

Year 6 Science Progression Map

	<u>Autumn 1</u>	
Topic	Living things and their habitats	
Unit Aim	Children will learn how living things, including microorganisms, are classified. They will explore classification systems and keys, investigate yeast as a microorganism, and discover the beneficial and harmful roles of microorganisms in food, medicine and the environment.	
Prior Learning	Year 1 – Children will have learnt that plants are living things and have had experience naming and sorting plants using a variety of criteria. They will have learnt the basic structure of plants and conducted experiments to determine what plants need to grow well. Year 2 – Children will have extended their knowledge of plants to include the life cycle of a plant and learnt about seeds. In the ‘Living things and their habitats’ topic, children will have learnt about habitats (including microhabitats) and that animals and plants live in habitats that suit them. They also may have learnt about simple food chains. Year 3 – In the ‘Plants’ topic, children extend their knowledge of the parts of a plant and learn about flowering plants, including flowers, pollination and seed dispersal. Year 4 – During the ‘Living things and habitats’ topic, children will have further consolidated their understanding of habitats and learnt how to use a basic classification/identification key	
Knowledge	<u>Essential Knowledge</u>	<u>Working Scientifically</u>
	I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. I can give reasons for classifying plants and animals based on specific characteristics.	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and graphs. I can report and present findings from enquiries in oral and written forms such as displays and other presentations.
Vocabulary	Amphibians, group, reproduce, bird, growth, reptiles, carnivore, herbivore, omnivore, classification, invertebrate, respiration, characteristics, mammals, sensitivity, excretion, movement, taxonomy, fish, nutrition, vertebrate	
Future Learning	KS3 – Children will study cell structure and organisation and learn relationships within an ecosystem.	
KS2 End Point	Reasoning Ability to hypothesise using prior knowledge Independently apply skills Considering evidence and Evaluating Use our previous scientific learning to make choices and decisions about the world.	

	Autumn 2	
Topic	Light	
Unit Aim	During this unit of work, children will consolidate previous learning by exploring the way that light behaves, including light sources, reflection and shadows. Pupils will make predictions and investigate the relationship between light sources, objects and shadows and understand how the eye works. Children will extend their experience of light by looking at rainbows, prisms and bending light in water (although they don't need to explain why these phenomena occur at this stage).	
Prior Learning	KS1 – Children do not study light as a separate topic. However, as part of seasonal changes topic; children will have observed and talked about changes in the weather and the seasons and will have talked about the dangers of looking at the Sun directly. Year 2 – children might have observed the effect of light on plant growth. Year 3 – as part of the light topic, children will recognise that they need light in order to see things and that dark is the absence of light. They will have learnt to identify light sources; explore what happens when light reflects off mirrors or other reflective materials and know that the Sun can be damaging to our eyes. They may have investigated patterns in the way the size of shadows changes.	
Knowledge	<u>Essential knowledge</u>	<u>Working scientifically</u>
	I can recognise that light travels in straight lines I can explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes I can explain why shadows have the same shape as the objects that cast them	I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Vocabulary	Dark, reflect, shadow, opaque, translucent, transparent, luminous, scattering, absorption, refraction	
Future Learning	KS3 – Children will learn that human sight is based on the ability to see red, blue and green light and that the colour of an object depends on the colours of light that it absorbs and scatters. Light travels at 300 million metres per second in a vacuum and different colours of light have different frequencies. The path that light takes can be bent (refracted) and that transparent materials can be shaped into lenses and prisms to alter the path of light by refraction (convex and concave lens).	

	The ray model can describe the formation of an image in a mirror and how objects appear in different colours.
KS2 End Point	Reasoning Ability to hypothesise using prior knowledge Independently apply skills Considering evidence and Evaluating Use our previous scientific learning to make choices and decisions about the world.

	Spring 1	
Topic	Evolution and inheritance	
Unit Aim	Children will explore how plants and animals adapt to their environments and how adaptations can lead to evolution over time. They will investigate natural selection, inheritance and fossils, and carry out practical enquiries to understand how species survive and change.	
Prior Learning	KS1 – Children may have learnt that most living things live in habitats to which they are suited and be able to describe how different habitats provide the basic needs of different kinds of animals and plants. They may have learnt to identify animals and plants from a variety of environments. They may have noticed that animals have offspring that grow into adults. KS2 – In the Rocks and Soils topic (Y3), children may have learnt how fossils are formed.	
Knowledge	<u>Essential knowledge</u>	<u>Working scientifically</u>
	I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Vocabulary	Adaptation, environment, evolution, gene, inheritance, natural selection, organism	
Future Learning	KS3 – Children will learn about inheritance, chromosomes, DNA and genes. They will learn that heredity is the process by which genetic information is transmitted from one generation to the next and that there are differences between species. They will also learn that there is variation between species and between individuals of the same species. This means some organisms compete more successfully, which can drive natural selection. Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete	

	successfully and reproduce, which in turn may lead to extinction.
KS2 End Point	Reasoning Ability to hypothesise using prior knowledge Independently apply skills Considering evidence and Evaluating Use our previous scientific learning to make choices and decisions about the world.

	Spring 2	
Topic	Animals including humans	
Unit Aim	Children will develop their understanding of the human circulatory system and its role in keeping the body healthy. They will investigate how exercise affects heart rate, explore the impact of diet, exercise and drugs on the body, and use scientific evidence to make informed decisions about healthy lifestyles.	
Prior Learning	Year 1 – Children learn to identify and name common animals; identify and name basic body parts; learn the five main senses, and say which part of the body is linked to each sense. Year 2 – Children learn about the basic needs of animals and humans and understand that animals need the right conditions to survive. They learn that animals (including humans) have offspring that grow into adults. Year 3 – Children learn about the muscular-skeletal system. They identify different types of skeletons and learn about muscles and how they help us move. Year 4 – Children identify the main parts of the digestive system and understand its basic function. They learn about the different types of teeth and simple food chains. Year 5 – Children learn to describe the change as humans develop from birth to old age, and that humans grow and change over time.	
Knowledge	<u>Essential knowledge</u>	<u>Working scientifically</u>
	I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function I can describe the ways in which nutrients and water are transported within animals, including humans	I can plan different types of scientific enquiries to answer questions, including recognising, and controlling variables where necessary I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate I can record data and results of increasing complexity using scientific diagrams and

		labels, classification keys, tables, scatter graphs, bar and line graphs I can use test results to make predictions to set up further comparative and fair tests I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations I can identify scientific evidence that has been used to support or refute ideas or arguments.
Vocabulary	Arteries, blood, heart, lungs, veins	
Future Learning	Children will learn more about the importance of a healthy diet and how different foods are absorbed and used in the human body. They will learn more about the gas-exchange systems in the human lungs. Children will learn about cells and organisation, and how they apply to humans and animals (e.g. the digestive and circulatory systems). They will also look at the effects of recreational drugs, including substance misuse.	
KS2 End Point	Reasoning Ability to hypothesise using prior knowledge Independently apply skills Considering evidence and Evaluating Use our previous scientific learning to make choices and decisions about the world.	

	<u>Summer 2</u>
Topic	Electricity
Unit Aim	Children will build on their understanding of electrical circuits by constructing and drawing series circuits using scientific symbols. They will investigate how changing voltage affects circuit components, develop their working scientifically skills through practical enquiries, and explore renewable and non-renewable energy sources through research and communication.
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., the Toys topic in history). Year 4 – During the unit on electricity, children may have learnt to sort common electrical appliances into battery and mains-powered, and to construct simple series circuits containing a variety of components. They may be able to identify whether or not a bulb will light in a simple series circuit and put forward ideas to fix incomplete circuits. The children may have conducted investigations to discover which materials make good insulators and designed and tested their

	own switches.	
Knowledge	<u>Essential knowledge</u>	<u>Working scientifically</u>
	I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit I can 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 I can use recognised symbols when representing a simple circuit in a diagram	plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter, bar and line graphs I can use test results to make predictions to set up further comparative and fair tests I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations I can identify scientific evidence that has been used to support or refute ideas or arguments
Vocabulary	Appliance, battery, circuit, components, conductor, electrical, energy, insulator, mains power, pylon, renewable energy, non-renewable energy	
Future Learning	KS3 – Children will study electricity in more depth, including current and static electricity, as well as parallel and series circuits. They will learn how current is measured, work out potential differences, and calculate differences in resistance between conducting and insulating components (quantitative).	
KS2 End Point	Reasoning Ability to hypothesise using prior knowledge Independently apply skills Considering evidence and Evaluating Use our previous scientific learning to make choices and decisions about the world.	