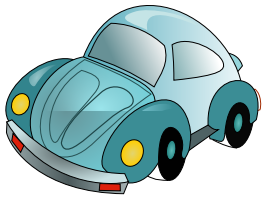

Problem of the Week
Problem A and Solution
Fuel Frenzy

Problem

Different vehicles are more fuel efficient than others, meaning some vehicles can go further on a tank of gas than others. Our car uses 6 litres for every 100 km of driving.

A) The car has a 42 litre tank. How many kilometres can our car drive on one tank of gas?

B) We are going on a trip to visit our family, 900 kilometres away. How much fuel will we use to get to our destination?

C) Fuel costs $2.00 per litre. How much will the fuel cost for the trip?

Solution

A) We can use a table to see the relationship between the number of litres of gas used and how far the car can travel. On each row we increase the litres used by 6 and the km travelled by 100.

Litres Used	km Travelled
6	100
12	200
18	300
24	400
30	500
46	600
42	700
48	800
54	900

From this table we see that you can travel 700 km on 42 litres of fuel.

B) From the table in part A) we can also see that we use 54 litres of fuel to travel 900 km.

Alternatively, we can calcuate how much fuel is required by using division and multiplication. We see that $900 \div 100 = 9$. This means we require 9 times as much fuel as it would take to travel 100 km. Since we know it takes 6 litres to travel 100 km, then it will take $9 \times 6 = 54$ litres of fuel to travel 900 km.

C) It will cost $2.00 \times 54 = \$108.00$ to buy the fuel necessary for the trip.

Teacher's Notes

This problem is analogous to questions that deal with the relationship between velocity, distance and time. We could use an equation to describe the relationship between the rate of fuel consumption (R), the volume of fuel (V), and the distance travelled (d):

$$R = \frac{V}{d}$$

Given any two of the values for R, V, and d we can calculate the third value. Rearranging the equation we get:

$$d = \frac{V}{R}$$

or

$$V = R \cdot d$$

In this problem, we are given the rate ($\frac{6}{100} = 0.06$).

In part A) we are given the volume and are asked to find the distance travelled. We can calculate that by substituting the known values into our equation for d:

$$d = \frac{42}{0.06} = 700$$

In part B) we are given the distance travelled and asked to find the volume of fuel consumed. We can calculate that by substituting the known values into our equation for V:

$$V = 0.06 \cdot 900 = 54$$

When we are able to describe these kinds of relationships with equations, we can calculate values quickly. Equations also allows us to use tools such as spreadsheets for quick calculations. However, understanding the relationship between these values is important. Creating a table can help solidify understanding this kind of relationship.