

Measuring Your Impact 12

Choosing a Car: Conventional or Hybrid

One person buys a compact sedan that costs \$15,000 and gets 20 miles per gallon. Another person pays \$22,000 for the hybrid version of the same compact sedan, which gets 50 miles per gallon. Each owner drives 12,000 miles per year and plans on keeping the vehicle for 10 years.

- (a) A gallon of gas emits 20 pounds of CO₂ when burned in an internal combustion engine. The average cost of a gallon of gas over the 10-year ownership period is \$3.00.
- Calculate how many gallons of gas each vehicle uses per year.
 - Calculate the cost of the gas that each vehicle uses per year.
 - Calculate the amount of CO₂ that each vehicle emits per year.
- (b) Based on your answers to questions (i)–(iii), complete the data table below.

Year of operation	Sedan: total costs-purchase and gas (\$)	Sedan: cumulative CO ₂ emissions (pounds)	Hybrid: total costs-purchase and gas (\$)	Hybrid: cumulative CO ₂ emissions (pounds)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

- (c) Use the data in the table to answer the following questions:
- Estimate how many years it would take for the hybrid owner to recoup the extra cost of purchasing the vehicle based on savings in gas consumption.
 - After the amount of time determined in (i), compare and comment on the total costs (purchase and gas) for each vehicle at that time.

- (iii) Over the 10-year ownership period, which vehicle is the more economically and environmentally costly to operate (in terms of dollars and CO₂ emissions), and by how much?

- (d) Suggest ways that the owner of the conventional car could reduce the overall yearly CO₂ emissions from the vehicle.

- (e) Suggest ways that the hybrid owner could become carbon-neutral.