

Why Moon Views Change

Use the Sun-Earth-Moon arrangement to explain the visible phase.

4.6 "The student will investigate and understand that there are relationships among Earth, the moon, and the sun. Key relationships include the motions of Earth, the moon, and the sun; the causes for Earth's seasons..."

NAME _____

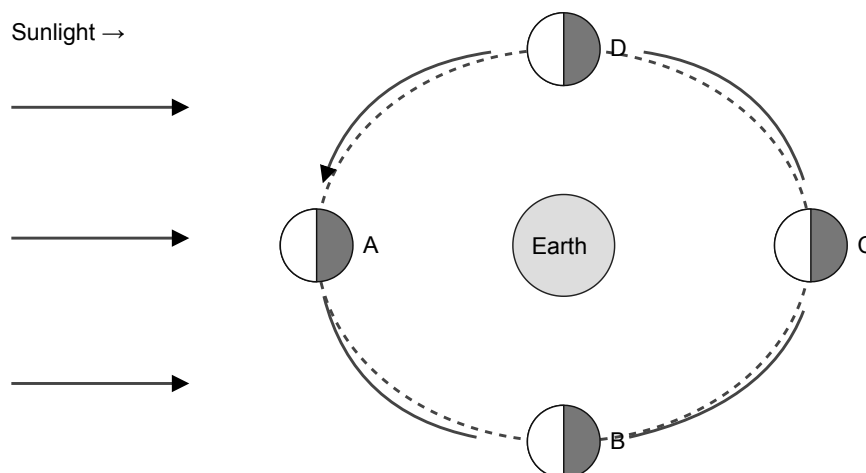
DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Follow A → B → C → D → A. White is sunlit; gray is unlit. These circles show a SPACE VIEW, not the disk seen from Earth. Draw a line of sight from Earth to each position.

One Moon, Changing View

Sunlight lights half of the Moon. From Earth, we see different amounts of that sunlit half as the Moon orbits.



Space view: view from north; sunlight from left. Follow A → B → C → D → A. White = sunlit; gray = unlit.

Sizes and distances are not to scale; orbital tilt is omitted. Ordinary phases reflect our changing view, not Earth's shadow. Eclipses do not occur every month.

Tide range

At new and full Moon, Sun, Earth and Moon roughly align: spring-tide ranges are larger. At quarter phases, Sun and Moon directions form right angles: neap-tide ranges are smaller. Range is the difference between high and low water. Local geography and weather also matter.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 At A, which half faces Earth: the sunlit or unlit half? Name the phase and explain using the model.

2 At C, what fraction of the disk seen from Earth is bright? Name the phase and use the Sun's direction to explain.

3 B and D both appear half lit from Earth. Follow the orbit to name each phase and explain which is waxing.

4 Use the spatial model: which positions align Sun, Earth and Moon, and which form a right angle? Connect each arrangement to spring or neap tide RANGE.



YOUR TURN

Your own words

Draw a new position between A and B. Mark the half facing the Sun as lit. Beside it draw the Moon's appearance from Earth, and explain how the space view and Earth view differ.



PART 1 • READ AND MARK

Follow A → B → C → D → A. White is sunlit; gray is unlit. These circles show a SPACE VIEW, not the disk seen from Earth. Draw a line of sight from Earth to each position. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	At A, which half faces Earth: the sunlit or unlit half? Name the phase and explain using the model.	The unlit half faces Earth: new Moon. The sunlit half faces left, away from Earth.
2	At C, what fraction of the disk seen from Earth is bright? Name the phase and use the Sun's direction to explain.	All of the visible disk: full Moon. The sunlit half on the left faces Earth.
3	B and D both appear half lit from Earth. Follow the orbit to name each phase and explain which is waxing.	B is first quarter, following new Moon as the visible lit portion grows. D is third quarter, following full Moon as the visible lit portion shrinks.
4	Use the spatial model: which positions align Sun, Earth and Moon, and which form a right angle? Connect each arrangement to spring or neap tide RANGE.	A and C are roughly aligned: larger spring-tide ranges. B and D form right angles: smaller neap-tide ranges. These are differences between high and low water, not exact local heights or times.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Between A and B the phase is waxing crescent. The Sun-facing half of the sphere remains lit; an observer on Earth sees only a crescent of it. The two drawings must distinguish the whole illuminated hemisphere from the visible lit part of the disk.

Focus: Moon phases, with tides where explicitly included below. Broad umbrella standards include other topics that this worksheet does not assess. Model viewed from north; A→B→C→D is counterclockwise. Sizes, distances, tilt and timing are simplified. Do not draw Earth's shadow over ordinary phases. NASA Moon Phases and NOAA Spring Tides were used to check the explanation.