

Year 4 Unit Summaries

Year 4	Properties/changing materials	Energy – Sound	Alive (Structure and Function)	Diversity	Thrive and Survive	Energy - Electricity
	Observe and measure changes of state	Explore how sound energy travels in vibration waves	Identify the structure and function of different parts of the digestive system (including teeth)	Use knowledge of structure of plants and animals to group them	Construct food chains and reason about the impact of environmental change on thrive and survive	Explore the impact of an open and closed circuit on electrical energy?
Generalisations	Children can identify DV in a given enquiry and know this is what they measure and record (e.g. features on diagrams)	Children can identify chosen CV and DV in a given enquiry and know that systematically changing the chosen CV gives us our process for collecting and recording the results on the DV	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our system for collecting and recording the results on the DV, which we look for patterns and relationships in.	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question and our system for collecting and recording the results on the DV, which we look for patterns and relationships in.	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question based on enquiry type and our system for collecting and recording the results on the DV, which we explain the patterns and relationships in.	Children can identify chosen CV and DV in a given enquiry and know the chosen CV gives us our question based on enquiry type and our system for collecting and recording the results on the DV, which we explain the patterns and relationships in and use to predict from.
Observing and measuring	<ul style="list-style-type: none"> I know that I observe / measure the dependent variable. I know that a dependent variable is the variable that is changing I know that systematic observation is one that is controlled. I know that temperature is measured in °C using alcohol and digital thermometers. 	<ul style="list-style-type: none"> I know that systematic observation is one that is controlled. I know that sound is measure in decibels using dataloggers. 		<ul style="list-style-type: none"> 		
Recording Data	<ul style="list-style-type: none"> I can label and identify features I have observed I know that a diagram is simplified and contains key features. 	<ul style="list-style-type: none"> I know that the control variable builds the table I know that the dependent variable data is organised in a table. 	<ul style="list-style-type: none"> <i>I can label and identify features I have observed</i> <i>I know that a diagram is simplified and contains key features.</i> 	<ul style="list-style-type: none"> I know how to use my careful observations in a given simple key to identify 		
Asking and exploring questions	<ul style="list-style-type: none"> I know there are different types of scientific enquires. I know that comparative and fair testing involves exploring cause and effect. I can identify the control and dependent variables I can recognise a fair test 	<ul style="list-style-type: none"> I know there are different types of scientific enquires. I know that comparative and fair testing involves exploring cause and effect. I can identify the control and dependent variables I can recognise a fair test 	<ul style="list-style-type: none"> I know that researching involves using secondary sources to find answers to questions 	<ul style="list-style-type: none"> I know that classifying involves sorting and grouping according to similarities and differences. I know that my question is based on my variables I can identify the control and dependent variables 	<ul style="list-style-type: none"> I know and give reasons for my choice of enquiry I know that my question is based on my variables 	
Performing Tests	<ul style="list-style-type: none"> 		<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> I can make suggestions as to how to investigate 	<ul style="list-style-type: none"> I can make suggestions as to how to investigate 	<ul style="list-style-type: none"> I can make suggestions as to how to investigate
Concluding, prediction, evaluating		<ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<ul style="list-style-type: none"> I can use my scientific knowledge to explain my findings 	<ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I know how to use the relationship (cause and effect) or pattern to predict a future change I can use my scientific knowledge to explain my findings 	<ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I know how to use the relationship (cause and effect) or pattern to predict a future change I can use my scientific knowledge to explain my findings
Applications & Communication	<p>Applications</p> <ul style="list-style-type: none"> I can name an application of science and an associated scientist) <p>Communication</p> <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	<p>Applications</p> <ul style="list-style-type: none"> I can name an application of science and an associated scientist) 		<p>Communicating</p> <p>I know relevant scientific language and can use that language to discuss and present my ideas</p>		<p>Communicating</p> <p>I know relevant scientific language and can use that language to discuss and present my ideas</p>

Yr 4 A1	BIG Q: How can the state of materials change? (7 lesson unit) Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. Note: teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning. Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.						
Lesson Qs		What gives materials their structure?	What are the three states of matter?	How can materials change from one state to another?	How do changes in temperature affect materials?	What is the water cycle?	Application / Assess How can the state of materials change?
Key Concepts Properties/changing materials Observe and measure changes of state	<i>Materials have properties (structure) which enables function and therefore a use.</i>	<ul style="list-style-type: none"> Know that materials are made from matter. Matter is the building blocks of everything. Know that the three states of matter are solids, liquid and gas. 	<ul style="list-style-type: none"> Know that a solid is a substance that holds its shape. Know that liquids form a pool not a pile. Know that gas escape from an unsealed container. 	<ul style="list-style-type: none"> Know that temperature is a measure of the amount of heat (Celsius) Know that some materials change state when they are heated or cooled Know that melting is when a solid changes to a liquid and that freezing is when a liquid changes to a solid 	<ul style="list-style-type: none"> Know that materials all have a melting and freezing point Know that water freezes at 0 degrees and evaporates at 100 Know that evaporation is when a liquid changes to a gas and that condensation is when a gas changes to a liquid 	<ul style="list-style-type: none"> Know that the sun's thermal energy evaporates water from the earth's surface. Know that the water held in clouds cools and condensates back to earth as rain / snow. 	
Disciplinary Concepts		Recording Data <ul style="list-style-type: none"> I can label and identify features I have observed I know that a diagram is simplified and contains key features. 	Observing and measuring <ul style="list-style-type: none"> I know that I observe / measure the dependent variable. I know that a dependent variable is the variable that is changing I know that systematic observation is one that is controlled. 	Asking and exploring Questions <ul style="list-style-type: none"> I know there are different types of scientific enquires. I know that comparative and fair testing involves exploring cause and effect. I can identify the control and dependent variables I can recognise a fair test I know that temperature is measured in $^{\circ}\text{C}$ using alcohol and digital thermometers. 	Asking and exploring Questions <ul style="list-style-type: none"> I know there are different types of scientific enquires. I know that comparative and fair testing involves exploring cause and effect. I can identify the control and dependent variables I can recognise a fair test 	Applications <ul style="list-style-type: none"> I can name an application of science and an associated scientist) Communication <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	Applications <ul style="list-style-type: none"> I can name an application of science and an associated scientist)
Key learning tasks	Explorify – Zoom in zoom out. (https://www.stem.org.uk/explorify)	<ul style="list-style-type: none"> Use three balloons: one filled with water and frozen, one filled with water and one blown up with air. Ask children to discuss in small groups the similarities and differences between the balloons. What do they notice? Record findings in scientific diagrams. 	<ul style="list-style-type: none"> Demonstration of the candle being smelt as the gas fills the room (container) - gases spread out when uncontained Research enquiry:- Does liquid have a set shape? Identify the CV as the liquid and the DV as the shape it forms Id how the observations can be systematic to find the answers. 	<ul style="list-style-type: none"> Label the parts of thermometer Comparative and fair test e.g. How does the temperature of the water affect the time it takes for ice to melt? Id how CV is effected by DV in comparative and fair test ID CV that will need to stay the same to know which is causing the effect Chn generate a new enquiry qu based upon a different cv 	<ul style="list-style-type: none"> Comparative and fair test e.g. How does the amount of water affect the time it takes to freeze. Id how CV is effected by DV in comparative and fair test ID CV that will need to stay the same to know which is causing the effect Chn generate a new enquiry qu based upon a different cv 	Annotate the water cycle focus on the process associated with states of matter etc.	How does the mass of an object affect the time it takes to melt?
Generalisation		Materials have properties (structure) which enables function and therefore a use. Materials are made from matter. Matter can be structured as solid, liquid or gas.	Materials have properties (structure) which enables function and therefore a use. Materials are made from matter. Matter can be structured as solid, liquid or gas, this is called a state of matter.	Materials can change state when heated or cooled. Changing the thermal energy (heating, cooling) can cause a change of state (work done)	Materials can change state when heated or cooled. Changing the thermal energy (heating, cooling) can cause a change of state (work done)	Materials can change state when heated or cooled. Changing the thermal energy (heating, cooling) can cause a change of state (work done)	<i>Materials have properties (structure) which enables function and therefore a use.</i> Materials are made from matter. Matter can be structured as solid, liquid or gas. Changing the thermal energy (heating, cooling) can cause a change of state (work done)

Yr 4 A2	<p align="center">BIG Q: How can we control sound?</p> <p>Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.</p>					
Lesson Qs	Elicitation / Activate	What is sound and how is it made?	How can we control volume?	How can we control pitch?	How does the size of object affect the sound?	Application / Assess How can we control sound?
<p>Key Concepts Energy – Sound</p> <p>Explore how sound energy travels in vibration waves</p>	<ul style="list-style-type: none"> Light travels from a source to an object and can be controlled by changing the journey. Light (energy) gives us the capacity to see (work done) Materials are made from matter. Matter can be structured as solid, liquid or gas. 	<ul style="list-style-type: none"> To know that sound is a form of energy. To know that sound occurs due to an object vibrating. To know that the vibrations of sound travel through solids, liquids and gases to the ear. 	<ul style="list-style-type: none"> To know that strength of a vibrations causes a louder volume. To know that a sound gets fainter as the distance from the sound source increases. 	<ul style="list-style-type: none"> To know that the speed of the vibrations changed the pitch. A high-speed vibration causes a higher pitch 	<p><i>Application of previous knowledge into finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses</i></p>	<p><i>Application of previous knowledge: they might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.</i></p>
<p>Disciplinary Concepts</p>	<p>Observing and measuring</p> <ul style="list-style-type: none"> I know that I observe / measure the dependent variable. I know that a dependent variable is the variable that is changing I know that systematic observation is one that is controlled. 	<p>Observing and Measuring</p> <ul style="list-style-type: none"> I know that systematic observation is one that is controlled. I know that sound is measure in decibels using dataloggers. <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know there are different types of scientific enquires. I know that comparative and fair testing involves exploring cause and effect. I can identify the control and dependent variables I can recognise a fair test 	<p>Recording Data</p> <ul style="list-style-type: none"> I know that the control variable builds the table I know that the dependent variable data is organised in a table. <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that comparative and fair testing involves exploring cause and effect. I can recognise a fair test 	<p>Recording Data</p> <ul style="list-style-type: none"> I know that the control variable builds the table I know that the dependent variable data is organised in a table. <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<p>Recording Data</p> <ul style="list-style-type: none"> I know that the control variable builds the table I know that the dependent variable data is organised in a table. <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<p>Applications</p> <ul style="list-style-type: none"> I can name an application of science and an associated scientist) <p>Communicating</p> <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas
<p>Key learning tasks</p>		<ul style="list-style-type: none"> Represent in scientific diagram, understanding of how sound energy travels from source to ear. Comparative and fair test enquiry – sound travelling through mediums. Identify the CV and DV and how this relates to systematic, controlled observation Identify the CV and DV in the enquiry question and how this is cause and affect Record the variable being kept the same to ensure test is fair. Record results as decibels in a given format. 	<ul style="list-style-type: none"> Comparative and fair test enquiry – sound travelling distance and strength of vibration. Identify the CV and DV in the enquiry question and how this is cause and affect Identify the CV and DV from question and use to build table to record results Perform test measuring decibels and record the DV in their own tables Justify and explain how and why it is a fair test 	<ul style="list-style-type: none"> Comparative and fair test enquiry – pitch Identify the CV and DV in the enquiry question and how this is cause and affect Identify the CV and DV from question and use to build table to record results Perform test measuring decibels and record the DV in their own tables Find patterns in data (cause and effect and describe in words 	<ul style="list-style-type: none"> Comparative and fair test enquiry – size of object Identify the CV and DV in the enquiry question and how this is cause and affect Identify the CV and DV from question and use to build table to record results Perform test measuring decibels and record the DV in their own tables Find patterns in data (cause and effect and describe in words 	
<p>Generalisation</p>		<p>Sound (energy) is made by vibrations and gives us the capacity to hear / feel (work done). Sound waves travel through a medium from a source to a receiver.</p>	<p>Sound (energy) gives us the capacity to hear / feel (work done). Strong sound waves travelling through a medium from source are received at an increased volume as there is more energy.</p> <p>Sound waves traveling further through a medium from source are received at a decreased volume as the energy is shared over a larger distance.</p>	<p>Sound (energy) gives us the capacity to hear / feel (work done). Faster sound waves travelling through a medium from source are receiver at a higher pitch.</p>	<p>Sound (energy) gives us the capacity to hear / feel (work done). <i>Apply the previous generalisations to size and power of vibration to support conclusion</i></p>	<p>Sound (energy) is made by vibrations and gives us the capacity to hear / feel (work done). Sound waves travel through a medium from a source to a receiver</p>

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Yr 4 Sp1	<p align="center">BIG Q: What is the structure and function of the digestive system?</p> <p>Pupils should be introduced to the main body parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, and explore questions that help them to understand their special functions. Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.</p>					
Lesson Qs	Elicitation / Activate	What is the structure and function of teeth?	What is the structure and function of the oesophagus and stomach?	What is the structure and function of the intestines and anus?	How do we keep the structure of our teeth strong and healthy?	Application / Assess What is the structure and function of the digestive system?
<p>Key Concepts Alive (Structure and Function) Identify the structure and function of different parts of the digestive system (including teeth)</p>	<ul style="list-style-type: none"> Animals and plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work). Different food types provide different nutrition as they have different structure and function. 	<ul style="list-style-type: none"> Know that teeth break down food into small swallowable pieces. Know the function of the molars is to grind food. Know the function of the canines is to rip food Know the function of the incisors is to cut food. 	<ul style="list-style-type: none"> Know the oesophagus transports chewed food and liquid to the stomach Know that the stomach breaks down the chewed food into a liquid 	<ul style="list-style-type: none"> Know that the small intestine allows nutrients to be absorbed into the body. Know that the function of the large intestine is to absorb water. Know that the anus allows the body to store and excrete waste 		<p>Apply knowledge putting the whole digestive system together as a model (They might draw and discuss their ideas about the digestive system and compare them with models or images.)</p>
<p>Disciplinary Concepts</p>	<p>Observing and Measuring</p> <ul style="list-style-type: none"> I know that systematic observation is one that is controlled. <p>Recording Data</p> <ul style="list-style-type: none"> I know that the control variable builds the table I know that the dependent variable data is organised in a table. <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that comparative and fair testing involves exploring cause and effect. I can recognise a fair test 	<p>Recording Data</p> <ul style="list-style-type: none"> I can label and identify features I have observed I know that a diagram is simplified and contains key features. <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that researching involves using secondary sources to find answers to questions <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<p>Recording Data</p> <ul style="list-style-type: none"> I can label and identify features I have observed I know that a diagram is simplified and contains key features. <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that researching involves using secondary sources to find answers to questions <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<p>Recording Data</p> <ul style="list-style-type: none"> I know that the control variable builds the x axis I know that the dependent variable data is organised on the y axis <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals. <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<p>Recording Data</p> <ul style="list-style-type: none"> I know that the control variable builds the x axis I know that the dependent variable data is organised on the y axis <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals. <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<ul style="list-style-type: none">
<p>Key learning tasks</p>		<ul style="list-style-type: none"> Research enquiry into the function of different types of human teeth Identify the CV (types of human teeth- structure) and DV (function) Record results as labelled diagram of human teeth arrangements identifying the structure and function of the different types of teeth. Look for pattern and relationship on a bar chart of comparison of teeth type in herbivores, omnivore and carnivores – describe in own words. 	<ul style="list-style-type: none"> Research enquiry into the function of oesophagus and stomach Identify the CV (- structure) and DV (function) Record results as labelled diagram of CV with DV labels Look for pattern and relationship on a bar chart of approximate time for stomach to break down food type – describe in own words 	<ul style="list-style-type: none"> Research enquiry into the function of small and large intestine Identify the CV (- structure) and DV (function) Record results as labelled diagram of CV with DV labels Identify the DV and CV in observation over time enquiry – how does the length of the small and large intestines change as we grow? Identify the cv as the x axis and the dv as the y axis. Look for pattern and relationship on a bar chart– describe in own words 	<ul style="list-style-type: none"> Observation over time enquiry into keeping teeth healthy Identify the CV time and DV (what is changing) Record results on a given bar chart y the cv as the x axis and the dv as the y axis. Look for pattern and relationship on a bar chart– describe in own words 	
<p>Generalisation</p>	<ul style="list-style-type: none"> Animals and plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work). 	<ul style="list-style-type: none"> Animals and plants need nutrition (energy) to survive and thrive (function / work done). The supply of energy (food) travels through digestive system, where different teeth (structures) perform function of breaking food down into 	<p>The supply of energy (food) travels through digestive system, where the (structures) oesophagus transports the food to the stomach which breaks the food into a liquid (functions -work done)</p>	<p>The supply of energy (food) travels through digestive system, where the (structures) small and large intestines allow the function of absorption of nutrients and water. (functions -work done)</p>	<p>Recap this generalisation from year 3 and apply to teeth: Living things are healthy (thrive) when they have the right conditions.</p>	<p>Animals and plants need nutrition (energy) to survive and thrive (function / work done). The supply of energy (food) travels through digestive system, where different structures perform different functions (work done) allowing the body to survive and thrive.</p>

		smaller pieces (work done) allowing them to be swallowed.				
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<p>Yr 4 Sp 2</p> <p align="center">BIG Q: How can we classify living things?</p> <p>Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Note: plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, for example ferns and mosses. Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.</p>						
Lesson Qs	Elicitation / Activate	How can we identify a living thing?	How can vertebrates be classified?	How can invertebrates be classified?	How can plants be classified?	Application / Assess How can we classify living things?
<p>Key Concepts Diversity</p> <p>Use knowledge of structure of plants and animals to group them</p>	<p><i>Animals and plants have different parts (structure) which allow them to do different things (functions) These parts vary and this helps us identify what type of animal or plant they are.</i></p>	<ul style="list-style-type: none"> Know that vertebrates have a backbone Know invertebrates are animals which do not have a backbone. Know that a classification key is a tool for identifying and grouping based on differences Know that something that is living has to have 7 life processes (MRS NERG) (year 2) 	<ul style="list-style-type: none"> Classify vertebrates into fish, amphibians, birds, fish and mammals Know that a classification key is a tool for identifying and grouping based on differences 	<ul style="list-style-type: none"> Classify non-vertebrates into insects, arachnids, molluscs. Know that a classification key is a tool for identifying and grouping based on differences 	<ul style="list-style-type: none"> Classify plants in flowering and non-flowering plants Know that a classification key is a tool for identifying and grouping based on differences 	
<p>Disciplinary Concepts</p>	<p>Recording Data</p> <ul style="list-style-type: none"> I know that the control variable builds the x axis I know that the dependent variable data is organised on the y axis <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that ‘observations over time’ focus on similarities and differences, patterns and change at regular intervals. <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. 	<p>Recording Data</p> <ul style="list-style-type: none"> I know how to use my careful observations in a given simple key to identify <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that classifying involves sorting and grouping according to similarities and differences. I know that my question is based on my variables I can identify the control and dependent variables 	<p>Recording Data</p> <ul style="list-style-type: none"> I know how to use my careful observations in a given simple key to identify <p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that classifying involves sorting and grouping according to similarities and differences. I know that my question is based on my variables I can identify the control and dependent variables <p>Performing Tests</p> <ul style="list-style-type: none"> I can make suggestions as to how to investigate 	<p>Asking and exploring Questions</p> <ul style="list-style-type: none"> I know that my question is based on my variables I can identify the control and dependent variables <p>Performing Tests</p> <ul style="list-style-type: none"> I can make suggestions as to how to investigate <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I can use my scientific knowledge to explain my findings <p>Communicating</p> <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	<p>Performing Tests</p> <ul style="list-style-type: none"> I can make suggestions as to how to investigate <p>Concluding, prediction, evaluating</p> <ul style="list-style-type: none"> I can use my scientific knowledge to explain my findings <p>Communicating</p> <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	
<p>Key learning tasks</p>	<ul style="list-style-type: none"> Collect and observe a variety of plants and animals. 	<ul style="list-style-type: none"> Classifying enquiry – how can I group living things based upon their basic structure? From the question identify the CV (living things) and DV (similarities and differences in structure) Perform test knowing that careful observation of DV is needed to move through classification key Record results as examples placed in position on a given key 	<ul style="list-style-type: none"> Classifying enquiry – into vertebrates – give chn the CV and DV Children identify the enquiry question from the given CV and DV (similarities and differences in structure) Perform test knowing that careful observation of DV is needed to move through classification key Record results as examples placed in position on a given key 	<ul style="list-style-type: none"> Classifying enquiry – into invertebrates – give chn the CV and DV Children identify the enquiry question from the given CV and DV (similarities and differences in structure) Chn make suggestions for the DV questions to group and classify Record results as the key created 	<ul style="list-style-type: none"> Classifying enquiry – into plants – give chn the CV and DV Children identify the enquiry question from the given CV and DV (similarities and differences in structure) Chn make suggestions for the DV questions to group and classify Record results as the key created 	<ul style="list-style-type: none">
<p>Generalisation</p>		<p>Animals and plants have different structure and function. These enable us to group and identify them.</p>	<p>Vertebrates have a backbone. Their structures can vary, and this helps us to group them and identify what type of vertebrate it is.</p>	<p>Invertebrates have no backbone. Their structures can vary, and this helps us to group them and identify what type of invertebrate it is.</p>	<p>Plants have different structures. These vary and help us to group and identify them. Eg flowering and non-flowering.</p>	<p>The structure and function of living things have similarities and differences. These enable us to group them and identify individual diversity in species (types)</p>

Yr 4 Su1	BIG Q: Why are food chains important?					
Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences						
Lesson Qs	Elicitation / Activate	What is the function of a producer in a food chain?	What is the function of predators and prey in a food chain?	How does drought impact food chains?	How can changes in the environment harm living things in a habitat?	Application / Assess Why are food chains important?
Key Concepts Thrive and Survive Construct food chains and reason about the impact of environmental change on thrive and survive	<ul style="list-style-type: none"> Animals and plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work). Living things are healthy (thrive) when they have the right conditions. The sun is the main source of heat energy and light energy on earth. Energy enables things to happen 	<ul style="list-style-type: none"> Know that a food chain starts with a producer 	<ul style="list-style-type: none"> Know that a consumer eats plants and or animals Know that a food chain includes predators who feed on prey. Know how to construct a food chain containing producers predators and prey 	<ul style="list-style-type: none"> Know the direction of the arrow in a food chain shows the direction of the flow of energy. 	<ul style="list-style-type: none"> Know that environmental change can endanger living things in a habitat e.g. warmer waters affect salmon eggs leading to fewer salmon for animals like otters and birds to eat. 	Animals and plants need nutrition (energy) to survive and thrive (function / work done). Food chains show how energy travels from one source to another.
Disciplinary Concepts	Recording Data <ul style="list-style-type: none"> I know how to use my careful observations in a given simple key to identify Asking and exploring Questions <ul style="list-style-type: none"> I know that classifying involves sorting and grouping according to similarities and differences. I know that my question is based on my variables I can identify the control and dependent variables Performing Tests <ul style="list-style-type: none"> I can make suggestions as to how to investigate 	Asking and exploring Questions <ul style="list-style-type: none"> I know and give reasons for my choice of enquiry I know that my question is based on my variables Performing Tests <ul style="list-style-type: none"> I can make suggestions as to how to investigate Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I can use my scientific knowledge to explain my findings 	Asking and exploring Questions <ul style="list-style-type: none"> I know and give reasons for my choice of enquiry I know that my question is based on my variables Performing Tests <ul style="list-style-type: none"> I can make suggestions as to how to investigate Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I can use my scientific knowledge to explain my findings 	Asking and exploring Questions <ul style="list-style-type: none"> I know and give reasons for my choice of enquiry I know that my question is based on my variables Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I know how to use the relationship (cause and effect) or pattern to predict a future change I can use my scientific knowledge to explain my findings Communicating <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I know how to use the relationship (cause and effect) or pattern to predict a future change I can use my scientific knowledge to explain my findings Communicating <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	<ul style="list-style-type: none">
Key learning tasks		<ul style="list-style-type: none"> Represent understanding (labelled diagram, sorting table etc) of the structure (plant or algae) and function of a producer using sunlight to make their own food (energy). Identification enquiry – How can we identify species of producers based on their differences? Chn id the CV and DV from the enquiry questions Chn perform test given key Record results as identified labels for given producers 	<ul style="list-style-type: none"> Represent understanding of the structure of a food chain adding labels to identify the function of each part. Identification enquiry – How can we identify predators, producers and prey based on their function? Chn id the CV and DV from the enquiry questions Chn make suggestions as which DV structure ad function questions they ask to identify the species of producers Chn perform test using their questions Record results as classification key 	<ul style="list-style-type: none"> Comparative enquiry – into environmental change – e.g. decrease in producers in a food chain Chn id ways in which the food chain can change – CVs Chn identify the impact as the DV Chn select a CV to build an enquiry question e.g. how does the a decrease in producers affect the food chain? Provide data in a table to interrogate and find a pattern – describe in own words. Predict the effect of increasing the CV and explain 	<ul style="list-style-type: none"> Comparative enquiry – into environmental change – e.g. increase in prey or predators in a food chain. Discuss why this might happen Chn id ways in which the food chain can change – CVs Chn identify the impact as the DV Chn select a CV to build an enquiry question e.g. how does an increase in predators affect the food chain? Provide data in a table to interrogate and find a pattern – describe in own words. Predict the effect of reversing the CV and explain 	
Generalisation	Animals and plants need nutrition (energy) to survive and thrive (function / work done).	Food chains show how energy travels from one source, e.g. sunlight to another, e.g. producer	Food chains show how energy travels from one source, e.g. prey to another, e.g. predator	Food chains show how energy travels from one source to another.	Environmental changes can have an impact on the flow of energy in a food chain.	Animals and plants need nutrition (energy) to survive and thrive (function / work done). Food chains show how energy travels from one source to another.

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Yr 4 Su 2						
BIG Q: How does electricity travel and how can we control it?						
Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Note: pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity. Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.						
Lesson Qs	Elicitation / Activate	What is an electrical series circuit?	How does changing the structure of the circuit impact the function?	How can I identify materials which are conductors and insulators of electricity?	How can we control circuits?	Application / Assess How does electricity travel and how can we control it?
Key Concepts Energy - Electricity Explore the impact of an open and closed circuit on electrical energy?	<i>Materials have properties (structure) which enables function and therefore a use</i>	<ul style="list-style-type: none"> To know some common appliances that run on electricity. To know the basic parts of a circuit: bulb, cells, switch wire buzzer. To know that a complete circuit is needed to power a component. To know that a series circuit contains elements in a single complete loop 	<ul style="list-style-type: none"> To notice what happened when more components are added to a circuit (NB, chn do not need to explain – this is covered in year 6) 	<ul style="list-style-type: none"> To know that electrical insulators do not allow electricity to flow through them. To know that electrical conductors do allow electricity to flow through them To know that metal make good conductors. 	<ul style="list-style-type: none"> To know the impact of a complete and open circuit To know that a switch completes and opens a circuit 	
Disciplinary Concepts	Asking and exploring Questions <ul style="list-style-type: none"> I know and give reasons for my choice of enquiry I know that my question is based on my variables Performing Tests <ul style="list-style-type: none"> I can make suggestions as to how to investigate Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data 	Performing Tests <ul style="list-style-type: none"> I can make suggestions as to how to investigate Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I know how to use the relationship (cause and effect) or pattern to predict a future change I can use my scientific knowledge to explain my findings Communicating <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	Performing Tests <ul style="list-style-type: none"> I can make suggestions as to how to investigate Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I know how to use the relationship (cause and effect) or pattern to predict a future change I can use my scientific knowledge to explain my findings Communicating <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	Concluding, prediction, evaluating <ul style="list-style-type: none"> I know how to describe the similarities and differences or changes in my data I know how to use the relationship (cause and effect) or pattern to predict a future change I can use my scientific knowledge to explain my findings Communicating <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	Applications <ul style="list-style-type: none"> I can name an application of science and an associated scientist Communicating <ul style="list-style-type: none"> I know relevant scientific language and can use that language to discuss and present my ideas 	<ul style="list-style-type: none">
Key learning tasks	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Label the structure and function of different electrical appliances – identifying how electricity enable the function – provided the energy to work. Comparative enquiry – how does the structure of a circuit affect the bulb (or component of your choice) – identify the CV and DV. Provide different circuits in picture form to make – chn suggest how to investigate e.g. trying them and noting the impact. Chn organise and record their results using knowledge of CV and DV Conclude by finding what structure is needed for an electrical series circuit to enable the component function. 	<ul style="list-style-type: none"> Identify the CV ad DV in the enquiry question Use CV and DV to make suggestions as to how to investigate Use CV and DV to construct a table and record results Conclude through finding pattern and use to predict a future impact 	<ul style="list-style-type: none"> Identify the enquiry type Identify the CV ad DV in the enquiry question Use CV and DV to make suggestions as to how to investigate Use CV and DV to construct a table and record results Conclude through finding pattern and use to predict a future impact 	<ul style="list-style-type: none"> How can I build a switch – children apply their knowledge of circuits conductors and insulators to building a switch Label the component parts (structure) of their switch and their functions 	
Generalisation		Appliances have structure which enable a function (use). This function is enabled by electricity. Electricity (energy) travels in a complete circuit from the power source to the component to enable a function (work done)	Electricity (energy) travels in a complete circuit from the power source to the component to enable a function (work done)	Materials have properties (structure) which enables function and therefore a use, e.g. electrical conductors enable electrical flow and insulators restrict or block.	Electricity (energy) travels through conductors in a circuit from the power source to the component to make it work (work done) Electrical switches have conducting and insulating components (structure) which enables the controlling of the circuit (function).	Electricity (energy) travels in a circuit from the power source to the component to enable a function (work done) <i>Materials have properties (structure) which enables function and therefore a use, e.g. electrical</i>

						conductors and insulators. Combining these enables the controlling of the circuit (function) through a switch.
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