

Animals Including Humans					
Lesson Sequence					
Describe the simple functions of the basic parts of the digestive system in humans - teeth, oesophagus, stomach, small/large intestines, and rectum.	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 - incisors, canines, pre-molars, molars, wisdom.	Identify the different teeth in humans and their simple functions - incisors, canines, pre-molars, molars, wisdom. Modelling teeth with modelling clay Identify the different types of teeth in humans and their simple functions - investigation to show how to keep teeth healthy.	Investigate animal teeth and how the types of teeth can tell you about their diet.	Construct and interpret a variety of food chains, identifying producers, predators and prey.
Substantive Knowledge					
Digestion is the way the body breaks down the food we eat into smaller parts that can be used to give the body the nutrients it needs. The main parts of the digestive system are – mouth, teeth, tongue, pharynx, oesophagus, stomach, gall bladder, pancreas, large intestine, small intestine.	1. Food is put into the mouth where it is chewed. Food is swallowed and passes through the pharynx and oesophagus to the stomach. 2. In the stomach food is broken into smaller pieces and mixed with stomach acid. 3. The mixture passes into the small intestine where nutrients are absorbed into the blood stream. 4. The food that is left passes through the large intestine. 5. Waste leaves the body through the rectum.	Types of teeth Molars/pre molars – back teeth used for crushing and grinding Canines – long pointed teeth used for ripping Incisors – sharp front teeth used for cutting	Carnivores – eat meat. They have teeth that are shaped to slice and rip. E.g. large sharp canines. Herbivores – eat plants. They have teeth that are shaped to squash and grind plants e.g. bumpy molars. Omnivores – eat meat and plants. They have both teeth that are shaped to slice and rip (e.g. canines) and teeth that are shaped to squash and grind (e.g. bumpy molars).	Food chain – a diagram that shows the transfer of energy from the energy source to the producer to the consumer. Energy – the property that gives humans strength. Producer – usually a green plant or algae that makes its own food. Consumer – a living thing which gets their food by eating plants or other animals. Predators – animals that eat other animals Prey – animals that are eaten by other animals.	
Disciplinary Knowledge					
Identify and classify To identify and classify you make observations and investigations to organise	Identify and classify To identify and classify you make observations and investigations to organise	To identify and classify you make observations and investigations to organise	To identify and classify you make observations and investigations to organise	To identify and classify you make observations and investigations to organise things into groups or	Know that results from a scientific enquiry can be used to answer a scientific question. To answer a

things into groups or categories. Know that you need to use scientific language when identifying and classifying. Research is an investigation to establish facts about something. Know that information texts use scientific language Know that a diagram is the best way to display the workings of something. A diagram is a simple drawing that shows the appearance or workings of something. Know that scientific evidence has been used to classify the parts of the digestive system. Know that an experiment will demonstrate and consolidate known facts.	things into groups or categories. Know that you need to use scientific language when identifying and classifying. Research is an investigation to establish facts about something. Know that information texts use scientific language Know that a diagram is the best way to display the workings of something. A diagram is a simple drawing that shows the appearance or workings of something. Know that scientific evidence has been used to classify the parts of the digestive system. Know that an experiment will demonstrate and consolidate known facts.	things into groups or categories. Research is an investigation to establish facts about something. Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources. Know that information texts use scientific language.	things into groups or categories. Research is an investigation to establish facts about something. Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources. Know that information texts use scientific language.	categories. Know that you need to use scientific language when identifying and classifying. Know that a diagram is the best way to display the workings of something. A diagram is a simple labelled drawing.	scientific question, you should include evidence from your scientific enquiry. Conclude that herbivores can be recognised based on their types of teeth. Conclude that different teeth have different purposes both in humans and animals.
---	---	--	--	---	--

Year 4
Autumn 2

States of Matter					
Lesson Sequence					
Compare and group materials together, according to whether they are solids or liquids - define the properties of a solid and liquid.	Investigate gasses - what is a gas, what are the properties of a gas?	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). introduce children to how to use a thermometer.	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) - look at how some changes of state are reversible and some are irreversible.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature - carry out investigation to demonstrate different stages of the water cycle
Substantive Knowledge					
Solid: They keep their shape unless force is applied. They take up the same amount of space and do not spread out or flow (e.g. wood, metal, chocolate, rice) Liquid: They can change shape but do not change their volume. They take the shape of the container they are in. Can be poured (e.g. water, orange juice, honey)	Gas: They spread out to completely fill the shape they are in. They do not keep their shape and can be squashed (e.g. air, helium, water vapour).	Some materials change state when they are heated or cooled. When water (liquid) is heated it changes to water vapour (gas). When it is cooled it changes to ice (solid). When solid chocolate is heated, it melts and when it is cooled it changes back to a solid. Water changes to a gas at 100°C (Celsius) Water changes to a solid at 0°C	Some changes of state are reversible (can change back to its original state) and some are irreversible (can't change back to its original state).	Water on Earth is constantly moving. It is recycled over and over again. This recycling process is called the water cycle. Evaporation - The sun heats up water on land, in rivers, lakes and seas and turns it into water vapour. The water vapour rises into the air. Condensation - Water vapour in the air cools down and changes back into tiny drops of liquid water, forming clouds.	
Disciplinary Knowledge					
Identify and classify To identify and classify, you make observations	Research is an investigation or study to find out facts in order to	Observation over time Observing over time is when you make	Observation over time Observing over time is when you make	Identifying/classifying To identify and classify, you make observations and measurements to find similarities and differences. This	

and measurements to find similarities and differences. This help to organise things into groups and make connections. Know that you need to use scientific language when identifying and classifying. Know that a table is the best way to present the results when you identify and classify. To draw a scientific conclusion you need to look at your results and identify patterns.	reach a conclusion. Know that information texts use scientific language. A measuring jug is used to measure the volume of liquid. A millilitre is a unit of volume. 1 litre = 1000ml Scales measure the weight of something. Grams is a unit of measure for weight. 1kg = 1000g Know that you can present information from research in a table to make it clearer and easier to understand. Know that scientific evidence has been used to classify solids, liquids and gasses	systematic and careful observation to identify and measure changes in materials over a period of time. A thermometer is an instrument that measures temperature. The degree Celsius is a unit of temperature. A stopwatch measures the amount of time that has passed. Know that results from an observation over time can be collected and presented in a table. Know that you need to use scientific language when reporting result To draw a scientific conclusion you need to look at your results and identify patterns. To answer a scientific question, you should include evidence from your scientific enquiry	systematic and careful observation to identify and measure changes in materials over a period of time. A thermometer is an instrument that measures temperature. The degree Celsius is a unit of temperature. A stopwatch measures the amount of time that has passed. Time can be measured in: hours, minutes, seconds and milliseconds. Know that results from an observation over time can be collected and presented in a table. A line graph is a graph that shows changes over time. To draw a scientific conclusion you need to look at your results and identify patterns.	help to organise things into groups and make connections. Know that you need to use scientific language when identifying and classifying. Research Research is an investigation or study to find out facts in order to reach a conclusion. A ruler is a tool used to measure length. A centimetre is a unit of measurement. 1cm = 10mm A measuring jug is used to measure the volume of liquid. A millilitre is a unit of volume. 1 litre = 1000ml To draw a scientific conclusion you need to look at your results and identify patterns.
---	--	--	--	--

Electricity					
Lesson Sequence					
Lesson sequence Identify common appliances that run on electricity. Look at the difference between mains and battery powered appliances. Look at how to keep safe around 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 some common conductors and insulators, and associate metals with being good conductors. Look at everyday uses of conductors and insulators and consider why these materials are used. E.g. plastic around a plug	Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.	Review that a switch opens and closes a circuit.
Substantive Knowledge					
Many household devices and appliances run on electricity: e.g. washing machine, television, toaster, and kettle. Some devices run on batteries others need mains power to work.	A simple series electrical circuit allows a flow of current through each component. The parts of a circuit can be named, including cells, wires, bulbs, switches and buzzers.	Electricity will flow if there is a complete circuit, a bulb will light up if there is no break in the circuit. Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.	Electricity passes easily through metals, such as copper, iron and steel. These are called conductors. Electricity does not pass through plastic, glass or rubber. They are called insulators and are used to cover metals that carry electricity to prevent electric shocks. Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit. You	An open switch means a circuit is incomplete. This means that an electrical current will not flow and the lamp will not light up. When the switch is closed, the circuit is complete and therefore the electrical current can flow through the circuit and the bulb can light. Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit. You can use crocodile clips to put a switch in a circuit.	

			can use crocodile clips to put materials within a circuit to test if they are conductors or insulators. Know that a table is the best way to present the results when you identify and classify. Know that results from a scientific enquiry can be used to answer a scientific question. To answer a scientific question, you should include evidence from your scientific enquiry. Know that conclusions drawn from scientific enquires can be used to make recommendations such as how to keep safe around electrical equipment in the home.	
Disciplinary Knowledge				

Identifying and classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections. You can classify electrical appliances in ones that are mains powered and ones that are battery powered. A Venn diagram is a clear way to present findings from an identifying and classifying enquiry. A Venn diagram uses circles to show the relationship between things. Items placed in the cross over between the circles show that they fit into both categories.	Identify Identifying means that you find out what something is. You can identify the parts of an electrical circuit. Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.	Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns. Variables are anything that can change or be changed You can carry out a pattern seeking enquiry to investigate what is needed to ensure the bulb will light in an electrical circuit. You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry. When you collect data it needs to be presented in a way that is clear and easy to understand. Know that results from a pattern seeking enquiry can be presented clearly in a table. Know that results from a scientific enquiry can be used to answer a scientific question. To answer a scientific question, you should include evidence from your scientific enquiry.	Identifying and classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections. You can sort common everyday materials into conductors and insulators. Comparative test A comparative test is when you test and compare different cases and situations. You can set up a comparative test to see if a material conducts electricity or not. Using existing knowledge, you can make a prediction about what the outcome of your scientific enquiry will be.	Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns. Variables are anything that can change or be changed. You can carry out a pattern seeking enquiry to find out that a switch breaks a circuit and therefore the bulb will light/not light when the switch is open or closed. Pattern seeking Children to apply knowledge of switches, conductors and insulators to make switches that are fit for different purposes. When you collect data it needs to be presented in a way that is clear and easy to understand. Know that results from a pattern seeking enquiry can be presented clearly in a table. Know that results from a scientific enquiry can be used to answer a scientific question. Know that results from a scientific enquiry can be used to make recommendations or suggest improvements.
---	---	--	--	---

		A diagram is a picture that is usually labelled. You can draw a diagram to show the parts of an electrical circuit.		
--	--	---	--	--

Living Things and their Habitats					
Lesson Sequence					
Recognise the characteristics of a living thing - movement, respiration, sensitivity, growth, reproduction, excretion, nutrition (MRS GREN). Children to tour local area and collect examples of living and non-living things.	Recognise that living things can be grouped in a variety of ways. Vertebrate/invertebrate. Explore different types of vertebrates. Fish/ amphibian/ reptile/ mammal/ bird. Children to group animals into vertebrates and invertebrates using their knowledge of the definitions. Split them into land and sea.	Children to investigate different types of invertebrate.	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment Children to use a classification key to classify animals in our local environment.	Recognise that environments can change and that this can sometimes pose dangers to living things - investigate natural changes e.g. seasons	Recognise that environments can change and that this can sometimes pose dangers to living things - investigate human changes and how these can be both positive and negative (e.g. protecting endangered species/ deforestation). Children to research how humans have a positive and negative effect on the environment. Children to report findings in a table of how to help/ how
Substantive Knowledge					
Many household devices and appliances run on electricity: e.g. washing machine, television, toaster, and kettle. Some devices run on batteries others need mains power to work.	A simple series electrical circuit allows a flow of current through each component. The parts of a circuit can be named, including cells, wires, bulbs, switches and buzzers. Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.	Electricity will flow if there is a complete circuit, a bulb will light up if there is no break in the circuit. Conclude that you need a complete electrical circuit for the bulb to light. If there is a break in the circuit, the bulb will not light.	Electricity passes easily through metals, such as copper, iron and steel. These are called conductors. Electricity does not pass through plastic, glass or rubber. They are called insulators and are used to cover metals that carry electricity to prevent electric shocks. Wires, batteries, bulbs, buzzers and motors are	An open switch means a circuit is incomplete. This means that an electrical current will not flow and the lamp will not light up. When the switch is closed, the circuit is complete and therefore the electrical current can flow through the circuit and the bulb can light.	

			electrical components that make up a circuit. You can use crocodile clips to put materials within a circuit to test if they are conductors or insulators.	
Disciplinary Knowledge				
Identifying and classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections. You can classify electrical appliances in ones that are mains powered and ones that are battery powered. A Venn diagram is a clear way to present findings from an identifying and classifying enquiry. A Venn diagram uses circles to show the relationship between things. Items placed in the cross over between the circles show that they fit into both categories.	Identify Identifying means that you find out what something is. You can identify the parts of an electrical circuit.	Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns. Variables are anything that can change or be changed. When you collect data it needs to be presented in a way that is clear and easy to understand. Know that results from a pattern seeking enquiry can be presented clearly in a table. Know that results from a scientific enquiry can be used to answer a scientific question. To answer a scientific question, you should include evidence	Identifying and classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections. You can sort common everyday materials into conductors and insulators. Comparative test A comparative test is when you test and compare different cases and situations. You can set up a comparative test to see if a material conducts electricity or not. Using existing knowledge, you can make a prediction about what the outcome of your scientific enquiry will be.	When you collect data it needs to be presented in a way that is clear and easy to understand. Know that results from a pattern seeking enquiry can be presented clearly in a table. Know that results from a scientific enquiry can be used to answer a scientific question. Know that results from a scientific enquiry can be used to make recommendations or suggest improvements.

		from your scientific enquiry. You can carry out a pattern seeking enquiry to investigate what is needed to ensure the bulb will light in an electrical circuit. You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry. A diagram is a picture that is usually labelled. You can draw a diagram to show the parts of an electrical circuit. Conclude that you need a complete electrical circuit for the bulb to light. If there is a break in the circuit, the bulb will not light.	Know that a table is the best way to present the results when you identify and classify. Know that results from a scientific enquiry can be used to answer a scientific question. To answer a scientific question, you should include evidence from your scientific enquiry. Know that conclusions drawn from scientific enquires can be used to make recommendations such as how to keep safe around electrical equipment in the home.	
--	--	--	---	--

Year 4
Summer 2

Sound					
Lesson Sequence					
Identify how sounds are made, associating some of them with something vibrating	Recognise that vibrations from sounds travel through a medium to the ear. Look at how sounds travel through 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.	Investigate how to muffle a sound. (Use sound metres to take measurements).	Recognise that sounds get fainter as the distance from the sound source increases
Substantive Knowledge					
Recognise that vibrations from sounds travel through a medium to the ear.	How sounds travel through the ear: 1. A wave of vibrations enter the ear and travel to the eardrum. 2. The eardrum vibrates and sends the vibrations to the three tiny bones in the ear (malleus, incus and stapes). 3. The bones amplify the vibration and send it to the cochlea. 4. The cochlea is filled with fluid and tiny hairs that bump into each other and an electrical impulse is created. 5. The impulse sends a message to the brain via the auditory nerve and is understood as sounds. Parts of the ear: Anvil, stirrup and hammer – the three small bones in the ear. Cochlea	Pitch of a sound The pitch of a sound is how high or low it is. The shorter the object the higher the pitch. The longer the object the lower the pitch. With stringed instruments, the tighter the string the higher the pitch of the sound.	Volume of a sound The louder the sound, the bigger the vibration. The size of the vibration is called the amplitude. Quieter sounds have a smaller amplitude and louder sounds have a bigger amplitude.	The closer you are to the source of a sound, the louder the sound will be. The further away you are from the source of a sound, the quieter the sound will be.	

	– in the inner ear, translates vibrations to electrical signals. Ear drum – a thin sheet of skin- like tissue stretch ed tight (like a drum) bet			
Disciplinary Knowledge				
Identifying/ classifying	Comparative test	Comparative/fair test	Pattern seeking	Pattern seeking
To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections. Comparative test A scientific enquiry is carried out to answer a scientific question. Know that a table is the best way to present the results when you identify and classify. Know that results from a scientific enquiry can be used to answer a scientific question	A comparative test is when you test and compare different cases and situations. A variable is a factor that can change. Research using secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources. A ruler is a tool used to measure length. A centimetre is a unit of measurement. 1cm = 10mm Know that you need to use scientific language when reporting results. Modelling can be used to	A comparative test is when you test and compare different cases and situations. A scientific enquiry is carried out to answer a scientific question. You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry. Know that you can present information from research in a table to make it clearer and easier to understand. Know that a conclusion is when you answer a question using what you have found out in scientific enquiry.	Pattern seeking enquiries can help explain the relationship between volume and distance of sound source. You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry. Comparative/fair test A fair test is when one variable is hanged and the others stay the same. A comparative test is when you test and compare different cases and situations. A scientific enquiry is carried out to answer a scientific question. Using existing knowledge, you can make a prediction about what the outcome of your scientific enquiry will be. A sound meter measures the volume of sound in decibels. A bar chart is a graph that presents categorical data. Know that you need to use scientific language when reporting results. Know that you can present information from research in a table to make it clearer and easier to understand. To answer a scientific question, you should include evidence from your scientific enquiry. Know that you can	Pattern seeking enquiries can help explain the relationship between volume and distance of sound source. You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry. Comparative/fair test A fair test is when one variable is hanged and the others stay the same. A sound meter measures the volume of sound in decibels. A meter ruler is used to measure distance. A meter is a unit of measurement. 100cm = 1m

	explain/show scientific ideas and concepts. Know that a conclusion is when you answer a question using what you have found out in scientific enquiry. Know that results from a scientific enquiry can be used to answer a scientific question.		gather, record and present data in a variety of ways to help answer questions. To draw a scientific conclusion you need to look at your results and identify patterns.	Know that you can present information from research in a table to make it clearer and easier to understand. A line graph is a graph that shows changes over time. Know that you can gather, record and present data in a variety of ways to help answer questions. To draw a scientific conclusion you need to look at your results and identify patterns.
--	--	--	---	--