

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

## WebQuest Student Worksheet:

( <http://www.MrsClayPhysics.weebly.com> )

### Part I:

A. Speedometers in a car show: \_\_\_\_\_

What is the difference between Instantaneous speed and Average speed?

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The formula for average speed is: \_\_\_\_\_

Suppose that during your trip to school, you traveled a distance of 10 miles and the trip lasted 0.33 hours (20 minutes) What was your average speed? (Show work):

Answer: \_\_\_\_\_

B. Define Velocity: \_\_\_\_\_

What is the difference between speed and velocity?

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Velocity is a vector quantity. As such, velocity is \_\_\_\_\_ aware. When evaluating the velocity of an object, one must keep track of \_\_\_\_\_.

Speed is a \_\_\_\_\_ and does \_\_\_\_\_ keep track of \_\_\_\_\_; velocity is a \_\_\_\_\_ and is \_\_\_\_\_.

Velocity is speed with a \_\_\_\_\_.

The formula for average velocity is: \_\_\_\_\_

C. Define Acceleration: \_\_\_\_\_

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Anytime an object's velocity is changing, the object is said to be \_\_\_\_\_; it has an \_\_\_\_\_.

Acceleration has to do with changing how fast an object is \_\_\_\_\_. An object is accelerating if it is changing its \_\_\_\_\_. Therefore, if an object is not changing its velocity, then the object is not \_\_\_\_\_. An object with a constant \_\_\_\_\_ is not accelerating.

Since acceleration is the ratio of  $\Delta v/t$ , it's units would be velocity units per \_\_\_\_\_.

Typical acceleration units include the following Units: \_\_\_\_\_ or \_\_\_\_\_ or \_\_\_\_\_.

When an object is slowing down, the acceleration is in the opposite direction as the \_\_\_\_\_. Thus, this object has a \_\_\_\_\_.

The formula for average acceleration is:

Solve practice problem A from the bottom of the page here (show your work):

Answer: \_\_\_\_\_

## Part II:

### A. INTERPRETING GRAPHS OF POSITION VS. TIME:

The motion described as a constant, positive velocity results in a line of \_\_\_\_\_ and \_\_\_\_\_ slope when plotted as a position-time graph.

The motion described as a changing, positive velocity results in a line of \_\_\_\_\_ and \_\_\_\_\_ slope when plotted as a position-time graph.

If the velocity is constant, then the slope is \_\_\_\_\_ (i.e., a straight line). If the velocity is changing, then the slope is \_\_\_\_\_ (i.e., a curved line).

If the slope increases, what happens to the velocity? \_\_\_\_\_

*On your own:* If the graph shows a straight line, you can conclude the velocity is constant so the acceleration is \_\_\_\_\_. If the graph shows a curved line, you can conclude the velocity is changing so the acceleration is \_\_\_\_\_.

Describe the relationship between the slope of a position vs. time graph and velocity: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

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B. The slope of the line on a position versus time graph is equal to the \_\_\_\_\_ of the object.

Describe how to calculate velocity of a moving object from two points on a position-time graph:

The slope equation says \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

What is the formula for calculating slope? \_\_\_\_\_

Check your understanding problem answer: (show work)

C. The slope of a velocity vs. time graph tells me \_\_\_\_\_

Draw and label a graph of velocity vs. time for an object with constant velocity and one that has changing velocity:

**Constant Velocity**

**Changing Velocity**

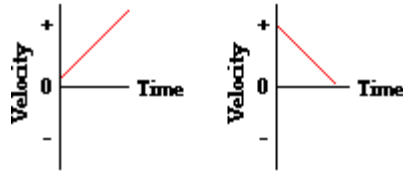
What is this a graph of? \_\_\_\_\_

How do you know from a velocity vs. time graph whether an object has positive or negative acceleration? \_\_\_\_\_

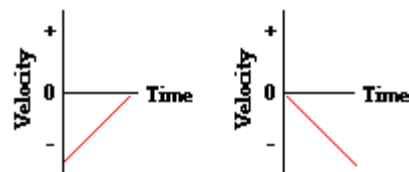
If the acceleration is zero, then the slope is \_\_\_\_ (i.e., a \_\_\_\_\_ line). If the acceleration is positive, then the slope is \_\_\_\_\_ (i.e., an \_\_\_\_\_ sloping line). If the acceleration is negative, then the slope is \_\_\_\_\_ (i.e., a downward \_\_\_\_\_ line).

Review these graphs then answer the “Check your understanding” question at the bottom of the page.

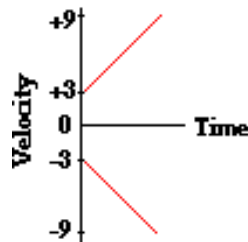
**These objects are moving with a positive velocity.**



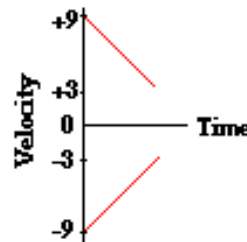
**These objects are moving with a negative velocity.**



**Speeding Up**



**Slowing Down**



Check your understanding answer: \_\_\_\_\_

Explain your answer:

### Part III.

A. Define Freefall: \_\_\_\_\_  
 \_\_\_\_\_

Free-falling objects do not encounter \_\_\_\_\_.

What is the acceleration of an object in free fall (on earth) \_\_\_\_\_  
 \_\_\_\_\_

B. What is the object doing? \_\_\_\_\_

Solve problem for acceleration due to gravity of object in free fall on mars here (show your work):

Answer: \_\_\_\_\_