Science

WRENINGHAM VC PRIMARY - CURRICULUM KNOWLEDGE AND KEY SKILLS PROGRESSION

Science

INTENT

At Wreningham we teach science following the 2014 national curriculum and we intend to

- Stimulate curiosity, awe and wonder of the scientific world.
- Encourage the children to ask WHY!
- Give the children the thinking and practical skills to be effective scientists.
- Develop scientific knowledge and conceptual understanding of the physical and natural world.
- Equip children with accurate scientific vocabulary and the ability to use it effectively.
- Develop critical thinking skills in relation to the physical and natural world around them.

IMPLEMENTATION

- The acquisition of key scientific knowledge is an integral part of our science lessons.
- Science will be taught in planned blocks by the class teacher.
- We teach specific scientific vocabulary for each science topic.
- Previous related topic vocabulary is recapped.
- We provide problem solving opportunities and give children the chance to ask their own questions and use their scientific skills and research to discover the answers.
- Teachers demonstrate how to use scientific equipment and working scientifically skills are embedded into lessons.
- Our curriculum is progressive. We build upon the learning and skills development of the previous years.
- Through enrichment days and LOtC, we promote the profile of science and create a culture of scientific enquiry.

IMPACT

- Children will have a love of science and be absorbed in their learning.
- Children will be able to demonstrate their scientific knowledge and skills with confidence.
- Most children will achieve at least age-related expectations.
- Children will be equipped with the skills and knowledge to progress confidently to KS3.
- Children will be confident in using scientific vocabulary.
- Children will be able to question scientific ideas and reflect on knowledge.

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HOW THE SCIENCE CURRICULUM HELPS DELIVER OUR SCHOOL VALUES

Stewardship, compassion, service

Stewardship - the school through its science curriculum and ECO schools work, supports pupils to learn how to help our planet be more sustainable and fair. The school has promoted environmental stewardship, developing science through ECO school activities. The school has developed a nature trail and a pond that supports pupils to learn about habitats, plants and animals, and to appreciate biodiversity.

Service - children learn about human impact, both positive and negative, and in its eco-school's work, issues such as litter, re-cycling, waste, transport and walking to school are considered. Children learn about the responsibility we have for our world and all its people.

Compassion - children are encouraged to show compassion, learning about ethical issues such as fair trade, or the need to not waste water and the worldwide problems caused by the lack of clean water. Children are encouraged to be active in problem solving and developing solutions.

National Curriculum Statutory requirements			**Units**
Year 1	Pupils should be taught to: <u>Plants</u> -Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees -Identify and describe the basic structure of a variety of common flowering plants, including trees <u>Animals, including humans</u> -Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals -Identify and name a variety of common animals that are carnivores, herbivores and omnivores -Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) -Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	<u>Everyday materials</u> -Distinguish between an object and the material from which it is made -Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock -Describe the simple physical properties of a variety of everyday materials -Compare and group together a variety of everyday materials on the basis of their simple physical properties <u>Seasonal changes</u> -Observe changes across the four seasons -Observe and describe weather associated with the seasons and how day length varies	<u>Year 1/2 cycle 1</u> Animals including humans Living Things & their Habitats Everyday Materials Plants Animals including humans

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	National Curriculum Statutory requirements		Units
Year 2	Pupils should be taught to: <u>Living things and their habitats</u> Explore and compare the differences between things that are living, dead, and things that have never been alive Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including microhabitats -Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food <u>Plants</u> -Observe and describe how seeds and bulbs grow into mature plants -Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy <u>Animals, including humans</u>	-Notice that animals, including humans, have offspring which grow into adults -Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) -Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene <u>Uses of everyday materials</u> -Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses -Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	<u>Year 1/2 cycle 2</u> Seasonal Changes Use of Everyday Materials Animals including humans Living Things & their Habitats Plants

	National Curriculum Statutory requirements		Units
Lower key stage 2 - Year 3	Pupils should be taught to: <u>Plants</u> -Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers -Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant -Investigate the way in which water is transported within plants -Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal <u>Animals, including humans</u> -Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat -Identify that humans and some other animals have skeletons and muscles for support, protection and movement <u>Rocks</u>	-Recognise that soils are made from rocks and organic matter <u>Light</u> -Recognise that they need light in order to see things and that dark is the absence of light -Notice that light is reflected from surfaces -Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light from a light source is blocked by an opaque object -Find patterns in the way that the size of shadows change <u>Forces and Magnets</u> - compare how things move on different surfaces -Notice that some forces need contact between two objects, but magnetic forces can act at a distance -Observe how magnets attract or repel each other and attract some materials and not others -Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials -Describe magnets as having two poles	<u>Year 3/4 cycle 1</u> States of Matter Electricity Rocks Holt Hall Living Things & their Habitats Animals including Humans

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	-Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties -Describe in simple terms how fossils are formed when things that have lived are trapped within rock	-Predict whether two magnets will attract or repel each other, depending on which poles are facing	

National Curriculum Statutory requirements			Units
Lower key stage 2 - Year 4	Pupils should be taught to: <u>Living things and their habitats</u> -Recognise that living things can be grouped in a variety of ways -Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment -Recognise that environments can change and that this can sometimes pose dangers to living things <u>Animals, including humans</u> -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 -Construct and interpret a variety of food chains, identifying producers, predators and prey <u>States of matter</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. <u>Sound</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 -Fnd 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 <u>Electricity</u> -Identify common appliances that run on electricity -Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers -Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery -Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit -Recognise some common conductors and insulators, and associate metals with being good conductors	<u>Year 3/4 cycle 2</u> States of Matter Animals including humans Sound Forces and Magnets How Hill Plants Animals including Humans Light Health and Well Being

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National Curriculum Statutory requirements			Units
Upper key stage 2 - Year 5	Pupils should be taught to: <u>Living things and their habitats</u> -Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird -Describe the life process of reproduction in some plants and animals <u>Animals, including humans</u> -Describe the changes as humans develop to old age <u>Properties and changes of materials</u> -Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets -Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution -Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating -Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic -Demonstrate that dissolving, mixing and changes of state are reversible changes	-Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda <u>Earth and space</u> -Describe the movement of the Earth, and other planets, relative to the Sun in the solar system -Describe the movement of the Moon relative to the Earth -Describe the Sun, Earth and Moon as approximately spherical bodies -Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky <u>Forces</u> -Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object -Identify the effects of air resistance, water resistance and friction, that act between moving surfaces -Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	<u>Year 5/6 cycle 1</u> Light Electricity Animals incl. humans(y6) Properties and changes of materials Evolution and inheritance Living things and their habitats (y6)

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National Curriculum Statutory requirements			Units
Upper key stage 2 - Year 6	Living things and their habitats -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 -Give reasons for classifying plants and animals based on specific characteristics Animals, including humans -Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood -Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function -Describe the ways in which nutrients and water are transported within animals, including humans Evolution and inheritance -Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago -Recognise that living things produce offspring of the same kind, but normally offspring	vary and are not identical to their parents -Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution Light -Recognise that light appears to travel in straight lines -Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye -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 -Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them Electricity -Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit -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 -Use recognised symbols when representing a simple circuit in a diagram	Year 5/6 cycle 2 Earth and Space Forces Living things and habitats (y5) Animals including humans (y5)

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SUBSTANTIVE KNOWLEDGE

Knowledge & Understanding				
Year 1/2	**BI: Animals, including humans, have offspring which grow into adults** **KQ: What do animals need to survive?** **NC Unit: Animals including humans** -identify name, draw and label the basic parts of the human body -Say which parts is associated with the senses -Notice that animals including humans have offspring that grow into adults -Find out about and describe the basic needs of animals including humans for survival -Describe how to be healthy and live a healthy lifestyle. (exercise, food, hygiene)	**BI: Materials are used in different ways according to their properties** **KQ: How do you know a material is fit for purpose?** **Everyday Materials** -identify and name different materials according to properties (sorting games/activities) -Group materials depending on their properties -begin to talk about how materials are used -give reasons why materials are used e.g. waterproof a house on a lego house.	**NC Unit: Plants** **Big Idea: There is a relationship between structure and function - every flower part has a job to do.** **KQ: How do you identify trees and plants?** -Identify and describe the structure of a variety of common flowering plants and trees. -Know there are different varieties of plants, but they all have common features -identify and name a variety of wild and garden plants including deciduous and evergreen trees	**NC Unit: Living Things & their Habitats** **BI: Organisms including plants and animals have characteristics that make it possible for them to survive in their habitat** **KQ: How have animals adapted to their habitats?** -Identify that most living things live in habitats to which they are suited. -Describe how different habitats provide the basic needs of different kinds of animals and plants and how they depend on each other.

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	NC Unit - Seasonal Changes (unit coverage taught ongoing throughout the year) **Big Idea: The Earth is one of eight planets that orbit the sun. The Earth is tilted and spins on its axis leading to day and night, the seasons and the climate.** **KQ: How does the weather differ across the year?** -identify changes across the 4 seasons (observations) -Observe and describe the weather linked with the seasons and how the length of the day changes -identify suitable clothes for each season - track seasonal changes to rainfall/tree growth **NC Unit - Animals including humans** **Big Idea: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.** **KQ What other types of living things are there?** -identify and name a variety of common animals that are carnivores, herbivores, and omnivores. -Identify and name common animals including fish, mammals, amphibians, birds and reptiles - Begin to separate animals based on their structure (has wings does not have wings, has 0 legs, 2 legs 4 legs or more than 4 legs) Use names reptile, insect, amphibian, birds, mammals.	**Everyday Materials** **The arrangement, movement and type of the building blocks of matter and the forces that hold them together or push them apart explain all the properties of matter. (hot/cold, soft/hard, light/heavy etc)** **KQ: Are all changes to materials reversible?** -Know how shapes of materials can be changed by stretching, bending, twisting and stretching.	**NC Unit - Living Things & their Habitats** **Big Idea: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.** **KQ: Can living things stay healthy and live forever?** Explore and compare the differences between things that are living, dead and never been alive Identify that most living things live in habitats to which they are suited. Describe how different habitats provide the basic needs of different kinds of animals and plants and how they depend on each other. Identify and name a variety of plants and animals in their habitats including micro habitats. Describe how animals get their food from plants and other animals- explore food chains.	**NC Unit Plants** **BI: That there is a significant difference between being dead and never having been alive.** **KQ: What is alive, dead or was never alive?** -Observe and describe how seeds and bulbs grow into mature plants -plant and grow flowers and plants from seeds -Find out about and describe what a plant needs to grow and stay healthy **Use of**

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	-describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)					
Year 3/4	**Cycle A** **States of Matter** **Key question: Is water always wet?** **Big idea: All matter in the universe is made of very small particles.** 1.Compare and group materials together, according to	**Cycle A** **Electricity** **Key question: what pieces of equipment might you use to make an electrical circuit?** **Big idea: you need electricity to make electrical circuits work and this**	**Cycle A** **Rocks** **Key question: Are rocks all the same?** **Big idea: Through observing and investigating properties we create scientific groups.** 1.Three main types of rocks (igneous, metamorphic, sedimentary) and	**Cycle A** **Rocks** **Key question: Are rocks all the same?** **Big idea: Through observing and investigating properties we create scientific groups.** 1.Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties (**Aylmerton Residential** – beach walk). 2.Recognise that soils are made from rocks and organic matter.	**Cycle A** **Animals including Humans (Year 4)** **Key question: What do our bodies do with the food we eat?** **Big Idea: Food is a source of energy. All animals need food to provide energy.** 1.Describe the simple functions of	**Cycle A** **Living Things & their Habitats** **Key question: How can living things be grouped?** **Big idea: Recognise that living things can be grouped in a variety of ways. Classifying and grouping things can help support our scientific understanding.**

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	whether they are solids, liquids or gases. 2.Observe that some materials change state they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius. 3.Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**impacts on our everyday lives.** 1.Identify common appliances that run on electricity. 2.Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, writes, bulbs, switches and buzzers. 3.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. 4.Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. 5.Recognise some common conductors and insulators, and associate	how they are formed. 2.Describe in simple terms how fossils are formed when things that have lived are trapped within rock. **Borrow 'Deep History Coast Handling Box' from Cromer Museum.**		the basic parts of the digestive system. 2.Identify the different types of teeth in humas and their simple function. 3.Construct and interpret a variety of food chains, identifying producers, predators, prey. 4.Extra vocabulary: herbivore, omnivore, carnivore.	1.Recognise that living things can be grouped in a variety of ways. 2.Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. 3.Recognise that environments can change and that this can sometimes pose dangers to living things.

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		metals with being good conductors.				
	Cycle B **Forces and Magnets** **Big Idea: Matter is all the stuff, or mass, in the universe. Forces are different kinds of pushes and pulls that act on all the matter that is in the universe.** **KQ: What can magnets do?** -Compare how things move on different surfaces -Notice that some forces need contact between two objects, but magnetic forces can act at a distance. -Observe how magnets attract or repel each other and attract some materials and not others. -Compare and group together a variety of everyday materials on the basis of what they are	**Cycle B** **Animals Including Humans** **Big Idea: Food is a source of energy. All animals need food to provide energy.** **KQ: How do living things work?** - Identify that animals, including humans, need the right types and amount of nutrition. -Identify that animals, including humans, cannot make their own food; they get nutrition from what they eat. -Identify that humans and some animals have skeletons and muscles for support, protection and movement.	**Cycle B** **Sound** **Big Idea: Both light and sound are forms of energy that move in waves. Understanding waves helps us to communicate, explore the universe, and transfer energy to where we want it.** **KQ: How do we hear different sounds?** -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.	**Cycle B** **How Hill: Living Things & their Habitats** *Link to local environment.* **Big idea: recognise that living things can be grouped in a variety of ways** **-Big Idea: Classifying and grouping things can help support our scientific understanding** **KQ: How can living things be grouped?** -Recognise that living things can be grouped in a variety of ways. -Explore and use classification keys to help group, identify and name a variety of living things in their wider environment -**How Hill activity:** Dyke Dipping (catching water invertebrates and work out what they are).	**Cycle B** **Plants** **Big Idea: There is a relationship between structure and function - every flower part has a job to do.** **KQ: What do living things need to survive?** -Identify and describe the functions of different parts of flower plants: roots, stem/trunk, leaves and flowers. -Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. -Investigate the way in which water is transported within plants. -Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	**Cycle B** **Light** **Big Idea: Dark is the absence of light.** **KQ: What is the dark?** -Recognise that we need light in order to see things and that dark is the absence of light. -Notice that light is reflected from surfaces. -Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. -Recognise that shadows are formed when the light from a light source is blocked by a solid object. -Find patterns in the way that the size of shadows change.

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	attracted to a magnet, and identify some magnetic materials -Describe magnets as having two poles. -Predict whether two magnets will attract or repel each other, depending on which poles are facing.		-Recognise that sounds get fainter as the distance from the sound source increases.			
Year 5/6	**NC Unit Light** **Big Idea: We can use evidence found in practical experiments to support an idea in science** **KQ: Are there rules which govern how light works?** Prove light travels in straight lines using pinhole camera designs. Show how shadows are created, Find out how light is reflected using mirrors and periscopes and prove this	**NC Unit Electricity** **Big Idea: Planning and carrying out an enquiry by changing a variable can answer a scientific question** **KQ: How does changing a circuit affect what is observed?** Learn what electricity is and how is it related to electrons What is voltage and current	**NC Unit Animals incl. humans**(y6) **Big Idea: Recording data and results in different ways can help explain our findings in a scientific enquiry** **KQ: How does exercise affect how the human body operates** – circ. system/health Learn about circulatory system/blood and put together and label a pop-up heart. Design an experiment to test how heart rate changes with exercise and	**NC Unit Properties and changes of materials(y5)** **Big Idea: Carrying out a fair test ensures that results are more accurate** **KQ: How do different materials react and change when subjected to different processes** Compare and group materials based on properties (including solubility, hardness, conductivity, magnetic properties) Dissolving/solutions – predict and test soluble materials – which dissolves quickest Filtering/sieving – investigate which material make the best filter and record results graphically Everyday materials - Demonstrate reversible changes and non- reversible or irreversible	**C Unit Properties and changes of materials(y5)** **Big Idea: Carrying out a fair test ensures that results are more accurate** **KQ: How do different materials react and change when subjected to different processes** **Continued** **Focus on hypothesis fair testing, write-up in formal manner**	**NC Unit Evolution and inheritance** **Big Idea: Time can affect how living things can change in more, or less significant ways.** **KQ: Why may the offspring of living things be different from their parents** Recognise that living things have changed over time – look at fossils and learn how they are made Recognise that living things produce offspring Identify how animals /plants are adapted to their environment

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	with an experiment. Show how light travels from light sources to our eyes. Find out how light can be bent and split – find out how a rainbow is made and design an experiment to show light is made up of different colours.	and how do batteries work. Investigate brightness of a lamp and how it's affected by voltage of cells Find out how a bulb works Use recognised symbols when representing a simple circuit in a diagram and create circuit diagrams to represent circuits made.	represent the results using a spreadsheet and graphs. Learn about the impact of diet/ drugs on health.			Investigating variation in the classroom – height, hair colour, shoe size etc. Data collection and graph drawing to analyse. Predicting how humans might adapt over years to come based on new technologies and changes to the environment in which we live.
	NC Unit Earth and Space **KQ: How are our watches and calendars related to the movements of earth in space?** **Big Idea: The movement of our planet is key to our experience of time.** Investigating our own solar system. Learn about the mechanisms which result in earth having day and night and leap year every 4 years.	**NC Unit Forces** **KQ: How can we measure the forces we experience on earth?** **Big Idea: Forces influence our everyday life** Explain that unsupported objects fall towards the Earth – gravity. Learn about Newton's laws of gravity Air resistance – design and testing of parachutes Investigate use of the Newton meter Test and write-up scientifically experiments involving predication, weight in air, water and other solutions. Present data effectively using graphs. Recognise mechanisms, e.g. levers, pulleys and gears, allow a smaller force to have a greater effect.		**NC Unit Living things and their habitats (y6)** **Big Idea: Classifying and grouping things can help support our scientific understanding** **KQ: Why are certain characteristics significant in creating classification groups** Learn how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Learn about Linnaeus's classification system. Give reasons for classifying plants and animals based on specific characteristics – justify reasons for classifying unusual animals such as the duck-billed platypus.	**NC Unit Living Things and Their habitats** (y5) **KQ: How do environmental conditions affect growth?** **Big Idea: There are differences and similarities in the lifecycles of mammals, amphibians, insects and birds** Learn about the life cycles of a mammal, an amphibian, an insect and a bird and identify the differences and similarities. Investigate how a bean grows and the	**NC Unit Animals including humans- changes** **KQ: How does time affect the development of different animals from infancy to old age?** **Big Idea: Living things use different mechanisms to reproduce** Describe the changes as humans develop to old age and give reasons why these changes occur. Compare the reproduction in

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	Investigate how the moon interacts with the earth. Investigate why we have seasons and what would happen if the earth wasn't on a tilt.			factors which influence its growth.	plants with reproduction in animals (including SRE)

DISCIPLINARY KNOWLEDGE

	Year 1/2	Year 3/4	Year 5/6
Asking Questions	-Ask simple questions and recognise that they can be answered in different ways -Use simple secondary sources to find answers	-Ask relevant questions and use different types of scientific enquiries to answer them -Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions -Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	-Use their science experiences to explore ideas and raise different kinds of questions -Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact

	Year 1/2	Year 3/4	Year 5/6

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Planning Tests	-Perform simple tests -Suggest some ideas and questions based on simple knowledge and say how they might find out about them	-Set up simple practical enquiries, comparative and fair tests -Suggest questions that can be tested and make predictions about what will happen, some of which are based on scientific knowledge -Design a fair test or plan how to collect sufficient evidence -Recognise when a simple fair test is necessary and help to decide how to set it up	-Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary -Use test results to make predictions and identify when further observations, comparative and fair tests might be needed (and explain which variables need to be controlled and why in a fair test) -Decide how to turn ideas into a form that can be tested and, where appropriate, to make predictions of what will happen based on scientific knowledge and understanding

	Year 1/2	Year 3/4	Year 5/6
Gathering & Recording	-Identify and classify -Use simple features to compare objects, materials and living things and with help decide how to sort and group them (identifying and classifying) -Record simple data - With help, record and communicate their findings in a range of ways and begin to use simple scientific language	-Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables -Gather, record, classify and present data in a variety of ways to help in answering questions	-Decide how to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

	Year 1/2	Year 3/4	Year 5/6
Observing & Measuring	-Observe closely, using simple equipment (e.g. hand lenses, egg timers to gather data) -use their observations and ideas to suggest answers to questions	-Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers -Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them	-Choose the most appropriate equipment to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate -Make their own decisions about what observations to make what measurements to use and how long to make them for

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	Year 1/2	Year 3/4	Year 5/6
Recording/ Presenting/	-Gather and record data to help in answering questions - Talk about what they have found out and how they found it out -Begin to use simple scientific language -Record simple data	-Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions -Talk about criteria for grouping, sorting and classifying; and use simple keys	-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 -Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places (Maths)

	Year 1/2	Year 3/4	Year 5/6
Analysing & Evaluating	-Using their observations and ideas to suggest answers to questions	-Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions -Identify differences, similarities or changes related to simple scientific ideas and processes -Use straightforward scientific evidence to answer questions or to support their findings	-Identify scientific evidence that has been used to support or refute ideas or arguments. -Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (Maths)

SUBJECT SPECIFIC VOCABULARY - SCIENCE

PLANTS/ LIVING THINGS

Year 1/2

wild plants, garden plants, deciduous, chestnut tree, evergreen, holly tree

suitable temperature, water, light, grow

leaves, petals, roots, bulb, seed, trunk, branches, stem

germination, sprout, shoot, seedling, fruit

Year 3/4

flowering plants, roots, stem, trunk, leaves, flowers

growth/grow, nutrients, air, light, water, nutrients from soil, room to grow

water transported within plants, fertiliser

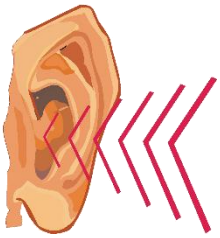
life cycle, pollination, pollen, seed formation, seed dispersal

Year 5/6

life cycle, pollination, fertilisation, germination, photosynthesis, chlorophyll

stamen, anther, filament, stigma, style, carpel, ovary, ovule

SOUND

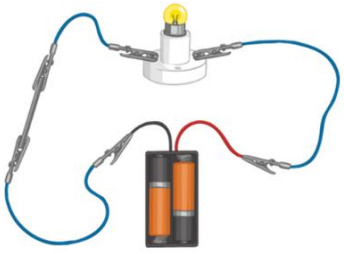


Year 3/4

eardrum, vibration

pitch, volume, soundproof, soundwave

ELECTRICITY



Year 3/4

electricity, series, electrical circuit, cells, wires,

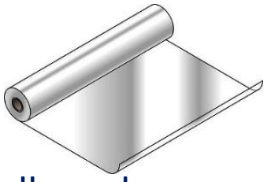
bulbs, switch, buzzer, motor

conductor, insulator

Year 5/6

renewable, non-renewable, electrons, symbols, series circuit

EVERYDAY MATERIALS, STATES OF MATTER, PROPERTIES AND CHANGES OF MATERIALS



Year 1/2

wood, plastic, glass, metal, water, rock**,** brick, paper and cardboard

hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy

waterproof/not; waterproof; absorbent/not absorbent; opaque/transparent

Year 3/4

solid, liquid, gas

changing state, molecule, vibrate, evaporate, degrees Celsius (°C), condensation,

water cycle, temperature

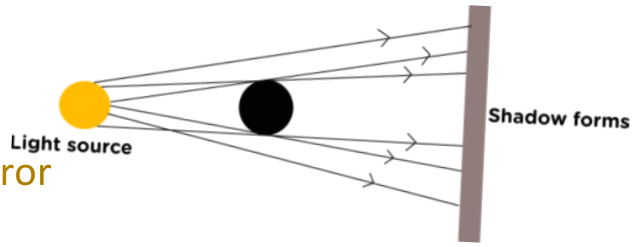
Year 5/6

Hardness, solubility, transparency, conductivity (electrical and thermal)

dissolve, solution, mixture, insoluble, filtering, sieving, separate evaporation, condense, melt,

reversible changes, irreversible changes

LIGHT



Year 3/4

shadow, dark, reflection, opaque, mirror

Year 5/6

retina, pupil, translucent, transparent, light source, visible spectrum, prism, ray, image

EARTH AND SPACE

Year 5/6

Sun, Moon, Earth, planet, solar system

rotation, day and night, star, sphere, orbit, sundial

axis, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto

ANIMALS INCLUDING HUMANS

Year 1/2

fish, amphibians, mammals, reptiles, birds

carnivores, herbivores, omnivores,

baby, toddler, child, teenager, adult

egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog

animals, survival (water, food, and air)

exercise, hygiene, healthy diet, germs

head, neck, arms, elbows, legs, knees, ears, eyes, hair, teeth, mouth

Year 3/4

nutrition

skeletons, muscles, support, protection, movement

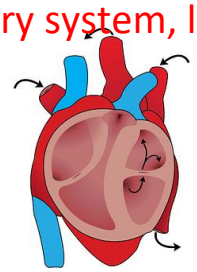
digestive system, human teeth, oesophagus, stomach, large and small intestine

food chains, producers, predators, prey

carnivores, herbivores

Year 5/6

heart, blood vessels, circulatory system, lifestyle, aorta, vein, artery, carbon dioxide, oxygen, nutrients



puberty gestation period

diet, exercise, drugs

ROCKS

Year 3/4

fossil, grains, crystals

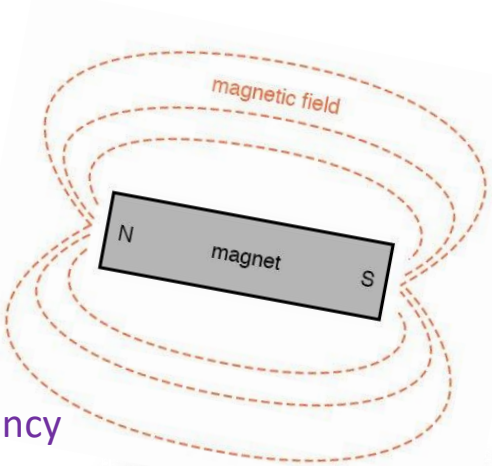
sedimentary rock, soil, permeable, impermeable, erosion

Science

EVOLUTION AND INHERITANCE

Year 5/6 Charles Darwin, adaptation, evolution, offspring, inheritance, variations, habitat, environment, characteristics

FORCES AND MAGNETS



Year 3/4

repel, attract, magnetic, north pole, south pole

Year 5/6

gravity, air resistance, water resistance, friction

lever, pulley, inertia, Isaac Newton, upthrust, buoyancy

SEASONAL CHANGES

Year 1/2

day, night, light, dark, weather, rain, sunshine, snow

summer, winter, autumn, spring, season, months of the year, seasons

LIVING THINGS AND THEIR HABITATS

Year 1/2

living, dead, never alive,

habitat, micro-habitat (e.g. woodlice under a stone), coastal, urban, woodland, pond

food chain (e.g. grass, cow, human)

Year 3/4

living things, classification keys

local environment, wider environment, habitat, seashore, woodland, nature reserves, ecologically planned parks, or garden ponds

negative effects of population and development, litter or deforestation

Science

parks, or garden ponds

group vertebrate animals such as fish, amphibians, reptiles, birds, and mammals

group invertebrates such as snails and slugs, worms, spiders, and insects

Year 5/6

sexual reproduction, mammals, life cycle

sexual and asexual reproduction in plants photosynthesis, pollination, germination, fertilization, chlorophyll

insect, classification, microorganisms,

WORKING SCIENTIFICALLY

Year 1/2

asking simple questions, equipment, observe, observing closely, identifying, classifying, sort, diagram, compare, data, perform simple tests

Year 3/4

make careful observations, bar charts, tables, evidence, setting up a fair test, comparative test, labelled diagrams, experiment, make predictions, apparatus, investigate, draw simple conclusions, explanations, taking accurate measurements, thermometer, secondary sources, interpret, data loggers, identifying differences, similarities or changes

Year 5/6

hypothesis, taking measurements with accuracy and precision, taking repeat readings, variables, classification, develop keys to identify, classify and describe living things and materials, systematic, pattern, causal relationship, line graph, scientific diagram, repeat readings, enquiries, scatter graphs