Name _____

Motion & Mass Crash

Supplies:

1 Hot Wheels car, 7 washers, ring stand, clamp, jenga block, track, scale, stopwatch and ruler.

To create a Ramp:

a. Using a ruler, find 10 cm, set the ruler tall ways against the ring stand, slide the clamp down, then tighten it at 10 cm.
b. Use the track at your lab station, and clamp it to the stand…You just made a ramp.

To Set up Acivity:

a. Measure the mass of the hot wheels car, with 0 washers, on the scale, and record mass in data table.
b. Place the jenga block at the bottom center of the ramp, so that the car is able to crash into it.
c. Set the hot wheel car on top of the ramp, as soon as the car starts rolling down the ramp, start the timer.
d. Stop the timer as soon as the Hot Wheels car crashes into the jenga block and record in the data table.
e. When the jenga block stops moving, use the ruler to measure the distance it moved away from the bottom of the ramp and record in the data table below
f. Repeat a – e adding 1 washer to the hot wheel car after each trial

Part 1 – 10 cm ramp height

# of Washers	**Mass** of Car (g)	Car Crash Time (sec) **Trial #1**	Car Crash Time (sec) **Trial #2**	Car Crash Time (sec) **Trial #3**	Car Crash Time (sec) **Average**	Jenga Block Distance (cm) **Trial #1**	Jenga Block Distance (cm) **Trial #2**	Jenga Block Distance (cm) **Trial #3**	Jenga Block Distance (cm) **Average**
0									
1									
2									
3									
4									
5									
6									
7									

Part 2 – 20 cm ramp height

Adjust the clamp to a height of 20 cm and clamp the track back to it. Repeat steps a-f above.

# of Washers	**Mass** of Car (g)	Car Crash Time (sec) **Trial #1**	Car Crash Time (sec) **Trial #2**	Car Crash Time (sec) **Trial #3**	Car Crash Time (sec) **Average**	Jenga Block Distance (cm) **Trial #1**	Jenga Block Distance (cm) **Trial #2**	Jenga Block Distance (cm) **Trial #3**	Jenga Block Distance (cm) **Average**
0									
1									
2									
3									
4									
5									
6									
7									

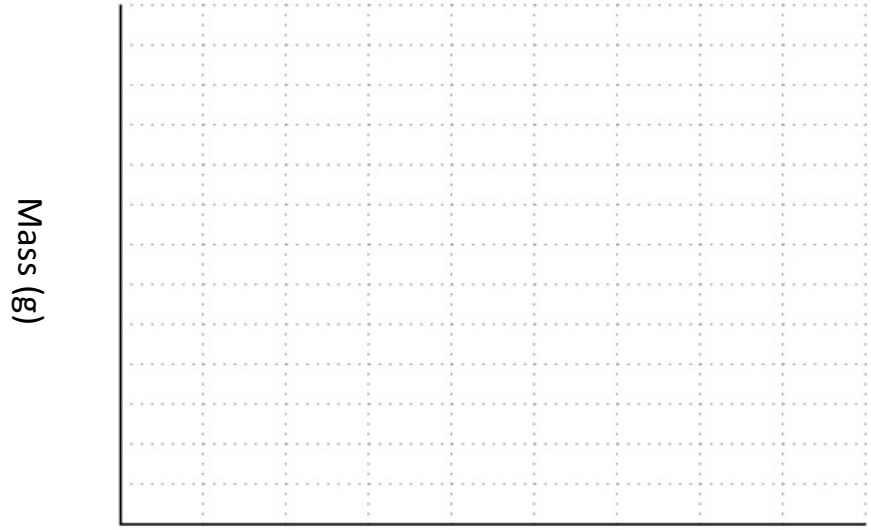
Part 3

Use the date from the Motion and Mass Crash Lab to create a line graph of the **TIME** for each height of the ramp. You will need to use one color for the ramp at 10 cm and another color for the ramp at 20 cm.

10 cm color=

20 cm color=

Use the date from the Motion and Mass Crash Lab to create a line graph of the **DISTANCE** for each height of the ramp. You will need to use one color for the ramp at 10 cm and another color for the ramp at 20 cm.



10 cm color=

20 cm color=

Analysis **Questions**

1. What is a controlled variable in this activity?
2. What is the independent variable in this activity?
3. What is the dependent variable in this activity?
4. What pattern did you see and the mass of the hot wheel car increased? What pattern did you see as the height of the ramp increased?