

Fuel Consumption #29

Multiplication, division, problem solving, using the metric system

Gas prices have been on the rise for many years. In the summer of 2008 they were at their highest. Some places paid \$1.21/L while others paid \$1.50/L. In this activity we are going to compare fuel consumption of vehicles, and cost out trips. Fuel consumption is always calculated by litres per 100 km in Canada.



Example: The Campbell family is driving from Edmonton to Yellowknife. The cost of gas in Yellowknife is \$1.01/L. Gas gets cheaper as you drive south but for this activity we will use the Yellowknife gas prices. The van that the Campbells are travelling in uses 10 L/100 km. The distance between Yellowknife and Edmonton is 1600 km.



Problem: How much will it cost in gas for the Campbell family to go from Yellowknife to Edmonton?

Solution: Step 1: Calculate how many litres you will need.
Divide $1600 \text{ km} \div 100 \text{ km} = 18$
Multiply $18 \times 10 \text{ L} = 180 \text{ L}$

Step 2: Calculate how much it will cost.
Multiply $180 \text{ L} \times \$1.01 = \181.50

It will cost the Campbell family \$181.80 to go to Edmonton one way.

Directions: Look at the chart and answer the questions below.

Vehicle (all 2009)	Highway per 100 km	City per 100 km
Ford Ranger Pick-up (4WD)	12.4 L	15.7 L
Ford Escape (4WD)	9.4 L	12.4 L
Ford Focus	6.7 L	9.8 L
Dodge Caravan	9.4 L	13.8 L
Dodge Caliber	7.8 L	9.8 L
Sierra GMC (4WD)	11.8 L	16.8 L
Hummer SUV	14.7 L	18.1 L
Smart Car	3.9 L	4.6 L

- Which vehicle has the worst fuel consumption overall? _____
- Which vehicle has the best fuel consumption overall? _____
- You travel 300 km in a Ford Focus. Gas costs \$1.01/L.
 - How many litres of gas would you use in the city? _____
 - How much would it cost? _____
 - How many litres of gas would you use on the highway?

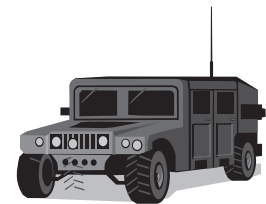
 - How much would it cost (round to the nearest cent)? _____
 - What is the difference in cost? _____

Consumer Math

4. You travel 300 km in a Smart Car. Gas costs \$1.01/L

- a. How many litres of gas would you use in the city? _____
- b. How much would it cost? _____
- c. How many litres of gas would you use on the highway? _____
- d. How much would it cost? _____
- e. What is the difference in cost? _____

5. You travel 300 km in a Hummer. Gas costs \$1.01/L.



- a. How many litres of gas would you use in the city?

- b. How much would it cost? _____
- c. How many litres of gas would you use on the highway?

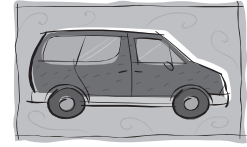
- d. How much would it cost? _____
- e. What is the difference in cost? _____

6. Compare your results from #3, 4 and 5.

- a. How much more does it cost to travel in a Hummer than a Smart Car on the highway for 300 km? _____
- b. How much more does it cost to travel in a Ford Focus than a Smart Car on the highway for 300 km? _____
- c. How much more does it cost to travel in a Hummer than a Ford Focus on the highway for 300 km? _____

7. How much more would it cost you to travel from Yellowknife to Edmonton in a Hummer verses a Ford Focus if gas cost \$1.04/L. Yellowknife to Edmonton is 1600 km. _____

8. You are going from Yellowknife to Edmonton in a 2009 Dodge Caravan. The trip is 1600 km. How much will it cost you to get there if the price of gas is \$1.10/L?



9. You are going on a big trip with your family. You are moving from Inuvik to Yellowknife. Gas costs are different in different places. You are travelling in a 2009 Ford Escape. Answer the questions below to find out how much it will cost you in gas. Round your answers to the nearest cent.



- a. How much does it cost for your first leg of the trip from Inuvik to Whitehorse. It is 1226 km and gas costs \$1.19/L. _____
- b. When you get to Whitehorse you decide to do a daytrip to Skagway, Alaska. It is 180 km (one way) on the highway and gas costs \$1.05/L.

- c. You stay in Whitehorse for a couple of days. You drive 100 km around the city. Gas costs \$1.05/L. _____
- d. You drive from Whitehorse to Yellowknife on the highway. Gas costs on average \$1.07/L. It is 2704 km. _____
- e. How much in total did you spend for gas? _____
- f. Now do the same thing for a Dodge Caliber. How much money do you save if you travel in a Dodge Caliber? _____

Finding Fuel Consumption #30

Multiplication, division, decimals

Calculate Your Own Fuel Consumption

You need to learn how to calculate your own **fuel consumption**. Don't take anyone's word for it. Especially, do not rely on the manufacturer's estimate. This is a number that is used to sell cars, not to save gas. They use professional drivers on closed courses. You will never get the same gas usage unless you are coasting down a hill. Use the manufacturer's number to compare different models of cars, but don't think it will help you determine how much gas you will end up putting in your car.

The Simple Gas Consumption Test

The first thing you need to do is drive until your tank is empty. When you get low, just drive near a gas station until the low fuel indicator has been on for some time, and you are quite sure there are just a few drops left. If you do not have a dashboard indicator which tells you how many miles you have left, make sure to bring a full gas can in case you run out on the road. When your tank is empty, fill it up and write down the number of litres your tank holds.

How to Calculate Your Fuel Consumption

Now, reset your trip odometer and drive normally. Obey all speed limits and do not load the car with anything that you don't always take with you. When your tank is empty again, note how many kilometres you have driven. Divide the kilometres you have driven by the number of litres that your tank holds and then multiply by 100 and you will have your baseline gas in litres/100 km.

Example: You filled up your tank and zeroed the trip odometer. Next time you are at the gas station, your trip odometer shows 480 km and it took 42 litres to fill up the tank again. That means your car consumed 42 litres to drive 470 kilometres.

Problem: What is your fuel consumption or fuel economy?

Solution: $42 \text{ L} \times 100 \div 470 \text{ Km} = 8.9 \text{ L}/100 \text{ km}$

The fuel consumption for your vehicle is 8.9 L/100 km.

Directions: Calculate the fuel consumption for the following problems. Fuel consumption is measured in L/100 Km.

1. Rick and his family drove from Yellowknife to Hay River for the May long weekend. The odometer read 22,320 kilometres at the beginning of the trip, and 23,220 kilometres at the end. They used 75 litres of gas to travel that distance. On the window sticker of their new car, the gas consumption rating is 7.5 L/100 km on the highway. Round your answers to the first decimal point.
 - a. What is the estimated fuel consumption of their car for this trip?

 - b. How does it compare to the gas consumption rating?

2. Mike wanted to figure out the gas consumption in the city of his truck. He made sure the tank was close to empty and then he filled it up. The odometer read 45,600 when he filled it up and read 46,056 when it was empty again. He has an 80 L tank. The cost of fuel is \$.99 per L.
 - a. What is Mike's estimated fuel consumption for his truck in L/100 km?

 - b. How much does it cost Mike to fill his tank at the listed gas price?

 - c. Mike usually drives at least 250 km per week. How much would this cost him? (you will need to do a ratio)

Consumer Math

3. Dora travels from Fort Providence to Yellowknife twice a month for meetings. The distance between Fort Providence and Yellowknife is 300 km. Gas prices are usually around \$1.10/L. She has an 80 L tank. She uses 45 L for a one way trip.
- What is Dora's gas consumption for one trip?

 - How much money does it cost Dora for one trip?

 - How much does it cost Dora each month? _____
 - How much does it cost Dora to fill up? _____
 - Should Dora fill up again in Yellowknife for her trip home?

4. The bus costs \$90 return from Fort Providence to Yellowknife.
- Would it be cheaper for Dora to take the bus? _____
 - What is the difference in price? _____
 - Sometimes Dora travels with a friend and they share expenses. How much would it her cost her then for one trip? _____