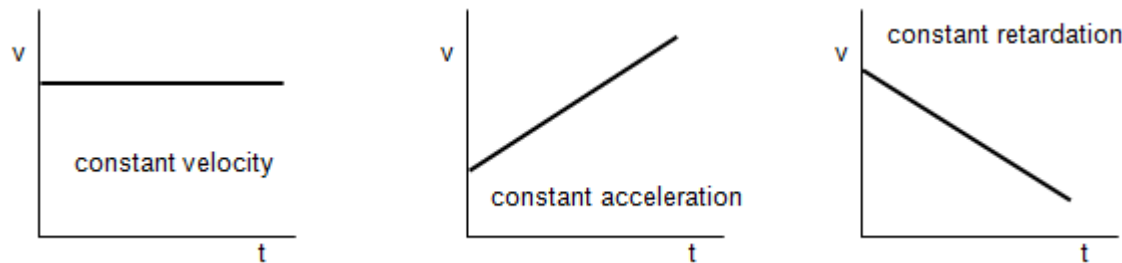


**AQA P5b Forces and motion**  
**Combined Higher**

**Required Practical for this topic:**  
**None**

<b>Speed and acceleration</b>	Speed unit	Metres per second (m/s)
	Velocity	The vector form of speed. Speed in a given direction
	Acceleration	The rate of change of velocity
	Deceleration	A negative acceleration. Slowing down.
	Acceleration unit	Metres per second per second or metres per second squared (m/s/s or m/s <sup>2</sup> )
	Circular motion	Constant speed, but changing velocity
	For questions with two speeds	Use <i>u</i> for initial speed and <i>v</i> for final speed
	Distance = speed × time ( $s = v \times t$ )	
Acceleration = change in velocity ÷ time ( $a = \Delta v \div t$ or $a = (v - u) \div t$ )		
$v^2 - u^2 = 2as$		

<b>Terminal velocity</b>	Terminal velocity	The maximum speed of a falling object
	When an object accelerates	The force of air resistance increases
	Terminal velocity is achieved when	The forces of weight and air resistance balance



**Typical speeds:** Walking ~ 1.5 m/s, Running ~ 3 m/s, Cycling ~ 6 m/s.  
Typical speed of sound in air ~ 330 m/s.

<b>Motion graphs</b>	Distance time graph for a stationary object	Horizontal line
	Distance-time graph for an object at a steady speed	Straight line sloping upwards
	Distance-time graph gradient	Equals the speed
	Velocity-time graph for an object at a steady speed	Horizontal line
	Velocity-time graph for an accelerating object	Straight line sloping upwards
	Velocity-time graph for a decelerating object	Straight line sloping downwards
	Velocity-time graph gradient	Equals the acceleration
	The area underneath a velocity-time graph	Equals the distance travelled
	The gradient of the tangent to a distance-time graph	Equals the instantaneous speed

