Name_____ Period _____ Date _____

Acceleration

STEM Sims

Lesson 3: How Does Acceleration Affect Fuel Consumption?

Fuel consumption is defined as how much gasoline or other fuel a vehicle uses in a given period of time. The mass of the vehicle and its movement both impact the use of fuel. Can you determine the best acceleration for reducing fuel consumption?

Doing the Science

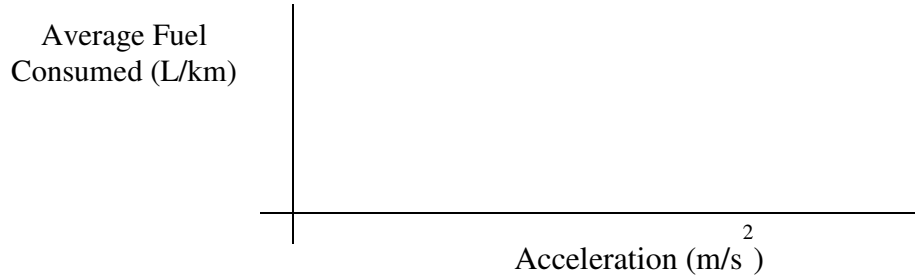
1. Start the Vehicle Simulation.
2. Select one of the three vehicles on the left side of the screen by clicking on the vehicle.
3. Select a speed of 10 m/s. Make sure to record your selected speed value.
4. Allow a couple of seconds for the vehicle to reach a constant speed. The Acceleration dialogue box appears when the vehicle reaches a constant speed.
5. Choose an acceleration value of "2 m/s^2."
6. Select the "Display Data" option. Click on the "Fuel Consumption" graph tab.
7. Note and record the average fuel consumption of the vehicle.
8. Select the "Restart" option.
9. Choose the same vehicle and speed as you did before.
10. Choose an acceleration value of 4 m/s^2.
11. Select the "Display Data" option. Click on the "Fuel Consumption" graph tab.
12. Note and record the average fuel consumption of the vehicle.
13. Select the "Restart" option.
14. Repeat steps 9 – 12 with an acceleration of 6 m/s^2.

Table 1.

Trial	Speed (m/s)	Acceleration (m/s^2)	Average Fuel Consumption (L/km)
1	10	2	
2	10	4	
3	10	6	

Do You Understand?

1. Make a graph of the vehicle acceleration versus the amount of fuel consumed during each test.



2. What generalization can you make about how fuel consumption and acceleration are related?