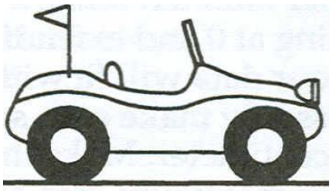
Name: _____ Period: _____ Date: _____



Go! Go! Go!

Required Equipment and Supplies:

- constant velocity cart
- continuous (unperforated) paper towel
- masking tape
- stopwatch
- meter stick
- graph paper

Procedure:

Step 1: Fasten the paper towel to the floor. It should be as flat as possible-no hills or ripples.

Step 2: Aim the car so that it will run the length of your paper towel. Turn it on and give it a few trial runs to check the alignment.

Step 3: Practice using the stopwatch. For this experiment, the stopwatch operator needs to call out something like, "Go!" at each one-second interval. Try it to get a sense of the one-second rhythm.

Step 4: ***Practice*** the task.

a. Let the car drive across the length of the paper towel

b. Soon ***after*** it starts, the stopwatch operator will start the stopwatch and say, "Go!"

c. Another person in the group should ***practice*** marking the location of the front or back of the car on the paper towel using the ***eraser*** of a pencil every time the watch operator says, "Go!"

d. The watch operator continues to call out, "Go!" once each second and the marker continues to practice marking the location of the car until the car reaches the end of the paper towel.

Step 5: Perform the task.

a. Let the car drive across the paper towel.

b. Soon ***after*** it starts, the stopwatch operator will start the stopwatch and say, "Go!"

c. Another person in the group will mark the location of the front or back of the car on the paper towel with a pencil every time the watch operator says, "Go!"

d. The watch operator continues to call out, "Go!" once each second and the marker continues to mark the location of the car until the car reaches the end of the paper towel.

Step 6: Repeat the task.

a. Complete five different trials.

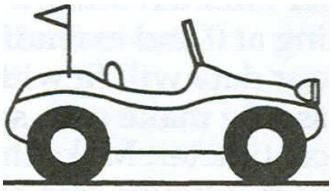
b. Mark each trail with a different color, or mark each dot with a different point protector.

c. **Measure the distance from the start line to the marks for each of your trials**.

d. Record your data below.

Time: (seconds)	0	1	2	3	4	5	6	7	8
Distance (cm) Trial 1									
Trial 2									
Trial 3									
Trial 4									
Trial 5									

Name: _____ Period: _____ Date: _____



Go! Go! Go!

Purpose

In this experiment, you will plot a graph that represents the motion of an object.

Discussion

Sometimes two quantities are related to each other, and the relationship is easy to see. Sometimes the relationship is harder to see. In either case, a graph of the two quantities often reveals the nature of the relationship. In this experiment, we will plot a graph that represents the motion of a real object. In this experiment you will allow the car to run and record its distance every second. The car is set to run at the same speed and not get faster or slower. We want to see how the distance from the starting point is influenced by how long the car runs.

1. What is the independent variable: _____

Write an operational definition of the independent variable: _____

_____

2. What is the dependent variable: _____

Write an operational definition of the dependent variable: _____

_____

3. What are the controlled variables:

_____

_____

4. Use the variables to write a research question below.

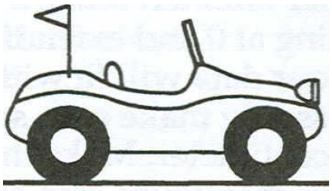
_____

5. Hypothesis _____

_____

Name: _____ Period: _____ Date: _____

Go! Go! Go!



Step 7: Calculate the Average distance for each second and record it in the table below:

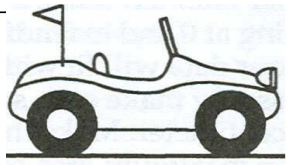
Time: (seconds)	0	1	2	3	4	5	6	7	8
Average Distance (centimeters)									

Step 8: Make a plot of Average distance vs. time using excel

Graph the data following the rules discussed in class.

- Correctly ***label the axes*** and ***include units***
- Include a ***title*** for your graph
- Include a trendline
- Add the equation of your trendline

Name: _____ Period: _____ Date: _____



Go! Go! Go!

Summing Up

1. Write a caption for the graph and include the **conclusion** & **type of relationship**.

_____

_____

2. Suppose a ***faster car*** were used in this experiment.

a. What would have been different about the **distance between the marks on the paper towel** if a faster car were used? ***Describe*** in sentences

_____

_____

b. What would have been different about the **number of seconds the car would have spent on the paper towel** before reaching the edge if a faster car were used? ***Describe*** in sentences

_____

_____

c. What would have been different about the resulting **distance vs. time graph** if a faster car were used? (How would the slope have been different?) ***Describe*** in sentences

_____

_____

d. Use a ***colored pencil*** to add a line to your graph that represents a ***faster car***. ***Label it appropriately on your graph***.

OVER

OVER

3. Suppose a ***slower car*** were used in this experiment.

a. What would have been different about the distance between the **marks on the paper towel** if a slower car were used? ***Describe*** in sentences

_____

_____

b. What would have been different about the **number of seconds the car would have spent on the paper towel** before reaching the edge if a slower car were used? Describe and explain in sentences

_____

_____

c. What would have been different about **the resulting distance vs. time graph** if a slower car were used? (How would the slope have been different?) Describe in sentences

_____

_____

d. Use a ***different colored pencil*** to add a line to your graph that represents a ***slower car***. Add this line to your graph. ***Label it appropriately on your graph***.

4. Suppose the **car's battery ran out** during the run so that the car slowly came to a stop.

a. What would happen to the space between **marks on the paper towel** as the car slowed down?

_____

b. Use a ***different colored pencil*** to add a line to your graph that represents a car whose battery ran out so that the car slowly came to a stop. Add this line to your graph. ***Label it appropriately***.

5. Look at the graph below. Determine what motions do these lines on the graph represent. In other words, **what was the car doing** to generate these lines on the graph?

Line A _____

Line B _____