

Energy on the Move

Trace how waves pass energy through a medium.

6.8.C “explain how energy is transferred through transverse and longitudinal waves.”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each sentence that explains how energy moves through a wave. Circle words that describe how the material in the wave moves.

Moving Energy, Staying Matter

- ① At a crowded soccer game, fans can make a wave travel around the stands. Each person stands and sits in place, yet the pattern moves from section to section. This is like a transverse wave. In a transverse wave, the material moves back and forth at a right angle to the direction the wave travels. A rope provides another example. When Maya shakes one end up and down, a raised pulse can carry energy along the rope to her friend’s hand.
- ② Not every wave makes material move across its path. Imagine a long spring resting on a floor. If Jamal pushes several coils together and releases them, a crowded region travels down the spring. The coils move forward and backward in the same direction as the traveling disturbance. This is a longitudinal wave. The crowded regions are compressions, and the spread-out regions are rarefactions. Energy moves through the spring because each coil pushes or pulls on the next coil, even though individual coils only vibrate near their starting places.
- ③ Waves transfer energy by making nearby parts of a material move, then pass the disturbance onward. The material is called the medium. In the rope and spring, the medium stays present while energy travels through it. Sound in air is also a longitudinal wave. A vibrating speaker makes nearby air particles bunch together and spread apart. Those changes pass energy from particle to particle until they reach an ear. The air particles do not travel all the way from the speaker to the listener.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 In Maya's rope pulse, how does the rope move, and what direction does the energy travel?

2 How can energy travel through Jamal's spring if the individual coils stay near their starting places?

3 Why is sound in air a longitudinal wave, according to the passage?

4 How does the passage show that energy transfer is different from the movement of the medium? Use the rope, spring, or air as evidence.

3 YOUR TURN _____ Your own words

Choose a wave situation not described in the passage. Write exactly three sentences that name the medium, identify the wave as transverse or longitudinal, and explain how energy passes through it without the medium traveling all the way with the energy.

PART 1 • READ AND MARK

Underline each sentence that explains how energy moves through a wave. Circle words that describe how the material in the wave moves. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	In Maya's rope pulse, how does the rope move, and what direction does the energy travel?	The rope moves up and down, while energy travels along the rope. The rope's motion is at a right angle to the energy transfer.
2	How can energy travel through Jamal's spring if the individual coils stay near their starting places?	Each coil pushes or pulls on the next coil. This passes the disturbance and energy down the spring.
3	Why is sound in air a longitudinal wave, according to the passage?	Air particles bunch together and spread apart, moving back and forth in the same direction the sound disturbance travels.
4	How does the passage show that energy transfer is different from the movement of the medium? Use the rope, spring, or air as evidence.	Energy travels through the medium, but the material only moves or vibrates near its position. For example, air particles do not travel all the way from the speaker to the listener.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A drummer strikes a drum, making the nearby air the medium. The air particles move back and forth in the same direction that the sound energy travels, so this is a longitudinal wave. Each group of moving air particles pushes on the next group, passing energy toward a listener without the same air particles traveling across the room.

Accept equivalent descriptions of perpendicular motion for transverse waves and parallel back-and-forth motion for longitudinal waves. For the open response, accept any accurate new situation that identifies a medium and clearly separates energy transfer from matter moving across the entire distance.