Y8 Cycle 3 Science

Scholar's Guide

Oxford Spires Academy

Full Name: _____

Tutor Group : _____

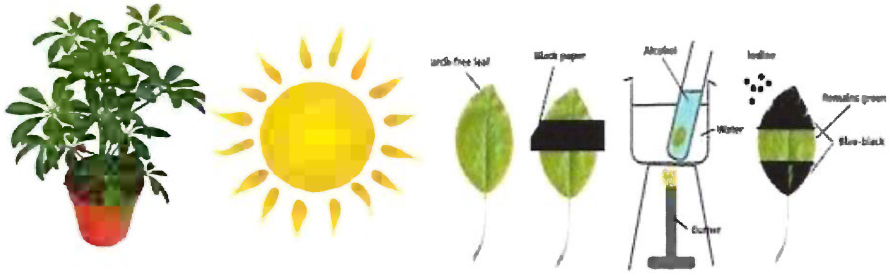
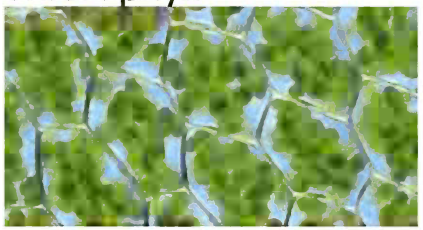
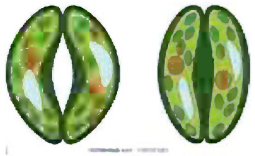
Science Class : _____

Science Teacher(s): _____

Science Y8
Cycle 3

The Knowledge Organisers contain all the knowledge you need to learn.
Below is what you need to be able to do.

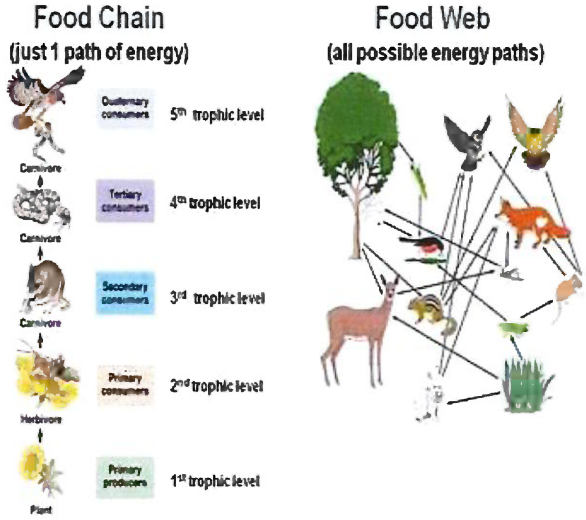
Week	Date	Topic 8.5 Photosynthesis and Ecosystems	Topic 8.6 Electricity and Magnetism
1&2	23rd March	Describe ways in which plants obtain resources for photosynthesis. Explain why other organisms are dependent on photosynthesis.	Describe how current changes in series and parallel circuits when components are changed. Turn circuit diagrams into real series and parallel circuits, and vice versa. Describe what happens when charged objects are placed near to each other or touching. Use a sketch to describe how an object charged positively or negatively became charged up.
3&4	20th April	Sketch a line graph to show how the rate of photosynthesis is affected by changing conditions. Use a word equation to describe photosynthesis in plants and algae. Suggest how particular conditions could affect plant growth.	Draw a circuit diagram to show how voltage can be measured in a simple circuit. Use the idea of energy to explain how voltage and resistance affect the way components work. Given a table of voltage against current.
5&6	5th May	Suggest reasons for particular adaptations of leaves, roots and stems. Compare the movement of carbon dioxide and oxygen through stomata at different times of day	Use the ratio of voltage to current to determine the resistance. Use an analogy like water in pipes to explain why part of a circuit has higher resistance. Compare the advantages of series and parallel circuits for particular uses.
7&8	18th May	**Mid Point Assessment Re-teach.** Describe how a species' population changes as its predator or prey population changes.	**Mid Point Assessment Re-teach.** Use the idea of field lines to show how the direction or strength of the field around a magnet varies. Explain observations about navigation using Earth's magnetic field. Predict the pattern of field lines and the force around two magnets placed near each other.
9&10	8th June	Explain effects of environmental changes and toxic materials on a species' population. Combine food chains to form a food web	Use a diagram to explain how an electromagnet can be made and how to change its strength. Explain the choice of electromagnets or permanent magnets for a device in terms of their properties. Suggest how bells, circuit breakers and loudspeakers work, from diagrams.
11&12	22nd June	Assessment & Reteach	Assessment & Reteach

8.5 Photosynthesis and Ecosystems KO 1 (Photosynthesis)	**Key Word**	**Meaning**
Know Plants and algae do not eat, but use energy from light, together with carbon dioxide and water to make glucose (food) through photosynthesis. They either use the glucose as an energy source, to build new tissue, or store it for later use. Plants have specially-adapted organs that allow them to obtain resources needed for photosynthesis.	Fertilisers 	Chemicals containing minerals that plants need to build new tissues.
carbon dioxide + water → (sunlight) glucose + oxygen 	Photosynthesis	A process where plants and algae turn carbon dioxide and water into glucose and release oxygen.
	Chlorophyll 	Green pigment in plants and algae which absorbs light energy.
Fact Iodine is used to test for the presence of starch	Stomata 	Pores in the bottom of a leaf which open and close to let gases in and out.

8.5 Photosynthesis and Ecosystems KO 2 (Ecosystems)

Know

Organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others. The population of a species is affected by the number of its predators and prey, disease, pollution and competition between individuals for limited resources such as water and nutrients.



The *arrow* points to the eater and shows the transfer of energy.

Fact

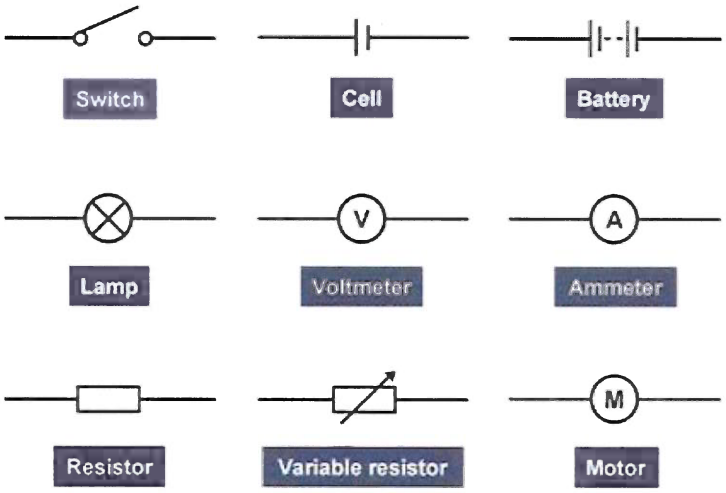
Insects are needed to pollinate food crops

Key Word	**Meaning**
Food web	Shows how food chains in an ecosystem are linked.
Food chain	Part of a food web, starting with a producer, ending with a top predator.
Ecosystem	The living things in a given area and their non-living environment.
Environment	The surrounding air, water and soil where an organism lives.
Population	Group of the same species living in an area.
Producer	Green plant or algae that makes its own food using sunlight.
Consumer	Animal that eats other animals or plants.
Decomposer	Organism that breaks down dead plant and animal material so nutrients can be recycled back to the soil or water.

8.6 Electricity KO 1

Know

We can model voltage as an electrical push from the battery, or the amount of energy per unit of charge transferred through the electrical pathway. In a series circuit, voltage is shared between each component. In a parallel circuit, voltage is the same across each loop. Components with resistance reduce the current flowing and shift energy to the surroundings.



Fact

Two similarly charged objects repel, two differently charged objects attract.

Two 'like' magnetic poles repel and two 'unlike' magnetic poles attract. Field lines flow from the north-seeking pole to the south-seeking pole. The magnetic field of an electromagnet decreases in strength with distance.

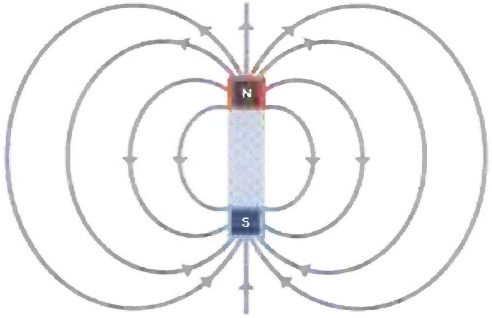
Key Word	Meaning
Potential Difference (voltage)	The amount of energy shifted from the battery to the moving charge, or from the charge to circuit components, in volts (V).
Resistance	A property of a component, making it difficult for charge to pass through, in ohms (Ω).
Conductor	A material that allows current to flow through it easily, and has a low resistance.
Insulator	A material that does not allow current to flow easily, and has a high resistance
In series	If components in a circuit are on the same loop.
In parallel	In parallel: If some components are on separate loops.
Current	Flow of electric charge, in amperes (A).
Electrostatic force	Non-contact force between two charged objects.
Negatively charged	An object that has gained electrons as a result of the charging process.
Positively charged	An object that has lost electrons as a result of the charging process.

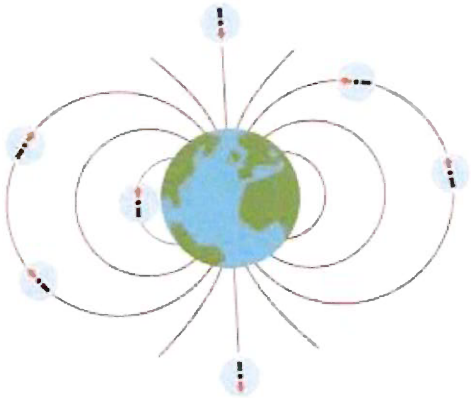
8.6 Magnets and Electromagnets KO 2

Know

Magnetic materials, electromagnets and the Earth create magnetic fields which can be described by drawing field lines to show the strength and direction.
The stronger the magnet, and the smaller the distance from it, the greater the force a magnetic object in the field experiences.
An electromagnet uses the principle that a current through a wire causes a magnetic field.
Its strength depends on the current, the core and the number of coils in the solenoid.

Diagrams

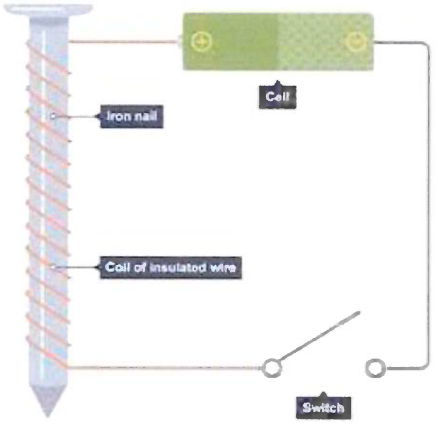




Fact

Two 'like' magnetic poles repel and two 'unlike' magnetic poles attract.
Field lines flow from the north-seeking pole to the south-seeking pole.
The magnetic field of an electromagnet decreases in strength with distance.

Key Word	Meaning
Electromagnet	A non-permanent magnet turned on and off by controlling the current through it.
Solenoid	Wire wound into a tight coil, part of an electromagnet.
Core	Soft iron metal which the solenoid is wrapped around.
Magnetic force	Non-contact force from a magnet on a magnetic material.
Permanent magnet	An object that is magnetic all of the time.
Magnetic poles	The ends of a magnetic field, called north-seeking (N) and south-seeking poles (S).



A simple electromagnet