



Acceleration

STEM Sims

Lesson 5: How Does Acceleration Affect Vehicle Wear?

Complex machines, such as vehicles, have many moving parts. The moving parts of a vehicle wear out depending on the amount of friction experienced. Can the way a person drives affect how long moving parts on a vehicle last?

Doing the Science

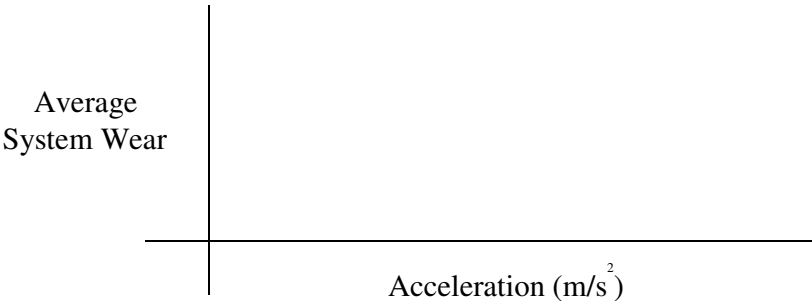
1. Start the Vehicle Simulation.
2. Select one of the three vehicles on the left side of the screen by clicking on the vehicle.
3. Select a speed of 10 m/s. Make sure to record your selected speed value.
4. Allow a couple of seconds for the vehicle to reach a constant speed. The Acceleration dialogue box appears when the vehicle reaches a constant speed.
5. Choose an acceleration value of “2 m/s².”
6. Select the “Display Data” option. Click on the “Wear” graph tab.
7. Note and record the system wear 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/s².
11. Select the “Display Data” option. Click on the “Wear” graph tab.
12. Note and record the system wear of the vehicle.
13. Select the “Restart” option.
14. Repeat steps 9 – 12 with an acceleration of 6 m/s².

Table 1.

Trial	Speed (m/s)	Acceleration (m/s ²)	Average System Wear
1	10	2	
2	10	4	
3	10	6	

Do You Understand?

1. Make a graph of the vehicle acceleration versus the system wear during each test.



2. What generalization can you make about how system wear and acceleration are related?