

1. Shine your sun (flashlight) towards your Earth (Tennis ball). How much of the Earth is lit up?
2. Now spin the stick that goes through the Earth. What is this spinning called?
3. Now poke a pin in the Earth somewhere near the equator. Let that represent a person living in that area. Spin the Earth so that the pin is illuminated. What is the person experiencing at this time?
4. Spin the earth so the pin is facing away from the sun. What is the person experiencing at this time?
5. How long does it take the Earth to spin in place one time?
6. Now get the moon (golf ball on a stick). How does it compare in size to the Earth?
7. The moon actually orbits around the Earth. Simulate this a few times. How much time does it really take for the moon to orbit around the Earth once?
8. What is another word for orbit?
9. Make your moon orbit the Earth once again, but this time do it so that it casts a shadow on the Earth. Spin the Earth in such a way that the shadow lands on your push pin person. What is this person experiencing?

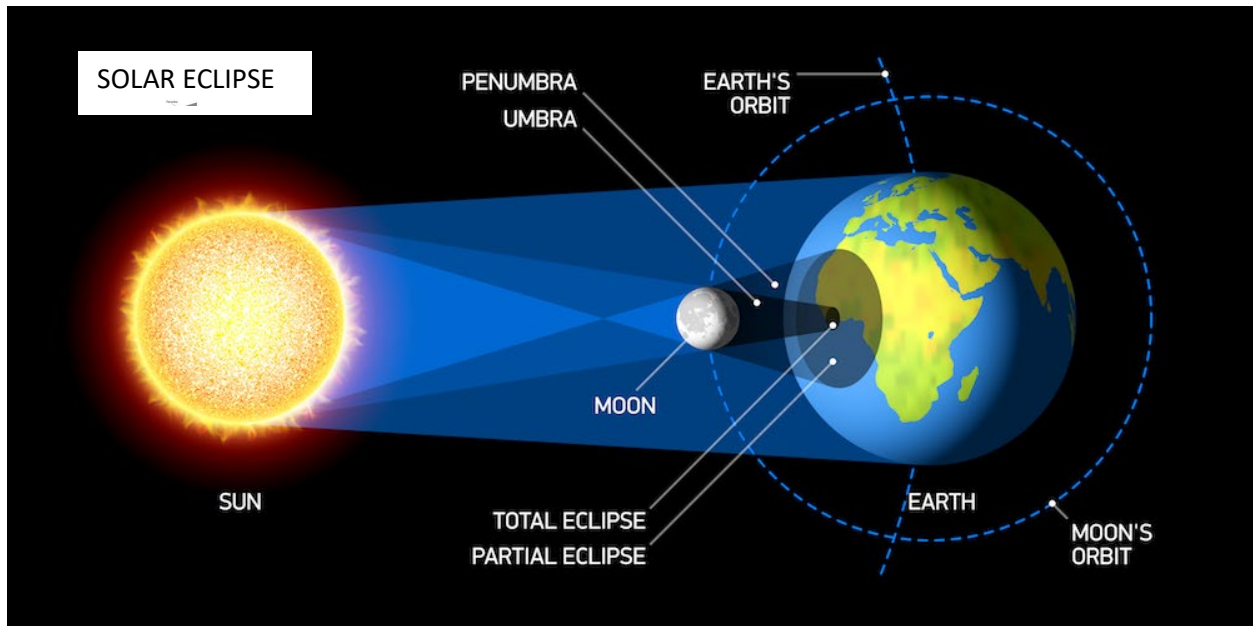
READ:

Sometimes when the moon orbits Earth, it moves between the sun and Earth. When this happens, the moon blocks the light of the sun from reaching Earth. This causes an eclipse of the sun, or solar eclipse. During a solar eclipse, the moon casts a shadow onto Earth.

During a solar eclipse, the moon casts two shadows on Earth. The first shadow is called the umbra (UM bruh). This shadow gets smaller as it reaches Earth. It is the dark center of the moon's shadow. The second shadow is called the penumbra (pe NUM bruh). The penumbra gets larger as it reaches Earth. It is only a light shadow. People standing in the penumbra will see a partial eclipse. People standing in the umbra will see a total eclipse.

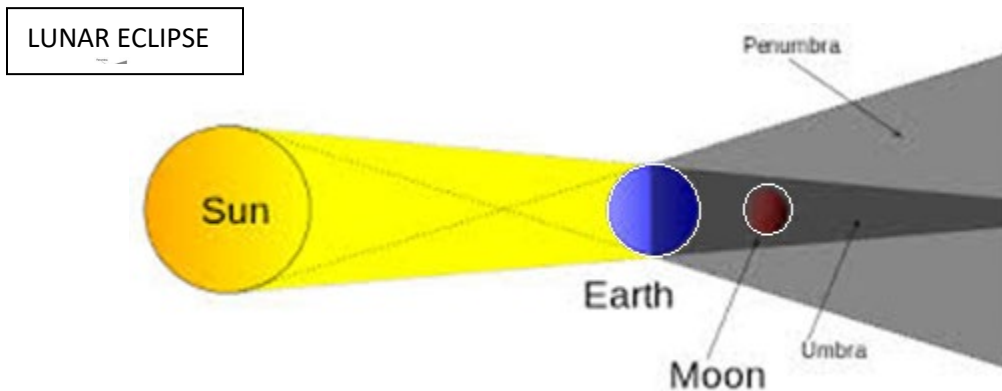
Solar eclipses happen once every 18 months. Solar eclipses only last for a few minutes.

NEVER look directly at the sun: It can permanently damage your eyes! You must use proper safety equipment to look at any type of solar eclipse.



10. If the moon passed between the sun and Earth every single month, then we would have a solar eclipse every month. How often **do** we have solar eclipses?
11. In order to **not** have solar eclipses every month, how must the moon be orbiting the earth? Demonstrate for me using your moon and earth. Teacher's initial here →

Now make the moon orbit to the back side of the Earth. Like this.



12. Normally when the moon goes behind the Earth we see a full moon (fully lit up). If the moon is in the shadow of the Earth, we don't see a full moon -- what is it called?

What Is a Lunar Eclipse?

The moon moves in an orbit around Earth, and at the same time, Earth orbits the sun. Sometimes Earth moves between the sun and the moon. When this happens, Earth blocks the sunlight that normally is reflected by the moon. (This sunlight is what causes the moon to shine.) Instead of light hitting the moon's surface, Earth's shadow

falls on it. This is an eclipse of the moon -- a lunar eclipse. A lunar eclipse can occur only when the moon is full. A lunar eclipse can only be seen from Earth at night.

A lunar eclipse usually lasts for a few hours. At least two partial lunar eclipses happen every year, but total lunar eclipses are rare. It is safe to look at a lunar eclipse.

- 13. While the moon is in the Earth's shadow, can a person experiencing daylight see it?
- 14. Who CAN see a lunar eclipse?
- 15. How long do lunar eclipses last?
- 16. How often do lunar eclipses occur?
- 17. In order to not have lunar eclipses every month, how must the moon be orbiting the earth? Demonstrate for me using your moon and earth. Teacher's initial here →
- 18. Draw the position of the moon during full moon



- 19. Draw the position of the moon during lunar eclipse



- 20. Draw the position of the moon during a solar eclipse



WHICH ECLIPSE IS BEING DESCRIBED -- "SOLAR" OR "LUNAR?"

21. _____ I last only a few minutes
22. _____ I last for a couple of hours
23. _____ People having night time can see me
24. _____ People having day time can see me
25. _____ The earth is casting a shadow on the moon
26. _____ The moon is casting a shadow on the earth
27. _____ During the day, everyone in my shadow can see me. Daylight people who are NOT in the shadow see nothing out of the ordinary
28. _____ I happen during a full moon phase
29. _____ I happen during a new moon phase