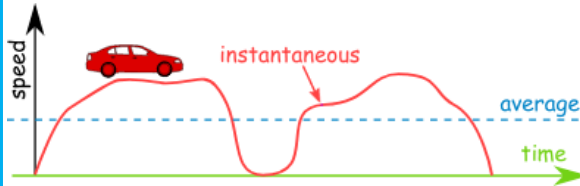# Motion

Topic outcome: Learn to recognise units of speed and how to calculate the speed or velocity of a moving object. Identify these properties on a graph
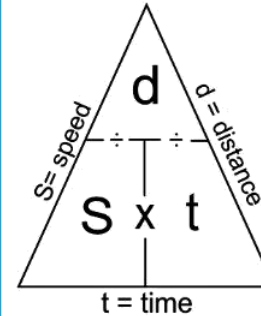
Units of speed

Speed—how far you travel in a period of time OR how it takes to travel a distance…

Speed is a SCALAR quantity; it only has magnitude.

Units are always a distance per unit of time

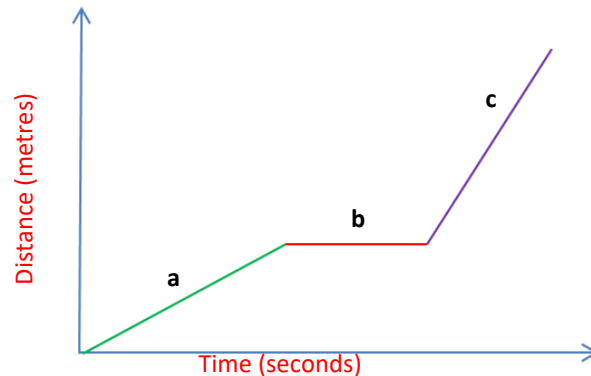Write down some units of speed… **m/s** **m/day** **km/hour**

Motion Graphs

- Describe a journey being taken by plotting how far an object travels per unit time.

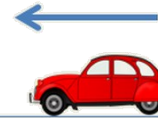- The gradient of the graph is equal to the speed of the object

Label the axes and describe the motion of the object at each point on the graph.

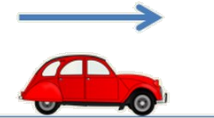a) Moving slowly at constant speed

b) Stationary

c) Moving quickly

Calculating Speed

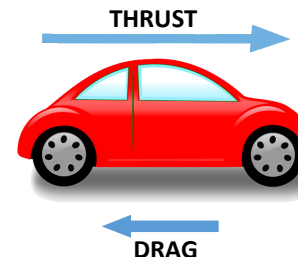| Speed (m/s)	Distance (m)	Time (s)
20	80	4
147	8820	60
65	1820	28
90	9000	100
150	9675	64.5
5	0.1	0.02

Velocity

Speed = 25 m/s
Velocity = -25 m/s

Speed = 25 m/s
Velocity = +25 m/s

- Same units as speed but must have a direction of travel

- This is a vector quantity—it has magnitude and direction

Acceleration

THRUST

DRAG

- How fast an objects velocity is changing is called… acceleration

- The change in velocity is caused by… unbalanced forces

- An object will accelerate if… thrust is greater than drag

Helston Science Department

Motion

Topic outcome: Learn to recognise units of speed and how to calculate the speed or velocity of a moving object. Identify these properties on a graph
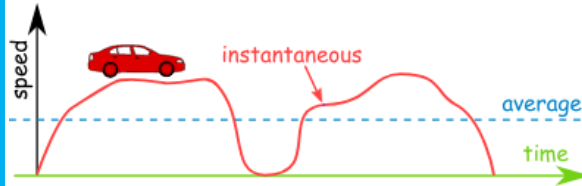
Units of speed

Speed—how far you travel in a period of time OR how it takes to travel a distance…
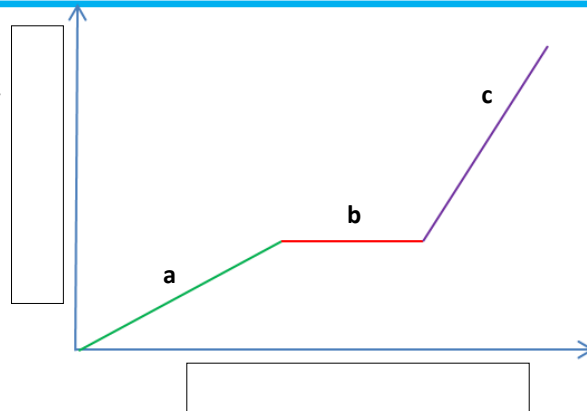Speed is a SCALAR quantity; it only has magnitude.

Units are always a distance per unit of time

Write down some units of speed…

Motion Graphs

- Describe a journey being taken by plotting how far an object travels per unit time.

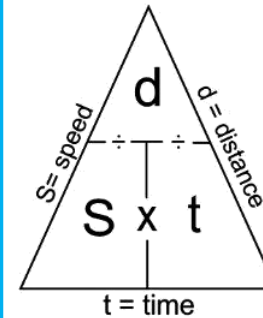- The gradient of the graph is equal to the ……… of the object

at rest	
constant	
accelerating	

Label the axes and describe the motion of the object at each point on the graph.
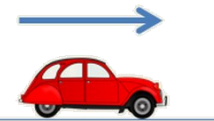
a)

b)

c)

Calculating Speed

S = speed
d = distance
t = time
S x t

Speed (m/s)	Distance (m)	Time (s)
20		4
	8820	60
65	1820	
90		100
150	9675	
	0.1	0.02

Velocity

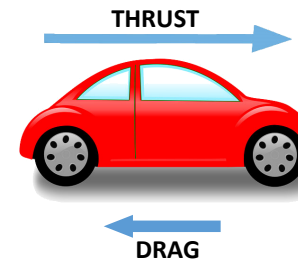Speed = 25 m/s
Velocity = -25 m/s
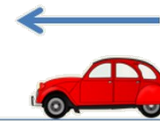
Speed = 25 m/s
Velocity = +25 m/s

- Same units as speed but must have a direction of travel

- This is a vector quantity—it has …………… and direction

Acceleration

THRUST

DRAG

- How fast an objects velocity is changing is called…

- The change in velocity is caused by…

- An object will accelerate if…