Why Moon Views Change

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

SC.8.E.5.9 "Explain the impact of objects in space on each other including: the Sun on the Earth including seasons and gravitational attraction the Moon on the Earth, including phases, tides, and eclipses, and the relative position of each body."

NAME _____ DATE _____

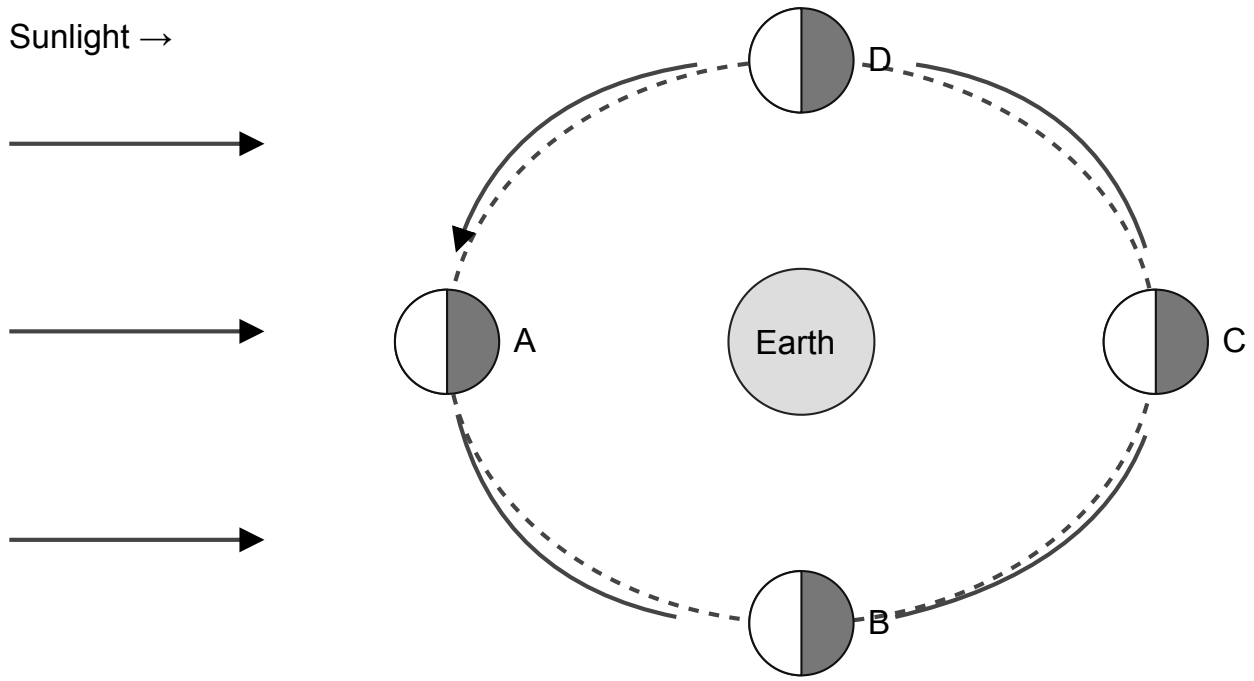
1 READ AND MARK

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 except during a lunar eclipse. The half facing the Sun is lit at every shown position. As the Moon orbits Earth, an observer on Earth sees different amounts of that sunlit half.



Space view: sunlight comes from the left. Orbit A → B → C → D → A. White = sunlit; gray = unlit. Shapes and distances are not to scale.

The model is not to scale. It leaves out the tilt of the Moon's orbit, so it does not predict an eclipse each month. Normal phases are caused by a changing view of the sunlit half, not Earth's shadow.

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. A student says Earth's shadow causes all monthly phases. Explain why that is incorrect.

3 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.

Why Moon Views Change

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	A student says Earth's shadow causes all monthly phases. Explain why that is incorrect.	**The viewing angle changes as the Moon orbits, exposing different portions of the sunlit half. Earth's shadow causes a lunar eclipse, not normal monthly phases.**

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.