

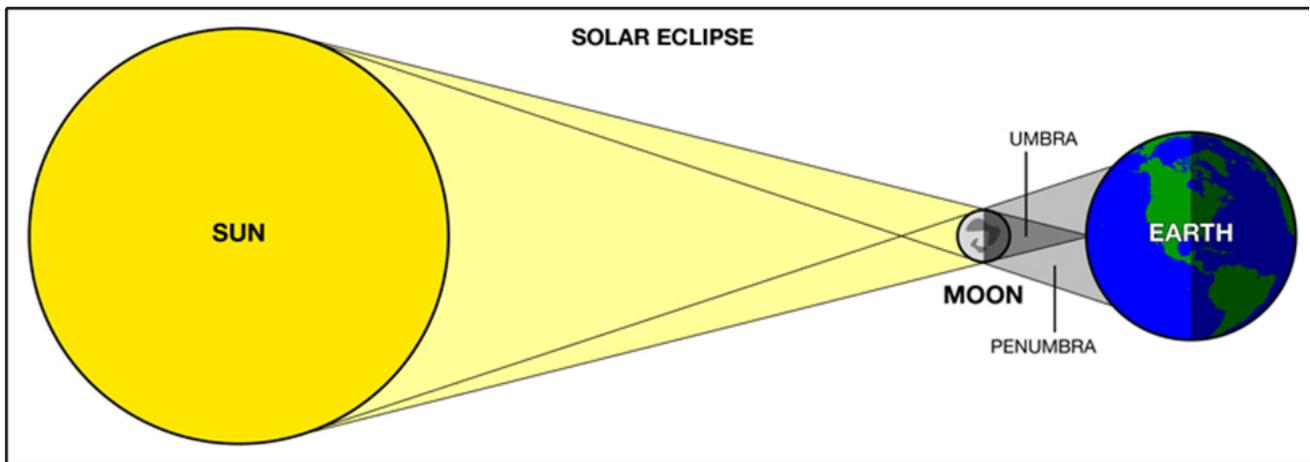
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Eclipse, Solar Eclipse, Lunar Eclipse, the Moon 'Red' During a Lunar Eclipse (For CBSE, ICSE, IAS, NET, NRA 2022)

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- The earth, along with the other planets, revolves around the sun in its orbit. In turn, the moon revolves around the earth in the moon's orbit.
- There comes a time when the three heavenly bodies get aligned in the same straight line.
- This is when an eclipse occurs.
- There are two types of eclipse
 - Solar Eclipse
 - Lunar Eclipse
- It is defined as an astronomical phenomenon which occurs when one spatial object comes within the shadow of another spatial object.
- This obstructs the observer from seeing one of them in space.

Solar Eclipse

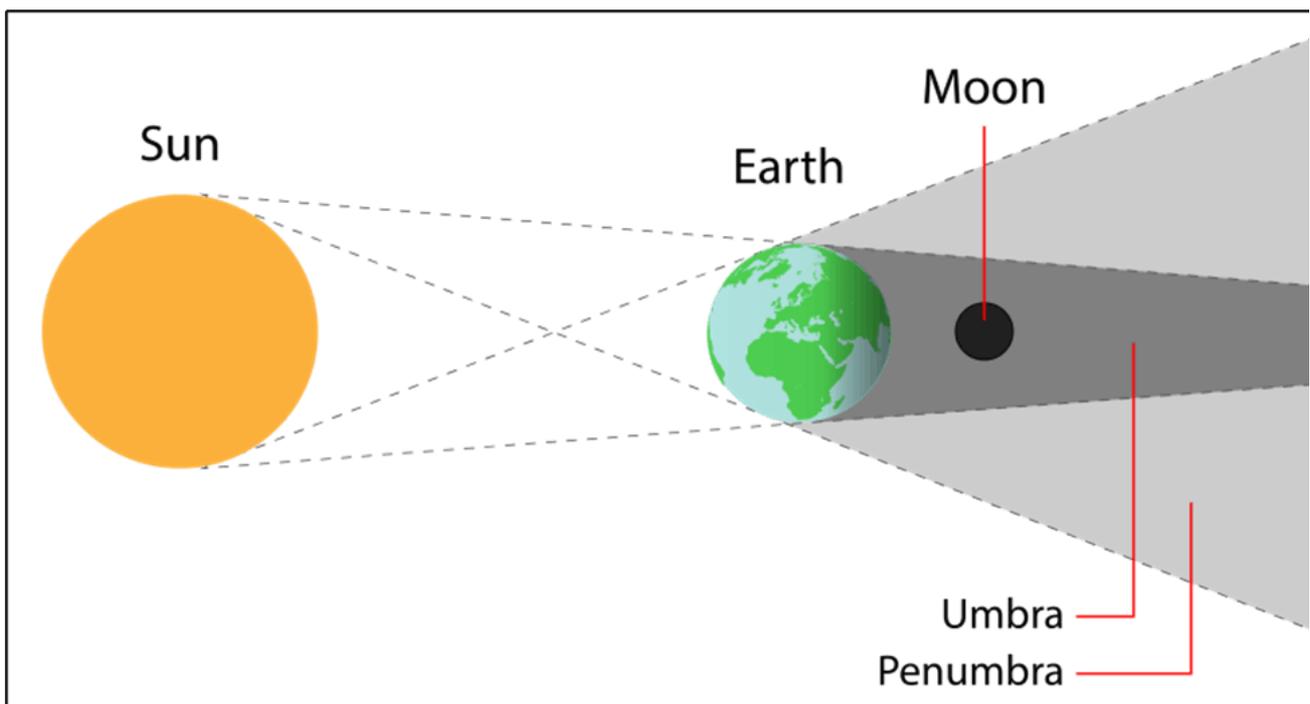


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- It occurs when the moon comes in between the sun and the earth.
- Also known as the eclipse of the sun
- So, the moon blocks the light of the sun from reaching the earth's surface and casts a shadow on it.
- This occurs on a new moon phase. We can observe up to 5 solar eclipses per year.
- Depending on the distance of the moon from the earth during the event, different types of solar concealment can be observed.
- It can be categorized as:
 - **Partial:** When the moon does not align completely with the sun and so only a portion of the sunlight is blocked from reaching earth.
 - **Annular:** When the moon covers the sun but the sun can be seen around the edges of the moon giving an impression of the sun is a bright ring surrounding the dark disc of the moon

- **Total:** When the sun is completely covered by the moon. The sky becomes so dark that it appears to be night. Only a small area on the earth can witness it.

Lunar Eclipse



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- Also known as the eclipse of the moon
- It occurs when the earth comes in between the sun and the moon.
- So, the earth blocks the light of the sun from reaching the moon's surface and casts its shadow on the moon. It occurs on a full moon day.
- We can observe up to 3 lunar eclipses per year.
- Depending on how the sun, the moon, and the earth line up, lunar eclipse too can be categorized as:
 - **Partial:** When only a part of the moon moves into the shadow of the earth.
 - **Total:** When the earth passes directly in front of the moon and casts its shadow on the full moon.
- It is advised that one should not look at the sun directly during the solar eclipse as it can permanently damage the eyes.
- Though, it is safe to watch the lunar eclipse with naked eyes.

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

- The plane of the Moon's orbit around the Earth is not the same as the plane of the Earth's orbit around the Sun, so the Earth (as seen from the Moon) generally passes over or under the Sun during times of Full Moon.
- Only twice a year, when the orbits cross, at the "nodes," are eclipses possible, called "eclipse seasons;" even then, the Moon also has to be in the right place in its orbit to experience an eclipse.
- There will generally be at least two partial lunar eclipses each year, but there can be more.
- If there is a total solar eclipse that season, then there must be at least a partial lunar eclipse two weeks earlier or two weeks later.

Why is the Moon 'Red' During a Lunar Eclipse?

- The reason the Moon appears RED when it is partially/fully cast within the shadow of Earth is because of Earth's atmosphere.
- During the alignment of the Sun, Earth & Moon, light from the Sun glimmers through Earth's atmosphere (atmosphere extends approximately 80 km above the Earth) & the green-to-blue light of the visible light spectrum is filtered out, giving way to the deeper orangey-red tones of the spectrum.
- This reddish light is then refracted to the surface of the Moon (when viewed from Earth) .

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