Motion

Speed

N4

Speed

Speed is the **distance** travelled by an object per **second** (usually expressed in metres per second, m/s or ms^{-1}).

Average Speed

The average speed of an object is the average for the whole journey
(total distance travelled divided by time taken).
e.g. Sports presenters on T.V. measure the average speed of a footballer's shot at goal

Instantaneous Speed

The instantaneous speed of an object is its speed at one particular point during the journey.
e.g. speed cameras measure the speed of a vehicle at a particular point in a journey to ensure that it is within the speed limit.

Speed during a journey

During a journey the instantaneous speed of a vehicle will change. For example at one point a car may be travelling along a street at 30 mph and when it is stopped at traffic lights its speed is 0 mph. These speeds can be very different from the average speed which may be something like 8 mph.

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Speed, Distance and Time Equation

From the definition: $\text{speed} = \frac{\text{distance}}{\text{time}}$

In symbol form: $\mathbf{v = \frac{d}{t}}$ $\mathbf{d = v\,t}$ $\mathbf{t = \frac{d}{v}}$

Quantity	Symbol	SI Unit
speed	v	m/s or ms^{-1}
distance	d	m
time	t	s

Example: Calculate the average speed of a car which takes 3 minutes to travel 1000m.

List	**Equation**	d = v t (as written in data book)
d= 1000 m	**Substitute**	1000 = v x 180
v = ?	**Answer & units**	v = 5.56 ms^{-1}
t = 3 minutes = 180 s		