

Pre-lab discussion

1. (What is motion?) How can you tell that something is moving?
 - a. speed
 - b. not in the same place anymore
2. What are some examples of things that move? Things that are in motion?
 - a. fast movers
 - b. slow movers
 - c. odds: wind, water, light, sound etc.
3. How are those things alike and different? (ex: walking vs. driving)
 - a. shorter time, faster speed, propulsion
 - b. stopping at stoplight vs. setting cruise control
 - c. how far you go vs. how long it takes

Intro to Materials—for each group (4 students)

1. 2 meter sticks
2. 3 stop watches
3. masking tape
4. ramp
5. clay
6. marble

Intro to Question

1. We need to build a system to make the marble move the same along the entire length of the meter sticks.
2. You have 3 stopwatches—HINT: collect three times along the length of the meter stick (best if all three measurements are right next to each other)
3. Build a data table: what do we need to measure
 - a. distance/displacement
 - b. time
4. COLLECT AND RECORD DATA EVERY SINGLE TIME!!!!!!!!!!!! (EVEN THE BAD ONES)
5. Rotate jobs.
6. make sure to practice

Our Questions for Walking Around

1. Check student set-ups and data when they think they have uniform motion.
 - a. How do you know you have uniform motion?
 - b. How do you know this isn't a fluke?
2. Discuss acceptable error in time.
3. Repeat at least total of 3 times. On your data table, circle/color your best 3 trials.

Our Questions for Group Presentations—THIS NEEDS TO BE IN THE STUDENTS' NOTES

1. Why did you choose those data points and your “good” trials?
2. How does the data for the whole class compare?

- a. They all have even time intervals.
3. How do the graphs for the whole class compare?
 - a. All should have the same shape, even if numbers are different
4. How do values for slope compare?
5. What do the units mean?
 - a. rise over run = position over time
 - b. over is like per
 - c. THIS IS VELOCITY (like speed)
 - d. velocity was the same over the entire meter stick (all slopes along line are the same) = UNIFORM MOTION
 - e. EQUATION : $v = X/T$
6. Extending the line past graph
 - a. is velocity ever going to change in uniform motion? (NO)
 - b. If it traveled B meters, how much time?
 - c. If it traveled R seconds, how far?
 - d. as a group, graph velocity vs time—straight line, slope=0

Final Data Table: ONLY put your data from your final 3 “good” trials here. If you did more than 3 “good” trials, add more rows. In the last column, record the total time that has elapsed since the marble started on the track.

Trial	Position	Time	Total Time
1			
2			
3			

Graph

Using your data from above, and only that data, create a line graph. Make a position vs. total time graph (y axis: position, x axis: total time). Label your axes!!!!

(graph paper)

Find the slope of the line (remember—slope = rise/run)

What would the units of the slope be?

What does the slope of the line tell you about the motion of the marble?

If your marble traveled the same way for 2 meters, how long would it take?

Organize your information so that you can present to the class

1. Your data
2. Your graph
3. What it all means

Notes from Class Discussion