

MEASURING MOTION
SPEED
&
VELOCITY

Motion

When an object changes position over time as compared to a *reference point*.



Did the stick figure above move from fig 1 to fig 2? _____
 Explain how you know.

SPEED

Speed is how fast something is going. It is the amount of distance travelled over a certain amount of time. In science, we will use meters/second (m/s), however *any* distance over time works for speed.

$$\text{Speed (meters/sec)} \rightarrow S = \frac{\Delta D}{\Delta T}$$

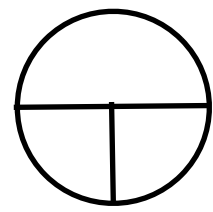
↗ Change of distance (meters)
 ↖ Change of time (seconds)

Speed equals the change in distance over the change in time

$\Delta D = D_F - D_I$
 $\Delta T = T_F - T_I$

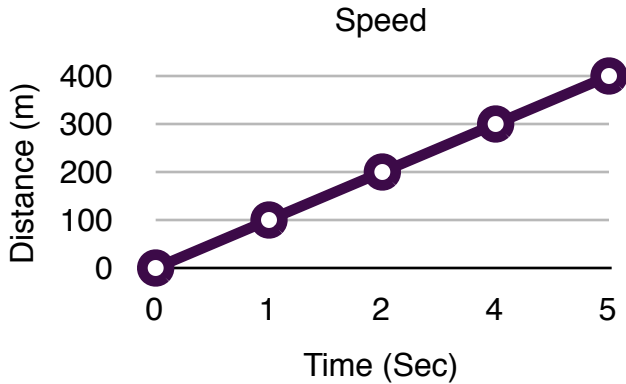
A car travels 100 miles in 2 hours. Calculate its speed.	A person walks from 20 meters to 60 meters in 10 seconds. What is the person's speed?	A person travels at 5 m/s for 8 seconds. How far has the person travelled?
Step 1: Assign variables S=? $\Delta D = 100 - 0 = 100$ $\Delta T = 2 - 0 = 2$	Step 1: Assign variables S=? $\Delta D = ?$ $\Delta T = ?$	Step 1: Assign variables S=? $\Delta D = ?$ $\Delta T = ?$
Step 2: Put variables in equation $S = 100 / 2$	Step 2: Put variables in equation $S = ?$	Step 2: Put variables in equation $S = ?$
Step 3: Solve with units $S = 50 \text{ m/h (miles/hour)}$	Step 3: Solve with units $S = ?$	Step 3: Solve with units $S = ?$

You should know there is a super circle you can use for this equation. Fill in appropriate variables with units it to the right.



SPEED GRAPHS

Speed graphs are plotted with distance(y-axis) over time(x-axis)



Calculate the average speed for all five seconds.

$$S = D/T$$

$$S = ? \underline{\hspace{2cm}}$$

$$D = \underline{\hspace{2cm}}$$

$$T = \underline{\hspace{2cm}}$$

VELOCITY IS A VECTOR

Velocity is the *speed* of an object in a particular *direction*.

Because we are using TWO measurements velocity is called a VECTOR MEASUREMENT.

Any Change in SPEED or DIRECTION is a change in velocity

