## **Fuel Consumption**

A car's **fuel consumption** is the rate at which fuel (petrol, or gasoline) is used in the car. This is also called **fuel economy**.

In Australia, distance was measured in units of miles, and liquid volume was measured in units of gallons. These measures are still used in the USA. Today, Australia and many other countries use kilometres for distance units and litres for liquid volume units.







When using miles and gallons, we would actually talk about *how far* we can go on an amount of fuel.

When using kilometres and litres, we would talk about *how much fuel* it would take to go a distance.

So, we can measure fuel consumption as how many miles per gallon we can go.

We can measure fuel consumption as **how many litres per hundred kilometres** we use up.

Fuel consumption =  $\frac{\text{miles}}{\text{gallon}}$  OR  $\frac{\text{litres}}{100 \text{km}}$ 

These are commonly written as:

mpg or MPG (miles per gallon)

L/100km (Litres per hundred kilometres)





As you can see, it is not enough to simply convert from miles to kilometres and from gallons to litres. The ratios (rates) are opposite to each other! One has the **distance on top**, and the other has the **liquid volume on top**.

For **miles per gallon** (mpg), the bigger the number, the more miles you get for your fuel, so the happier you would be.

For **litres per hundred kilometres**, the bigger the number, the more fuel you are using to get somewhere. You would be happier with a smaller number!

**Note:** A gallon in the USA is a bit smaller than a gallon in England. A litre is equal to about 0.26 US gallons, but only 0.22 Imperial (English) gallons.

**Formula:** To get from one measure to the other, divide 235.215 by that measure.

**Example:** 10 L/100km = 235.215 ÷ 10 = 23.52 mpg

**Example:** 40 mpg = 235.215 ÷ 40 = 5.88 L/100km

**Typical numbers:** 

My Honda Civic averages just under 7 L/100km

What is this in mpg?

**Solution:** mpg = 235.215 ÷ 7 = 33.6 mpg

My old Morris Minor used to get 35 mpg.

What is this in L/100km?

**Solution:** L/100km = 235.215 ÷ 35 = 6.7 L/100km

## Activities:

- 1. A "gas guzzler" is a car that is considered high in fuel consumption. Since 1991, the U.S. government introduced the Gas Guzzler Tax as a part of the Energy Tax Act. This tax was applied to cars with a combined fuel economy rating under 22.5 mpg.
  - a. What fuel consumption is 22.5 mpg in L/100km?
  - b. Would the tax be applied to cars whose consumption in L/100km is higher or lower than your answer in the previous question?
- 2. The 2019 Jeep Grand Cherokee Trackhawk 4x4 has a fuel consumption of 17 mpg. What is this in L/100km?
- 3. The 2019 Toyota Prius has a fuel economy of about 6 L/100km. What is this in mpg?