

Accelerometer Lab

Name _____ Period _____

Objective: To build a device that measures acceleration; To understand that acceleration is a change in SPEED or DIRECTION.

Pre-lab Questions:

1. Define speed.
2. Define velocity.
3. Define acceleration.

Materials:

Index card
Tape
Piece of string (about 6-8 inches long)
Washer
Ruler

Procedures:

Cut out ONE of the accelerometer patterns.

Glue or tape the pattern to an index card, aligning the top edge of the pattern with the top of the card.

Center the index card on a ruler and tape it to the ruler.

Tie a washer to the bottom of the string.

Use a SMALL piece of tape to attach a piece of string to the top of the index card at the center point of the pattern.

Check the figure at the right to be sure that you have set it up correctly. Your accelerometer should look nearly identical to the picture (including the length of the string).

Hold the accelerometer, grabbing it by the bottom end of the ruler, straight up and down in front of you. Turn it so that the pattern is facing you.

Walk across the room *at a steady pace*. The string should move as you FIRST begin to walk, then it should stop moving as you CONTINUE to walk at a steady pace. When you FIRST begin to stop walking, the string should move again. Then, when you are completely stopped, it should stop moving. Movement of the string indicates that you have accelerated!

Move as necessary to answer the questions in the data section.
Disassemble your accelerometer. Return the washer and ruler to the front of the room.
Discard the rest.

Data:

- What happens to the string...
- ...when you're standing still?
 - ...while you are walking forward at a steady pace?

 - ...while you are walking forward and speeding up?

 - ...while you are walking forward and slowing down?

 - ...when you begin to run forward from a stopped position?

 - ...when you begin to stop from a running position?

 - ...while you turn a corner at a steady pace?

Post-lab Questions:

1. Place a box in the "yes" or "no" column for each movement description to indicate whether or not you were accelerating.

	Yes	No
While speeding up?		
While slowing down?		
While moving at a steady pace?		
While walking straight?		
While changing direction?		

2. Look at the data table below. Did your accelerometer indicate that you were

accelerating during the movements checked "yes" above? Describe any error that could have occurred during the lab to make your accelerometer move when you DID NOT accelerate.

3. The speedometer of a car measures _____.

- a. acceleration.
- b. average speed.
- c. instantaneous speed.
- d. velocity.

4. You are walking down the hall at a constant speed and you turn the corner. Have you accelerated? Explain your answer.

Accelerometer Guides

