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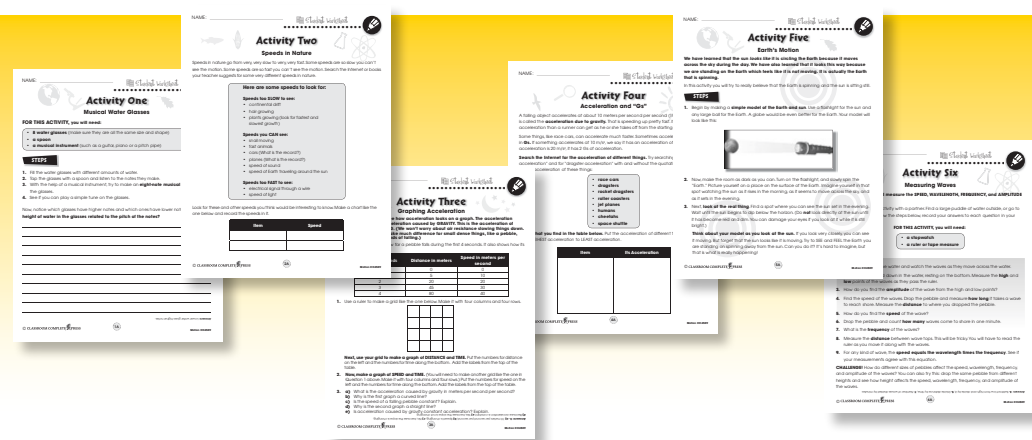
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6 Bonus Activities!

3 EASY STEPS to receive your 6 Bonus Activities!

- Go to our website:
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- Click on item CC4509 – Motion
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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?

So far we have been talking about steady motion in a straight line. There are other kinds of motion. A moving thing can be slowing down or it can be speeding up. A car slows down as it comes to a stop sign and then speeds up as it leaves the stop sign. Motion can change direction too, as when a car goes around a corner.

Speeding up is called **acceleration**. Slowing down is called **deceleration**. Changing direction is also a kind of acceleration. Spinning is one way of changing direction. Spinning is called **rotation**. Things that move back and forth are said to be **vibrating**. Guitar strings make sound by vibrating very fast.

It took Jesse 15 minutes to ride her bike to school. What else would you need to know to find Jesse's speed?



We can also use numbers to tell how much something accelerates. It is easiest if something has a regular, steady acceleration. By steady, we mean that every second, the speed of the accelerating thing increases by the same amount. When things fall they accelerate in a regular, even way. Every second a falling rock increases its speed by about 22 miles per hour. A speed of 22 miles per hour is the same as 32 feet per second. So we say that falling things accelerate at 32 feet per second per second.



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.

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

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

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

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.



Comparing Speed of Animals

In this activity, you will compare the speeds of animals. The speeds of most of the common animals have been measured. You will choose some different animals and then research how fast each can move. You may look for your information on the Internet, or ask your teacher to suggest some books that will help.

Begin by deciding which animals to research. Here are some interesting ways to choose your animals:

1. You could find which animal is FASTEST in each class of animals: fish, reptiles, amphibians, birds, and mammals. Make some guesses before you start to gather information. Which class has the speed record? Try putting them in order of fastest class to slowest class.
2. You could compare several animals of ONE class with each other. If you choose mammals, look for the speed of the sloth and the cheetah. If you choose fish, look for the speed of the sailfish. Again, try to guess before you start which animals will be fastest and slowest and what their speeds will be.
3. So far the suggestions have been for vertebrates. You could also compare the speeds of some common INVERTEBRATES, like earthworms, snails, squid, and ants. You could also just compare different kinds of INSECTS.

Before you start your search, make a table like the one below in which to record your speeds. Have one column for animals' names and one column for their speeds.

Name of Animal	The Animal's Speed

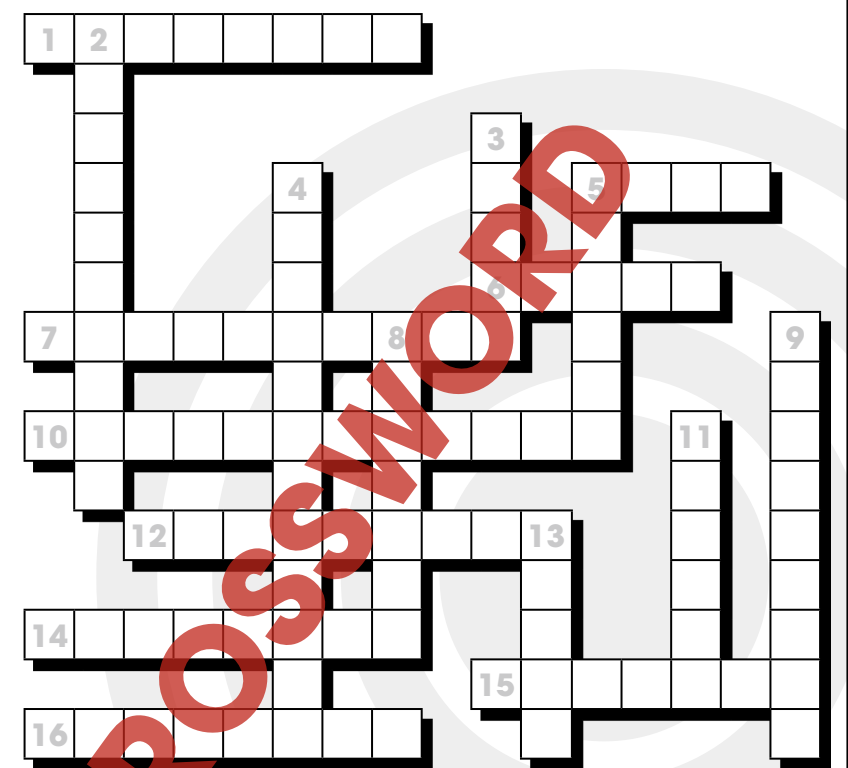
When you have found all your speeds, make a bar chart to show how they compare. How did your guesses compare to what you found?



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

24

Part A

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

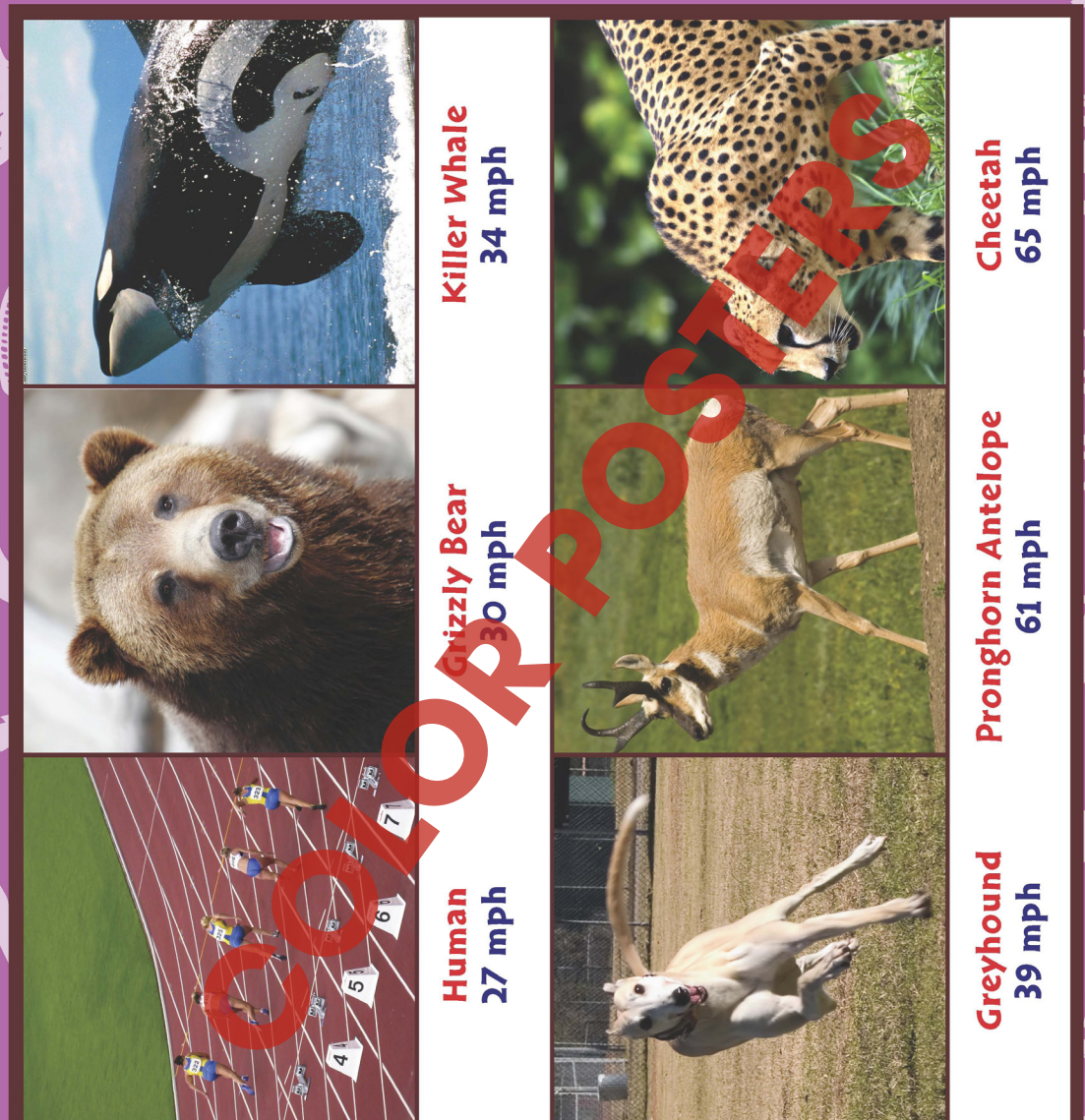
- 1) Speed is time divided by distance.
True False
- 2) Velocity is speed in a given direction.
True False
- 3) Things in motion decelerate because of the force of friction.
True False
- 4) All sounds come from something that is vibrating.
True False
- 5) The slope of a distance and time graph is speed.
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

Animal Speeds



NAME: _____

After You Read 



What Is Motion?



Answer the questions in complete sentences.

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

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

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

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

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.

3.

Rotation means spinning. Answers will vary (e.g. a top, the Earth, a merry-go-round).

4.

Vibration means moving back and forth or up and down. Answers will vary (e.g. guitar string, insect wings, jackhammer)

5.

Motion is change of position.

6.

Acceleration is speeding up. Deceleration is slowing down. Examples will vary.

7.

$200 \div 4 = 50$ miles per hour.

8.

Decelerating going up, accelerating coming down

11

Answers will vary

12

Part A

3.

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



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

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.

Down:

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

Answers will vary

13

14

16

EASY MARKING ANSWER KEY