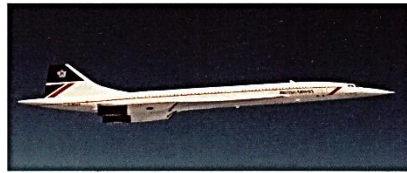


Travelling at speed

Ideas you need from Key Stage 3

Faster than the speed of sound

Concorde was built for speed. It can travel a very long distance in a very short time. In fact, it has so much speed that you can travel faster than sound travels through the air!



1 Copy and complete the following sentence.

At top speed you cover the longest _____ in the shortest _____.

How to calculate speed

You can work out speed like this:

$$\text{speed (metres per second)} = \frac{\text{distance travelled (metres)}}{\text{time taken (seconds)}}$$


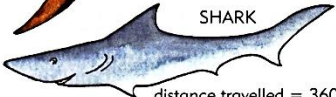

[On your calculator: distance ÷ time]

Example: On a motorway, a car travels 300 metres in 10 seconds.

distance travelled = 300 metres (m)
time taken = 10 seconds (s)
speed = ?

$$\text{so speed} = \frac{300}{10} = 30 \text{ metres per second (m/s)}$$

2 Look at the examples in the picture and work out the missing item for each one.

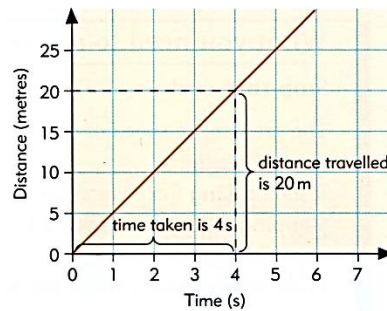
| | |
|--|--|
|  | distance travelled = 240 m time taken = 6 s speed = ? |
|  | distance travelled = 360 m time taken = 30 s speed = ? |
|  | distance travelled = 5 m time taken = 50 s speed = ? m/s |

(You might find it easier if you work it out in cm/s.)

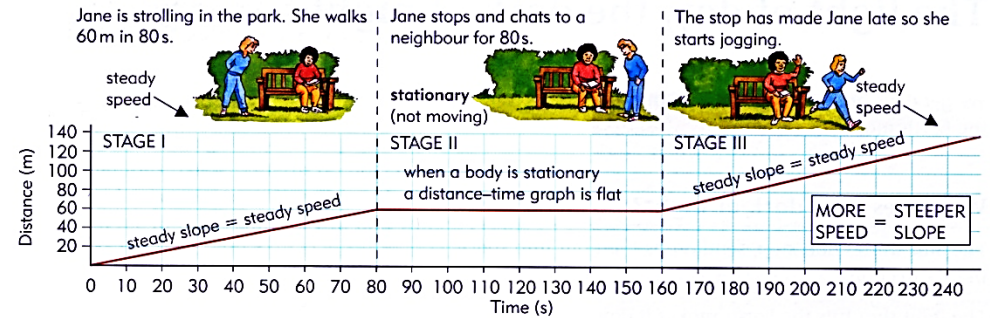
Showing movement on a graph

This graph shows distance travelled against time taken, so it is called a **distance-time** graph. You can read from the graph the distance travelled in a period of time. For example, it takes 4 seconds to travel 20 metres.

3 What speed is this?



A distance-time graph.



Jane's journey

This example shows how a journey can be described on a distance-time graph. Look at it carefully and use it to answer the questions.

- 4 Look at stage I of the journey, where Jane is walking.
- How many metres does Jane walk?
 - How long does it take Jane to walk this distance?
 - What is her speed for this part of her journey?

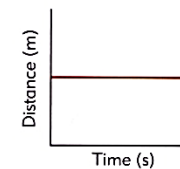
The slope of the graph tells you about the speed.

- 5 (a) What is Jane's speed when she chats (stage II)?
- (b) Describe the shape of the graph for this stage.
- (c) Write down a rule for telling when something is stationary on a distance-time graph.
- 6 (a) Which part of the graph is steeper, (I) or (III)?
- (b) Which stage of the journey is faster, (I) or (III)?
- (c) What is the connection between speed and slope on a distance-time graph?

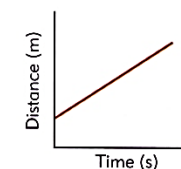
What you need to remember [Copy and complete using the key words]

Travelling at speed

You can show speed on a _____ graph.



This graph shows an object that is _____.



This graph shows the distance moved by an object that is moving with a steady _____.

If an object has more speed, the graph has a steeper _____.