



Science. Year 8



Plants and Photosynthesis

In this topic, students will discover how plants are adapted to make food by the process of photosynthesis.

- Describe the structure and function of major plant parts: roots, stems, leaves, and flowers.
- Explain the process of photosynthesis and write its word equation.
- Understand the importance of chlorophyll and light energy in photosynthesis.
- Identify the raw materials needed for photosynthesis and the products made.
- Describe how water and minerals are absorbed by roots and transported through the plant.
- Explain how carbon dioxide enters leaves and oxygen exits through stomata.
- Understand the role of xylem and phloem in transport.
- Investigate how factors like light, temperature, and carbon dioxide affect photosynthesis.

Assessment:

Summative assessment: Mixed topic exam style questions (50 min)

Specialist key terms for this unit:

Photosynthesis Chlorophyll Glucose Stomata Xylem
Phloem Carbon dioxide Oxygen Nutrients

Key Concept: Photosynthesis

Photosynthesis is the process by which green plants, algae, and some bacteria convert light energy, typically from the sun, into chemical energy in the form of glucose (sugar). This process also releases oxygen as a byproduct.

Subject reading/further support:

YouTube video's:

Photosynthesis – FuseSchool

<https://www.youtube.com/watch?v=eo5XndJaz-Y>

Transport in Plants – BBC Bitesize

<https://www.youtube.com/watch?v=LmEwHkz1zHc>

Factors Affecting Photosynthesis – Cognito

<https://www.youtube.com/watch?v=QWrEb0GzMLI>

Suggested enrichment/wider reading activities:

Visit: MME Revision - <https://mmerevise.co.uk/ks3-revision/key-stage-3-science/gravity>

Seneca - <https://senecalearning.com/en-GB/>



Topic: Forces and Motion

Students learn to carefully describe motion observations. They identify objects that travel a greater distance in the same time interval, and those that travel the same distance in different times, to explain the interplay between distance and time to describe uniform speed

Students then build on their understanding of line graphs as tools to interpret relationships, in this case between distance and time to describe speed. It focusses on uniform speed, then asks students to consider what a curve would represent to lead to ideas about a change in speed: acceleration.

Students begin with a qualitative understanding of how to identify through observation and measurement that acceleration is happening; then they learn about the causes of acceleration and how its size and direction can vary.

Students then thread together these concepts with ideas of drag forces: what drag forces are, when they happen, what causes them, how they can be reduced, their size and direction relative to other forces acting on an object and its relative motion, hence the effect on the resultant force, and therefore an object's motion

Assessment:

This is part of the year 8 Autumn Exam

Specialist key terms for this unit:

Air Resistance	Applied Force	average speed	balanced forces	decelerating
distance-time graph	drag force	driving force	energy pathway	energy store
transfer	falling object	fluid	friction force	energy
instantaneous speed	kinetic store	frame of reference	mechanical pathway	gravity force
contact force	rate	relative motion	relative speed	normal
resultant force	speed	stationary	thrust	resistive force
unbalanced force	uniform speed	unpropelled	thermal store	time interval
			water resistance	

Suggested enrichment activities:

- [BBC Bitesize](#) – Introduction to forces
- [BBC Bitesize](#) – Force diagrams and resultant forces
- [BBC Bitesize](#) – Motion and speed
- [BBC Bitesize](#) – Representing journeys
- [BBC Bitesize](#) – Energy stores and energy transfers
- [BBC Bitesize](#) – How to explain forces
- [BBC Bitesize](#) – Planning an experiment
- [BBC Bitesize](#) – Maths skills for science

Key Concept: Motion and Forces

Students build on their knowledge of forces (7.02) and focus specifically on motion and speed. They draw and interpret distance-time graphs. They also consider how speed can be increased by reducing the force of air resistance through streamlining.

Key Concept: Matter

Students build on their knowledge of particles of matter (8.01) to explain how drag forces arise and explain how different objects and materials affect them.



Topic: Forces and Work

Students naming and describing forces during interactions, in the context of compression and tension—support forces. They are introduced to Hooke's Law and the elastic limit.

Students are formally introduced to the concept of mechanical work and learn how to recognise it and calculate work done in the context of an inclined plane. They go on to explore turning effects on rigid objects and rotational equilibrium, using the formula to solve problems.

Students develop knowledge through the contexts of simple machines, including levers, pulleys and gears; they learn to apply ideas about efficiency (8.05), understanding why machines cannot be 100% efficient, and use the formula to demonstrate this knowledge. Hydraulic machines are introduced (without exploring ideas of pressure further).

Assessment:

This is part of the year 8 Autumn Exam

Specialist key terms for this unit:

Anticlockwise turning effect	Applied Force	Attractive force	Balanced forces
Clockwise turning effect	Compress	Conservation of Energy	Contact force
dissipate	distort	elastic	elastic store
Joule (J)	efficiency	equilibrium	gears
lever	load	newton metre (Nm)	interaction
force	mechanical work	pivot	non-contact
normal contact force	proportional	pulley	
repulsive force	rotational equilibrium	spring constant	
support force	tension force	turning effect	weight
			work

Suggested enrichment activities:

- [BBC Bitesize – Introduction to forces](#)
- [BBC Bitesize – Force diagrams and resultant forces](#)
- [BBC Bitesize – Energy stores and energy transfers](#)
- [BBC Bitesize – Moments](#)
- [BBC Bitesize – Hooke's Law](#)
- [BBC Bitesize – How to explain forces](#)
- [PhET Colorado – Balancing Act](#)

Key Concept: Motion and Forces

Students build on concepts of compression and tension (7.02) and are introduced to Hooke's law; they build on their practical experience of pulleys, levers and gears (KS2) and forces (8.03) and are taught about moments and balance; simple machines; work done and efficiency.

Key Concept: Energy

Students revisit energy stores and the electrical pathway (7.02) in the context of mechanical work done by machines. The tendency of energy to dissipate (8.01) is revisited in the context of useful and non-useful energy transfers. Students compare efficiency of machines.