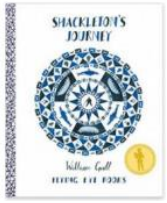
Year Group 4

Term 1 & 2

States of Matter

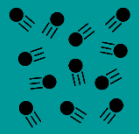
Living things and their habitats | States of matter | Sound | Electricity | Animals Including Humans

Enquiry Question	What materials can change their state of matter and how?			
Scientific Enquiry	• Identify similarities, differences or changes related to simple scientific ideas and processes. • Make systematic and careful observations, taking measurements using a range of equipment. • Ask relevant questions and use different scientific enquiry to answer them. • Gather, record, classify and present data in a variety of ways to answer questions			
NC Objectives	• 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 temperature. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.			
Curriculum Coherence	**Prior Knowledge**		**Future Learning** Links to future learning regarding the water cycle and the stages of that process.	
	Vocabulary Thermometer, melting point, boiling point, solid, liquid, gas, evaporation, condensation, water vapour, substance.	**High Quality Text** 	**Misconceptions** All substances can only exist in one state of matter. All substances change state at the same temperature: Water disappears during evaporation:	**Assessment/Outcomes** Retrieval Practice Written Task Online Platform

Year Group 4

Term 1 & 2

States of Matter

Living things and their habitats  States of matter  Sound  Electricity  Animals Including Humans 

Unit Summary: This unit '**States of matter**' takes children through six lessons where they learn how to: **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);** and finally, **identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.**	
Knowledge Sequence	Lesson 1 – What are the 3 different states? During the lesson the children will discover the differences between solids, liquids and gases and how they can be identified. Discuss similarities and differences between the properties of each state of matter and address misconceptions relating to each of the different states, proving and disproving some common misconceptions. DE Lesson 1
	Lesson 2 – What is a particle and how does it behave in different states of matter? Within this lesson the children are using the particle model, the children can explore the different states of matter (solids, liquids, and gases). They will learn that the state of the material is affected by the amount of energy the particles have. The children should have the opportunity to observe and record the temperature at which water changes state. DE lesson 2
	Lesson 3 – Do all objects melt at the same temperature? During this lesson the focus shifts to look at discovering that a solid changes state to a liquid when it is heated. This is known as melting. This happens because the particles in a solid absorb energy by being heated. As a result, the particles move around more, and the bonds between them become weaker. The temperature at which this happens is known as the melting point. They will use different equipment to accurately measure temperature. DE lesson 3
	Lesson 4 – Top freeze or to boil, that is the question? The children will discover that a liquid changes its state to a solid when it is cooled. Known as freezing. Ask for a few children to act out how the particles behave in the freezing process. The temperature at which this happens is known as the freezing point and is the same temperature as a substance's melting point. Explore unique examples where a solid changes state straight into a gas (sublimation) and where a gas changes state straight to a solid (deposition). DE Lesson 4
	Lesson 5 – What is evaporation and condensation? Next up the children begin to will discover that the process of condensation is when a gas is cooled. During condensation, the gas changes state to a liquid. This can be seen when water vapour comes into contact with a cool glass and liquid water droplets. The process of evaporation occurs when a liquid is heated and changes state into a gas. Encourage the children to think of examples where they have seen condensation and evaporation. DE Lesson 5
	Lesson 6 – Am I drinking the same water as the dinosaurs? During this final lesson, discuss all the things that make planet Earth so unique. Explore the water cycle, identifying the key part played by condensation and evaporation. The children will explore the process of the water cycle and what happens at each stage. DE Lesson 6
Aspiration	Your key knowledge will help you to be one of the following: Nuclear Scientist, Product design, lab technician, .
Scientist/Historical figure	Daniel Fahrenheit - Daniel Gabriel Fahrenheit - Students | Britannica Kids | Homework Help – Developed the thermometer

Year Group 4

Term 3

Electricity

Living things and their habitats  States of matter  Sound  Electricity  Animals Including Humans 

Enquiry Question	What is electricity and how is it safe for us to use?	
Scientific Enquiry	• To ask relevant questions and use different types of scientific enquiries to answer them • To set up practical enquiries and record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. • To report on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	
NC Objectives	• Identify common appliances that run on electricity Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, bulbs, switches, and buzzers. • Identify whether or not a lamp will light in a simple series circuit, 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.	
Curriculum Coherence	**Prior Knowledge:**	**Future Learning** Associate brightness of a lamp or volume of a buzzer with the number and voltage of cells used in the circuit. (Y6) Compare and give reasons for the variation in certain functions of electrical items. Use recognised symbols when representing a single circuit. (Y6)
	Vocabulary Electricity, batteries, circuits, voltage, current, bulb, conductor, insulator, switch, control, wind turbines, hydropower.	**High Quality Text** The Lighthouse Keeper's Son 
	Misconceptions Switches create electricity. More batteries mean more power. All materials conduct electricity equally	**Assessment/outcomes** Retrieval Practice Written Task Online Platform

Year Group 4

Term 3

Electricity

Living things and their habitats  States of matter  Sound  Electricity  Animals Including Humans 

Unit Summary: This unit '**Electricity**' takes children through six lessons where they learn how to: **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.** Children also learn how to: **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;** and finally, **recognise some common conductors and insulators, and associate metals with being good conductors**	
Knowledge Sequence	Lesson 1 – What uses electricity in my home and at school? Teach the children about where electricity comes from and how it reaches our houses. The lesson also enables the children to learn about the dangers of electricity and how to stay safe. Throughout the lesson, discuss real-life situations where the children might use electricity. Discuss the importance of electricity in our day to day lives and the impact when we don't have it. DE Lesson 1
	Lesson 2 – What is an electrical component and how does it make a circuit? Within this lesson the children will learn about a series circuit and how electricity flows from the positive end of a battery to the negative end. They will learn that only a complete series circuit will work. The children will also discover 6 different electrical components - bulb, switch, battery, switch, buzzer and bell. It will also start to address the misconception around where electricity comes from. DE lesson 2
	Lesson 3 – Can I make a circuit that works? During this lesson the focus shifts to look at diagnosing why a circuit may or may not work. The children will problem solve and begin to correct the errors made to ensure that the circuit does work. Start though by thinking back to the last lesson, ask the children the following questions: Can you name these electrical components? How does electricity travel through a circuit? DE lesson 3
	Lesson 4 – What helps electricity to flow but also keeps us safe? This lesson progresses the children's learning to consider materials that make good conductors, materials that make good insulators and why these materials are used for specific purposes. They will initially explore the terms conductor and insulator making links back to the last units learning on particles. They will explore items that allow electricity to flow and those that restrict including the impact of this restriction. DE Lesson 4
	Lesson 5 – What factors influence how well a circuit works? Recap on the following questions: What is an insulator? What is a conductor? Which materials are good conductors? Giving examples. The children will discover what an electrical switch is and how it works. Explains that a switch opens and closes, causing a break in a circuit when open or completes the circuit when closed. DE Lesson 5
	Lesson 6 – What materials conduct electricity? During this final lesson, the children conduct an experiment such as: How can I make my bulb dimmer and brighter? What will happen to the brightness of the light if I create a circuit with 3 bulbs? What will happen to my bulb if I connect 2 batteries? DE Lesson 6
Aspiration	Your key knowledge will help you to be one of the following: Electrician, Product designer, Operations manager, Mechanic, Solar farm manager, Engineer.
Scientist/Historical figure	Dr Zubera Iqbal - Research fellow, battery recycling | Job profile | RSC Education Thomas Edison - Mini Bio - Thomas Edison (youtube.com)

Year Group 4

Term 4

Sound

Living things and their habitats | States of matter | Sound | Electricity | Animals Including Humans

Enquiry Question	What is that sound?			
Scientific Enquiry	• To use straightforward scientific evidence to answer questions or to support their findings. • To be able to set up practical enquiries, comparative, and fair tests. • To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. • To report on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.			
NC Objectives	• 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 and volume of a sound and features of the objects that produce it. • Recognise that sound gets fainter as the distance from the sound source increases.			
Curriculum Coherence	**Prior Knowledge**		**Future Learning**	
	Vocabulary Vibration, medium, source, energy, materials, reflect, volume, decibel, pitch, tone, instrument, particles, source.	**High Quality Text** 	**Misconceptions** Sound travels instantaneously. Sound needs air to travel	**Assessment/outcomes** Retrieval Practice Written Task Online Platform

Year Group 4

Term 4

Sound

Living things and their habitats  States of matter  Sound  Electricity  Animals Including Humans 

Unit Summary: This unit '**Sound**' takes children through six lessons where they learn how to: **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;** and finally, **recognise that sounds get fainter as the distance from the sound source increases.**

Knowledge Sequence	Lesson 1 – How are sounds made? During the lesson the children are explore that sounds are caused by vibrations. They will learn that sounds travel from an object, through a medium (usually the air) and into the ear. Here, they are carried down the ear canal and processed by the brain. The children will look at the anatomy of the ear to see where the sound is heard and processed. They will also look at how sound is passed through the particles in the air through waves. DE Lesson 1
	Lesson 2 – Can sound travel through solids, liquids and gasses? Within this lesson the children will recap on the previous lesson's learning by asking the children the following questions: How is sound created? How does sound travel? How does the ear receive the sound? Explore with the children how sound moves through different mediums, such as air, liquids and gases. Enable the children to discover that sound cannot travel through space because it is a vacuum. The children will explore and investigate whether they can hear and sound does travel through each of the 3 mediums. DE lesson 2
	Lesson 3 – Can sound travel through every material? During this lesson the children will initially recap the learning around sound and how it is able to travel more efficiently through certain materials than others. The begin to explore which materials reflect sounds and which materials absorb sounds. The children will discover the properties that materials need to have to be suitable sound insulators, which they will be able to apply when carrying out their investigation. DE lesson 3
	Lesson 4 – Loud or quiet, what effects the volume of the sound we hear? This lesson starts by asking the following questions: How can you protect your ears from loud noises? Which materials make good sound insulators? Why are these materials good sound insulators? Explore the idea that in order to increase the volume of the sound more energy is required to be transferred. Teach the children about how loud and quiet sounds are created. Introduce them to decibels as a unit of measure. A decibel meter is used to measure this and can be used for safety DE Lesson 4
	Lesson 5 – High or low, what effects the pitch of the sounds we hear? This lesson explores the idea of pitch and how high pitch and low pitch sounds are created. Give the children the opportunity to play with instruments and have practical experience of high and low pitched sounds. They will be taught how humans and animals can hear different pitches and it is linked to the frequency and the number of waves. DE Lesson 5
	Lesson 6 – What can you hear? During this final lesson the children to explore how the volume of sounds change as they travel. This lesson should bring together all they have learnt about how sound vibrations travel. Children will investigate how the volume of sound changes as they get further away from a sound source. DE Lesson 6
Aspiration	Your key knowledge will help you to be one of the following: Musician, sound engineer, composer, audiologist, instrument designer/repairer, tv and film technician.
Scientist/Historical figure	Aristotle - Acoustics - Early Experimentation | Britannica Developed the concept that sound travels through the air.

Year Group 4

Term 5

Living things and their habitats

Living things and their habitats | States of matter | Sound | Electricity | Animals Including Humans

Enquiry Question	What type of species are you and where are you from?			
Scientific Enquiry	• Ask relevant questions and use different types of scientific enquiries to answer them. • To make systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment including thermometers and data loggers. • To use straightforward scientific evidence to support their findings or answer questions			
NC Objectives	• Know that 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.			
Curriculum Coherence	**Prior Knowledge** Year 2 curriculum – Living things and their habitats – Habitats around the world • Exploring the rainforest and its problems • Examining ocean life		**Future Learning** Describe the differences in life cycles of mammals, amphibians, insects and birds. Describe the life process of reproduction. (Y5) Describe how living things are classified into broad groups with common characteristics. Give reasons for the classification. (Y6)	
	Vocabulary Habitat, adapted, conditions, camouflage, microhabitat, climate, exposure, environment, classify, species, invertebrate, vertebrate, characteristics.	**High Quality Text** 	**Misconceptions** Animals can easily switch habitats Conservation is only about animals Conservation is only the responsibility of adults	**Assessment/Outcomes** Retrieval Practice Written Task Online Platform

Year Group 4

Term 5

Living things and their habitats

Living things and their habitats  States of matter  Sound  Electricity  Animals Including Humans 

Unit Summary: This unit 'Living things and their habitats' takes children through six lessons where they learn how to: **recognise that living things can be grouped in a variety of ways; and explore** and **use classification keys to help group, identify and name a variety of living things in their local and wider environment.**	
Knowledge Sequence	Lesson 1 – Where are the different habitats and which animals live there? Start by recapping on the children's learning from Year 2. What does the word 'habitat' mean? Can they remember any habitats from around the world? Over the unit, the children will be looking at a variety of habitats and conducting their own research about areas that interest them. They will begin to understand how animals have adapted to cope with the conditions they live in. DE Lesson 1
	Lesson 2 – Who lives in this habitat…? Within this lesson the children will start by identifying where animals live and explain why they are suited to their habitat. The children will independently research factors that contribute to the conditions that would be found in certain habitats. They will learn that the climate, temperature, exposure to the weather, type of soil and type of water will all impact the species of plants and animals that would be found. DE lesson 2
	Lesson 3 – How do we classify these animals? In this lesson, the children will start to become familiar with the classification of animals. They will learn that there are many stages of classification, usually beginning with whether an animal is a vertebrate or invertebrate. These animals can then be split into even more specific groups until you are left with only the animals that belong to the same species.DE lesson 3
	Lesson 4 – What is a classification key and how do I make my own? This lesson starts by recapping on the children's previous learning by asking – what is a classification key and how does it work? The aim of the lesson is for the children to design their own classification key through a series of 'yes or no' questions. The children will play a simple game of 'Guess my Animal' prior to writing their keys to help them think of the types of questions they should be asking. DE Lesson 4
	Lesson 5 – What is adaption and how has it allowed animal species to survive on earth? In this lesson, the children will be using and applying their knowledge of grouping and classifying and their knowledge of habitats to create their own animal. Firstly, the presentation will look at bears and how polar bears and grizzly bears have adapted. This will help the children to begin to understand how animals change to suit their environments as well as how animals from the same species can be grouped into even smaller sub-groups. DE Lesson 5
	Lesson 6 – Can I classify the plants and animals found in a pond? During this final lesson in the sequence, the children will start by considering the different habitats found in the UK and animals that reside within these habitats. The children will be encouraged to take part in a Pond dipping exercise in which they will be asked the to draw and identify all the living things they can see in the pond, including the plant life. Once the plants have been identified, ask the children to classify the plants into groups of flowering or non-flowering plants.DE Lesson 6
Aspiration	Your key knowledge will help you to be one of the following: Agriculture (working on a farm), Vet or caring for animals, Dog trainer, Beekeeper.
Scientist	Rachel Carson - Rachel Carson | Biography, Books, & Facts | Britannica– Biologist who wrote about environmental pollution

Year Group 4

Term 6

Animals including Humans

Living things and their habitats | States of matter | Sound | Electricity | Animals Including Humans

Enquiry Question	What happens when food enters the body?			
Scientific Enquiry	• To ask relevant questions and using different types of scientific enquiry to answer them. • To make systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment including thermometers and data loggers. • To be able to use straightforward scientific evidence to support their findings or answer questions.			
NC Objectives	• Construct and interpret a variety of food chains, identify predators and prey. • Describe the simple functions of the basic parts of the human digestive system. Identify different teeth and their function.			
Curriculum Coherence	**Prior Knowledge** • Year 2 curriculum – Animals including humans: Growth and Living things and their habitats • The needs of humans and animals for survival • Understanding food chains		**Future Learning** Describe changes in humans from birth to old age. (Y5) Identify the mains parts of the circulatory system. (Y6)	
	Vocabulary Oesophagus, saliva, Peristalsis, incisors, molars, enamel, fluoride, consumer, predator, tundra, hide	**High Quality Text** 	**Misconceptions** The stomach is the only organ involved in digestion: Food chains are always linear:	**Assessment/outcomes** Retrieval Practice Written Task Online Platform

Year Group 4

Term 6

Animals including Humans

Living things and their habitats  States of matter  Sound  Electricity  Animals Including Humans 

Unit Summary: This unit '**Animals including humans**' takes children through six lessons where they learn how to: **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**; and finally, **construct and interpret a variety of food chains, identifying producers, predators and prey**.	
Knowledge Sequence	Lesson 1 – Which organs make up the digestive system? During the lesson the children recap on prior learning and what food does for our bodies, discussing how this occurs inside our digestive organs. The children should recall that different foods have differing nutritional values and these are needed for us to stay healthy. They will discover the main organs within the digestive system and the order that they are connected. They will learn about the functions of the mouth, oesophagus, stomach, small intestine and large intestine.DE Lesson 1
	Lesson 2 – What is the function of the organs in the digestive system? Within this lesson the children will further explore the organs within the digestive system by discovering the functions of the mouth, oesophagus, stomach, small intestine and large intestine. They will touch on further organs, such as the liver and gall bladder. Using the model of the digestive system, explain the journey the food takes, describing the function of each organ.DE lesson 2
	Lesson 3 – What are our teeth for and how do they work? During this lesson the children will discover that teeth can be classified into 3 groups. They will learn about the number, location and function of the incisors, canines and molars, along with the jaw and gums. They will explore the types of teeth carnivores, omnivores and herbivores have and apply this to their knowledge of what these types of animals eat. DE lesson 3
	Lesson 4 – How do different liquids impact our teeth? This lesson progresses the children's learning by setting up an experiment that will explore the importance of caring for their teeth because humans only get one adult set and we use them for eating and speaking. They will explore the stages of tooth decay and how it can be caused. They will learn how tooth decay can be prevented and treated.DE Lesson 4
	Lesson 5 – What is a food chain? This lesson allows the children to discover what a food chain is and that the arrow shows energy flow within an ecosystem. Explore the key terms within a food chain - producer, consumer, prey and predator. Discuss some examples of food chains within ecosystems and identify producers, consumers and predators. Explore some issues within food chains and the importance of keeping them balanced. DE Lesson 5
	Lesson 6 – Do all ecosystems have food webs? During this final lesson in the sequence, the children will discover that a food web is a way of showing the energy flow in an ecosystem in a more complex way. Discuss some examples of ecosystems - coral reefs, deserts, tundras, forests, rainforests, savannas and marine ecosystems. Explore the Arctic tundra to model how to create a food web. DE Lesson 6
Aspiration	Your key knowledge will help you to be one of the following: dietician, dentist, Doctor, Vet, Care worker, Ambulance worker/paramedic.
Scientist/Historical figure	Paul Sharpe – Bioengineer - Instead of Filling Cavities, Dentists May Soon Regenerate Teeth | Scientific American