Moon Model Mystery

Use a physical model to connect an observed pattern to its cause.

4.1.e.i "developing and using models develop and/or use models to explain natural phenomena"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the three objects used in the model. Circle the sentence that tells what pattern the model explains.

A Model of Moon Shapes

1. During several evenings, students noticed that the Moon did not look the same. On one night it looked like a thin curve. Later, it looked round. The class wanted to explain this pattern. They asked, "Why does the Moon seem to change shape when it travels around Earth?" They did not think the Moon itself changed shape.

2. To test their idea, the students built a model. A lamp stood for the Sun, a globe stood for Earth, and a small foam ball stood for the Moon. The lamp shone on one half of the ball. One student moved the ball around the globe while another looked from the globe's position. From that spot, the lit part looked different at different places around the globe.

3. The model showed that the lamp always lit half the ball. Yet the viewer could see different amounts of that lit half as the ball moved. This explained the changing shapes. The class compared the model with Moon observations. They also named a limit: the model's sizes and distances were not like the real Sun, Earth, and Moon.

2 ANSWER WITH EVIDENCE

Use the passage

1. What natural pattern did the students want their model to explain?

2. What did the lamp, globe, and foam ball represent in the model?

3. What did the viewer notice as the foam ball moved around the globe?

4. What limit of the model did the class name?

3 YOUR TURN

Your own words

Use two panels to draw a model that explains why a flagpole's shadow is longer in the morning than near noon. In each panel, label the light source, flagpole, and shadow, add arrows for light, then write one sentence that explains the change.

ANSWER KEY

Moon Model Mystery

GRADE 4 · 4.1.e.i

PART 1 · READ AND MARK

Underline the three objects used in the model. Circle the sentence that tells what pattern the model explains. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What natural pattern did the students want their model to explain?	**The changing visible shapes of the Moon over several evenings.**
2	What did the lamp, globe, and foam ball represent in the model?	**The lamp represented the Sun, the globe represented Earth, and the foam ball represented the Moon.**
3	What did the viewer notice as the foam ball moved around the globe?	**The viewer saw different amounts of the ball's lit half from different places around the globe.**
4	What limit of the model did the class name?	**The sizes and distances in the model were not like the real sizes and distances of the Sun, Earth, and Moon.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: Draw and label a low Sun, a flagpole, and a long shadow. Add arrows showing light slanting from the Sun to the flagpole. Panel 2: Draw and label a higher Sun, the flagpole, and a shorter shadow. Add arrows showing light coming from higher above. Sentence: When the Sun is higher in the sky, its light makes a shorter shadow.

Accept answers that identify how each model object represents a real object and explain that the visible lit portion changes as the model Moon moves. For the open task, accept clear labeled panels that show a lower light source making a longer shadow and a higher light source making a shorter shadow.