Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Lesson 2: What is Acceleration?**A car speeds up and most people know that it is 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. Select the Simulation tab to open the Acceleration 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 dialog box appears when the vehicle reaches a constant speed.

5. Choose an acceleration value of “2 m/s2.”

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 4–6 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/s2)** | **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?