



Why are total solar eclipses so rare?

By solar scientist and presenter Dr Lucie Green.

A total solar eclipse happens at New Moon, when the Moon passes between the Sun and the Earth, temporarily blocking its light and casting a small shadow on our planet.

The moon orbits the Earth every month, so why don't we see an eclipse just as often?

This is because the Moon actually orbits the Earth on a five degree tilt, compared to the Earth's orbit around the Sun.

So when the Moon travels between the Sun and the Earth each month, it's usually too high or too low in the sky to pass in front of the Sun.

It's only once every 18 months that it drifts into a perfect line-up and blocks some of the Sun's light from reaching us – creating a total eclipse on Earth.

But even then not everyone will get to see it.

A total eclipse is seen if you are standing at the centre of the Moon's shadow. This is known as the umbral shadow and it covers only a tiny part of the Earth's surface.

As the umbral shadow zips across our planet's surface, its path covers less than one percent of the Earth.

So the shadow is far more likely to pass over uninhabited regions – such as the vast oceans –making a total eclipse notoriously difficult to catch!