Name: _____

Rube Goldberg Machine Data Sheet

Physical Science and Technology

For ONE moving object on your Rube Goldberg Machine, collect data for the table below. Use the velocity sensor to measure the acceleration of the object; use a 3-beam balance to measure the mass of the object. The 3-beam balance measures mass in grams, so you will need to divide by 1000 to find the equivalnent mass in kilograms.

Measure the mass of the object and write your answer here: _____ g / 1000 = _____kg.

Each time you measure the acceleration of the object, you should completely reset your Rube Goldberg Machine and run it again from the beginning. That way, the acceleration you measure will reflect the actual acceleration of that object when your Rube Goldberg Machine runs from start to finish.

Trial #	Mass (in kg; always the same!)	Acceleration (from velocity sensor in m/s^2; will be different for each trial)
1		
2		
3		
4		
5		
Average		

Now you have calculated the mass and average acceleration of the object you're looking at, you can ESTIMATE what the net force acting on that object must be: F = m x a. Calculate your estimated net force and write your answer here: _____ N.

Now that you have an estimate of the net force acting on your object, test your prediction. Use the force sensor to measure the actual force on the object and complete the table below:

Trial #	Estimated net force (N; always the same!)	Actual net force (from force sensor in N; will be different for each trial)
1		
2		
3		
4		
5		
Average		

Questions:

1. Was your predicted net force the same as the actual net force you measured? Why do you think you got the answers that you did?
2. Does the net force you calculated seem to match with what you observed? In other words, did the object seem to accelerate in the direction of the net force?
3. What do you think would happen to the net force you found if you left everything about your Rube Goldberg Machine the same, but increased the mass of the object that was moving?