Follow the Light

Read observations, then model how light behaves.

P.4.6B "Students will demonstrate an understanding of the properties of light as forms of energy. Construct scientific evidence to support the claim that white light is made up of different colors..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle the three materials Maya tests, underline what happens to the light at each one, and put a star beside the evidence that white light contains many colors.

Maya's Light Lab

1. At a science table, Maya shines a white flashlight beam through a glass prism. Colors spread across a white card: red, orange, yellow, green, blue, and violet. The prism bends different colors by different amounts, so they separate. Sir Isaac Newton used a prism to show that white light contains many colors. The colors on Maya's card are evidence for the same claim.

2. Maya tests three materials with a flashlight pointed at a wall. Transparent clear glass lets most light through, leaving a bright spot. Translucent wax paper lets some light through but scatters it, making a blurry patch. Opaque black cardboard blocks light from passing through; it absorbs much of the light that strikes it. Maya changes only the material, so she can compare how each one affects the beam.

3. When Maya aims the flashlight at a mirror, light bounces off it. This bounce is called reflection. She can see the mirror because light from the flashlight reflects from it into her eyes. At a water tank, a beam enters the water at an angle and changes direction. This bending is called refraction. Maya draws arrows to model the beam's path before and after it enters the water.

2 ANSWER WITH EVIDENCE

Use the passage

1. What on Maya's card supports Newton's claim about white light? Explain what the prism does.

2. Maya wants a bright spot on the wall. Which tested material should she use? What happened with the other two?

3. Describe the path light takes from the flashlight to Maya's eyes when she sees the mirror.

4. How should Maya draw arrows to show refraction when the beam enters the water at an angle?

3 YOUR TURN

Your own words

Plan a flashlight test with one sheet of thin tissue paper between the flashlight and a wall. Draw and label a model with arrows showing your predicted light path, then write two sentences about what you would look for on the wall and what that result would tell you about the tissue.

ANSWER KEY

Follow the Light

GRADE 4 · P.4.6B

PART 1 · READ AND MARK

Circle the three materials Maya tests, underline what happens to the light at each one, and put a star beside the evidence that white light contains many colors. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What on Maya's card supports Newton's claim about white light? Explain what the prism does.	**The card shows several colors from the white beam. The prism bends the colors by different amounts, separating them.**
2	Maya wants a bright spot on the wall. Which tested material should she use? What happened with the other two?	**She should use clear glass. Wax paper made a blurry patch, and black cardboard blocked the light from passing through.**
3	Describe the path light takes from the flashlight to Maya's eyes when she sees the mirror.	**Light travels from the flashlight to the mirror, then reflects from the mirror into Maya's eyes.**
4	How should Maya draw arrows to show refraction when the beam enters the water at an angle?	**She should draw an arrow toward the water and another continuing into the water in a different direction.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Drawing: A labeled flashlight, sheet of tissue paper, and wall, with arrows passing through the tissue and spreading toward the wall I would look for a dim, blurry patch of light on the wall. A blurry patch would show that the tissue lets some light through but scatters it, so it is translucent.

Accept a prediction that some light passes through the thin tissue and spreads out, producing a dim or blurry patch. For question 4, the arrows must show a change in direction at the water's surface.