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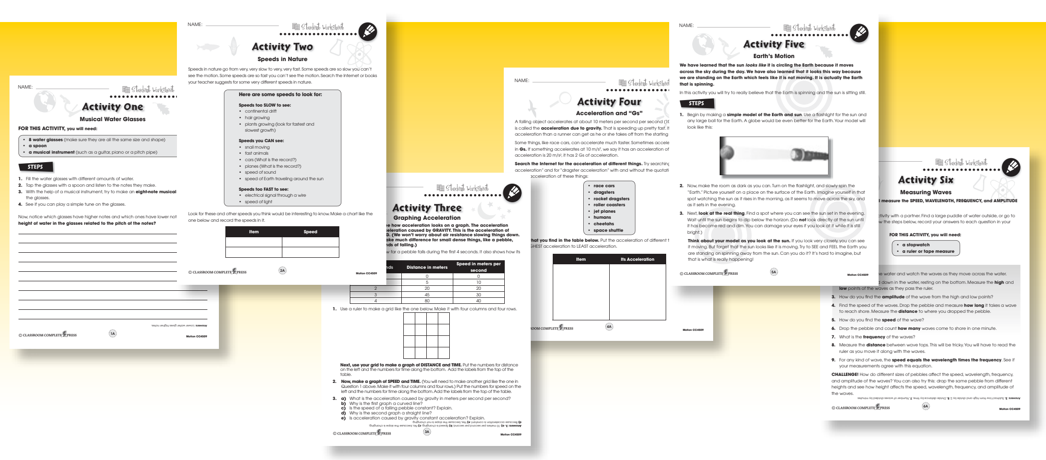
FREE! **6 Bonus Activities!**

3 EASY STEPS to receive your 6 Bonus Activities!

- Go to our website: **www.classroomcompletepress.com\bonus**
- Click on item CC4509 – Motion
- Enter pass code CC4509D



NAME: ____________________

Before You Read

Wave Motion

PREASSESSMENT

1. Put a check mark (✓) next to the answer that is most correct.

a) What are waves sent by an earthquake called?

- ◯ **A** radio waves
- ◯ **B** gravity waves
- ◯ **C** seismic waves
- ◯ **D** magnetic waves

b) Which sound has the highest pitch?

- ◯ **A** the sound that is the loudest
- ◯ **B** the sound with the highest speed
- ◯ **C** the sound with the lowest frequency
- ◯ **D** the sound with the most vibrations per second

c) What is a wavelength?

- ◯ **A** the distance a wave travels from where it began
- ◯ **B** the distance a wave travels after it lands on a beach
- ◯ **C** the distance from the top of one wave top to the next
- ◯ **D** the distance from the top of a wave to the low point between waves

2. Circle the word True if the statement is true. Circle the word False if it is false.

a) Pitch is a measure of loudness.

True **False**

b) Sound waves cannot travel across empty space.

True **False**

c) Sound can travel through a brick wall.

True **False**

d) An ocean wave carries water along with it.

True **False**

e) The material that carries a wave is called the "medium."

True **False**

Reading Passage

NAME: ____________________

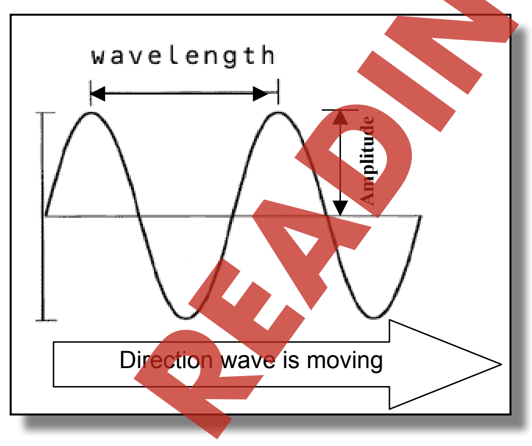
Wave Motion

READING PASSAGE

We have learned that sound waves pass in some mysterious way through particles that we can't even see. Water waves are easier to make sense of. First of all, we can see them, and they look like what we think of as waves.

We learned that frequency is the number of waves per second. The frequency is much lower for water waves than for sound. It is so low we can count the waves as they pass by. Water waves are good for explaining some other things about wave motion.

The picture below shows water waves. This is what they would look like if you could look at the surface of the water sideways.



Two things about the wave are shown. The **wavelength** is the distance between waves. To get wavelength we measure the distance from the top of one wave to the top of the next. The **amplitude** is the height of the wave. Amplitude is measured from the middle to the top of a wave.

For all kinds of waves, high frequency waves have short wavelengths, and low frequency waves have long wavelengths. Amplitude in sound waves measures loudness. The amplitude of a sound tells how tightly packed the air particles are in the thick air part of a sound wave.

After You Read

NAME: ____________________

Wave Motion

COMPREHENSION QUESTIONS

1. Match the word to its meaning.

wavelength	frequency	amplitude	medium	seismic

- ____________ **a)** the height of a wave
- ____________ **b)** the material that carries a wave
- ____________ **c)** the distance between two wave tops
- ____________ **d)** the kind of waves an earthquake makes
- ____________ **e)** the number of waves or vibrations per second

2. Put a check mark next to the answer that is most correct.

a) Which of these waves carries the *least* energy?

- ◯ **A** water waves
- ◯ **B** sound waves
- ◯ **C** seismic waves
- ◯ **D** earthquake waves

b) What does the amplitude of a sound wave measure?

- ◯ **A** frequency
- ◯ **B** loudness
- ◯ **C** pitch
- ◯ **D** speed

c) Which things move along with an ocean wave?

- ◯ **A** just water
- ◯ **B** just energy
- ◯ **C** wave shape and water
- ◯ **D** energy and wave shape

NAME: ____________________

After You Read

Wave Motion

SHORT ANSWER QUESTIONS

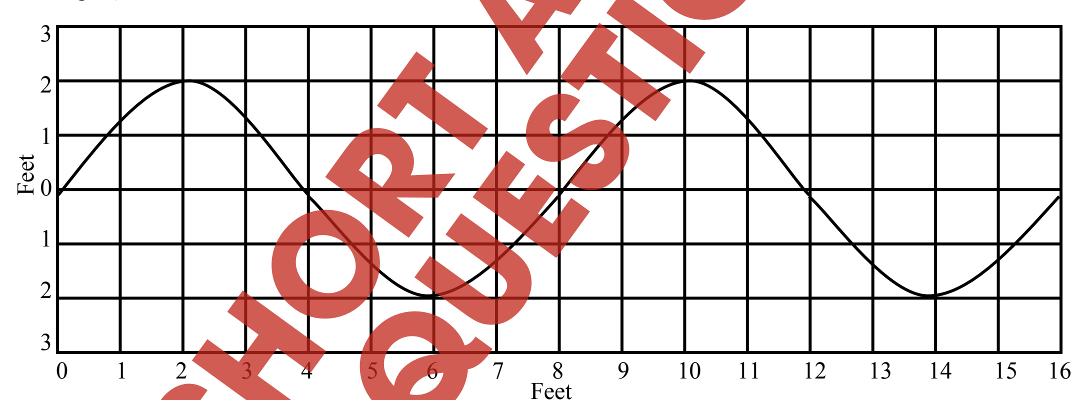
Answer the questions in complete sentences.

3. Give some **proof** that water does not travel along with an ocean wave.

4. Name **three** different mediums that waves move through. For each medium name a kind of wave that could move through it.

Extension & Application

5. A graph of a wave is shown below.



a) What is the **wavelength** of the wave? ____________

b) What is the **amplitude** of the wave? ____________

c) Draw a double arrow (⟷) on the graph to show the wavelength. Label it "wavelength".

d) Draw another double arrow on the graph to show amplitude. Label it "amplitude".

HANDS-ON ACTIVITIES

Hands-On Activity # 4

Vibrating Strings

In this activity, you will study vibrating strings. You will try to find out what the length of a string has to do with the frequency of the note it makes when it vibrates.

For this activity all you really need is a rubber band. You could learn more, however, if you have any of the following: a guitar, pitch pipe, piano, or set of tuning forks.

This is what you do:

1. Stretch the rubber band as tight as you can between two points the way a guitar string is stretched across the neck of a guitar.
2. Pluck the rubber band and listen to the note it makes. Try to find the same note on a piano, tuning fork, or pitch pipe (if you have them).
3. Hold the rubber band down in the middle and pluck one side of it. How did the note change? Can you find the new note the piano?
4. Try holding the rubber band down at other places to make different lengths that will make different notes. You can do the same thing with guitar strings if you have a guitar.

What does string LENGTH have to do with FREQUENCY? (Remember, higher pitch is higher frequency.) Remember the frequency of a note is twice the frequency of the note one octave below it. On the piano keyboard, octaves are eight white keys apart. Can you figure out how to make rubber band notes an octave apart?

____

____

____

____

____

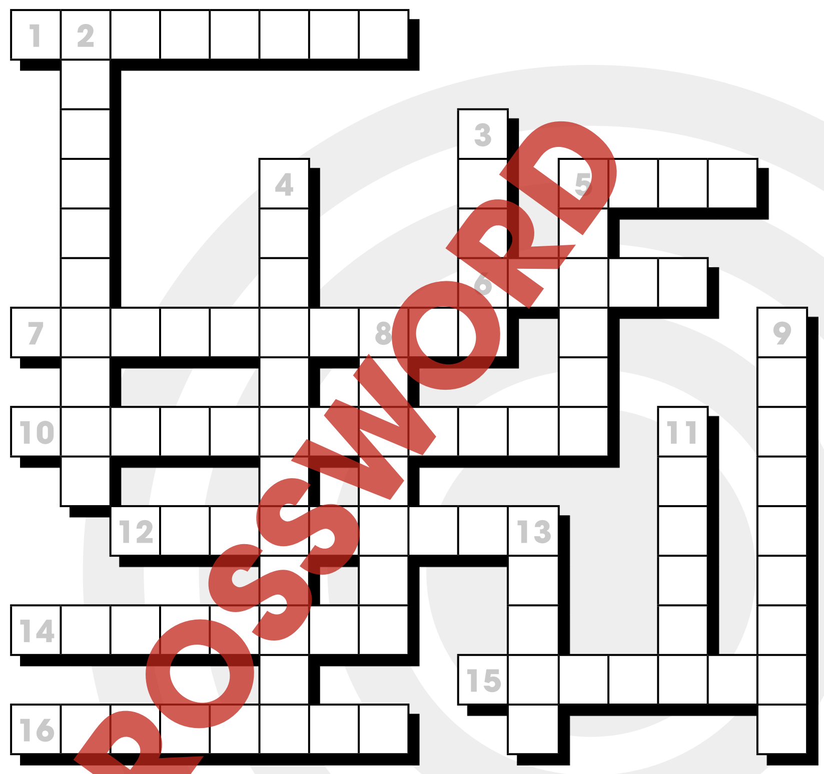
____

CROSSWORD

After You Read NAME: ______________________

Crossword Puzzle!

Word List
acceleration
resistance
distance
medium
friction
frequency
seismic
gravity
velocity
deceleration
pitch
graph
mass
motion
rotations
speed
wavelength



Across

1. A force that resists motion.
5. A measure of how much stuff is in something.
6. The frequency of a musical note.
7. The distance between the high points of two waves.
10. A speeding up motion
12. Spins
14. Speed in a given direction.
15. The kind of waves caused by earthquakes.
16. Divide it by time to get speed.

Down

2. Falling things are slowed down by air ____.
3. Steady speed is a straight, sloping line on a ____ of distance and time.
4. A slowing down motion.
5. A change of position.
8. The force that makes things fall.
9. The number of vibrations per second.
11. What waves travel through.
13. Distance divided by time.

ASSESSMENT

NAME: ______________________ After You Read

Comprehension Quiz

Part C

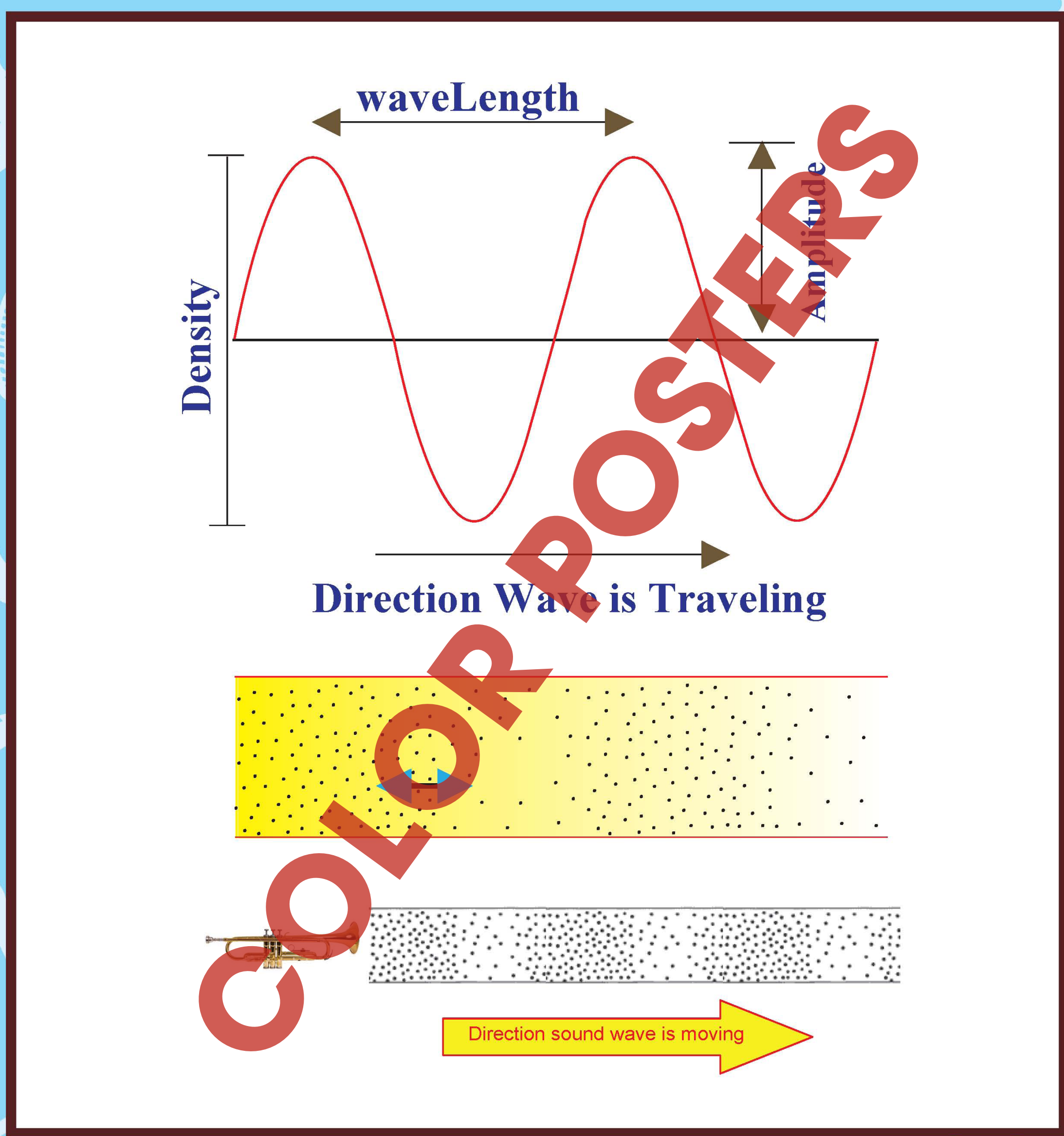
Here are some short answer questions. The first three are about the same spaceship.

1. You have been captured by aliens who have locked you in a windowless room on their spaceship. The spaceship is in outer space far from Earth or anything else. As you sit in the room, which of these questions could you answer? Write "**could tell**" or "**could not tell**" after each question. (5)
   a) Is the ship moving at a constant speed? ____________
   b) Is the ship accelerating? ____________
   c) Is the ship rotating? ____________
   d) Is the ship changing direction? ____________
   e) Is the ship standing still? ____________
2. You discover a window in the wall of the spaceship. You pull open the curtains and look out. All you see are very distant stars. Could you learn anything new about the ship's motion that you didn't know before? Explain why or why not. (2)
3. Help is on the way! You see the space shuttle coming to rescue you. Its engines are going full blast. Can you hear the space shuttle's engines as it approaches? Explain why or why not. (2)
4. Things change their motion because they are being acted on by a force. (2)
   a) How does the **size of the force** affect how much the motion changes?
   b) How does the **mass of the thing** affect how much the motion changes?
5. Name **two** things that appear to move across the sky but do not. What motion of Earth makes it look like these things move across the sky? (3)

SUBTOTAL: /14

COLOR POSTERS

Wave Characteristics



NAME: ______________________

After You Read

Wave Motion

Answer the questions in complete sentences.

3. Give some **proof** that water does not travel along with an ocean wave.

____

____

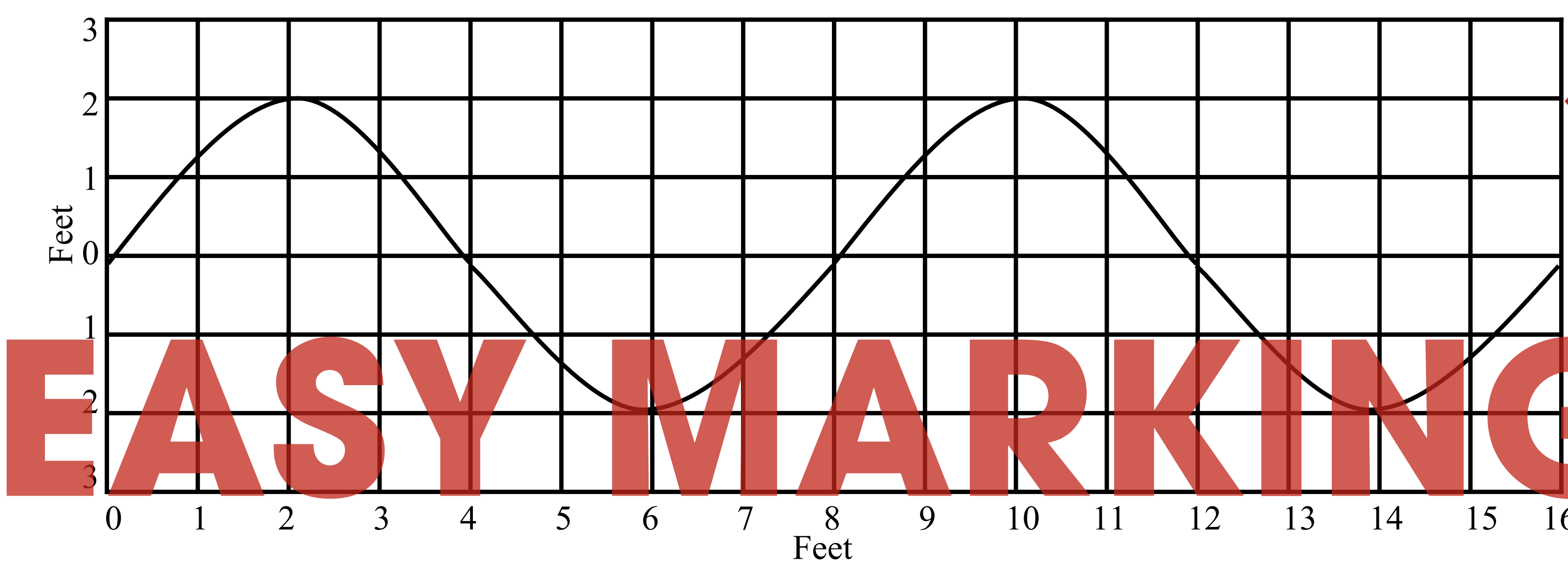
4. Name **three** different mediums that waves move through. For each medium name a kind of wave that could move through it.

____

____

Extension & Application

5. A graph of a wave is shown below.



EASY MARKING ANSWER KEY

a) What is the **wavelength** of the wave? ______________

b) What is the **amplitude** of the wave? ______________

c) Draw a double arrow (←→) on the graph to show the wavelength. Label it "wavelength".

d) Draw another double arrow on the graph to show amplitude. Label it "amplitude".

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3.

Answers will vary. Water does not pile up on the beach. Sea level is about the same where the waves came from and where they are going.

4.

Answers will vary (e.g. air carries sound waves; water carries water waves; earth/ [illegible] carries seismic [illegible]).

5.

a) 8 feet

b) 2 feet

c) Draw: ←→ from hump to hump labeled "wavelength"

d) Draw: ↕ from the zero line to the top of the wave labeled "amplitude"

11

Answers will vary

12

Answers will vary

13

Part A

3.

The change of direction was the change of the wheel's motion. The force was the force of hands.

Part B

2.

Spinning sped up

3.

Spinning slowed down

4.

Change in motion was acceleration when arms came in and deceleration when arms went out. Force was force of arms acting against centrifugal force.

14

EZY

Shorter string gives higher pitch. Half the length raises the pitch one octave.

15

Across:

1. friction
5. mass
6. pitch
7. wavelength
10. acceleration
12. rotations
14. velocity
15. seismic
16. distance

Down:

2. resistance
3. graph
4. deceleration
5. motion
8. gravity
9. frequency
11. medium
13. speed

16