

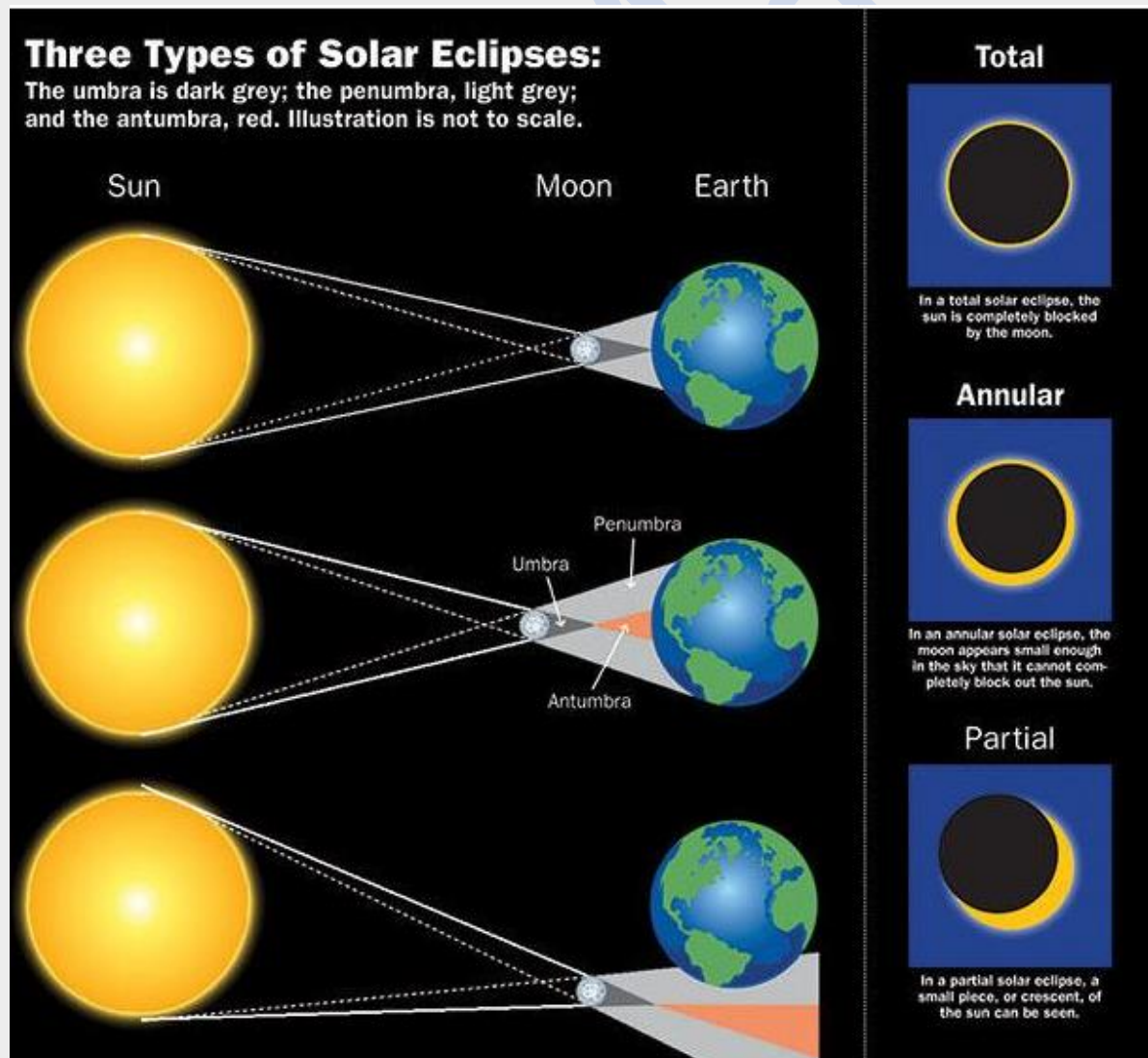
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**1. What makes today's total solar eclipse so rare?**

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.

**But first, what is a 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.



There are four different types of solar eclipses, including total solar eclipse, annular solar eclipse, partial solar eclipse, and hybrid 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.

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.

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.

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.

### **How often does a solar eclipse take place?**

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.

### **But why?**

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.

### **Why is a total solar eclipse so rare?**

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.

This is because a total eclipse is only visible if one is standing in the umbra — the other part of the shadow is called the penumbra, which is not as dark as the umbra. The umbral shadow is very small, covering only a small part of Earth. In fact, the entire path of the umbral shadow during a solar eclipse will only cover less than one per cent of the globe. This is why only very few people will get to see a total eclipse at a time.

Relevance: GS Prelims & Mains Paper I; Geography

Source: Indian Express

## 2. Right against climate change a distinct fundamental and human right, SC judgment

### Why in News?

The Supreme Court has recognised a much-felt, but less articulated right against the adverse effects of climate change as a distinct fundamental right in the Constitution.

### Views of Supreme Court

"It is yet to be articulated that the people have a right against the adverse effects of climate change. This is perhaps because this right and the right to a clean environment are two sides of the same coin. As the havoc caused by climate change increases year-by-year, it becomes necessary to articulate this as a distinct right. It is recognised by Articles 14 (right to equality) and 21 (right to life)," the Supreme Court observed in a judgment released on April 6.

The judgment came in a case connected with the survival of the endangered Great Indian Bustard species.

### Climate change and human rights

Linking the right against climate change to Articles 21 and 14, Chief Justice Chandrachud said the rights to life and equality cannot be fully realised without a clean, stable environment.

The court also highlighted the interconnection between climate change and various human rights, including the right to health, indigenous rights, gender equality, and the right to development

The judgment noted that the right to a healthy environment, safe from the ill-effects of climate change, was a "fundamental human right".

Relevance: GS Prelims & Mains Paper II; Governance

Source: The Hindu

## 3. Large gatherings, political or not, must be avoided in summer

### Why in News?

With the advent of summer, the India Meteorological Department (IMD) has warned that more heatwaves are likely than last year. Andhra Pradesh, Gujarat and Maharashtra are expected to be particularly vulnerable.

### What are Heatwaves?

Heatwave days are defined as when day temperatures in a place are at least 4.5° C above normal or greater than 45° C on two consecutive days. For several years on the trot now, the IMD has been forecasting hotter summers.

### What is the reason to worry?

This year, the weather agency's warnings are more portentous as millions are expected to queue up outside polling stations in India over several afternoons in April and May. Last April, at a mid-day, open-air public, political function in Navi Mumbai, 12 people died due to

dehydration and 600 had to be hospitalised. Some of the speakers in fact congratulated the crowd for 'braving' the heat before the disaster unfolded.

This highlights the degree of disregard that the governmental machinery accords to the public-health impacts of heatwaves. This election year, for instance, the Election Commission of India had already issued an advisory to its State electoral officers — ahead of the IMD's public heat warnings — to prepare for the polls amid blistering heat.

The trouble is that these advisories are too generic. There is a perfunctory note to provide for oral rehydration supplements and mothers to avoid bringing children with them to the polling booths. There is no requirement that polling stations prioritise cooling beyond the confines of the rooms where the officers are seated.

There has been, for many years, a suggestion, even by prominent politicians, for elections to be held in the relatively more clement months of February-March or October-November but it is one that loses traction almost immediately after the polls. India's size and logistical challenges have seen the electoral process innovate and adopt measures such as multi-phase polling and even the use of electronic ballots. With temperature records collapsing every year and the links between heatwaves, climate and health becoming even more explicit, it is time that the electoral process mulls over creative ways to account for the crisis.

Relevance: GS Prelims & Mains Paper III; Disaster Management

Source: The Hindu