Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Position vs. Time Graphs**

**Review of speed, velocity, & acceleration**



**Instantaneous Speed** = speed at a given \_\_\_\_\_\_\_\_\_

**Average Speed** = the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ traveled divided by the \_\_\_\_\_\_\_\_ \_\_\_\_\_\_ of travel

\_\_\_\_\_\_\_\_\_\_\_is a description of how fast an object moves.

*\_\_\_\_\_\_\_\_\_\_\_* is a description of \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ *and in what \_\_\_\_\_\_\_\_\_\_* an object moves.

 **Velocity is speed with direction.**

***Constant velocity***requires constant \_\_\_\_\_\_\_\_\_\_\_ AND constant \_\_\_\_\_\_\_\_\_\_\_\_\_.

If an object is moving in a circular path at a constant speed, it is NOT moving with constant velocity because its \_\_\_\_\_\_\_\_\_\_\_\_is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Acceleration –** the *rate* at which \_\_\_\_\_\_\_\_\_\_\_\_\_ is *changing* over \_\_\_\_\_\_\_\_

 Acceleration = change in velocity

 time interval



**It is often useful to look at data on \_\_\_\_\_\_\_\_\_\_\_\_.**

**This is true of data on velocity and acceleration so we will do a review of graphing.**

A \_\_\_\_\_\_\_\_ graph is a graph that uses line segments to connect data points and show changes in data.

**Graphs are an important tool used to show the relationships between \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_.**

* A good way to show a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between two variables is to use a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* A graph makes it easy to see if \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in one variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes in the other variable
	+ Shows a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ relationship
* Position vs. Time Graph
	+ To graph data, you put \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ goes on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable
* An object moving at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ always creates a position vs. time graph that is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Slope of Position vs. Time Graphs – Speed
	+ You can use position vs. time graphs to quickly compare the speeds of different objects.
		- A steeper line on a position vs. time graph means a



faster speed.

* The “steepness” of a line is called its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ The rise is equal to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the triangle.
		- Change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ The run is equal to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ along the base of the triangle.
		- Change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The slope is equal to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ divided by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ The slope for position vs. time graph is therefore \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

divided by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - Which equals WHAT? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Graphing Motion**

AAA

BB

**slope =**

**steeper slope =**

**Straight line =**

**flat line =**

**Single point =**

 **instantaneous speed**

**Who started out faster?**

**Who had a constant speed?**

**Describe B from 10-20 min.**

**Find their average speeds.**

**Practice:**



1. Looking at the graph, answer the following questions:
	1. How far did runner B travel in 100 seconds?

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

* 1. How far did runner A travel in 100 seconds?

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

* 1. Who was traveling at a faster speed?

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

* 1. Calculate the average speed of runner A

(total distance ÷ total time)

* 1. Calculate the average speed of runner B (total distance ÷ total time)
1. Circle the graph below that has a steeper slope

 

* 1. If these were position vs. time graphs what would the slope tell you? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. Looking at the graph, answer the following questions:
	1. What distance was traveled after 3 hours?

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

* 1. What happened between 1 and 1.5 hours?

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

* 1. Did they travel at the same speed the entire trip?

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

* 1. What time interval were they traveling the fastest (part of graph with steepest slope)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. What was the average speed traveled (total distance ÷ total time)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. Looking at the graph, answer the following questions:



* 1. What is the unit of time used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. How many miles did they travel in 2 hours?

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

* 1. How long did it take them to travel 20 miles?

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

* 1. If I am traveling at 6 miles/hr, would I win or lose

a race against the runner in the graph.

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

* 1. If the runner continued at the average speed

(calculated above), how far would they travel after 2 more hours?

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

1. Looking at the graph, answer the following questions:



* 1. How long did it take for them to travel 200 meters?

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

* 1. What time intervals on the graph was there no

motion (no change in position)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. What time interval were they moving the fastest

(steepest slope)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. What was the total distance traveled?

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

* 1. What was the total time it took? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Calculate the average speed of the position vs. time

graph? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_