
Umbra

1
00:00:00,010 --> 00:00:07,020
[Music]

2
00:00:07,040 --> 00:00:13,580
Like clockwork, the full Moon appears every month in our sky, a sight so familiar that we often take it for grante

3
00:00:13,600 --> 00:00:20,010
but about twice a year, over the course of a few hours, the full Moon sports a decidedly different look.

4
00:00:20,030 --> 00:00:26,150
What causes this sudden change? A lunar eclipse occurs when the Moon passes through the Earth's shadow,

5
00:00:26,170 --> 00:00:30,800
just as a solar eclipse occurs when part of the Earth passes through the Moon's shadow.

6
00:00:30,820 --> 00:00:37,980
But the Moon circles the Earth every month as it cycles through its phases, lining up at both full Moon and new

7
00:00:38,000 --> 00:00:44,240
So why don't eclipses happen twice a month? The reason is that the Moon's orbit around the Earth is tilted

8
00:00:44,260 --> 00:00:50,280
relative to the Earth's orbit around the Sun. Although the Earth and the Moon always cast long shadows,

9
00:00:50,300 --> 00:00:54,430
they rarely shade each other thanks to the Moon's orbital tilt.

10
00:00:54,450 --> 00:00:57,830
But if that's the case, why do eclipses happen at all?

11
00:00:57,850 --> 00:01:05,360
Throughout the year, the Moon's orbital tilt remains fixed with respect to the stars, meaning that it changes with

12
00:01:05,380 --> 00:01:12,780
About twice a year, this puts the Moon in just the right position to pass through the Earth's shadow, causing a l

13
00:01:12,800 --> 00:01:18,480

As the Moon passes into the central part of the Earth's shadow, called the umbra, it darkens dramatically.

14
00:01:18,500 --> 00:01:25,180
Once it's entirely within the umbra, the Moon appears a dim red due to sunlight scattered through the Earth's a

15
00:01:25,200 --> 00:01:28,580
In fact, if you watched the eclipse from the surface of the Moon,

16
00:01:28,600 --> 00:01:33,640
you'd see the Sun set behind the entire Earth, bathing you in a warm red glow.

17
00:01:33,660 --> 00:01:40,130
Back home, you'll have to stay up late to watch a lunar eclipse, but if you do you'll see the Moon in rare form,