



Acceleration

STEM Sims**Lesson 2: What is Acceleration?**

A car speeds up and most people know that it's accelerating. But, if a car is slowing down or changing direction, is it undergoing acceleration? Can you find out what factors affect acceleration?

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.
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. Read the speed gauge and record in Table 1 the final speed of the vehicle.
7. Select the "Restart" option.
8. Select the same vehicle as before.
9. Select a speed of 20 m/s.
10. Repeat steps 4 to 6 above.
11. The vehicle traveled for 10 seconds during each of the two trials. If the vehicle increased its speed by 2 m/s each second, calculate and record in Table 1 the vehicle's final speed after the 10-second acceleration for each of the two trials.

Table 1.

Initial Speed (m/s)	Elapsed Time (seconds)	Acceleration (m/s^2)	Actual Final Speed (m/s)	Calculated Final Speed (m/s)

Do You Understand?

1. Explain in your own words how a vehicle's motion can change as a result of an acceleration.
2. How did your calculated final speed of the vehicle compare to the actual final speed values?
3. A car traveling at 40 meters/second accelerates at a rate of -4.0 meters/second for 2 seconds. How fast will the car be traveling after the 2-second acceleration?