Motion Detector Lab – AP & Phys

Turn on LabQuest. Plug motion detector into DIG 1 port on side. Along the top of the screen, use the stylus (little pen) to select the graphing tab (looks like 2 red hills). Two graphs should appear. Select GRAPH then GRAPH OPTIONS. Along the top select MANUAL then hit OK.

The graph on the **top** is a velocity graph that has time (on the x axis) vs position [also known as distance] (on the y axis). *How many seconds does the graph last for? \_\_\_\_ So how long do you have to do the motion?\_\_\_\_*

*What is the furthest distance from the 0 m mark that the graph will show?\_\_\_\_\_*

*What does this mean about how far you can stand from the wall?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The graph on the **bottom** is time (x) vs velocity (y). *What range of velocities are shown on the y axis?\_\_\_\_\_\_\_*

*If the top graph of t vs d was a velocity graph, what type of graph do you think this may be?\_\_\_\_*

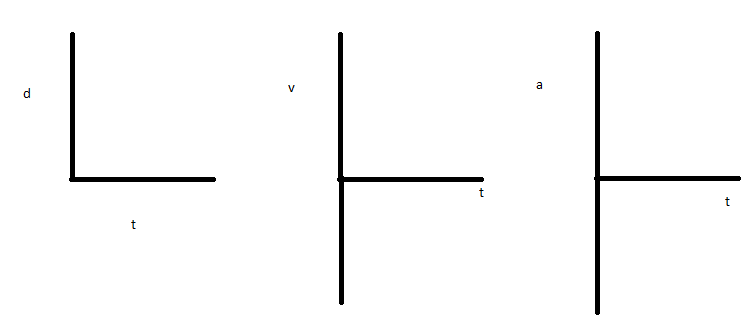
To get the third graph, click “velo (m/s)” along the left side of the bottom graph. A menu should appear from which you can choose “Acceleration”. You will have to keep switching this back and forth between v and a.

*What units is acceleration measured in? \_\_\_\_\_\_\_\_\_\_*

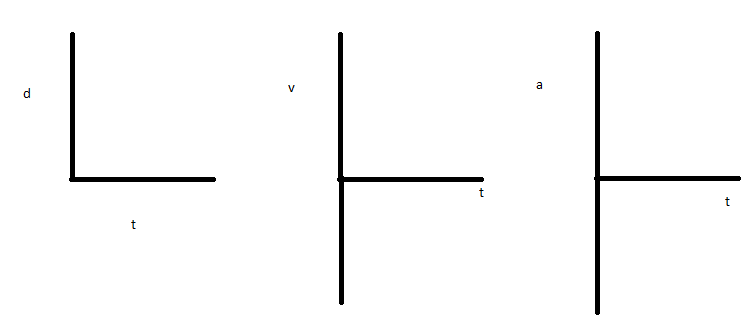
*What range of accelerations are shown on the y axis? \_\_\_\_\_\_\_\_\_\_\_\_*

When your group is ready, point the motion detector at the biggest flat part of wall you can find. Hit the PLAY button and move as directed below. Record the general shape of the graph. Then select FILE and NEW. Repeat the GRAPH, GRAPH OPTIONS, MANUAL steps from above.

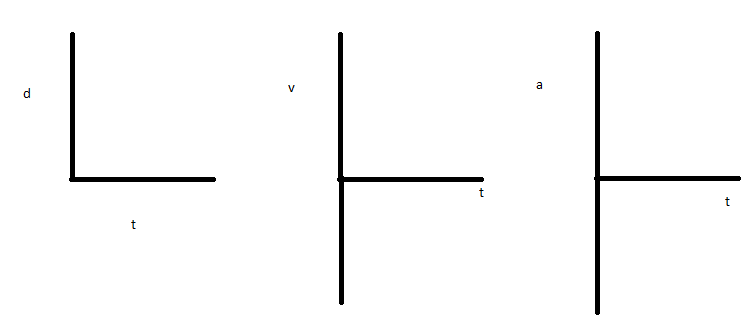
1. For each of the following motions, record the *general* shape for d vs t, v vs t, and a vs t.
   1. Stand **still** while recording data.



* 1. Walk at a constant speed **towards** the wall.



* 1. Walk at a constant speed **away** from the wall.



* 1. **Accelerate** smoothly towards the wall. Also describe in words how you moved.

