Speed Buggy Lab, Part 1: Determining the Speed of a uniform motion car

**QUESTION:** How does the position of a constant speed electric car vary with its travel time?

**Background Information:** The position of the electric car will most obviously increase with its travel time unless it encounters an obstacle. We have much experience with this in everyday vehicles. But, determining what the position versus time graph looks like and what the graph indicates may tell us more about the speed of the car. We are going to reverse the above question to gain the answer. We will measure the time of travel as we vary its distance of travel.

**HYPOTHESIS:** If the position of the buggy increases then ....

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**MATERIALS:**

- Electric Car
- Meterstick
- Stopwatch
- Masking Tape

**PROCEDURES:**

- Manipulated Variable: X
- Responding Variable: X
- Controlled Variables (3):

  - List out your procedures below:

  - # steps. 1 thing to do per step.
  - When to start the timer & stop.
  - In front or back of car?
  - Indicate how to mark off your distances?
  - "Record", indicate what to record.
  - Clarity how to keep the car in a straight line?
  - Multiple Trials (at least 3)
DATA: Position Versus Time for Electric Car Data Table

- Title each column?
- MV on the far left? (position)
- Units?
- Best value on the far right?
- Title "Time" & "trials"?

GRAPH: Plot your best values for your trials above on a Position versus Time graph: (Position on Y-axis, Time on X-axis)

Position Versus Time for the Speed Buggy
ANALYSIS:
Description of the consistency of the data:
- Comparing how close each value was for each trial (uncertainty)
- Cite data?

Description of potential sources of error:
- More than 1

Calculate the slope of your best-fit line (include the units for the slope):

\[
\text{Slope} = \frac{\Delta Y}{\Delta X} = \frac{Y_2 - Y_1}{X_2 - X_1} = \frac{\text{1 meter} - \text{0 meters}}{1 \text{ sec} - 0 \text{ sec}} = \frac{\text{1 meter}}{\text{1 sec}} = 1 \text{ meter/sec}
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CONCLUSION: Was your hypothesis correct? What does the slope of the position-time graph represent?

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