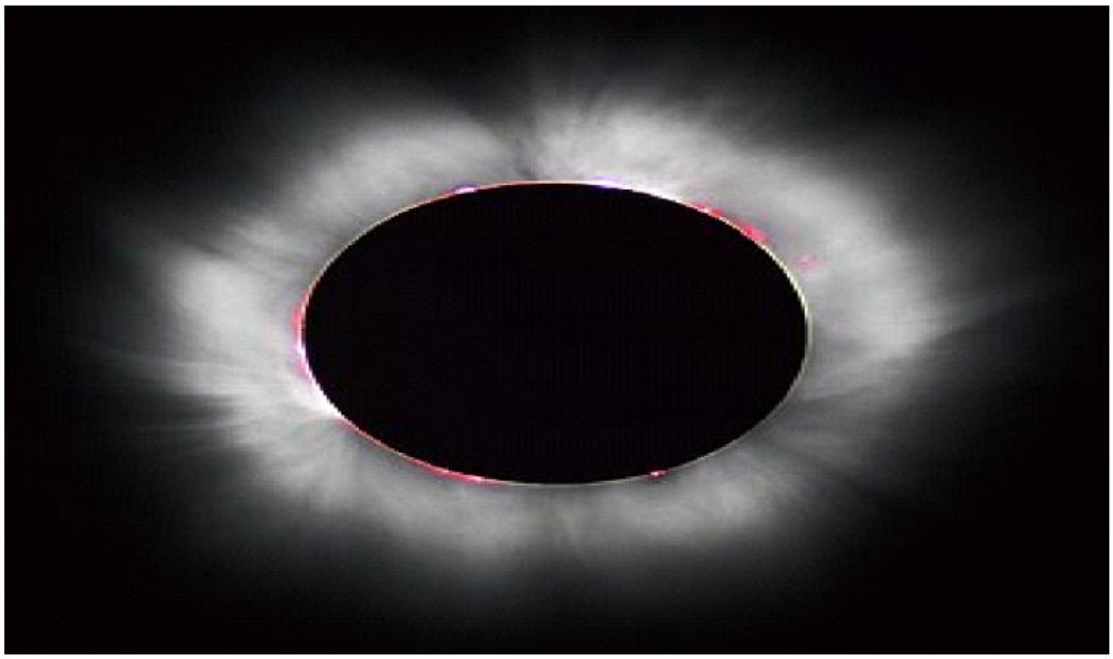
A solar eclipse occurs when the Moon comes between Earth and the Sun. In this process, the moon casts a shadow over Earth. The moon moves over the sun during the day and it becomes dark as the sunlight gets blocked.

Since Moon is smaller as compared to the Sun and Earth, its shadow on Earth isn't very big. As a result, only some places on the planet get to witness the phenomenon. People who are on the sunny side of Earth and in the path of the moon's shadow can see the solar eclipse, while others miss it.

"On average, the same spot on Earth only gets to see a solar eclipse for a few minutes about every 375 years," says the National Aeronautics and Space Administration (NASA).

some parts of the planet will see the annular solar eclipse. However, this will be different from a total solar eclipse. During an annular solar eclipse, the moon does not completely cover up the sun, due to which a 'ring of fire' is left out. That's why this eclipse is also called the ring of fire eclipse.

Getting a chance to see a total solar eclipse is rare. The Moon's shadow on Earth isn't very big, so only a small portion of places on Earth will see it. You have to be on the sunny side of the planet when it happens. You also have to be in the path of the Moon's shadow.



A total solar eclipse occurs when the Moon completely covers the Sun's disk, as seen in this 1999 solar eclipse.

why more people will have seen a lunar eclipse than a solar eclipse?

A total lunar eclipse occurs when the Sun, Earth and Moon are aligned such that the Moon is in the Earth's shadow. As the Earth is bigger than the Moon, the event is visible from the nighttime hemisphere of the Earth at the time of the eclipse.

A total solar eclipse occurs when the Sun, Moon and Earth are aligned and the Moon is close enough to the Earth that its disc completely covers the Sun's disc. The track of the Moon shadow is at most a few hundred kilometres wide. A total eclipse can only be seen when inside the track.

Larger numbers of people can only see a total solar eclipse if the path of totality passes over a large city. This doesn't tend to happen very often. Many total solar eclipses are only visible in uninhabited areas such as mid-ocean and near to the poles.

A partial eclipse can be seen in areas outside of the path of totality.

A total solar eclipse is a truly amazing sight. I am an eclipse chaser and I have seen ten. Getting to the right place at the right time takes some advance planning. Cruise ships will sometimes change their schedules to include the centre line of a total solar eclipse. This is often the best way of seeing an eclipse.

Lunar Eclipses and Solar Eclipses

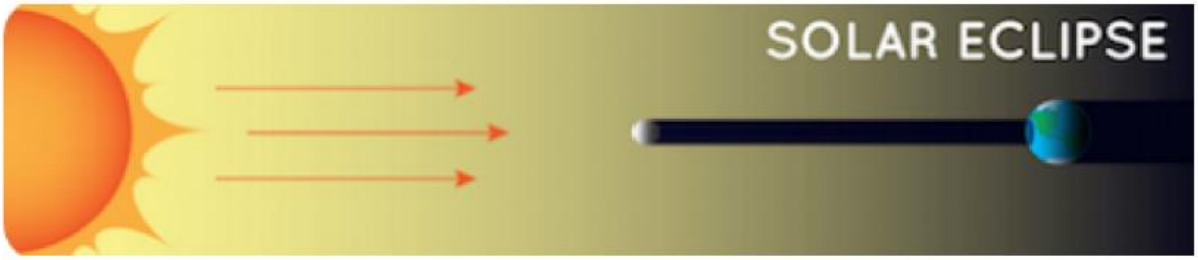
An eclipse happens when a planet or a moon gets in the way of the Sun's light. Here on Earth, we can experience two kinds of eclipses: **solar eclipses and lunar eclipses.**

A solar eclipse happens when the Moon gets in the way of the Sun's light and casts its shadow on Earth. That means during the day, the Moon moves over the Sun and it gets dark. Isn't it strange that it gets dark in the middle of the day?

Space Place Trivia Alert!

While we call it a *solar eclipse*, astronomers call it an *occultation*. An **occultation** happens when an object blocks your view of another object. In this case, the Moon blocks your view of the Sun.

This total eclipse happens about every year and a half somewhere on Earth. A partial eclipse, when the Moon doesn't completely cover the Sun, happens at least twice a year somewhere on Earth.

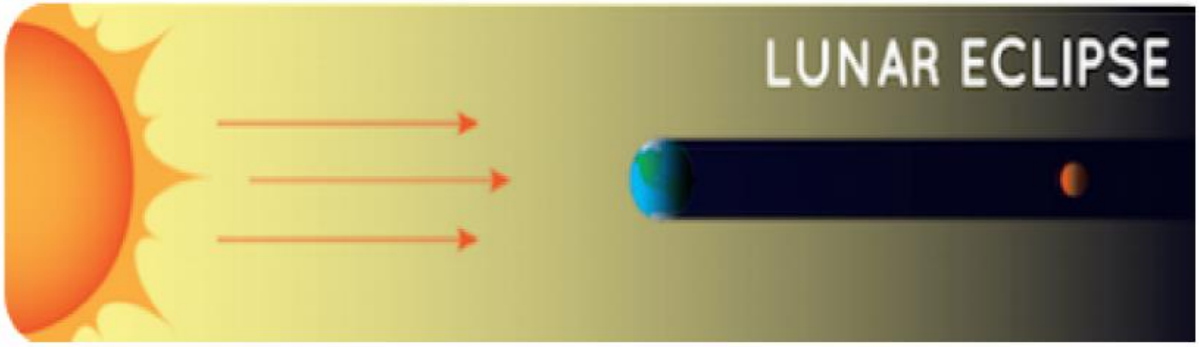


But not everyone experiences every solar eclipse. Getting a chance to see a total solar eclipse is rare. The Moon's shadow on Earth isn't very big, so only a small portion of places on Earth will see it. You have to be on the sunny side of the planet when it happens. You also have to be in the path of the Moon's shadow.

On average, the same spot on Earth only gets to see a solar eclipse for a few minutes about every 375 years!

Lunar Eclipse

During a lunar eclipse, Earth gets in the way of the Sun's light hitting the Moon. That means that during the night, a full moon fades away as Earth's shadow covers it up.



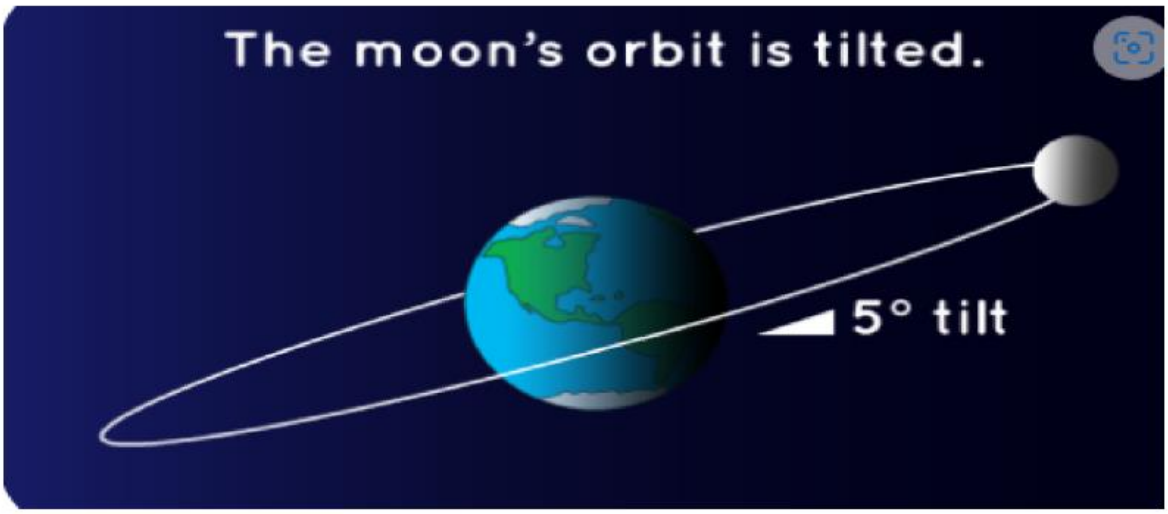
The Moon can also look reddish because Earth's atmosphere absorbs the other colors while it bends some sunlight toward the Moon. Sunlight bending through the atmosphere and absorbing other colors is also why sunsets are orange and red.

During a total lunar eclipse, the Moon is shining from all the sunrises and sunsets occurring on Earth!

The Moon appeared a reddish color during a total lunar eclipse

Why don't we have a lunar eclipse every month?

You might be wondering why we don't have a lunar eclipse every month as the Moon orbits Earth. It's true that the Moon goes around Earth every month, but it doesn't always get in Earth's shadow. The Moon's path around Earth is tilted compared to Earth's orbit around the Sun. The Moon can be behind Earth but still get hit by light from the Sun.



Because they don't happen every month, a lunar eclipse is a special event. Unlike solar eclipses, lots of people get to see each lunar eclipse. If you live on the nighttime half of Earth when the eclipse happens, you'll be able to see it.

Remembering the Difference

It's easy to get these two types of eclipses mixed up. An easy way to remember the difference is in the name. The name tells you what gets darker when the eclipse happens. In a solar eclipse, the Sun gets darker. In a lunar eclipse, the Moon gets darker.

A solar or lunar eclipse occurs when the Earth, Moon, and Sun align in a specific way. During a solar eclipse, the Moon blocks the Sun's light from reaching certain areas on Earth. However, not everyone on Earth sees the eclipse because the alignment creates a shadow that falls on a limited region. Similarly, during a lunar eclipse, the Earth casts a shadow on the Moon, but only those on the night side of Earth can observe it. The visibility of an eclipse depends on the positions of the Sun, Earth, and Moon relative to each other and the observer's location on Earth.

In summary, the alignment and positions of the Sun, Earth, and Moon, along with the observer's location on Earth, determine who can see an eclipse at any given time. It's a fascinating interplay of celestial bodies and their relative positions in space.