Name _____

Date _____ Period _____

Speed

The speed limit sign pictured on the right says 5 MPH. MPH means miles per hour. It could be written 5 mi/h. Even the universe has a speed limit. It is 300,000 km/s. That is the speed of light. Nothing can go faster. Both speeds have something in common. The units are a fraction with distance in the numerator and time in the denominator. Speed is the distance per unit of time.

$$\boxed{\text{Speed} = \frac{\textbf{distance}}{\textbf{time}}}$$

Speed is often used interchangeably with velocity, although they are not the same. Velocity has a direction. Speed is the magnitude or size of a velocity. The symbol "v" is often used even in formulas where direction is not important. If "d" is the symbol for distance, and "t" is the symbol for time, the calculational formula can be written:

- $v = \dfrac{d}{t}$

Other formulas follow from this:

- $d = vt$
- $t = \dfrac{d}{v}$
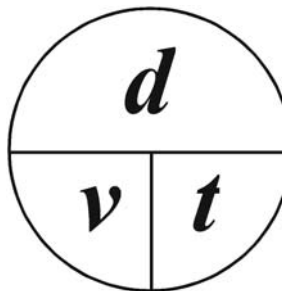
The circle shown to the upper right is often a convenient way of remembering these.

Sample Problem

How long does it take to travel 9,750 km at a speed of 75 km/h?

$$t = \frac{d}{v} = \frac{9,750 km}{75 \,{}^{km}\!/_{h}} = 130h$$

Answer the questions below by applying the calculational formulas above.

1. How fast are you traveling if a 4,500 km trip takes 4.5 h?

2. How far can you go in 3.0 h at 85 $^{km}\!/_{h}$?

3. What distance does a runner cover in 70 s at a speed of 6.5 $^{m}\!/_{s}$?

4. How long will it take to run a 0.4 km track at a speed of 0.16 $^{km}\!/_{min}$?

5. How fast does a jet fly if it takes 4.0 h to fly 4,100 km?

6. How long will it take to travel 320 km at a speed of 88 k$^{m}\!/_{h}$?