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- Reading Comprehension

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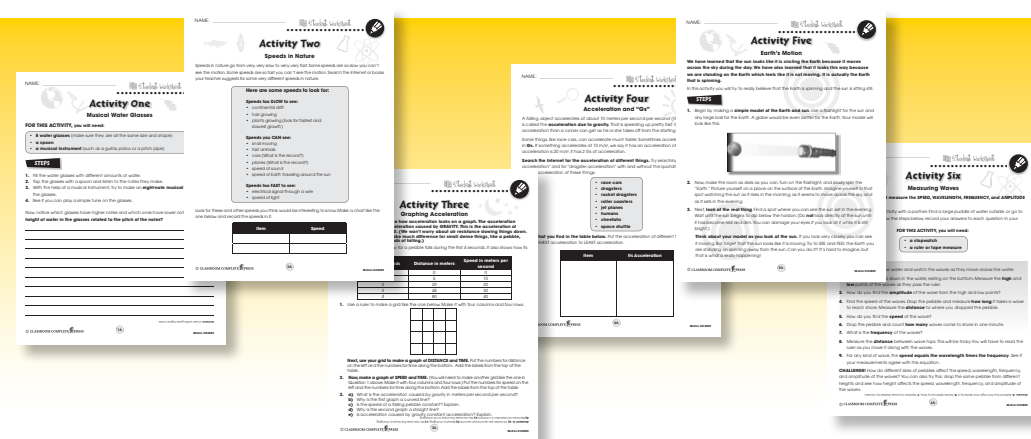
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**FREE!** 6 Bonus Activities!

**3 EASY STEPS** to receive your 6 Bonus Activities!

- Go to our website:  
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- Click on item CC4509 – Motion
- Enter pass code CC4509D





## How to Recognize Motion

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

- a) Acceleration means speeding up.  
**True**      **False**
- b) Something thrown into the air decelerates on the way up.  
**True**      **False**
- c) To find the speed of something we multiply time by distance.  
**True**      **False**
- d) The sun moves across the sky.  
**True**      **False**
- e) Vibration is a kind of motion.  
**True**      **False**

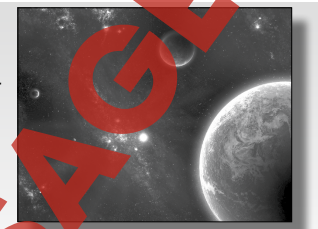
2. Put a check mark (✓) next to the answer that is most correct.

- a) What is spinning motion called?  
 A acceleration  
 B frequency  
 C rotation  
 D vibration
- b) What kind of motion does any thing have just after it drops from a height?  
 A acceleration  
 B deceleration  
 C steady speed  
 D change of direction
- c) How many of these things move in a circle around the Earth?  
 the sun      the moon      a star  
 A none  
 B one  
 C two  
 D three



## How to Recognize Motion

**Y**ou can tell when something is moving because you can see it move. Or can you? If *you* are moving, you can feel you are moving. Or can you? Motion is trickier than it looks—and more interesting.



To see and measure motion, we must always compare the moving object to some other object or a background. We usually think of big things, like the Earth, as not moving. The sun seems to move across the sky during the day. If we could step outside the solar system, we would see the sun as *not* moving and the Earth as *spinning*. We think the Earth is not moving because we are standing on it.

If you were in a spacecraft lost in space, far from the nearest star, you could not tell if you were moving or staying in the same place. Out there, you would have no object or background to compare your motion to.

1. Name one thing that seems to move across the sky but does not.

2. Name one thing that actually does move across the sky.

We can't *feel* motion either. We feel the wind on our face, we feel changes in motion, but we can't feel steady, smooth motion. Suppose you were riding in a car at a steady speed on a perfectly smooth road. If you closed your eyes, you would have no feeling of motion.

Now you are back in the spacecraft. You could tell if the spacecraft suddenly speeded up, slowed down, or changed direction. You could *not* tell the difference between standing still and moving at a steady speed in a straight line.



## How to Recognize Motion

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

- a) Earth does not move.  
**True**      **False**
- b) If something causes us to suddenly accelerate, we can always feel it.  
**True**      **False**
- c) Things in outer space are in fixed positions.  
**True**      **False**
- d) We can tell if a car we are riding in is moving by looking out the window.  
**True**      **False**
- e) We cannot feel steady, smooth motion in a straight line.  
**True**      **False**

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

- a) How can we always tell if something is moving?  
 A by its size  
 B by the noises it makes  
 C by seeing it against a background  
 D by looking closely at it for a long time
- b) Which moves across the sky?  
 A the sun  
 B the stars  
 C the planets  
 D the clouds
- c) Why can we feel ourselves falling?  
 A because we are moving fast  
 B because we are accelerating  
 C because we are changing direction  
 D because we are getting closer to the Earth



## How to Recognize Motion

Answer the questions in complete sentences.

3. You get into an **elevator** to travel from the first floor to the tenth floor. The elevator moves very smoothly and does not stop at any other floors. Describe which things about your motion you would feel on your trip from the first to the tenth floor.
- \_\_\_\_\_
- \_\_\_\_\_
4. You are riding on a **train at night**. The ride is so smooth it feels like you aren't moving. When you get up and walk to the restroom, it *does* feel like you are moving. Why couldn't you tell the train was moving at 60 miles per hour, but you could tell you were moving when you were walking through the train at only 2 miles per hour?
- \_\_\_\_\_
- \_\_\_\_\_

### Extension & Application

5. **Are you sitting still?** Are you sure? The planet Earth is moving in several different ways, and you are moving with it.

- a) Describe **two** kinds of motion of Earth that are also happening to *you* because you are riding along.
- \_\_\_\_\_
- \_\_\_\_\_

- b) Explain why you *cannot* feel the Earth moving in these ways.
- \_\_\_\_\_
- \_\_\_\_\_



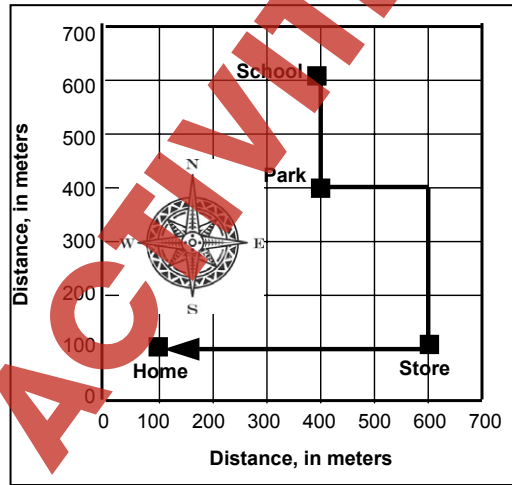
# Treasure Map Game

This activity is for two people or two teams of people.

FOR THIS ACTIVITY, you will need:

- paper
- a pencil
- a compass
- a long tape measure

You will try to find your way as if you were walking on a large graph, like the one to the right. The goal is to find a prize by following directions or reading a map.



### STEPS:

1. One person or team makes a map like the one above, or writes directions for finding a prize.
2. First decide on a path from a starting point to a place where a prize will be hidden.
3. Measure distances with the tape measure along each section of the path. The directions should all be either NORTH, EAST, SOUTH, or WEST. Use the compass to find the directions. Have about four sections in the path.
4. The directions might be something like this: "Go 30 feet north, turn left, and go 90 feet west. Turn left again, and go 60 feet south. Turn right, and go 60 feet west. Do you see the prize?" The directions can be written or they can be shown on a map.
5. The other person or team tries to find the prize by following the map or the directions. They use a compass but *not* the measuring tape. They will find distances by counting their steps. Before they start they will have to measure the length of one step. Then they will figure out how many steps to take for each distance on the map.
6. Take turns hiding a prize and looking for it.

**Here is another way to do the game:** One person hides the prize and makes the map. All the other people try to follow the map to the prize. The winner is the person who ends up closest to the prize. The winner gets to hide a prize next.



# Word Search

Find all of the words in the Word Search. Words are written horizontally, vertically, diagonally, and some are even written backwards.

- |              |          |           |
|--------------|----------|-----------|
| ACCELERATION | MASS     | SEISMIC   |
| AMPLITUDE    | MATTER   | SLOPE     |
| CONSTANT     | MEDIUM   | SPEED     |
| DECELERATION | MOTION   | VELOCITY  |
| FREQUENCY    | PITCH    | VIBRATE   |
| FRICTION     | POSITION | VIBRATION |
| GRAPH        | ROTATION | WAVE      |
| GRAVITY      | TIME     | SIZE      |
| FORCE        |          |           |

E	C	R	O	F	M	Y	Z	B	C	D	F	G	S
S	I	Z	E	U	M	D	D	L	H	K	J	H	E
S	T	N	I	V	E	W	E	X	C	Y	Z	B	I
J	R	D	O	E	D	H	C	G	T	I	M	E	S
K	E	L	P	I	L	M	E	N	I	H	P	Q	M
M	T	S	W	V	T	L	S	P	Z	R	O	I	
Y	T	Z	B	C	A	E	A	D	F	T	G	C	
E	A	C	C	F	L	E	R	A	T	I	O	N	G
T	M	M	V	L	P	G	A	B	O	K	J	R	H
A	N	A	P	Q	M	R	T	N	I	S	A	T	N
R	W	C	B	A	A	Z	I	Y	X	V	W	O	V
B	D	F	S	G	H	P	O	S	I	T	I	O	N
I	N	S	L	O	P	E	N	T	M	T	L	K	J
V	E	L	O	C	I	T	Y	P	A	Q	R	S	T
B	Z	Y	X	W	T	N	A	T	S	N	O	C	V
C	F	R	I	C	T	I	O	N	K	L	M	N	P
D	F	G	H	J	F	R	E	Q	U	E	N	C	Y

# 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.
  - 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. \_\_\_\_\_
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. \_\_\_\_\_
4. Things change their motion because they are being acted on by a force.
  - 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? \_\_\_\_\_

# Acceleration of Machines and Animals

Type	Distance	Speed	Time	Acceleration Gs
F16 Jet				9 G
Top Fuel Dragster	1/4 mile	1320 mph	4.4 Sec	3.3 G
Formula 1 Race Car		60 mph	2.7 Sec	2.7 G
Roller Coaster		120 mph	3 Sec	4 G
Cheetah		50 mph	4.38 Sec	0.8 G
Human	40 yds	27 mph		0.4 G

NAME: \_\_\_\_\_

After You Read 



# How to Recognize Motion

Answer the questions in complete sentences.

3. You get into an **elevator** to travel from the first floor to the tenth floor. The elevator moves very smoothly and does not stop at any other floors. Describe which things about your motion you would feel on your trip from the first to the tenth floor.

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4. You are riding on a **train at night**. The ride is so smooth it feels like you aren't moving. When you get up and walk to the restroom, it does feel like you are moving. Why couldn't you tell the train was moving at 60 miles per hour, but you could tell you were moving when you were walking through the train at only 2 miles per hour?

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## Extension & Application

5. **Are you sitting still?** Are you sure? The planet Earth is moving in several different ways, and you are moving with it.

a) Describe **two** kinds of motion of Earth that are also happening to *you* because you are riding along.

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b) Explain why you *cannot* feel the Earth moving in these ways.

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3.

You would feel acceleration as you left the first floor, and you would feel deceleration as you arrived at the tenth floor.

4.

Answers will vary. You couldn't feel the train's motion because it was smooth and there was no background or other objects to compare to. When you walked on the train you compare your changing position to other objects/to the background.

5.

- a) Rotating, traveling around the sun
- b) Answers will vary. Air moves with the Earth. The motion is smooth. We take Earth as our reference for motion.

Answers will vary

11

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.

14

Across:

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

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.

16. distance

Down:

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

Answers will vary

10

12

13

15

EASY MARKING ANSWER KEY