Solar Eclipse

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Why is in news? What makes a total solar eclipse so rare?

On April 8, a total solar eclipse will cross North America, passing over Mexico, the United States, and Canada. **This type of solar eclipse is a rare event for any particular spot**.

According to **Royal Museums Greenwich**, once a place on Earth witnesses a total solar eclipse, it will be **about 400 years before that part sees the next one**.

Eclipse:

Eclipses are astronomical events that occur when the **sun, moon, and Earth align in specific ways**.

There are two primary types of eclipses: **solar and lunar**.

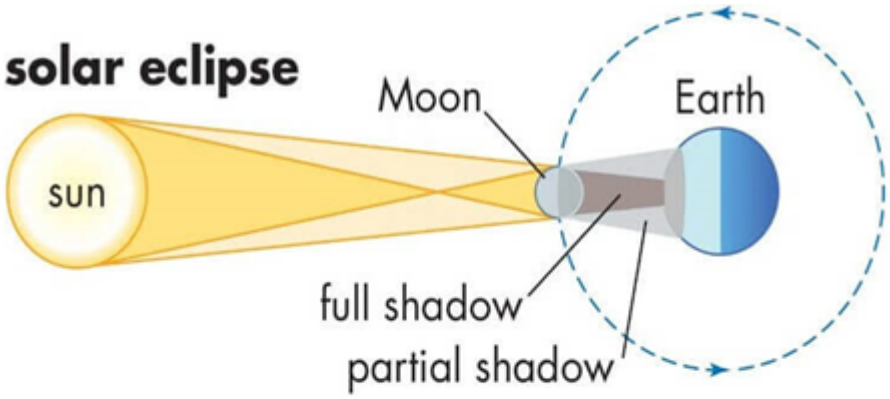
A **solar eclipse** happens when the **moon comes between the sun and Earth** during a **new moon**, blocking out the sun's light.

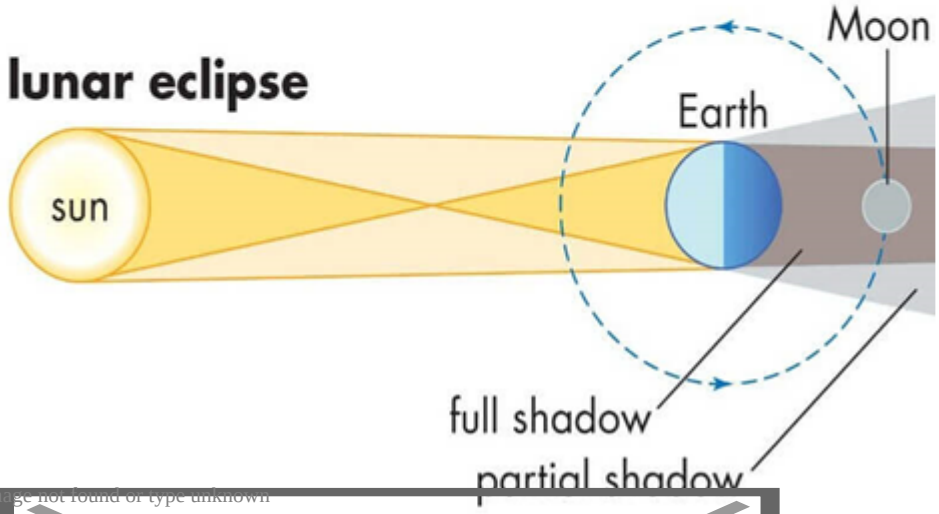
Conversely, a **lunar eclipse** occurs when the **Earth is positioned between the sun and the moon** during a **full moon**, casting a shadow on the moon.

Solar Eclipse:

A solar eclipse takes place when the **Moon moves in the middle of Earth and the Sun**.

The Moon blocks the light of the Sun, **either fully or partially**, which casts a huge shadow on some parts of the world.





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Types of solar eclipses:

Total solar eclipse:

When the **Moon blocks the Sun entirely**, the areas in the centre of the Moon's shadow at the time witness a total solar eclipse.

The sky darkens and people who are in the path of a total solar eclipse can get a **glimpse of the Sun's corona** — the outer atmosphere — which is usually not visible due to the bright face of the Sun.

Annual solar eclipse:

When the **Moon passes in front of the Sun** but is **at or near the farthest point from Earth**, an annular solar eclipse occurs.

In this scenario, the Moon covers the Sun in such a way that **only the periphery of the Sun remains visible** — looking like a **ring of fire**.

Partial solar eclipse:

A partial solar eclipse takes place when the **Moon blocks just a part of the Sun**, giving it a **crescent shape**.

During both partial and annular eclipses, the regions outside the area covered by the Moon's umbra — the middle and the darkest part of the lunar shadow — will see a partial solar eclipse.

Partial solar eclipse is the **most common type** of solar eclipse.

Hybrid solar eclipse:

A hybrid solar eclipse — the **rarest type of solar eclipse** — is witnessed when an **eclipse shifts between annular and total** as the shadow of the Moon moves across the globe.

In this case, some parts of the world see a total solar eclipse, while others observe an annular solar eclipse.

Frequency of occurrence of solar eclipse:

A solar eclipse is witnessed **only during the new moon** — when the **Moon and Sun are aligned on the same side of Earth.**

A new moon occurs **about 29.5 days** because that is how long it takes the Moon to orbit Earth. This, however, **does not mean** that a solar eclipse **happens every month**.

It takes place **only between two to five times annually**.

It is because the Moon does not orbit Earth in the same plane as the Earth orbits the Sun. In fact, the **Moon is tilted by about five degrees with respect to Earth**.

As a result, most of the time when the Moon is in between the Sun and Earth, its shadow is either too high or too low to fall on the Earth.

Reason - Total solar eclipse – rare:

A total solar eclipse occurs when the **moon passes directly and entirely in front of the sun**, and it is rare because the **orbit of the moon is not a perfect circle around Earth**, and it does not orbit Earth in the same plane as Earth orbits the sun.

On average, the moon is **239,000 miles from Earth**, but the orbit is **slightly elliptical**.

As a result, it is not the same distance away from Earth all the time.

The variation is **not large, about 10 percent**, but this is why the moon sometimes looks a little bit larger — or smaller — in the night sky.

While there can be between two and five solar eclipses every year, total eclipses **only** happen **about once every 18 months or so**.

As mentioned before, a **particular spot** on Earth witnesses a total solar eclipse **only once in 400 years**.

Moreover, **about 70 per cent of the globe is underwater** and **half of the land is considered uninhabited**. That's why, it is **quite rare** when a total solar eclipse happens and a lot of people get to see it.

Conclusion:

In conclusion, solar eclipse is one of the crucial celestial phenomena. In this, the moon, sun and earth come in a straight line during their revolution.

Due to this, the moon blocks the sunlight and causes its shadow to fall on earth. Hence, during the eclipse, the temperature goes down, magnitude increases and ozone levels decrease. Also, the temperature and humidity levels decrease during the solar eclipse.

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