Light on the Move

Read how visible light carries energy in transverse waves.

5.6.a "visible light is radiant energy that moves in transverse waves;"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each sentence that tells why visible light is radiant energy. Circle the words that explain how a transverse wave moves compared with its travel direction.

A Flashlight Beam

1. At a school science night, Maya shines a flashlight through a window and onto a white wall. The beam carries visible light, the part of light that human eyes can detect. Visible light is radiant energy, which means energy that travels from place to place. It can move through empty space, so light from the Sun can cross space to Earth.

2. Light from the flashlight travels forward toward the wall. Yet its wave pattern has motion across that forward path. In a transverse wave, the disturbance moves perpendicular to the direction the wave travels. Imagine shaking one end of a rope up and down while the wave moves along the rope. The rope's up-and-down motion is across its travel direction.

3. Different visible-light waves can have different wavelengths. When white light passes through a prism, the prism bends the colors by different amounts, separating them into a band of colors. A red light wave and a blue light wave are both transverse waves and both carry radiant energy. Their differences do not change the fact that each travels outward from its source.

2 ANSWER WITH EVIDENCE

Use the passage

1. The flashlight beam moves forward to the wall. How does the disturbance in its transverse wave move compared with the beam's direction?

2. How does the rope example model the motion of a transverse light wave?

3. Red and blue light have different wavelengths. Name two properties the passage says they share.

4. What does light traveling from the Sun through empty space to Earth show about visible light?

3 YOUR TURN

Your own words

In Panel 1, draw a light source and an object, then show the direction the light travels. In Panel 2, draw an enlarged transverse wave with arrows for its travel direction and its sideways disturbance. Write one sentence explaining your drawing.

ANSWER KEY

Light on the Move

GRADE 5 · 5.6.a

PART 1 · READ AND MARK

Underline each sentence that tells why visible light is radiant energy. Circle the words that explain how a transverse wave moves compared with its travel direction. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	The flashlight beam moves forward to the wall. How does the disturbance in its transverse wave move compared with the beam's direction?	**It moves across, or perpendicular to, the direction the beam travels.**
2	How does the rope example model the motion of a transverse light wave?	**The rope moves up and down while the wave moves along the rope. Likewise, a transverse light-wave disturbance moves across the direction the light travels.**
3	Red and blue light have different wavelengths. Name two properties the passage says they share.	**Both are transverse waves, and both carry radiant energy. Both also travel outward from a source.**
4	What does light traveling from the Sun through empty space to Earth show about visible light?	**It shows that visible light can travel through empty space and carries energy from place to place.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: A camping lantern with an arrow pointing toward a tent. Panel 2: A transverse wave with a horizontal arrow showing travel and a vertical arrow showing the disturbance. Sentence: Light from the lantern travels toward the tent, while its transverse-wave disturbance moves up and down across the travel direction.

Accept perpendicular, across, sideways, up and down, or a similar accurate description of transverse motion. For the drawing, accept any light source and object if the student clearly shows forward travel and disturbance across that direction.