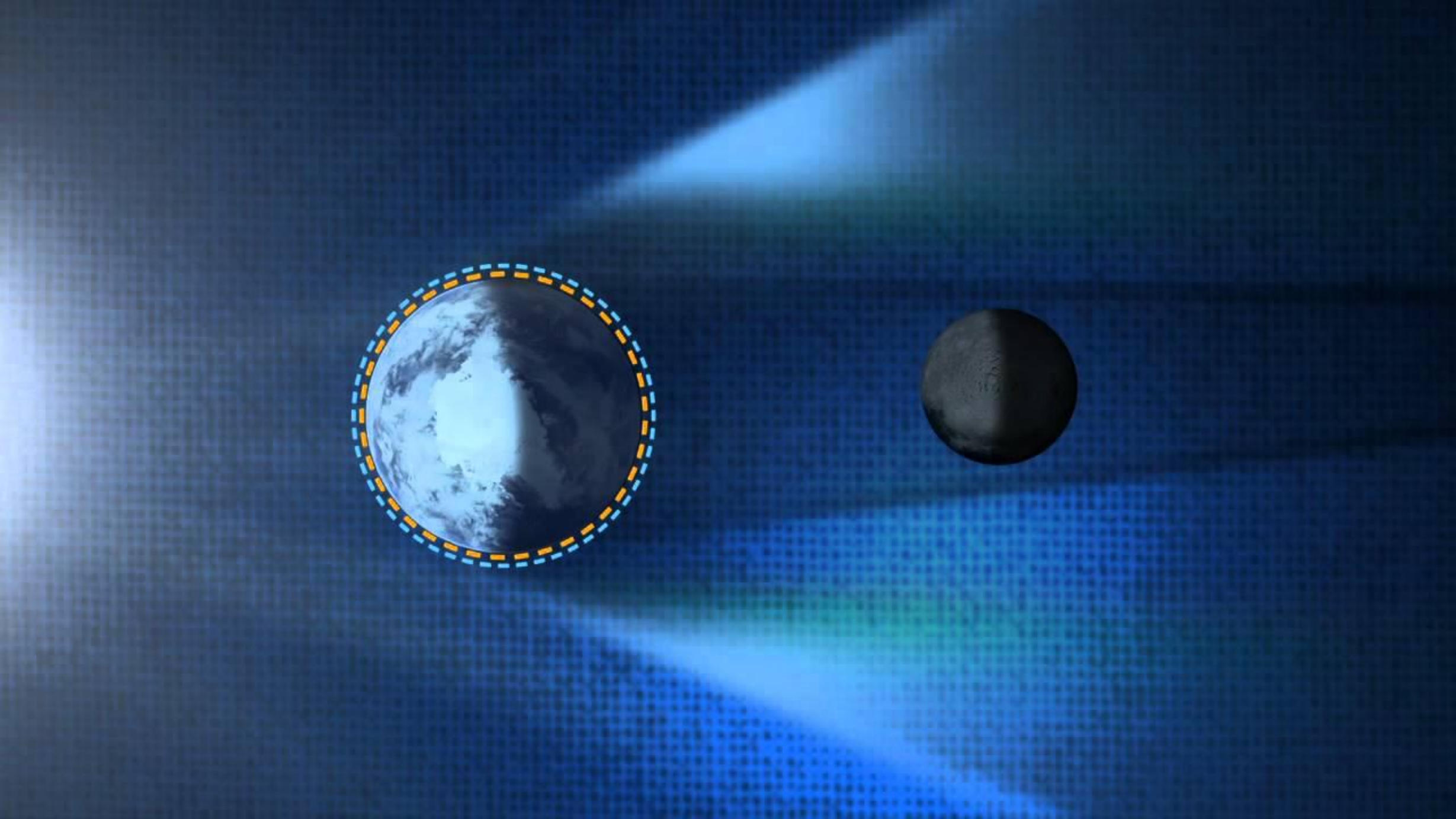

1
00:00:08,210 --> 00:00:04,100
[music]

2
00:00:08,230 --> 00:00:12,310
notice that it looks slightly different every day. The change in its shadow is based on

3
00:00:12,330 --> 00:00:16,410
where the moon is in its orbit. We call this cycle the phases of the moon, and it occurs

4
00:00:16,430 --> 00:00:20,490
roughly once a month. At least twice a year, however, something quite different

5
00:00:20,510 --> 00:00:24,570
happens. The moon passes through the shadow cast by the Earth, causing it to look extremely

6
00:00:24,590 --> 00:00:28,630
unusual for a short period of time. From the Earth, the moon will appear to

7
00:00:28,650 --> 00:00:32,680
darken and turn a deep red before eventually returning to normal. This is called a lunar

8
00:00:32,700 --> 00:00:36,710
eclipse. If we were to look at what happens from space during an eclipse, it would go

9
00:00:36,730 --> 00:00:40,720
something like this. First, the moon passes through what's called the penumbra,

10
00:00:40,740 --> 00:00:44,860
where the Sun's light is only partially obscured. This results in only a slight darkening

11
00:00:44,880 --> 00:00:48,980
of the moon. As the moon continues along its path, however, it enters what's

12
00:00:49,000 --> 00:00:53,110
called the umbra, where all direct light from the Sun is blocked. But if the Sun is blocked,

13
00:00:53,130 --> 00:00:57,210

why does the moon turn red? When light from the Sun goes by the side of the Earth,

14
00:00:57,230 --> 00:01:01,290
it passes through a long and thick layer of Earth's atmosphere. Shorter wavelengths

15
00:01:01,310 --> 00:01:05,390
of sunlight, like blue, are scattered by the atmosphere, so by the time the light has

16
00:01:05,410 --> 00:01:09,480
finished its trip to the moon, more of the longer wavelengths, like red, are left over.

17
00:01:09,500 --> 00:01:13,530
On the Earth, the same thing happens at sunset as the ground you stand on gradually

18
00:01:13,550 --> 00:01:17,590
passes into night. As the eclipse ends, the moon leaves the umbra, returns

19
00:01:17,610 --> 00:01:21,620
to its normal color, and then leaves the penumbra, brightening and resuming its original

20
00:01:21,640 --> 00:01:25,640
cycle. Overall, the whole process lasts only from a few minutes to a few hours,

21
00:01:25,660 --> 00:01:29,800
so you'll have to be quick if you want to see it. But--as long as you're willing to stay

22
00:01:29,820 --> 00:01:33,910
awake--you'll catch the moon as you won't see it too often.

23
00:01:42,120 --> 00:01:38,020
[music, beeping]