

## Measuring Constant Velocity

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

Class: \_\_\_\_\_

### Pre-Lab Questions:

1. Define *velocity* using words.
2. Define *velocity* using an equation.
3. Describe how to find the *slope* of a line.

### Goal:

To analyze the motion of the car using a position vs. time graph.

### Materials:

Battery-operated Car  
Measuring Tape  
Stopwatch  
Chalk  
Graph paper

### Procedure:

1. Within your group, appoint a Car Operator, a Timer, and a Marker.
2. Use chalk to mark a starting point on the ground.
3. Turn the car on and place it on the ground a few feet ahead of the starting line.
4. When the car crosses the starting line, the Timer starts the stopwatch.
5. Every 2 seconds, the Timer shouts "Mark!" to the Marker.
6. The Marker makes a chalk mark at the position of the car.
7. Make as many marks as you can, up to 10, in the space you have.
8. Turn off the car.
9. Measure and record (on the next page) the distances between the marks.

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Mark	Time (s)	Distance between marks (cm)	Position (distance from Start) (cm)
Start	0	0	0
1	2		
2	4		
3	6		
4	8		
5	10		
6	12		
7	14		
8	16		
9	18		
10	20		

- Plot each data point on a graph, with time as the independent variable (on the x-axis) and position as the dependent variable (on the y-axis).
- Do the data points seem to fall in a straight line? \_\_\_\_\_
- Draw a best-fit straight line through the data points.
- Calculate the slope of the line. Be sure to include units in your calculation.
  
- What physical quantity is represented by the slope of this line? \_\_\_\_\_
- Is the velocity of the car constant or not constant? \_\_\_\_\_
- How would you recognize a graph of constant velocity?

17. Attach your graph to this page.

