

On the Move: Velocity Activity

Name: _____ Date: _____

Group Mates: _____

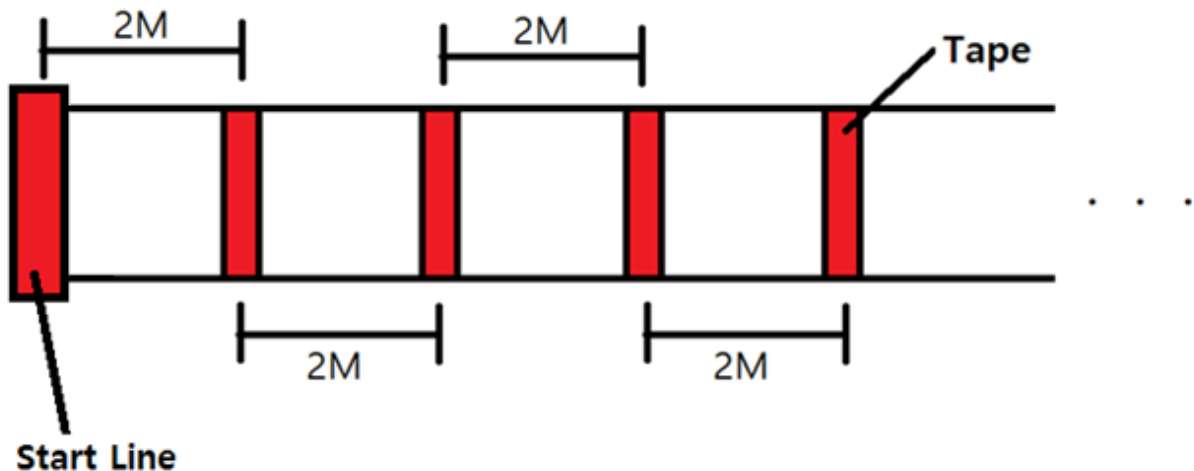
Materials:

- Meter stick
- Masking tape
- Timer

Directions:

In small groups you will conduct an experiment to create a position vs. time graph.

1. With masking tape, make a start line on the floor. Make sure it is visible to everyone.
2. Measure two meters from the start line. Place another strip of masking tape.
3. Have total of six masking tapes representing each two meter mark. The total distance marked off should be 12 meters.
4. After setting up your experiment, it should look something like this:

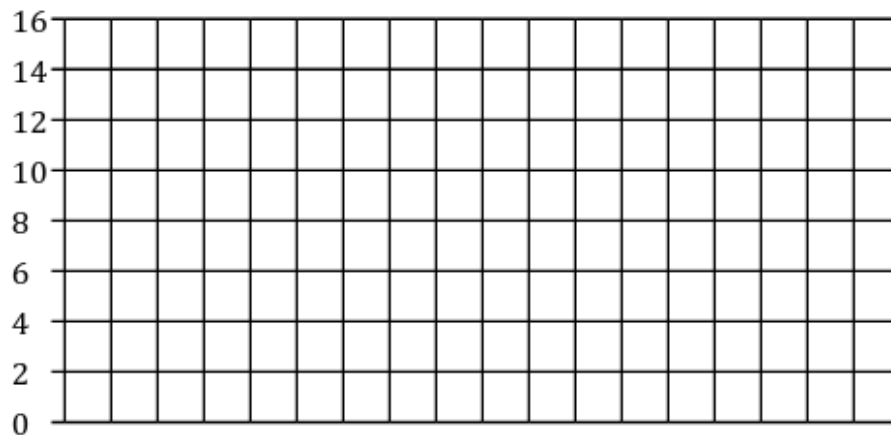


5. Start walking from 0-6 meters. Then, increase your speed (run) immediately after 6 meters and maintain a faster constant speed (same running speed).

Data:

Distance (m)	Time (seconds)
0	0
2	
4	
6	
8	
10	
12	

Graph (fill in appropriate increments for the time axis):



Velocity Calculations and Questions:

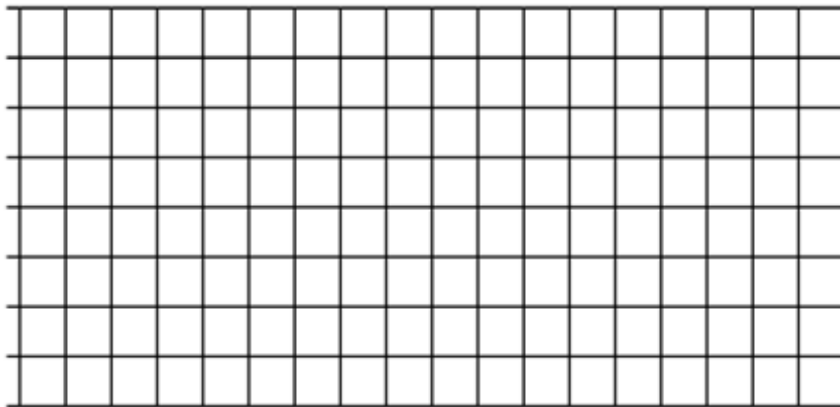
1. Calculate velocity.
 - a. Determining the velocity between 0-2 meters.
 1. What is the change in distance from the start to the 2-meter mark?
 2. What is the change in time from the start to the 2-meter mark?
 3. Calculate velocity as the change in distance (calculated in step 1) over the change in time (calculated in step 2).
 - b. Repeat this process for each increment (2-4, 4-6, 6-8, etc.) and fill in the table.

Distance Interval	Change in Distance (m)	Change in Time (seconds)	Velocity (m/s)
0m – 2m			
2m – 4m			
4m – 6m			
6m – 8m			
8m – 10m			
10m – 12m			

2. Did the velocity change over the 12 meter distance? Why do you think it changed or stayed the same?

3. What do you think would happen to the velocity if you decreased your speed over the 12-meters?

4. Draw a graph for velocity vs. time from the data you calculated in step 1.



Acceleration Calculations and Questions:

1. There is a change in speed between 6 meters to 8 meters. Whenever there is a change in speed or direction vs. time, it is called **acceleration**.
2. Calculate acceleration.
 - a. Determining the acceleration between 6-8 meters.
 1. What is the change in velocity from the 6 to the 8-meter mark that you calculated in the table in the previous section (velocity calculations and questions)?
 2. What is the change in time from the 6 to the 8-meter mark?
 3. Calculate acceleration as the change in velocity (calculated in step 1 above) divided by the change in time (calculated in step 2 above).
 - b. Repeat this process for each increment (2-4, 4-6, 6-8, etc.) and fill in the table.

Velocity Interval	Change in Velocity (m/s)	Change in time (seconds)	Acceleration (m/s ²)

3. What will happen to the acceleration if the speed increases more after 12m? Explain why.

4. Draw a graph for acceleration vs. time.

