Position Time Graph for Objects moving at Constant Speed
Lab #2

Safety Procedures
1. Perform this experiment, in a clear area. Moving masses can cause serious injury.
2. Tie back long hair, secure loose clothing, and remove loose jewellery to prevent their being caught in moving or rotating parts.

Goal
- To observe objects moving at a constant speed.
- To graph the relationships between distance and time for moving objects.
- Interpret graph relating distance and time for moving objects.

Materials
- Battery operated toy car
- Block, book or clay
- Graph paper
- Masking tape
- Metal ball
- Meterstick
- Stopwatch
- Track
- Wooden block

Moving at constant speed

Procedure
1. To perform the experiment find a clear, flat surface free of obstacles and traffic. Choose a starting point for your car. Mark this point with a masking tape, and label it “starting point”
2. Start the car and place it on the starting point. Release the car (your lab partner should start the stop watch at the same time). Let the car move in a straight line for 2.0 s. Notice where the car is after 2.0s. Repeat for several trials, until you find the point that the car consistently crosses after 2.0s. Mark this point with masking tape and label it “0.00m”. Through out this experiment, start the car at the original starting point, and begin to measure the distance and time of the car’s motion when the car crosses the 0.00 m mark.
3. Start the car, and place it on the floor at the starting point. Observe the car as it moves. Be sure to start the stopwatch as the car crosses the 0.00 m mark.

4. After 10.0 s, mark the position of the car with the masking tape. Label this mark “10.0s”

5. Repeat steps 3 and 4 for 9.0s to 2.0s. Label each point.

6. With the meterstick measure the exact distance from the 0.00m mark to each timed position mark.

7. For each position marked with tape, record the position and time in the notebook, using the appropriate SI units.

8. If your car has a multiple speed switch, set the car at a new speed and repeat steps 3-7.

**Observations**

<table>
<thead>
<tr>
<th>Time (seconds)</th>
<th>Distance (meter)</th>
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<tbody>
<tr>
<td>10.0s</td>
<td></td>
</tr>
<tr>
<td>9.0s</td>
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<td>8.0s</td>
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<td>7.0s</td>
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<td>6.0s</td>
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<td>5.0s</td>
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<td>4.0s</td>
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<tr>
<td>3.0s</td>
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<td>2.0s</td>
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</table>
Analysis

1. Did the car speed up or slow down as it traveled, or did it maintain the same speed? How can you tell?

2. Make a graph by placing time on x-axis and position on y axis. Label each axis with the appropriate SI units. Describe the shape of the graph.

3. Predict the position of the car at 12.0s? Explain your prediction.
4. How far did the car travel in each 1.0s time interval (2.0-3.0s, 3.0-4.0s, 4.0-5.0s etc.)
5. Use answers from 4 to make a graph with time on x axis and change in position on the y axis. Label each graph with appropriate SI units. Describe the shape of the graph.