

# Comparing Rates

In this tutorial, I'll compare rates and problem solve using equivalent rates.

How many hours will it take a plane to fly 3600 kilometres if it flies at a rate of 900 kilometres per hour?



- How would I explain and write the *unit rate* described in the problem above?
- How would I explain or define a *unit rate*?
- How would I write this *unit rate* in fraction form?

I'll write and solve a proportion to determine how long it will take the plane to fly 3600km.

How many hours will it take a plane to fly 3600 kilometres if it flies at a rate of 900 kilometres per hour?



- How would I explain writing my proportion?

$$\begin{array}{l} \text{Km} \\ \text{hour} \end{array} \frac{900}{1}$$

- When setting up my proportion to solve, what do I need to consider regarding the *units*?

$$\begin{array}{l} \text{Km} \\ \text{hour} \end{array} \frac{900}{1} = \frac{3600}{t} \begin{array}{l} \text{Km} \\ \text{hours} \end{array}$$

I'll complete my proportion by solving for the value of the variable.

- How could I use my knowledge of equivalent fractions to solve for the value of the variable?

$$\begin{array}{l} \text{Km} \\ \text{hour} \end{array} \frac{900}{1} = \frac{3600}{t} \begin{array}{l} \text{Km} \\ \text{hours} \end{array}$$

- How would I explain and demonstrate using algebra to solve for the value of the variable?

$$\begin{array}{l} \text{Km} \\ \text{hour} \end{array} \frac{900}{1} = \frac{3600}{t} \begin{array}{l} \text{Km} \\ \text{hours} \end{array}$$



How many hours will it take a plane to fly 3600 kilometres if it flies at a rate of 900 kilometres per hour?



A classmate simplified the previous solution steps by performing the following division.

$$\begin{array}{ccccc} \text{Km} & 900 & & 3600 & \text{Km} \\ & \underline{3600 \div 900} & & & \\ \text{hour} & 1 & & t & \text{hours} \end{array}$$

- How might I explain their reasoning in choosing this solution approach?
- How is the single division step shown above similar to the solution using a proportion?



I'll explore a different rate problem comparing distance and time.



How many hours will it take a plane to fly 3600 kilometres if it flies at a rate of 900 km/hr?



At what rate of speed is a plane flying if it travels 5950 km in 7 hours?

- How would I explain or describe how the two problems shown above are different?

At what rate of speed is a plane flying if it travels 5950 km in 7 hours?



- How would I explain calculating the *rate of speed* using just a division calculation?
- How would I explain writing a proportion that could be used to calculate the *rate of speed*?



At what rate of speed is a plane flying if it travels 5950 km in 7 hours?



- How would I use my understanding of equivalent fractions to solve my proportion?

$$\frac{5950}{7} = \frac{d}{1}$$

- How would I explain and demonstrate solving my proportion using algebra?

$$\frac{5950}{7} = \frac{d}{1}$$

- How could I use my previous solution to determine how far the plane will fly in 20 minutes?

850 km/hr



A classmate solved the same problem using the following approach...

$$d = 850 \times \frac{1}{3}$$

- How would I explain their reasoning in choosing to multiply by the fraction one-third?

## Comparing Rates

Which statements do I feel confident explaining and demonstrating?

Which statements do I not feel confident explaining and demonstrating?

- ✓ I can explain and write examples of a rate
- ✓ I can explain and write examples of a unit rate
- ✓ I can explain and demonstrate how I use a rate to calculate an equivalent rate, such as a unit rate
- ✓ I can explain and demonstrate writing a proportion equation to calculate an equivalent rate
- ✓ I can compare solving a proportion equation to calculating equivalent fractions
- ✓ I can explain and demonstrate how I solve a proportion equation using algebra