**Accident Challenge (Expanded) – Summative Assessment**

***Scale Factor***

The highest speed recorded on your simulation data table represents 40 mph. However, this was not the speed recorded in the simulation.

1. Determine the scale factor needed to convert your highest speed to 40 mph.

2. Multiply the other average speeds by this scale factor to convert them to mph.

***Graphing***

Use your data and Excel or other online graphing program to make the following graphs (3 graphs total):

1. Make a **bar graph** to compare distance the car traveled for each combination of truck speed and mass.

*Locate your tallest bar. Find the ramp height (speed) and mass combination that led to that tallest bar. These will be your "target speed" and "target mass". You will use these to determine which has a greater effect on the distance the car is pushed - speed or mass.*

2. For target speed, make a **scatterplot** of mass vs. distance. You will have 3 points in your scatterplot (target ramp height with 500, 750, 1000 g).

3. For target mass, make a **scatterplot** of speed vs. distance. You will have 3 points in your scatterplot (target mass at low, mid, high ramp height)

***Initial Questions:***

1. Classify each bar on your bar graph as "minor damage", "major damage", or "fatal damage". Explain how you distinguished between the level of damage.

2. Which bar represents the conditions that will most likely lead to fatal accidents? Why?

3. Which has the greater impact on distance - truck speed or mass? Explain.

***Solution Proposal***

Write a paragraph to propose a speed limit and/or weight limit to the mayor of McFarland. Your proposed solution must take all challenge information into account, including any limitations or restraints. Proposed speed and/or weight limits must be supported by data that you collected during the experiment. Use data to explain how/why your proposal could help the town of McFarland.