

Driving With Friction Worksheet

Name: _____ Date: _____

Materials: Use the following materials to complete the activity stated below.

- MiniSim Simulator
- Science Journals or Notebooks
- Calculations from the previous day

Activity Step by Step: Use the following steps to complete the activity and in complete sentences answer the questions below.

1. In your groups of three you will be assigned a combination of variables.
 - YOUR ASSIGNED VARIABLES ARE: _____
2. Plug in your variables into the stopping distance equation.

$$d = \frac{v_0^2}{2\mu g}$$

d = stopping distance
v = velocity = 50 mph = 22.352 meters/second
 μ = coefficient of friction
g = gravity = 9.8 meters/second²

YOUR REQUIRED STOPPING DISTANCE:

3. When driving the simulator one student within your groups will be the driver, one will be the recorder, and the other will be the driving assistant.
 - YOUR ASSIGNED JOB IS: _____
 - Driver: drive the simulation according to your calculations
 - Driving Assistant: help the driver by accurately counting the meter markers and preparing them to stop safely
 - Recorder: record your data found during the simulation.
4. If another group is using the simulator use this time to journal about your predictions. You can also practice the simulation by walking through what might happen and applying the equation.
5. After computing your stopping distance required to safely stop while driving the MiniSim, complete the simulation within your group.
6. After completing the number of trials of the simulation assigned to your group, record your data and your conclusion in your lab journals and answer the questions found below in complete sentences.
7. When all groups have finished the simulation and journal entries, discuss with the class your individual findings and interpretations of the data.

Predictions: Use the space below to answer the questions in complete sentences.

1. Based off of what you know about friction from previous activities completed in class, predict what you think will happen when your assigned variables are applied to the simulation.

Experiment Data: Add your data found in the experiment to the chart below.

	Road Marker When Brakes Were Applied	Road Marker When Car Came to Complete Stop
Driving Run 1		
Driving Run 2		
Driving Run 3		
Average		

Conclusion: Use the space below to answer the questions in complete sentences after discussing with the rest of the class about their data.

1. Based on the data that you have collected about your assigned variables, what can you conclude about how different masses affect your ability to stop versus the different surface frictions?

2. Did you complete the simulation successfully? If not, what could you have done differently to complete it?
