## Section A: Key Vocabulary

| Tier 3 vocabulary | Definition |
| --- | --- |
| Average speed (n) | Total distance/total time. Usually measured in m/s. |
| Scalar (n) | A quantity that has a size (magnitude), but no direction. |
| Vector (n) | A quantity that has a direction as well as a size (magnitude). |
| Displacement (n) | The distance from a point in a particular direction. |
| Velocity (n) | Speed in a particular direction. |
| Acceleration (n) | Change in velocity/change in time, measured in m/s$^2$. |
| Gradient (n) | How steep a graph is at any particular point, also called the slope. |
| Kinetic energy (n) | Energy in a kinetic store. |
| Kinetic store (n) | Energy store in a moving object. Calculated by: Kinetic Energy=1/2 x mass x velocity$^2$ |
| SI unit (n) | The internationally agreed set of units used in Science. |

| Tier 2 vocabulary | Definition |
| --- | --- |
| Distance (n) | The length of the space between two points. |
| Quantity (n) | The amount or number of a material or abstract thing not usually estimated by spatial measurement. |
| Steep (adj) | (Of a slope, flight of stairs, or angle) rising or falling sharply; almost perpendicular. |
| Accelerate (v) | Increase in rate, amount, or extent. |
| Stationary (adj) | Not moving or not intended to be moved. |
| Constant (n) | A situation that does not change. |
| Pressure (n) | Continuous physical force exerted on or against an object by something in contact with it. |
| Arrangement (n) | Put (things) in a neat, attractive, or required order. |

## Section B: Important Information

### Calculating Acceleration

A data logger is used with the light gates. It records the speed or velocity of the object through the light gates. If we measure the time (t) between the gates, we find acceleration (a) using:

Acceleration = (final velocity- initial velocity) / time

OR

a = (v –u)/t

Where initial velocity (u) is found by the first light gate and final velocity (v) is from the second one.

### Vectors

Speed is a scalar quantity. It has a size only.

Velocity is a vector, with a size and direction. The sign tells you the direction of the vector, so if A has a speed of 30m/s to the right, it's velocity is +30m/s. B's velocity is -30m/s and C has a velocity of -25m/s.
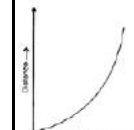
The relative velocity of B compared to A is -60m/s because that is how fast it would appear to the occupants of car A.
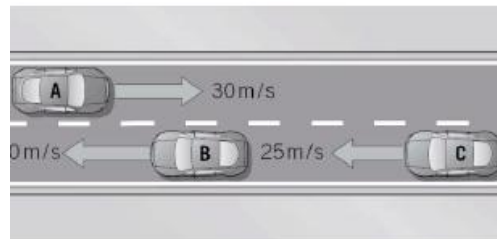


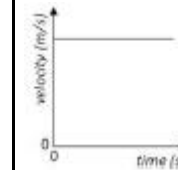## Section C: Graphs

### Distance-time Graphs
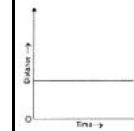


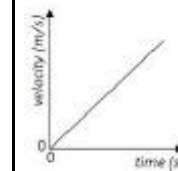A stationary object does not change distance.



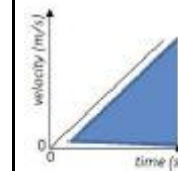Constant velocity is shown by a constant gradient.



Acceleration makes the graph get steeper.

### Velocity-time Graphs



This object is going at a constant (unchanging) velocity.



A constant gradient means constant acceleration.



The area under the graph is equal to the displacement.