Y9 Science Term 6	P2: Forces	
Week 1: Term 5 Recap	Week 2: Scalars and Vectors	Week 3: Distance Time Graphs

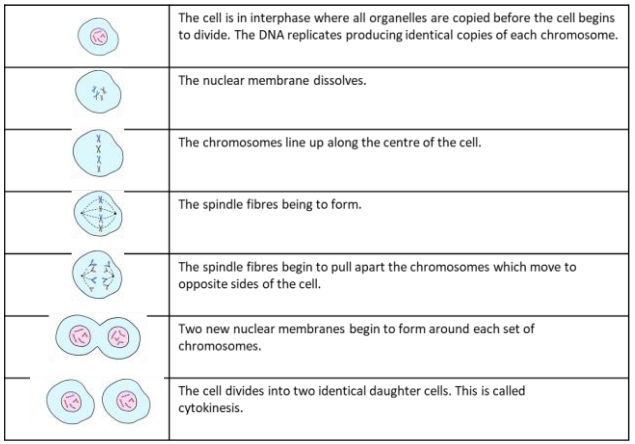
transpiration The movement of water and minerals from the roots to the leaves

potometer The piece of equipment used to measure the rate of transpiration

translocation The movement of sucrose (sugar) down from the leaves to the rest of the plant

phloem Vessels made from living cells that carry sucrose (sugar) through the plant

sieve plate Tissue separating phloem cells. Allow sugars to pass through



scalar A scalar has magnitude only. Examples of scalars are speed, distance, mass and time.

vector A vector has both magnitude and direction. Examples of vectors are velocity, displacement, weight and acceleration.

acceleration Acceleration is the rate of change of velocity.

Acceleration = change of velocity ÷ time taken

If the acceleration is negative, it means the object is slowing down.

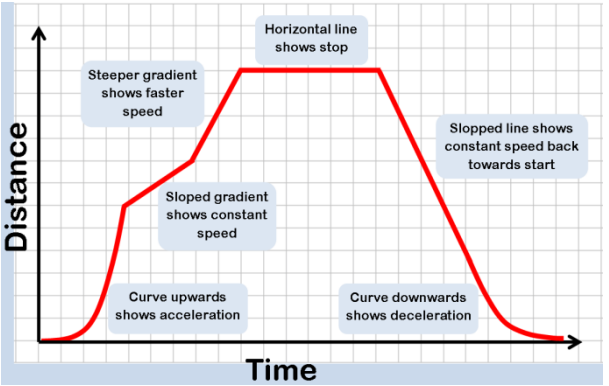
<u>Calculating Speed</u>

To calculate speed, we must measure distance and time then use the equation:

$$speed(m/s) = distance(m) \div time\ (s)$$

Distance can be measured with a measuring tape for small distances and a trundle wheel for larger distances.

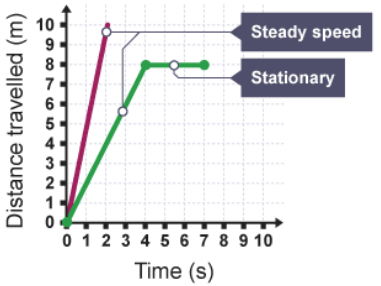
<u>Distance-time Graphs</u>



The gradient of the line is the speed of the object. The steeper the line the higher the speed.

To determine the speed at a particular point during acceleration a tangent to the curve must be drawn and the gradient determined.

$$gradient = \frac{change\ in\ y}{change\ in\ x}$$

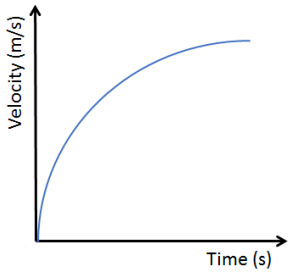


Extension QR Codes - Read the BBC bitesize new knowledge page, watch the video, and complete the self-quiz

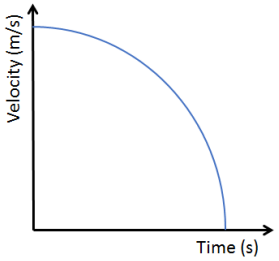
Y9 Science Term 6	P2: Forces	
Week 4: Velocity Time Graphs	**Week 5: Acceleration**	**Week 6: Newton's Laws of Motion**

Week 4: Velocity Time Graphs

Velocity-time Graphs (non-uniform motion)



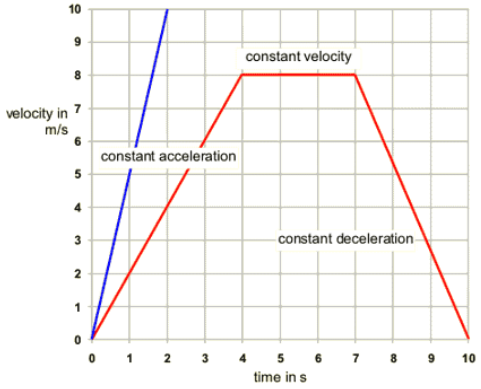
Non-uniform acceleration



Non-uniform deceleration

To determine the acceleration at a particular point a tangent must be drawn, and the gradient of the tangent determined.

Velocity-time graphs (uniform motion)



Week 5: Acceleration

Calculations when an object accelerates

If an object is accelerating, the following equation can be used:

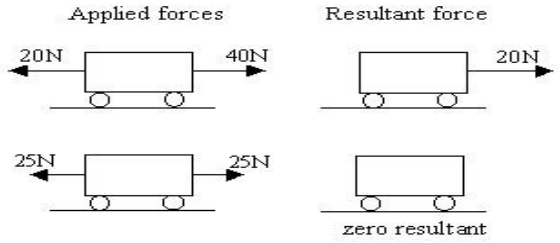
$$v^2 - u^2 = 2as$$

Where:
v is final velocity (m/s)
u is starting velocity (m/s)
a is acceleration (m/s^2)
s is displacement (m)

Resultant Forces

The resultant force is the overall force acting on an object.

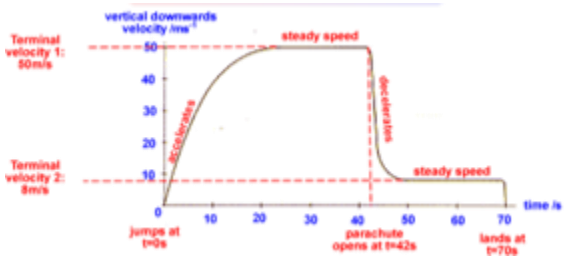
Examples:



contact forces	When two objects must touch to exert a force on one another.	• Friction • Drag • Normal contact • Tension
non-contact forces	When objects can exert a force on one another without touching.	• Electrostatic • Magnetism • Gravity

Week 6: Newton's Laws of Motion

Newton's first law	An object will remain at rest or moving at a constant velocity unless acted on by an external force.
Newton's second law	The acceleration of an object is proportional to the force applied. *Force = mass x acceleration*
Newton's third law	When two objects interact, they exert equal and opposite forces on one another.
terminal velocity	When the weight of a falling object is equal to the air resistance of the object terminal velocity will be reached.
momentum	Momentum is a quantity that depends on mass and velocity. The units of measure are kgm/s. Momentum = mass x velocity



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