

## Calculating Speed Practice

- 1 Fill in the table which shows typical speeds in m/s and km/h.  
The moving objects are **Express train**, **Truck on motorway**, **Road cyclist** and **Marathon runner** (but not in that order).  
The speeds in m/s are given, but the speeds in km/h will need to be added from the following options: 100 km/h, 12 km/h, 24 km/h and 320 km/h.

Object	Speed (m/s)	Speed (km/h)
	3	
	7	
	27	
	90	

- 2 A warthog runs at 20 m/s.

(a) Complete the sentence: They run  metres every second.

(b) Work out how far it will run in eight seconds using an equation.

$$\begin{array}{rcccl} \text{distance (m)} & = & \text{speed (m/s)} & \times & \text{time (s)} \\ \hline \text{ } & = & 20 & \times & 8 \end{array}$$

(c) Work out how far it will run in 40 s using an equation.

$$\begin{array}{rcccl} \text{distance (m)} & = & \text{speed (m/s)} & \times & \text{time (s)} \\ \hline \text{ } & = & 20 & \times & 40 \end{array}$$

(d) Work out how far it would travel in 200 s.

- 3 A tractor on a farm travels at 8 m/s.

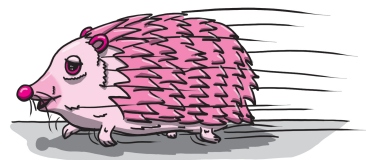
(a) How far does it travel every second?

(b) Work out how much time it will take to travel 160 m using an equation.

$$\begin{array}{rcccl} \text{distance (m)} & = & \text{speed (m/s)} & \times & \text{time (s)} \\ \hline 160 & = & 8 & \times & \text{ } \end{array}$$

(c) Work out how much time it would take to travel 1 km = 1000 m.

4 A hedgehog runs 180 m in 60 s.



(a) How many metres does it move in one second?

(b) Complete the sentence: The hedgehog's speed (in m/s) is .

(c) Complete the sentence: To get the speed, I divided the  by the .

(d) A kitesurfer travels 880 m in 40 s. Work out their speed using an equation.

$$\begin{array}{ccccc} \text{distance (m)} & = & \text{speed (m/s)} & \times & \text{time (s)} \\ \boxed{880} & = & \boxed{\phantom{000}} & \times & \boxed{40} \end{array}$$

(e) Work out the speed of a satellite which moves 160 m in 0.02 s.

(f) Work out the speed (in m/s) of a jet which travels 132 km in ten minutes.

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5 Complete the word equations.

(a) distance =

(b) time =

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6 Complete these equations using symbols.

$s$  is the distance,  $t$  is the time taken and  $v$  is the speed.

(a)  $s =$

(b)  $v =$

(c)  $t =$

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7 Use your understanding of speed, or the formulae, to calculate

(a) the distance when a runner runs at 6 m/s for 40 s

(b) the distance when a truck travels at 25 m/s for 8 s

(c) the time when a jogger runs 900 m at 3 m/s

(d) the speed when a trolley moves 15 m in 5 s

(e) the time when a tennis ball travels 18 m at 36 m/s

(f) the speed when a snail moves 10 cm in 20 s (1 cm = 0.01 m).

- 8 An athlete sprints at 9 m/s. How far will they run in  
(a) two seconds (b) 30 s?
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- 9 A coach on a motorway travels at 100 km/h. How much time does it take to travel  
(a) 600 km (b) 25 km?
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- 10 Use your understanding of speed, or the formulae, to calculate  
(a) the distance if a 7.5 km/s satellite moves for one minute  
  
(b) the time taken for a train to travel 60 km at 200 km/h  
  
(c) the speed if an airliner travels 6000 km in 7.5 h  
  
(d) the speed if a warthog runs 4.5 km in 5 min. (Hint: how far will it run in one hour?)
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- 11 A radio controlled car moves forward at 5 m/s for 4 s then backwards at 10 m/s for 3 s. How far is it from its starting point?
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- 12 A driver travels at 150 km/h for 20 min then at 90 km/h for 40 min.  
(a) How far have they travelled in total?  
  
(b) What is the average speed of the driver on this journey?
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- 13 A 4 km length of road has 'average speed' cameras at both ends. The speed limit is 130 km/h. A motorcycle rider travels the first and fourth kilometres at 120 km/h and the rest of the way at 150 km/h.  
(a) How much time does it take the rider to travel between the cameras?  
  
(b) What is the average speed of the rider?  
  
(c) Will the camera operator know that the rider broke the law?