

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

## Velocity Lab

### **Part 1:**

Objective:

To analyze the velocity and acceleration of an object traveling down a ramp.

Procedures:

1. Setup the pipe on a chair (set something at the end of the tube that will stop the marble).
2. Test your setup to make sure it stops the marble.
3. Assign one person in your group as the timer and one as the dropper.
4. Do a few practice runs from 3.00 meters to make sure that the timer knows when to stop the timer.
5. Start **all** trials at the “**start**” of the pipe.
6. Complete trial 1 for 0.00 m. Record how long (secs) it took to travel 0.00 m.
7. Complete trials 2-5 for 0.00 m. Record the values in the chart (Hint all of the times will be 0 seconds!)
8. Complete trials 1-5 for the object traveling .25 m (1st mark after start) down the pipe.
9. Complete trials 1-5 for every other mark on the pipe (.50m - 3.00m) and record for each value.
10. Calculate the average time (sec) for all 5 trials.
11. Calculate velocity (m/s) for each of the distances using the average time.
12. Calculate the acceleration for each distance starting at a distance of .25 m using the average speed for that distance and the velocities for the two distances in between desired value.

Hypothesis:

1. What do you think will happen to the average time as we increase the distance away from the start?  
(0.00 m to 3.00 m)
  
2. What do you think will happen to the velocities as we increase the distance away from the start?  
(0.00 m to 3.00 m)
  
3. What do you think will happen to the acceleration as we increase the distance away from the start?  
(0.00 m to 3.00 m)

Data Table:

Distance (m)	Trial 1 (sec)	Trial 2 (sec)	Trial 3 (sec)	Trial 4 (sec)	Trial 5 (sec)	Average Time (sec)	Velocity (m/s)	Acceleration (m/s <sup>2</sup> )
0.00								
0.25								
0.50								
0.75								
1.00								
1.25								
1.50								
1.75								
2.00								
2.25								
2.50								
2.75								
3.00								

On a piece of graph paper create the following graphs:

*Graph 1:* Create a Distance-Time graph for all of the distances and the average time.

## **Part 2:**

With your partner determine what you want to study tomorrow.

Have to come up with...

1. What are you going to study?
2. How are you going to measure it?
3. Create a data table that shows how you are going to measure it

### Finding Velocites

Velocity at 0.25m- Displacement from 0.50m to 0.00m, and the time difference from 0.50m to 0.00m

Velocity at 0.50m- Displacement from 0.75 to 0.25m, and the time difference from 0.75m to 0.25m

Velocity at 0.75m- Displacement from 1.00m to 0.50m, and the time difference from 1.00m to 0.50m

Velocity at 1.00m- Displacement from 1.25m to 0.75m, and the time difference from 1.25m to 0.75m

Velocity at 1.25m- Displacement from 1.50m to 1.00m, and the time difference from 1.50m to 1.00m

Velocity at 1.50m- Displacement from 1.75m to 1.25m, and the time difference from 1.75m to 1.25m

Velocity at 1.75m- Displacement from 2.00m to 1.50m, and the time difference from 2.00m to 1.50m

Velocity at 2.00m- Displacement from 2.25m to 1.75m, and the time difference from 2.25m to 1.75m

Velocity at 2.25m- Displacement from 2.50m to 2.00m, and the time difference from 2.50m to 2.00m

Velocity at 2.50m- Displacement from 2.75m to 2.25m, and the time difference from 2.75m to 2.25m

Velocity at 2.75m- Displacement from 3.00m to 2.50m, and the time difference from 3.00m to 2.50m

**Finding Accelerations:**

Acceleration at 0.25m- Velocity from 0.50m - 0.00m, and the time difference from 0.50m to 0.00m

Acceleration at 0.50m- Velocity from 0.75 - 0.25m, and the time difference from 0.75m to 0.25m

Acceleration at 0.75m- Velocity from 1.00m - 0.50m, and the time difference from 1.00m to 0.50m

Acceleration at 1.00m- Velocity from 1.25m - 0.75m, and the time difference from 1.25m to 0.75m

Acceleration at 1.25m- Velocity from 1.50m - 1.00m, and the time difference from 1.50m to 1.00m

Acceleration at 1.50m- Velocity from 1.75m - 1.25m, and the time difference from 1.75m to 1.25m

Acceleration at 1.75m- Velocity from 2.00m - 1.50m, and the time difference from 2.00m to 1.50m

Acceleration at 2.00m- Velocity from 2.25m - 1.75m, and the time difference from 2.25m to 1.75m

Acceleration at 2.25m- Velocity from 2.50m - 2.00m, and the time difference from 2.50m to 2.00m

Acceleration at 2.50m- Velocity from 2.75m - 2.25m, and the time difference from 2.75m to 2.25m

Acceleration at 2.75m- Velocity from 3.00m - 2.50m, and the time difference from 3.00m to 2.50m