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



**Lesson 4: How Does Acceleration Affect Carbon Dioxide Emissions?**Some scientists believe that changing carbon dioxide levels can affect the global annual temperature. Does speeding up your vehicle affect how much carbon dioxide is produced?

**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. Make sure to record your selected speed value.

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. Select the “Display Data” option. Click on the “CO2 Emission” graph tab.

7. Select the “Restart” option.

8. Repeat steps 9–12 with an acceleration of 6 m/s2.

**Table 1.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trial** | **Speed (m/s)** | **Acceleration (m/s2)** | **Average CO2 Emission (g/sec)** |
| 1 | 10 | 2 |  |
| 2 | 10 | 4 |  |
| 3 | 10 | 6 |  |

**Do You Understand?**

1. Make a graph of the vehicle acceleration versus the amount of carbon dioxide emissions during each test.

Average CO2 Emission (g/sec)

Acceleration (m/s2)

2. What generalization can you make about how carbon dioxide emissions and acceleration are related?