



Acceleration

STEM Sims

Lesson 6: How Does Vehicle Type Affect Fuel Consumption and CO₂ Emissions?

Have you ever heard of the term gas guzzler? A gas guzzler is a vehicle that uses much larger amounts of gasoline than most other vehicles. The high price of gasoline and the push to lower the amount of carbon dioxide (CO₂) emitted by vehicles has made vehicle makers investigate how to produce more efficient modes of transportation. Can you determine the relationship between vehicle type and fuel use? Start your engine and begin your investigation of vehicles.

Doing the Science

1. Select the Sim tab to open the Acceleration simulation.
2. Select the black car on the left side of the screen by clicking on the car.
3. Select a speed of 70 m/s.
4. Allow a couple of seconds for the car to reach a constant speed. A box appears when the car reaches a constant speed.
5. Select an acceleration of zero (“0”). This means that your car will be moving at a steady speed. As soon as you select a “0” acceleration, the simulation will begin running.
6. After the simulation runs, select the Fuel Consumption graph. Record this value in Table 1.
7. Select the “Restart” option. Select the same car as before. Select a speed of 40 m/s.
8. Complete steps 4–6 above.

Table 1.

Vehicle	Speed (m/s)	Average Fuel Consumption (L/km)	CO ₂ Emission (grams/second)
Black car	70		
Gray truck	70		
Red car	70		
Black car	40		
Gray truck	40		
Red car	40		

Do You Understand?

1. Which vehicle used the most fuel? Provide a reason for why this vehicle used the most fuel.

2. Which vehicle emitted the largest amount of carbon dioxide? Provide a reason for why this vehicle emitted the largest amount of carbon dioxide.
3. How did the vehicles' speed affect fuel consumption and carbon dioxide emission? Provide a reason for your answer.
4. What other vehicle factors might impact a given vehicle's fuel consumption and carbon dioxide emissions?
5. What are some implications of the results of this laboratory on your future choices for a personal vehicle?

Do You Understand?

3. How did the vehicles' speed affect fuel consumption and carbon dioxide emission? Provide a reason for your answer.

The faster a vehicle's speed, the more fuel was used and the more carbon dioxide was emitted.

4.

5.