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Numeracy and Driving II
Consumer Issues

Suggested grade levels: 10 and up.

Possible subject areas: Driver's education. Social studies.

Math skills: Arithmetic.

Overview: Consumer issues pertaining to driving can be quantitative. Is it worth driving out of your way to buy cheaper gas? Is it worth buying a more fuel efficient car? Questions such as these rely on basic quantitative reasoning to answer.

Student activities: Numeracy and Driving, Consumer Issues

Examples:

Does the lower price always pay?

1. Sue could buy gas on her way to work at Ace for $1.45 a gallon or at Acme for $1.40 a gallon. She gets 20 mpg and drives 10 miles to work round trip every weekday. After 50 weeks of driving, how much does she save by buying the cheaper gas?

2. Now, suppose Acme is 5 miles out of Sue's way (2 ½ miles each way) and suppose she gases up every two weeks. After 50 weeks of driving, how much does she save by buying the cheaper gas?

Fuel Efficient Cars

Sue wants to help the environment and conserve so she is considering buying a fuel efficient car. But she also wants to save money and the fuel efficient cars are generally more expensive. From a purely economical point of view which car should she buy?

Of course this depends on a lot of factors, some of which are: What is the difference in price of the cars? How far does she drive in a year? How much of her driving is city versus highway? What is the price of gasoline?

Here are some real examples:

The 2002 *Honda Insight* is a "hybrid" vehicle. With a five speed manual transmission, it lists for $19,080 (www.cars.com) with an EPA fuel economy rating of 61 mpg city/68 mpg highway. It accomplishes this by combining a 1.0 liter, three-cylinder gasoline engine and an electric motor.

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The two-door *Honda Civic's* least expensive model DX lists for $12,810 *(www.cars.com)* with an EPA fuel economy rating of 33 mpg city/39 mpg highway.

Let's make some assumptions about Sue's situation: Suppose gas costs $1.50 per gallon and she drives 60 miles a day round trip to work plus vacations for approximately 20,000 miles per year on the highway. Her town driving is negligible.

3. How much will Sue save on gas in one year of driving the Insight instead of the Civic?

4. How long will it take for the money saved on gas with the Insight instead of the Civic to equal the extra cost of buying it?

Let's change our assumptions about Sue's situation: Suppose instead of a Civic, she is considering a Honda SUV as her other car. The *Honda CR-V's* least expensive model lists for $18,800 *(www.cars.com)* with an EPA fuel economy rating of 22 mpg city/26 mpg highway.

5. How much will Sue save in one year of driving the Insight instead of the CR-V?

6. How long will it take for the money saved on gas with the Insight instead of the CR-V to equal the extra cost of buying it?

For the Instructor.

It may be useful to ask students to estimate answers first, then calculate them and compare the two.

1. After 50 weeks of driving, she'd spend $181.25 at Ace and $175 at Acme, so she'd save $6.25 by buying the cheaper gas at Acme.

2. She would not save by buying gas at Acme. It would cost her $2.50 more. After 50 weeks of driving, she would drive an extra 125 miles to go to Acme, so she'd spend $181.25 at Ace and $183.75 at Acme.

3. Sue would save about 219 gallons of gas a year, which would amount to $328 a year.

4. The Insight costs $6,270 more than the Civic, so it would take a little over 19 years to make it up. (19.11).

5. Sue would save about 475 gallons of gas a year, which would amount to $713 a year.

6. The Insight costs $280 more than the Civic, so it would take about 4½ months to make it up (0.393 years).

Discussion: This example can be implemented on a spreadsheet so that students can try out different values for gas prices, driving distances and vehicle types. Also a hybrid car such as the Insight may require replacement of batteries every few years. Students could be asked to research this question and figure out what effect it has on the overall cost.

Resources:

www.cars.com