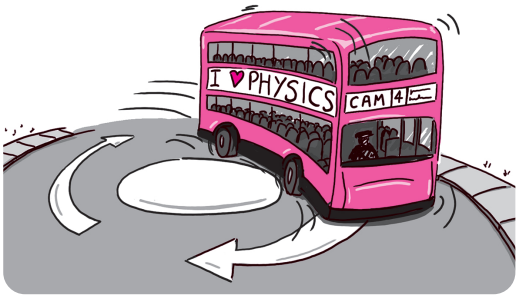
Acceleration

Velocity is the _____ and _____ of something's motion.

Acceleration means that the _____ is _____.

An accelerating bus could be _____, _____ or _____.

Slowing down is a special kind of acceleration called _____.



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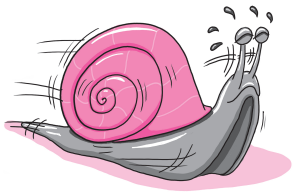
1 Is it accelerating? How did you decide?

(a) A snail starting to move.



(b) A cyclist riding East at 12 mph.

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2 Is it accelerating? How did you decide?

(a) The Earth going round the Sun.

(b) A train slows to stop at a station.

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3 An aeroplane begins to speed up down a runway. An airport worker measures the speed after each second. The speeds are in the table below.

Time (s)	0	1	2	3	4	5
Speed (m/s)	0	4	8	12	16	20

(a) Is the aeroplane accelerating? How can you tell?

(b) What do you think the speed is after 7 s?

(c) When will the speed be 36 m/s?

(d) How much does the speed change each second?

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4 A truck speeds up after leaving a town. The speeds are in the table below, but one is missing.

Time (s)	0	2	4	6	8
Speed (m/s)	10	13		19	22

(a) Is the truck accelerating? How can you tell?

(b) What is the missing speed?

(c) If it keeps accelerating like this, when will the speed be 28 m/s?

(d) How much does the speed change each second?

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5 The speeds of three accelerating vehicles are given in the tables below

Aeroplane

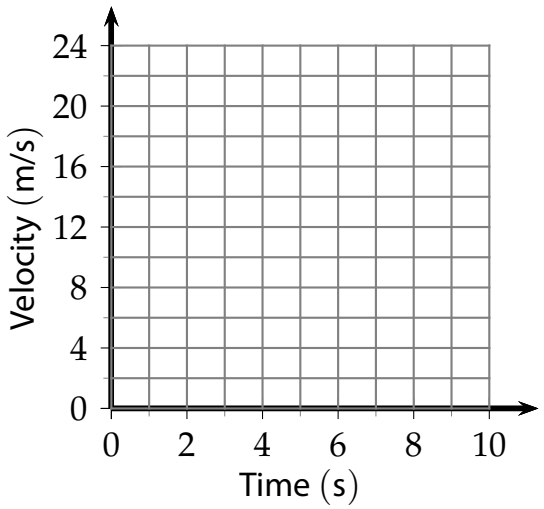
Time (s)	0	1	2	3	4	5
Speed (m/s)	0	4	8	12	16	20

Truck

Time (s)	0	2	4	6	8
Speed (m/s)	10	13		19	22

Bus

Time (s)	0	1	2	3
Speed (m/s)	12	9		3



(a) Plot graphs of the velocity of the three objects. Add best fit lines to your points.

(b) How can you tell from the graph which object has the largest acceleration?

(c) How can you tell from the graph which object is slowing down?

The _____ in _____ each _____ is called the acceleration.
Acceleration is measured in metres per second squared (m/s^2).
An acceleration of 5 m/s^2 means the object _____ each _____.

6 Use your answers to write down the acceleration of

(a) the aeroplane in question 3 (b) the truck in question 4

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7 Complete the word equations using **Acceleration**, **Velocity change** and **Time**.

(a) Acceleration $=$ (b) Velocity change $=$ (c) Time taken $=$

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8 Rewrite your word equations using symbols.
a is the acceleration, t is the time taken and v is the velocity change.

(a) $a =$ (b) $v =$ (c) $t =$

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9 A car leaving a town starts at 12 m/s and accelerates to 30 m/s in 6 s.

(a) Calculate its acceleration in m/s^2.

(b) How much time does it take to gain 12 m/s?