Waves Carry the Tour

Trace a live video tour from aquarium to home

4.6 "Construct an explanation of how light, sound, and digitized information are transferred by waves."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline one sentence about light traveling and circle one sentence about sound traveling. Write 1, 2, and 3 beside the sentences that show picture information being made, carried, and read.

A Turtle on the Screen

1. Maya joins a live video tour of an aquarium from home. At the tank, light bounces off a sea turtle and travels to the guide's camera. The camera changes the light it detects into digital information, a code made of numbers. Maya cannot see the turtle directly, but the camera can send information about what its light detected.

2. The guide says, "Look at its flippers!" Her voice makes the air vibrate. These vibrations travel as sound waves through the air to a microphone. The microphone changes the sound into digital information, too. A computer sends both the picture code and the sound code as quick pulses of light through a thin glass cable. The pattern of pulses carries the codes to Maya's home.

3. At home, a device reads the incoming light pulses and turns the codes back into a picture and sound. Maya's screen gives off light waves that travel to her eyes, so she sees the turtle. Her speaker vibrates the air, making sound waves that reach her ears, so she hears the guide. The original voice did not travel through the glass cable as sound.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does information about the turtle get from the tank to the camera?

2. How does the guide's voice reach the microphone, and what does the microphone do with it?

3. How do the picture and sound codes travel through the glass cable to Maya's home?

4. How do waves help Maya see and hear the tour after the codes reach her home?

3 YOUR TURN

Your own words

Choose an event to share with someone through a live video call. In four or five sentences, explain how light and sound become digital information, how that information travels through a glass cable, and how the other person sees and hears your event.

ANSWER KEY

Waves Carry the Tour

GRADE 4 · 4.6

PART 1 · READ AND MARK

Underline one sentence about light traveling and circle one sentence about sound traveling. Write 1, 2, and 3 beside the sentences that show picture information being made, carried, and read. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does information about the turtle get from the tank to the camera?	**Light bounces off the turtle and travels to the camera, which detects it.**
2	How does the guide's voice reach the microphone, and what does the microphone do with it?	**The voice travels through air as sound waves. The microphone changes the sound into digital information.**
3	How do the picture and sound codes travel through the glass cable to Maya's home?	**A computer sends the codes as a pattern of light pulses through the glass cable.**
4	How do waves help Maya see and hear the tour after the codes reach her home?	**Light waves from the screen reach her eyes, and sound waves from the speaker travel through air to her ears.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I show my cousin a toy train during a video call. Light from the train reaches my camera, which changes what it detects into digital information. My voice travels through air as sound waves to the microphone, which also makes digital information. A computer sends the codes as pulses of light through a glass cable to my cousin's home. Her screen sends light waves to her eyes, and her speaker sends sound waves through air to her ears.

For the marking job, accept either paragraph 2 or paragraph 3 for a sentence about sound traveling. For Your Turn, accept any event with an accurate path for light, sound, and digital information carried by light pulses.