

Shadow Alignment

Explain how changing positions create solar and lunar eclipses.

S6E2.b "Construct an explanation of the cause of solar and lunar eclipses."

NAME _____

DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline words that tell which object is between the other two, and circle words that tell whose shadow causes each eclipse.

When Shadows Cross Space

- ① An eclipse happens when objects in space line up so that a shadow changes what an observer can see. The Sun is a light source. Opaque objects, including Earth and the Moon, block sunlight and cast shadows. Their shadows have a dark central region called the umbra and a lighter outer region called the penumbra. An eclipse is not caused by the Sun disappearing or by a change in its light. It is caused by the positions of the Sun, Earth, and Moon.
- ② A solar eclipse occurs when the Moon moves between the Sun and Earth. From places where the Moon's shadow reaches Earth, the Moon blocks all or part of the Sun's bright disk. People in the umbra see a total solar eclipse, while people in the penumbra see a partial solar eclipse. The Moon appears able to cover the Sun because it is much closer to Earth, even though the Sun is far larger. Never look directly at the Sun during an eclipse without proper solar viewing equipment.
- ③ A lunar eclipse occurs when Earth moves between the Sun and the Moon. Earth then blocks sunlight that would normally reach the Moon. The Moon passes through Earth's shadow, so an observer on Earth's nighttime side may see the Moon grow dim or reddish. A total lunar eclipse happens when the whole Moon enters Earth's umbra. A partial lunar eclipse happens when only part enters it. Lunar eclipses are visible from a much larger area of Earth than solar eclipses because Earth's shadow is larger at the Moon.

2 ANSWER WITH EVIDENCE Use the passage

1 Explain the positions of the Sun, Moon, and Earth that cause a solar eclipse.

2 Explain how Earth's position causes a lunar eclipse.

3 How is the cause of a solar eclipse different from the cause of a lunar eclipse?

4 Why can a lunar eclipse be seen from a larger area of Earth than a solar eclipse?

3 YOUR TURN Your own words

In the first panel, sketch and label the Sun, Moon, and Earth during a solar eclipse. In the second panel, sketch and label them during a lunar eclipse, then write one sentence under each panel explaining the shadow.



PART 1 • READ AND MARK

Underline words that tell which object is between the other two, and circle words that tell whose shadow causes each eclipse. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Explain the positions of the Sun, Moon, and Earth that cause a solar eclipse.	The Moon is between the Sun and Earth. The Moon blocks sunlight and its shadow reaches Earth.
2	Explain how Earth's position causes a lunar eclipse.	Earth is between the Sun and the Moon. Earth blocks sunlight, and the Moon moves through Earth's shadow.
3	How is the cause of a solar eclipse different from the cause of a lunar eclipse?	In a solar eclipse, the Moon is between the Sun and Earth and casts a shadow on Earth. In a lunar eclipse, Earth is between the Sun and Moon and casts a shadow on the Moon.
4	Why can a lunar eclipse be seen from a larger area of Earth than a solar eclipse?	Earth's shadow is larger at the Moon, so a larger area of Earth can see the lunar eclipse.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: Draw and label Sun, Moon, and Earth in that order, with the Moon's shadow reaching Earth. Caption: The Moon blocks sunlight and casts a shadow on Earth, causing a solar eclipse. Panel 2: Draw and label Sun, Earth, and Moon in that order, with Earth's shadow reaching the Moon. Caption: Earth blocks sunlight and casts a shadow on the Moon, causing a lunar eclipse.

Accept explanations that correctly identify the object in the middle and the object that casts the shadow. In the panels, accept clear labeled positions and shadows, even if the drawing is not to scale.