

## How could we cope without electricity for one day? **PHYSICS**

Term: Autumn 1

**Statutory NC Objectives:**

- Y4 PoS : **Electricity**
- Identify common appliances that run on electricity;
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers;
- Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery;
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit;
- Recognise some common conductors and insulators, and associate metals with being good conductors.

### Key Vocabulary

### Knowledge Overview

ANCHOR WORDS	GOLDDILOCKS WORDS	STEP ON WORDS	Knowledge Overview
<p><b>Bulb</b> – an object made from rounded glass that uses electricity to create light.</p> <p><b>Electricity</b> – the flow of an electric current or charge through a material.</p> <p><b>Electrical appliance</b> – a piece of equipment or a device that uses electricity to do a certain job, e.g. – a washing machine.</p> <p><b>Plug</b> – a device that makes an electrical connection. Attaches a device to the electricity supply.</p> <p><b>Switch</b> – switches can be used to open or close the circuit.</p>	<p><b>Circuit</b> – a pathway that electricity can flow around.</p> <p><b>Complete circuit</b> – when the circuit has no gaps or breaks and the electricity can travel all the way around.</p> <p><b>Component</b> – the different parts that make up an electrical circuit, e.g. – bulb, switch, buzzer etc.</p> <p><b>Battery</b> – a device that stores electrical energy as a chemical.</p> <p><b>Non-renewable</b> – this source of energy will eventually run out.</p> <p><b>Renewable</b> – this source of energy will never run out. It is also usually better for the environment.</p> <p><b>Short circuit</b> – an electrical circuit that has a break in and hence, electricity cannot flow around.</p>	<p><b>Electrons</b> – small particles with an electrical charge.</p> <p><b>Insulator</b> – a material that doesn't allow electricity to pass through it easily.</p>	<p><u>By the end of this unit, the pupils should know that:</u></p> <ul style="list-style-type: none"> <li>• Many household devices and appliance run on electricity.</li> <li>• Some electrical devices plug in to the mains and others run on batteries.</li> <li>• An electrical circuit consists of a cell or battery connected to a component using wires.</li> <li>• If there is a break in the circuit, a loose connection or a short circuit, the component will not work.</li> <li>• A switch can be added to the circuit to turn the component on and off.</li> <li>• Metals are good conductors which is why they are used as wires in a circuit.</li> <li>• Non-metallic solids are insulators.</li> <li>• Water, if not completely pure, conducts electricity.</li> <li>• Circuits can be made in different ways with different components.</li> <li>• All circuits require a power source (battery/mains)</li> <li>• Some energy sources are renewable and some are non-renewable.</li> </ul> <p><b>ESSENTIAL KNOWLEDGE</b></p>

**Y4 Science**

	<b>Conductor</b> – a material that allows electricity to pass through it easily.		
<b>“Bridging Back”</b> (previous years/cross-curricular content)  N/A		<b>“Bridging Forward”</b> (future years/cross curricular content)  <b>Y6 PoS: Electricity – <i>Could you be an electrician’s apprentice?</i></b> <ul style="list-style-type: none"><li>- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li><li>- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</li><li>- Use recognised symbols when representing a simple circuit in a diagram</li></ul>	

## How can water be changed? CHEMISTRY

Term: Autumn 2

**Statutory NC Objectives:**

- Y4 PoS : **States of matter**
- Compare and group materials together, according to whether they are solids, liquids or gases;
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Key Vocabulary			Knowledge Overview
<b>ANCHOR WORDS</b>	<b>GOLDILOCKS WORDS</b>	<b>STEP ON WORDS</b>	<p>By the end of this unit, the pupils should know that:</p> <ul style="list-style-type: none"> <li>• A solid keeps its shape and has a fixed volume.</li> <li>• A liquid has a fixed volume but changes in shape to fit the container.</li> <li>• A liquid can be poured and keeps a horizontal, level surface.</li> <li>• A gas fills all available space; it has no fixed shape or volume.</li> <li>• Some solids can be poured, like liquids, but they are still solids – e.g. – sand. They do not create a level surface after pouring.</li> <li>• Melting is a state change from solid to liquid.</li> <li>• Freezing is a state change from liquid to solid.</li> <li>• The freezing point of water is 0°C.</li> <li>• Boiling is a change of state from liquid to gas.</li> <li>• Water boils at 100°C.</li> <li>• Evaporation is the process which happens when liquids are heated.</li> <li>• Condensation is the change back from a gas to a liquid caused by cooling.</li> <li>• The water cycle shows the process of water heating and cooling in the environment.</li> </ul> <p><b>ESSENTIAL KNOWLEDGE</b></p>
<p><b>Solid</b> – materials that keep their shape unless a force is applied to them.</p> <p><b>Liquid</b> – materials that take the shape of their container.</p> <p><b>Gas</b> – materials that spread out completely to fill the space they’re in.</p> <p><b>Melting</b> – when a solid changes to a liquid.</p> <p><b>Freezing</b> – when a liquid changes to a solid.</p>	<p><b>Freezing point</b> – the temperature at which a liquid freezes – for water this is 0°C</p> <p><b>Melting point</b> – the temperature at which a solid becomes liquid.</p> <p><b>Boiling point</b> – the temperature at which a liquid becomes a gas – for water this is 100°C.</p> <p><b>Evaporation</b> – when a liquid turns into a gas.</p> <p><b>Condensation</b> – when a gas turns into a liquid.</p> <p><b>Water cycle</b> – the journey water takes from land to sky and back again.</p>	<p><b>Change of state</b> – the process when a material changes from 1 type to another, e.g. – from liquid to gas.</p>	
<p>“<b>Bridging Back</b>” (previous years/cross-curricular content)</p> <p>N/A</p>			<p>“<b>Bridging Forward</b>” (future years/cross curricular content)</p> <p><b>Y5 PoS: Properties and changes of materials – <i>Could you be the next CSI investigator?</i></b></p>

#### Y4 Science

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Demonstrate that dissolving, mixing and changes of state are reversible changes
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

## What's that sound? **PHYSICS**

Term: Spring 1

**Statutory NC Objectives:**

- Y4 PoS : **Sound**
- Identify how sounds are made, associating some of them with something vibrating;
- Recognise that vibrations from sounds travel through a medium to the ear;
- Find patterns between the pitch of a sound and features of the object that produced it;
- Find patterns between the volume of a sound and the strength of the vibrations that produced it;
- Recognise that sounds get fainter as the distance from the sound source increases.

Key Vocabulary			Knowledge Overview
<b>ANCHOR WORDS</b>	<b>GOLDILOCKS WORDS</b>	<b>STEP ON WORDS</b>	<p><u>By the end of this unit, the pupils should know that:</u></p> <ul style="list-style-type: none"> <li>• A sound source produces vibrations which travel through a medium from the source to our ears.</li> <li>• Different mediums, such as a solids, liquids and gases can carry sound but sound cannot travel through a vacuum.</li> <li>• The vibrations cause parts of our body, inside our ears, to vibrate allowing us to hear (sense) the sound.</li> <li>• The loudness of the sound depends on the strength of vibrations.</li> <li>• The vibrations decrease as they travel through the medium which is why sound decreases in volume as you move away from the source.</li> <li>• A sound insulator is a material which blocks sound effectively.</li> <li>• Some materials are better than others at sound proofing.</li> <li>• Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds.</li> <li>• Inside your ear, vibrations hit the ear drum and are then passed to the middle, then the inner ear.</li> <li>• In the inner ear, vibrations are changed into electrical signals and sent to the brain – our brain tells us we are hearing a sound.</li> </ul> <p><b>ESSENTIAL KNOWLEDGE</b></p>
<p><b>Pitch</b> – how high or low a sound is.</p> <p><b>Source</b> – the place where the sound comes from.</p> <p><b>Sound wave</b> – vibrations traveling from the sound source.</p> <p><b>Volume</b> – the loudness of a sound.</p>	<p><b>Amplitude</b> – the size of a vibration, a larger amplitude = a louder sound.</p> <p><b>Eardrum</b> – the part of the ear where there is a thin, tight layer of skin (like a drum skin). Sound waves make the ear drum vibrate and we hear the sound.</p> <p><b>Particles</b> – solids, liquids and gases are all made of particles – they are so small we can't see them.</p> <p><b>Vibration</b> – a movement backwards and forwards.</p>	<p><b>Sound insulator</b> – a material that effectively blocks or muffles sound.</p> <p><b>Soundproof</b> – to prevent sound from passing.</p> <p><b>Vacuum</b> – a space where there is nothing, and no particles. No sound can be heard in a vacuum.</p>	
<p><b>“Bridging Back”</b> (previous years/cross-curricular content)</p> <p>N/A</p>			<p><b>“Bridging Forward”</b> (future years/cross curricular content)</p> <p>N/A</p>

## What happens to the food we eat? **BIOLOGY**

Term: Spring 2

**Statutory NC Objectives:**

- Y4 PoS : **Animals including humans**
- Describe the simple functions of the basic parts of the digestive system in humans;
- Identify the different types of teeth in humans and their simple functions;
- Construct and interpret a variety of food chains, identifying producers, predators and prey.

### Key Vocabulary

### Knowledge Overview

ANCHOR WORDS	GOLDILOCKS WORDS	STEP ON WORDS	
<p><b>Carnivore</b> – an animal that eats other animals (meat).</p> <p><b>Herbivore</b> – an animal that eats plants.</p> <p><b>Omnivore</b> – an animal that eats both plants and meat.</p> <p><b>Stomach</b> – an organ in the digestive system where food is broken down with stomach acid.</p> <p><b>Predator</b> – an animal that hunts and eats other animals.</p> <p><b>Prey</b> – an animal that gets hunted and eaten by other animals.</p> <p><b>Producer</b> – a plant that produces its own food.</p>	<p><b>Digest</b> – to break down food so it can be used by the body for energy.</p> <p><b>Digestive system</b> - a series of organs that break food down so it can be absorbed into our bloodstream.</p> <p><b>Food chain</b> – a chain that shows how living things get food and transfer energy.</p> <p><b>Oesophagus</b> – a muscular tube which moves food from the mouth to the stomach.</p> <p><b>Large intestine</b> – part of the intestine where water is absorbed from remaining waste food.</p> <p><b>Nutrients</b> – nutrients are found in foods that help the body to grow well.</p> <p><b>Small intestine</b> – part of the intestine where nutrients are absorbed into the body.</p>	<p><b>Canine</b> – the teeth that tear and rip food.</p> <p><b>Incisor</b> – the teeth that bite and cut food.</p> <p><b>Molar</b> – the teeth that grind food.</p> <p><b>Premolar</b> – the teeth that hold and crush food.</p>	<p>By the end of this unit, the pupils should know that:</p> <ul style="list-style-type: none"> <li>• Food enters the body through the mouth.</li> <li>• Digestion starts when the teeth start to break the food down.</li> <li>• Saliva is added and the tongue rolls the food into a ball.</li> <li>• The food is swallowed and passes down the oesophagus to the stomach.</li> <li>• In the stomach, food is broken down by being churned around and other chemicals are added.</li> <li>• In the small intestine, nutrients are removed from the food and leave the digestive system to be used elsewhere in the body.</li> <li>• In the large intestine, the water is removed for use elsewhere in the body. What is left then waits to leave the body as waste.</li> <li>• Humans have four types of teeth – incisors for cutting, canines for tearing, molars and premolars for grinding and chewing.</li> <li>• Living things can be classified as producers, predators and prey according to their place in the food chain.</li> </ul> <p><b>ESSENTIAL KNOWLEDGE</b></p>

**Y4 Science**

	<p><b>Saliva</b> – a liquid produced in the mouth that helps us chew and digest food.</p>		
<p><b>“Bridging Back”</b> (previous years/cross-curricular content)</p> <p><b>Y3 PoS : Animals including humans – <i>How can Usain Bolt move so quickly?</i></b></p> <ul style="list-style-type: none"><li>- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</li></ul>		<p><b>“Bridging Forward”</b> (future years/cross curricular content)</p> <p><b>Y5 PoS: Animals including humans – <i>How different will you be when you are as old as your Grandparents?</i></b></p> <ul style="list-style-type: none"><li>- Describe the changes as humans develop to old age</li></ul>	

**Which animals and plants thrive in your locality? BIOLOGY**

Term: Summer 1 and 2

**Statutory NC Objectives:**

- Y4 PoS : **Living things and their habitats**
- Recognise that living things can be grouped in a variety of ways;
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment;
- Recognise that environments can change and that this can sometimes pose dangers to living things.

**Key Vocabulary**

**Knowledge Overview**

ANCHOR WORDS	GOLDBLOCKS WORDS	STEP ON WORDS	By the end of this unit, the pupils should know that:
<p><b>Endangered species</b> – a plant or animal that has dropped in numbers and there are now very few left.</p> <p><b>Extinct</b> – when a living species has no living things left on the planet and they no longer exist.</p> <p><b>Habitat</b> – the natural home of an animal or plant.</p> <p><b>Hibernate</b> – to sleep through winter (some animals do this).</p> <p><b>Season</b> – a period of time in the year – we have 4 seasons: Autumn, Winter, Spring, Summer</p>	<p><b>Classification</b> – where plants or animals are placed into groups based on their similarities.</p> <p><b>Environment</b> - the area surrounding a living thing.</p> <p><b>Human impact</b> – the changes that humans make to the natural world, these can be good or bad.</p> <p><b>Natural impact</b> – the changes to the natural world that happen naturally (without any human involvement).</p> <p><b>Organisms</b> – living things</p> <p><b>Characteristics</b> – the features or qualities that are specific to a particular species.</p>	<p><b>Migrate</b> – to move from one region or another.</p> <p><b>Classification key</b> – a diagram used to help group, identify and name a variety of living things.</p>	<p>• Living things can be grouped (classified) in different ways according to their features.</p> <p>• Classification keys can be used to identify and name living things.</p> <p>• Living things live in a habitat which provides an environment to which they are suited.</p> <p>• Habitats can change naturally, e.g. – through flooding, fires, earthquakes etc. This has an impact on the things living there.</p> <p>• Humans can also cause the environment/habitats to change – this can be in a good way, e.g. – setting up nature reserves or a bad way, e.g. – through pollution/littering.</p> <p>• Different living things can be found in a habitat at different times of the year.</p> <p>• Some animals hibernate at different times during the year.</p> <p>• Living things can migrate between different places.</p> <p><b>ESSENTIAL KNOWLEDGE</b></p>

**“Bridging Back”** (previous years/cross-curricular content)

**“Bridging Forward”** (future years/cross curricular content)

**Y3 PoS : Plants – How did that blossom become an apple?**

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers;

**Y5 PoS: Living things and their habitats – Do all animals start life as an egg?**

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

#### Y4 Science

- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant;
- Investigate the way in which water is transported within plants;
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

- Describe the life process of reproduction in some plants and animals