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## EASY MARKING™ ANSWER KEY

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## MINI POSTERS

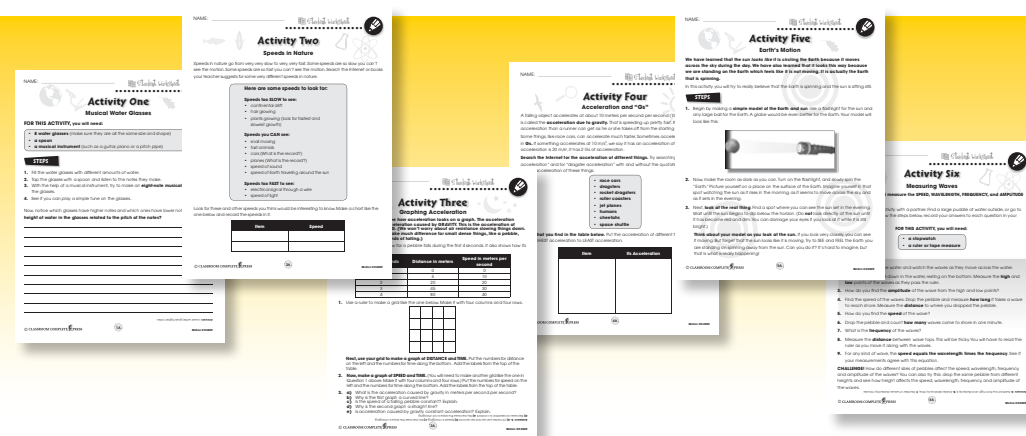
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- Enter pass code CC4509D





## What Is Motion?

1. Write each word beside its meaning. Use a dictionary to help you.

speed	rotation	position	acceleration
deceleration	distance	vibration	

- \_\_\_\_\_ a) spinning
- \_\_\_\_\_ b) distance traveled divided by the time it takes to get there
- \_\_\_\_\_ c) slowing down
- \_\_\_\_\_ d) moving back and forth
- \_\_\_\_\_ e) speeding up
- \_\_\_\_\_ f) the place where a thing is
- \_\_\_\_\_ g) the amount of space between two places

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

a) Acceleration is the fastest kind of speed.

True False

b) Motion is change of position.

True False

c) A spinning top has motion.

True False

d) Motion is always in a straight line.

True False

e) Speed is time divided by distance.

True False



## What Is Motion?

**M**otion is change of **position**. A snail might change its position from one side of your garden to the other. It could take all day. You would have to look closely to even see its motion.



An airplane passes overhead. Its motion is much faster than the snail's. In a few hours, the plane changes its position from New York to Los Angeles. We can see that an important thing to know about motion is the **speed** of motion.

To find the speed of something that is moving, we need to know how far it traveled and how long it took to get there. If a snail is in a hurry, it can travel three feet in one minute. We say its speed is "three feet per minute." In other words, we divided 3 feet by 1 minute to find the speed.



That is how to find speed—divide the **distance** traveled by the time it took to do it. We can use whatever is easiest to measure distance and time. Miles per hour works well for planes and cars. Feet per minute is better for snails. Inches, feet, miles, centimeters, meters, and kilometers are all ways of measuring distance. Seconds, minutes, and hours are used to measure time.

Airplanes usually travel 3,000 miles from New York to Los Angeles in about 6 hours. So the speed of a plane is 3,000 miles divided by 6 hours or 500 miles per hour. That's about 10,000 times faster than a snail.



## What Is Motion?

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

a) Which of these is a speed?

- A 50 miles
- B 50 hours
- C 50 miles per hour
- D 50 hours per mile

b) Which word **best** describes the motion of a falling rock?

- A accelerating
- B decelerating
- C rotating
- D vibrating

c) What do we know about something that has steady acceleration?

- A It is moving at a constant speed.
- B It is moving at a very fast speed.
- C Every second it travels the same distance.
- D Every second it increases its speed by the same amount.

d) Which word means moving back and forth?

- A deceleration
- B position
- C rotation
- D vibration

2. Circle the words that are kinds of motion.

position      acceleration      deceleration      rotation  
vibration      distance      time



## What Is Motion?

Answer the questions in complete sentences.

3. Tell what **rotation** means, and describe something that is rotating.

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4. Tell what **vibration** means, and describe something that is vibrating.

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5. In your own words, tell what **motion** is.

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6. What is the difference between **acceleration** and **deceleration**? Give one example of each.

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### Extension & Application

7. A car travels 200 miles in 4 hours at a constant speed. What is the speed of the car in miles per hour? Show your work.

8. Jordan throws a ball 30 feet into the air, and the ball falls back to the ground. Use the words "**acceleration**" and "**deceleration**" to tell how the ball changed its motion between the time Jordan threw it and the time it hit the ground.

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## Circular Motion

**T**his activity is best done with TWO people. You and your partner will need something to sit or stand on that will spin. A swivel office chair works well. A large "lazy Susan" platter will also work. You will also need a bicycle wheel. You will need the whole wheel and axle system, not just a tire. (Your teacher may be able to help you find these things.)

This activity has two parts.

### Part A

1. Hold the bicycle wheel by the axle with two hands. Have the other person spin the wheel as fast as he or she can.
2. When the wheel is spinning, try to change its ANGLE by moving one hand up while keeping the other where it is.
3. Tell what happened. Something in motion changed direction, so it must have been acted on by a force. What **changed direction**? What was the **force**?

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### Part B

1. Sit in the office chair and hold your arms straight out. Have someone spin you as fast as they can by pushing on one of your arms.
2. Now, pull your arms in tight against your body. What happened?
3. While you are still spinning, put your arms out again. What happened?
4. For Steps 2 and 3, what was the **change in motion**? What **force** was involved?

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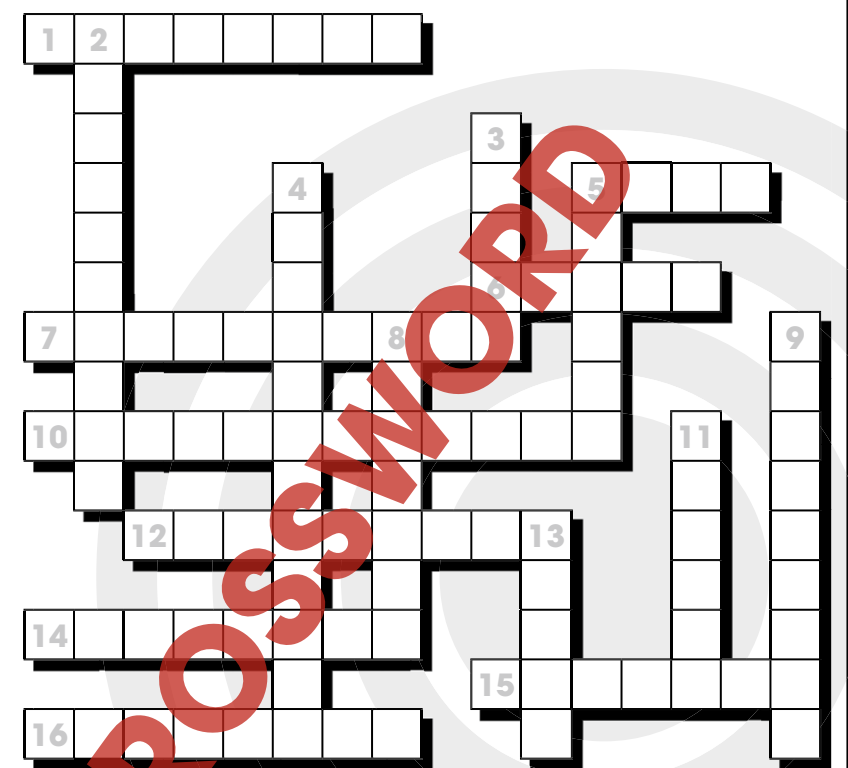
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## Crossword Puzzle!

### 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.



## Comprehension Quiz

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### Part A

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

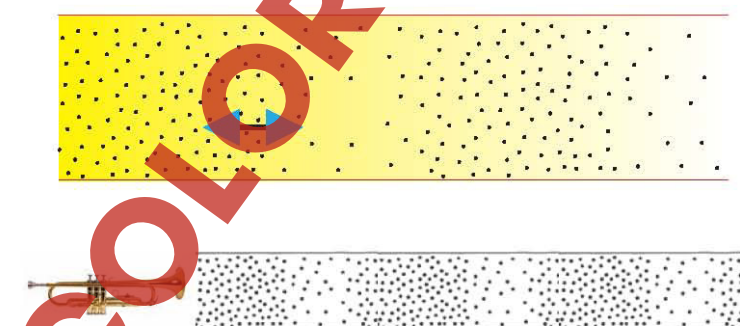
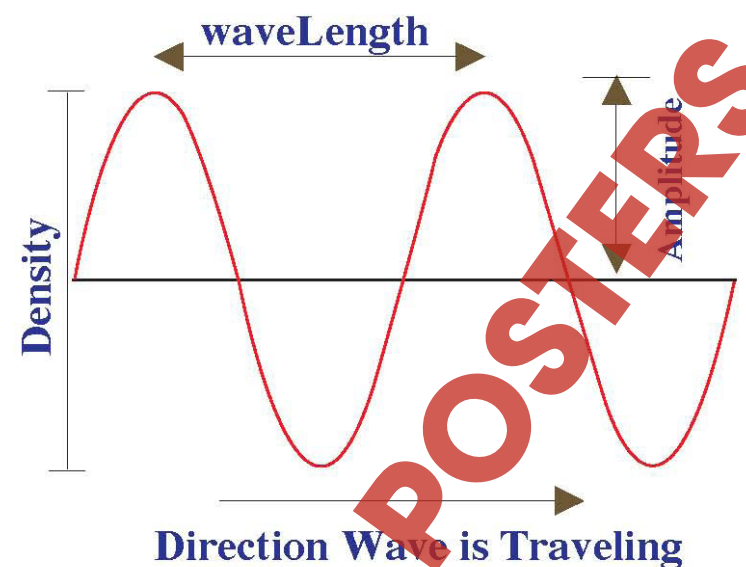
- 1) Speed is time divided by distance.  
True False
- 2) Velocity is speed in a given direction.  
True False
- 3) Things in motion decelerate because of the force of friction.  
True False
- 4) All sounds come from something that is vibrating.  
True False
- 5) The slope of a distance and time graph is speed.  
True False
- 6) The more mass a thing has, the more a force will change its motion.  
True False
- 7) Sound can travel across empty space.  
True False

### Part B

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

1. What is a measure of the height of a wave on water?
  - A amplitude
  - B frequency
  - C medium
  - D wavelength
2. Which kind of motion does a rock have just after it dropped from a high bridge?
  - A constant speed
  - B constant velocity
  - C constant acceleration
  - D constant deceleration
3. Which two things could you graph to show speed?
  - A force and mass
  - B velocity and time
  - C distance and time
  - D mass and distance

## Wave Characteristics





# Vibrating Motion

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

a) Vibrating motion is up and down or back and forth.

True      False

b) Sound can travel through solids.

True      False

c) Sounds are made by things that vibrate.

True      False

d) Pitch is the same as loudness.

True      False

e) Sound travels faster than cars.

True      False

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

a) Which of these moves with a vibrating motion?

- A a spinning top
- B a falling pebble
- C a flowing stream
- D a plucked guitar string

b) What is frequency?

- A how far something vibrates
- B how long something vibrates
- C how often something vibrates
- D how loudly something vibrates

c) Which does not carry sound?

- A iron
- B water
- C nitrogen gas
- D empty space

1.

a) True

b) True

c) True

d) False

e) True

2.

a)  D

b)  C

c)  D

22,000 vibrations per second is beyond the range of human hearing.

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1.

a) True

b) False

c) True

d) False

e) False

2.

a)  D

b)  C

c)  C

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3.

Answers will vary. A vibration causes sound waves (or bands of thick and thin air) to spread out from the source. The waves enter the ear and strike the eardrum, making it vibrate with the same frequency as the source. A message is sent to the brain to tell us what the frequency is.

4.

Answers will vary (e.g. strings on a guitar vibrate; metal on a horn vibrates; a drumhead vibrates; a reed in a woodwind vibrates).

5.

Accept any reasonable answer (e.g. both are vibrations and have frequency, sound waves have a higher frequency than seismic waves).

6.

Ten octaves. To get this answer, keep doubling the number 20 until you get to 20,000: 20, 40, 80, 160, 320, ... 20,480

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1.

a)  C

b)  D

c)  C

2.

a) False

b) True

c) True

d) False

e) True

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Answers will vary. A hole does not form where the pebble landed. Water does not pile up on the shore.

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# EASY MARKING ANSWER KEY