

Year 4 Science Progression Map

	<u>Autumn 1</u>	
Topic	Electricity	
Unit Aim	To develop pupils' understanding of electricity by exploring how it is used in everyday appliances, and by constructing and investigating simple series circuits. Pupils will learn to identify and name key components such as cells, wires, bulbs, and switches, and use this knowledge to predict whether a circuit will function. They will understand how switches control the flow of electricity, and investigate which materials act as conductors or insulators, recognising the role of metals as effective conductors.	
Prior Learning	KS1 – Electricity is not taught as a discrete topic in KS1 however some children may have looked at which items use electricity in other curriculum areas (e.g. Toys topic in history)	
Knowledge	<u>Essential Knowledge</u>	<u>Working Scientifically</u>
	Identify common appliances that run on electricity Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, Identify whether or not a lamp will light in a simple series circuit, based on whether or not the Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp Recognise some common conductors and insulators, and associate metals with being good conductors	Asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests Using results to draw simple conclusions, make predictions for new values, suggest improvements Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts
Vocabulary	Electrical, insulator, mains power, portable, pylon, switch appliance, battery, circuit, components, conductor, current	
Future Learning	Y6 – In the Y6 topic on electricity, children will learn to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. They will compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. They will use recognised symbols when representing a simple circuit in a diagram. KS3 – Children will study electricity in more depth, including; current and static electricity, parallel and series circuits. They will learn how current is measured and work out potential differences; calculate differences in resistance between conducting and insulating components (quantitative).	
KS2 End Point	To build an extensive vocabulary and discuss our observations of the world around us.	

	<u>Autumn 2</u>	
Topic	Living things and their habitats	
Unit Aim	Develop pupils' understanding of how living things can be identified, grouped, and classified based on observable characteristics. Pupils will learn to use and create simple classification keys to help organise and name a variety of living things found in both local and wider environments. They will also explore how habitats can change over time and consider how these changes may positively or negatively impact living organisms, fostering an awareness of environmental responsibility and the need to protect living things.	
Prior Learning	Year 1 – During the topic of plants, children will learn to describe the basic structure of various common flowering plants. They will have to compare the differences between living and non-living things. Year 2 – Children will have explored the differences between living and non-living things, identified that most living things live in habitats that they are suited to, and understood how living things in that habitat depend on each other. They may have learnt to name some living things in their local area and construct basic food chains. Year 3 – Children will have learnt to identify and describe the function of various parts of a plant. They will have explored the part flowers play in the life cycle including pollination, seed fertilisation and seed dispersal. UKS2 – Children will study the life cycles of plants and animals and examine how reproduction plays a vital part in them.	

	They will also extend their understanding of classification to include single-celled organisms.	
Knowledge	<u>Programme of Study</u>	<u>Working Scientifically</u>
	Pupils should be taught to recognise that living things can be grouped in various ways. Pupils should be taught to explore and use classification keys to help group, identify and name various living things in their local and wider environment. Pupils should be taught to recognise that environments can change and sometimes pose dangers to living things.	Observe characteristics of living things. Identify animals and classify into different groups. I can ask relevant questions to classify things. I can use evidence to answer questions and present findings. Record findings about endangered species.
Vocabulary	Environment, Classify, Vertebrate, Invertebrate, Exoskeleton, Key, Adaptation, Pollution	
Future Learning	KS3 – Children extend their knowledge of reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. They extend their knowledge of plant reproduction, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, and quantitative investigation of some dispersal mechanisms.	
KS2 End Point	To build an extensive vocabulary and discuss our observations of the world around us.	

	<u>Spring 1</u>	
Topic	States of Matter	
Unit Aim	This unit aims to develop pupils' understanding of the properties of solids, liquids, and gases, and how materials can be grouped based on their characteristics. Pupils will explore how materials change state when heated or cooled, including investigating and measuring the temperatures at which these changes occur. They will also learn about the processes of evaporation and condensation, and how these are involved in the water cycle, recognising how temperature affects the rate of evaporation.	
Prior Learning	KS1 – Children will have learnt to compare and group materials on the basis of their simple properties. They will have explored how to change the shape of solids by bending, twisting, squashing and stretching.	
Knowledge	<u>Programme of Study</u>	<u>Working Scientifically</u>
	Compare and group materials together, according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and Associate the rate of evaporation with temperature.	Set up simple practical enquiries, comparative and fair tests Make systematic and careful observations and, where appropriate, take accurate Measurements using standard units, using a range of equipment, including thermometers and data loggers Gather, record, classify and present data in a variety of ways to help answer questions Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
Vocabulary	Heat, liquid, precipitation, property, condensation, evaporation, freeze, gas	
Future Learning	UKS2 – Children will use their knowledge of solids, liquids and gases by deciding how materials might be separated, including filtering, sieving and evaporation. They will extend their knowledge and learn about dissolving and mixing and consider if these changes of state are reversible or irreversible. KS3 – Children will learn the particulate nature of matter, atoms, elements and compounds. They will learn what pure and impure substances are, including simple techniques of how to separate materials (filtration, evaporation, distillation and	

	chromatography). They will learn about chemical reaction (catalyses, combustion etc) and represent these using formulae and equations.
KS2 End Point	To build an extensive vocabulary and discuss our observations of the world around us.

	<u>Spring 2</u>	
Topic	Animals including Humans (Teeth)	
Unit Aim	This unit aims to develop pupils' understanding of the role of teeth and the human digestive system in helping the body to process food. Pupils will learn to identify the different types of human teeth and describe their simple functions in the process of eating and digestion. They will also explore the basic parts of the digestive system, understanding the function of each part in breaking down food and supporting the movement of nutrients through the body.	
Prior Learning	Identified, named and drawn basic parts of the human body. Recognised the importance of a healthy diet and basic food groups. Described how animals (including humans) get their food. Identified and named a variety of animals including carnivores, herbivores and omnivores. Used simple observations to describe how humans grow and stay healthy	
Knowledge	<u>Programme of Study</u>	
	Identify the different types of teeth in humans and their simple functions Describe the simple functions of the basic parts of the digestive system in humans	Make systematic and careful observations. Gather, record, classify and present data in a variety of ways to help answer questions Record findings using simple scientific language, drawings and labelled diagrams. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
Vocabulary	Canines, Carnivore, Digestion, Herbivore, Incisor, Stomach, Producer, Saliva, Small intestines, Large intestines, Molars, Oesophagus, Omnivore, Peristalsis, Predator, Prey	
Future Learning	Describe the changes as humans develop from birth to old age (Year 5). Understand how nutrients and water are transported within animals (Year 6 – circulatory system). Identify and name the main parts of the human circulatory system and their functions (Year 6). Recognise the impact of diet, exercise, drugs and lifestyle on the way the body functions (Year 6). Develop more detailed scientific explanations of body systems working together (e.g. digestion and circulation)	
KS2 End Point	To build an extensive vocabulary and discuss our observations of the world around us.	

	<u>Summer 1</u>	
Topic	Sound	
Unit Aim	This unit aims to develop pupils' understanding of how sounds are produced and how they travel from a source to the ear. Pupils will explore how sounds are created through vibrations and recognise that these vibrations travel through different media. They will investigate patterns linking the pitch of a sound to the features of the object producing it, and the volume of a sound to the strength of its vibrations. Pupils will also learn that sound becomes quieter as the distance from the source increases, developing their understanding of how sound changes over distance.	
Prior Learning	KS1 – sound is not taught as a separate topic in KS1 science however children may have some knowledge of pitch and volume through their music lessons. KS2 – children continue to explore sound through music (in their music lessons) and in the topic on light, children may compare how fast sound travels compared to light.	
Knowledge	<u>Programme of Study</u>	<u>Working Scientifically</u>

	Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibrations that produced it Recognise that sounds get fainter as the distance from the sound source increases.	Set up simple practical enquiries, comparative and fair tests Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
Vocabulary	Pinna, Cochlea, Eardrum, Vibrate/vibrations, Volume, Pitch	
Future Learning	KS3 – children will extend their understanding of sound by exploring frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound. They will build upon knowledge of how sound travels through a medium and explore the auditory range of humans and animals.	
KS2 End Point	To build an extensive vocabulary and discuss our observations of the world around us.	

	Summer 2	
Topic	Animals including Humans	
Unit Aim	To develop pupils' understanding of how living things depend on their habitats by investigating local environments, observing and classifying minibeasts, exploring how environmental changes such as climate change affect food chains and survival, and applying this knowledge by growing their own vegetables and preparing a sustainable meal.	
Prior Learning	Identified and named a variety of common animals (including fish, amphibians, reptiles, birds and mammals). Identified and named common plants, including garden plants and trees. Identified basic structures of plants (roots, stem, leaves, flowers). Described how animals obtain their food from plants and other animals (simple food chains). Identified that most living things live in habitats to which they are suited. Explored simple habitats (e.g. woodland, pond) and the animals that live there. Observed seasonal changes and how these affect plants and animals. Carried out simple observations and recorded findings using drawings and basic charts.	
Knowledge	<u>Programme of Study</u>	<u>Working Scientifically</u>
	Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to identify and name living things in the local environment. Recognise that environments can change and that this can pose dangers to living things. Identify how animals obtain their food from plants and other animals. Describe how different habitats provide for the basic needs of different kinds of animals and plants. Investigate how environmental factors (e.g. temperature, water) affect plant growth. Understand the impact of human activity (including climate change) on habitats and living things.	Ask relevant scientific questions about the local environment. Set up simple practical enquiries, including comparative and fair tests. Make systematic and careful observations of living things and habitats. Use simple equipment accurately (e.g. collection pots, measuring tools). Record findings using drawings, labelled diagrams, keys, tables and tally charts. Use evidence to identify patterns, relationships and changes in the environment.
Vocabulary	Habitat minibeast classification vertebrate invertebrate food chain predator prey environment climate	
Future Learning	Describe the life processes of reproduction in plants and animals. Explore life cycles (e.g. mammals, insects, amphibians). Investigate changes as humans develop and grow.	

	Classify living things into broader groups based on characteristics (including microorganisms). Give reasons for classifying plants and animals based on specific features. Understand evolution and inheritance. Recognise how living things have adapted to their environments.
KS2 End Point	To build an extensive vocabulary and discuss our observations of the world around us.