Tumble Buggy Lab Assignment Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A student is tasked with determining where two tumble buggies, of different speeds, will intersect when placed at different points on linear track. The cars will be traveling in the same direction. The student is allowed to collect data from each of the cars, but cannot have both cars at the same time until their predictions are tested. Part of the group grade will be determined by how accurate the group predicts the intersection point. No math can be used to determine the intersection point, only graphical methods.

1. Design an experiment that would allow you to accurately predict where the two cars would intersect. You will have access to stopwatches, metersticks, masking tape, graph paper and tumble buggies. If you feel any other materials would be useful, please ask and I will determine if possible.
   1. What quantities would you want to measure when working with each tumble buggy? (1 point)
   2. What lab materials will you use, and how will that equipment be used? (1 point)
   3. Describe the procedure you would follow. Be detailed enough in your description that another student could replicate your experiment. (2 point)
2. Describe how you would organize a data table and create a quantitative position vs time graph (both cars on one graph) that would include all of the data collected. Explain how you would use the data and the graph to determine where the cars would intersect. (3 points)
3. Collect data, organize, and graph. (graph is worth 2 points)
4. Final prediction of intersection point: \_\_\_\_\_\_\_\_\_\_\_\_ (2 points) (points awarded by percent difference between actual and predicted values)
   1. (0-3.0% difference = 2/2)

(3.1-7.5% difference = 1.5/2)

(7.6-12.0% difference = 1/2)

(12.1-20.0% difference = 0.5/2)

(20.1 or greater difference = 0/2)

1. Analysis of results: What factors may have impacted your results and how would they have impacted these results? (2 points)

Extension: Create a qualitative velocity vs time graph that accurately depicts the velocities of both tumble buggy cars (both cars on one graph) (2 points)

Extension: What errors (beyond your control) may have occurred and how may these errors have impacted your data? (2 points)

Score: \_\_\_\_\_\_\_\_\_\_\_/17

Comments: