Science Progression of skills 2025-26 Substantive knowledge

Animals, including Humans						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Prior Learning: Identify and name some different animals.	Prior Learning: understand how to take care of animals taken from their local environment and the need to return them safely after study. Pupils should become familiar with the common names of some animals including those that are kept as pets.	Prior Learning: The basic needs of animals for survival, as well as the importance of exercise and nutrition for humans	Prior Learning: the importance of nutrition; introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.	This year is about life cycles and reproduction.	Prior Learning: Y5- Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty.
Big Question:	Big Question: How do animals survive?	Big Question: What is the life cycle of an animal?	Big Question: Why do we have a skeleton?	Big Question: How does the body get nutrients from food into the bloodstream?	Scientists: Jane Goodall and David Attenborough	Big Question: How do we stay alive?
This year is about **observing animals**	This year is about the structure of the body.	This year is about requirements for healthy living.	This year looks more closely at healthy nutrition in animals.	This year focuses on how the body processes food	Big Question: Do all lifecycles looks the same?	This year focuses on healthy lifestyle.
Scientists-	Scientists- Leonardo Da Vinci, Mulier Hutchinson, Joan Beauchamp Procter and Patricia Bath	Scientists- Florence Nightingale, Elizabeth Garrett Anderson, Dr Kelly Blacklock, Daniella Dos Santos.	Scientists- Wilhelm Roentgen, Marie Curie, Adelle Davis, Michelle Williams	Scientists- William Beaumont, Washington and Lucius Sheffield, Paul Sharpe.	Progression of Skills: 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	Scientists- Richard Doll
Progression of Skills: Reception will give children the chance to learn about different animals through stories and real life experiences. In Summer term they will have observed chicks hatching from eggs. They will:	Progression of Skills: 1, Prior learning recap 2, Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 3, Identify and name a variety of common animals that are carnivores, herbivores and omnivores. 4, Describe and compare the structure of a variety of	Progression of Skills: 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	Progression of Skills: 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	Progression of Skills: 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	Problem solving ideas:	Progression of Skills: - 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

-Understand the key features of the life cycle of a plant and an animal -Observe animals and living things - Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.	common animals (fish, amphibians, reptiles, birds and mammals including pets) 5. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense					water are transported within animals, including humans
Problem solving ideas:	**Problem solving ideas:** Sorting pictures of animals into the 5 different groups. Hunt for snails around the school. Keep a food diary- do all animals eat the same food? Watch a video of an animal hunting/fleeing- how do these animals move? Explore local area- create simple food chain from what is found. Senses- taste test- different flavoured jellies with the colour not matching the taste. Create a camouflage coat for a teddy to hide in a part of the school.	**Problem solving ideas:** Construct a large bar chart for the wall of a person's height against ages. Add in details of the class, teachers, parents and grandparents. Children use this to try and work out at what age people typically stop growing and relate this to when they are able to reproduce and why humans need to be big in order to have babies. Create a large timeline on the wall from 0-100 years. Children bring in pictures of pets their parents had when they were younger with information about how old the pet was when it died. Hang the pets on the timeline at the age they were when they died.	**Problem solving ideas:** Compare X-rays of different animals. X-rays to identify broken and healed bones. How does the length of a bone affect its bending strength and compressional strength? How does the diameter of a bone affect its bending strength and compressional strength? Consider why some bones might need to be stronger than others? Fill in an empty torso. Draw around their hand and add in the bones and joints. Give chicken bones not assembled- predict what each bone does- compare to a completed skeleton. Show video footage of an animal moving- predict what	**Problem solving ideas:** Provide children with a variety of different foods and they predict what nutrients they provide. Show them the food labels to check their ideas. Children keep a food diary for a day and then check tally up how much of each food group was in their diet. How does this compare with a healthy diet? Compare the diets of athletes with different demands eg. cyclists and sprinters, marathon runners and weightlifters. How are they different and why? Give information about the poor diet of someone who is trying to be super skinny, predict the effects on the person's health and body. Children keep a food diary for what they ate the	**Problem solving ideas:** How does the size of a person affect their lung capacity? Candles need oxygen to burn. How is the time a candle burns affected by the number of times I have breathed in and out the air that it burns in? Children draw a diagram to show how they think blood moves around the body to the muscles to ensure they get what they need? How does the size of the muscle we exercise affect our pulse rate? How does sustained, gentle exercise affect our pulse rate? Use the model to predict the body wide symptoms of:	**Problem solving ideas:**

		Do the same for great grandparents (or a relative that died long before the child was born). Children use the timeline to try and spot any patterns for how long animals live (e.g., do bigger animals live longer?). Show children some examples of animals they don't know (e.g., uncle, elephant, cesere mice, chimpanzees) and ask them to predict how long they might carry their young for. Construct simple food chains.	their skeleton looks like. (dolphin)	previous day. Provide a large torso outline and ask children to annotate what has happened to the food they ate the previous afternoon and evening. After washing hands children see their teeth, describe what they are like, then look in a mirror and draw them. They then eat a variety of foods; identifying which teeth they use and hypothesise which teeth do which job. Show pictures or fossils of animals' teeth and jaws, predict what the animal eats. What liquids make teeth rot? (Use marble chips rather than eggshells as they fizz gently in lemon juice and acid). (This is interesting because sugar does not corrode teeth, only acids do. Sugar does result in tooth decay because bacteria in the mouth eat sugar and excrete acid; it is the acid that corrodes teeth). Construct a food chain from animals' teeth found in the local area (or ones you have bought) Bread is a carbohydrate and so provides our muscles with energy, but it needs to dissolve in the blood before	1. A disease that reduces the lungs' ability to transfer oxygen to the blood. 2. A disease that restricts the amount of blood that can flow around the body. How might the circulatory system be different for an elephant or a hummingbird? Does your exhaled air always contain the same amount of oxygen or does exercise change this? (Use the burning candles in jars test) How might doing exercise at the top of a mountain affect the body (less air at altitude)	

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				It can be transported to the muscles. Where in the body does this happen? Does chewing make it dissolve? Does chewing with saliva make is dissolve? Does mixing with acid make it dissolve? They can test all of these things. The point is that one of these things causes bread to dissolve, this happens in the intestines. (They don't need to know how is happens just that this is where it does)		
Future Learning:	Future Learning: Y2- the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans	Future Learning:	Future Learning:	Future Learning:	Future Learning:	Future Learning:
Key Vocabulary	Key Vocabulary *Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak*	Key Vocabulary	Key Vocabulary	Key Vocabulary	Key Vocabulary	Key Vocabulary

Living things and their habitats				
EYFS	Year 2	Year 4	Year 5	Year 6
Prior Knowledge:	Prior Knowledge:	Prior Knowledge:	Prior Knowledge:	Prior Knowledge:

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This year is about **observing animals** and their **own needs**.	This year is about **habitats** and what they **provide**.	This year is about **classification** and understanding that **environments** can **change** and animals adapt to this.		This year is about **classifying** living things including microorganisms.
Scientists:	Scientists- William Kirby, Prem Singh Gill, Dawood Qureshi	Scientists- Jacques Cousteau, Rachel Carson, Wangari Maathai, Kelsey Archer-Barrhil and Liz Bonnin		Scientists: Carl Linnaeus, Agnes Arber, Hu Xiansu and Beatrix Potter
Big Question:	Big Question: What is a habitat?	Big Question: What is classification?		Big Question: Are all bacteria harmful?
Progression of Skills:	Progression of Skills: 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	Progression of Skills: 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		Progression of Skills: 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
Problem solving ideas:	Problem solving ideas: Introduce a wide range of habitats- compare and discuss. Look at the local habitat. Monitor an area over time- place a big bit of wood and check underneath.	Problem solving ideas: Learn that a dichotomous key (a branching classification key in which each question has exactly two answers) can be used to identify organisms. Children learn about 5 different groups of vertebrate animals - fish, amphibians, reptiles, bird, and mammals - and how we can identify them from their body features, behaviour, and life cycles		Problem solving ideas:

		Use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals. Look for patterns between the size of an animal and its expected life span. Give the children data about the gestation period of different animals and ask them to look for patterns. Investigate your school grounds/ local area and draw pictures of 8 different organisms. Create their own classification key by repeatedly asking dichotomous questions (with exactly two answers) splitting the group up until each group only has one member. They discuss the best sort of questions to ask when making a classification key. Select a habitat in your school grounds/local environment. Children draw a picture of how it appears now, and describe or measure the weather, temperature and hours of daylight. They predict what the habitat will look like in 6 months' time and identify any changes that might take place. If possible, children revisit the site in 6 months and investigate the habitat as it actually appears.		
Future Learning: Y2- Different animals and plants live in different types of environments	Future Learning: Y4-. They should identify how the habitat changes throughout the year.	Future Learning: Y5- observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment	Future Learning: Year 6- broad groupings, such as micro-organisms, plants and animals can be subdivided	Future Learning: Understanding of classification and living things as a foundation for Biology and secondary school.

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Key Vocabulary *Wash, grow,*	Key Vocabulary *Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert*	Key Vocabulary *Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats*	Key Vocabulary *Mammal, Reproduction, Insect, Amphibian, Bird, Offspring, Classification, Vertebrates, Invertebrates, Microorganisms, Amphibians, Reptiles, Mammals, Insects*	Key Vocabulary *Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics*

Plants			
EYFS	Year 1	Year 2	Year 3
Prior Knowledge:	Prior Learning: Children will have observed plants and identified them in their environment	Prior Learning: **Children will be able to classify and identify common plants and trees**	Prior Learning: **How seeds and bulbs grown into mature plants with light, water and a suitable temperature.**
This year is *about observing plants.*	This year is about *careful observation of the parts of plants*	This year is about *the conditions plants need in order to grow*	This year is about *the functions of the different parts of plants.*
Scientists	Scientists Maria Sibylla Merian.	Scientists Daniel Solander, Joseph Banks, Thomas Wyatt Turner, Poppy Okotcha, Dr Ben Woodcock and Angie Burnett	Scientists Jan Ingenhousz, Carl Linnaeus, Charles Henry Turner, Jagadish Chandra Bose, George Washington Carver and Dr Kesey Byers
Big Question:	**Big Question** - How do plants grow?	**Big Question** - How are new plants made and how do they act?	**Big Question** - How do plants reproduce?
Progression of Skills: Children will have the opportunity to observe plants in their environment. They will look at plants that are food and observe plants growing from seeds. They will also observe what happens if you don't look after a plant. They will learn how to: - Explore the natural world around them, making observations and drawing pictures of animals and plants - Plant seeds and care for growing plants.	Progression of Skills: 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	Progression of Skills: 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	Progression of Skills: 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

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Problem solving ideas:	Problem solving ideas: Provide a range of seeds, bulbs and objects that look similar. Children predict if they are real and plan how they could check. Go on a seed hunt and plant what they find. Plant beans in a bag so you can see it germinate. Change conditions for mustard/cress. (How does the amount of light/warmth affect how well my plant grows?) (What are the perfect conditions for my cress to grow?) Which direction do shoots and roots go after germination? How long does a stem need to be before it produces leaves? If plants need water, could we grow cress in water by no soil? Do all plants have roots? Do all plants have leaves? If plants need water to grow, then surely the more the better- How does the amount of water affect how well a plant grows?	Problem solving ideas: Grow some flowers. Flower walk. Does cress produce seeds? Do all plants produce flowers and seeds? What happens to the parts after they have flowered? Daffodil investigation How does the amount of light affect how well a plant grows? Do plants take in water through their roots alone, their leaves or both leaves and roots? How could you find out? Do all plants prefer the same type of soil? How is the growth of a plant affected by removing different amounts of leaves? If we stop gases from getting in and out of leaves what will happen? How can we find out? If you set up a sealed glass dome containing damp soil, normal air and some small flowering plants, what would you predict to happen over a long period of time?	Problem solving ideas: Let children dissect a flower (lilies and daffodils are good) and identify the parts of the flower. If possible, use a microscope to observe the pollen. Children can draw and label each part of the flower as they dissect it. Bring in as many different flowers as possible, including grasses and trees. Children try and work out if they are wind or insect pollinated. They could check their predictions using the internet. Leave a tub of compost outside and let weeds develop. Where did they come from? Were the seeds already in the compost or have they come from elsewhere? Plan and carry out an investigation to find out. Collect as many different 'helicopter' seeds as possible and ask which ones would be due to go further (will need to explain that the longer it takes to fall the further the wind could blow them). Draw out questions like 'how does the wing length affect how long it takes to fall. This could be investigated with real seeds or modelling it with paper helicopters. Investigate the right conditions for germination. Plants grow best when they are damp, warm and in light. Is this true for seed germination? What is the relationship between seed size and plant growth rate? Plan and carry out investigations to test your ideas.
Purpose is to understand what is meant by a plant.	Future Learning: That plants need water, light and a suitable temperature to grow.	Future Learning: The relationship between the structure and function of plants.	Future Learning: Understanding of plants and how they grown ready for Biology in secondary school.
Key vocabulary: *leaves, flowers, trunk, seed*	*Key vocabulary:* *Deciduous, evergreen*	*Key vocabulary:* *bulb, mature, conditions* *Names of plants and trees*	*Key vocabulary:* *nutrients, pollination, seed dispersal, seed formation*

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	Plant structures, petals, fruit, roots, bulb, branches, stem *Names of plants and trees*		

Materials and Rocks					
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
Prior Knowledge:	Prior Learning: Looked and explored different materials. Children will be able to talk about how different materials feel.	Prior Learning: That objects are made of different materials and that they can be described as being hard/soft, bendy/ stretchy etc	Prior Learning: Y1- Digging for bones fossil topic.	Prior Learning: Y2 – Suitability of a material and its purpose. How objects can change shape.	Prior Learning: Y4- Some materials change state when they are heated or cooled. What is meant by condensation and evaporation.
This year is about exploring materials.	This year is about properties of materials.	This year is about the suitability of a material for its purpose and how objects can change shape.	This topic focus is all about the composition and formation of rocks and soil.	This year focuses on states of matter connected to the water cycle	This year is about reversible and irreversible changes.
Scientists	Scientists Chester Greenwood and Becky Schroeder	Scientists Charles Macintosh, John McAdam, Victoria Callaghan, Dr Peal Agyakwa	Scientists - William Smith, James Hutton, Florence Bascom, Arjana Khatwa, Brianna Green.	Scientists Joseph Priestly, Carl William Scheele, Daniel Fahrenheit, Anders Celsius, John Boyd Dunlop	Scientists Spencer Silver and Arthur Fry, Ruth Benerito, Ancre Geim, Konstantin Novoselov, Jamie Garcia and Raquel Prado.
Big Question:	Big Question – How can we describe materials?	Big Question – Why do we choose materials to do a certain job?	Big Question: What is the earth made from?	Big Question – How can I identify materials based on their properties?	Big Question- What are mixtures and how can they be separated? How are new substances made?

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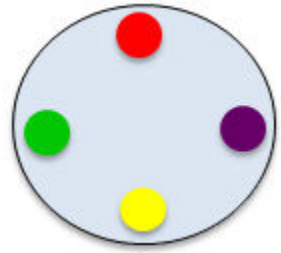
Progression of Skills:	Progression of Skills: Distinguish between an object and the material from which it is made • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • Describe the simple physical properties of a variety of everyday materials • Compare and group together a variety of everyday materials on the basis of their simple physical properties	Progression of Skills: 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	Progression of skills: 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 • Recognise that soils are made from rocks and organic matter	Progression of Skills: 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	Progression of Skills: 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
Problem solving ideas:	Problem solving ideas: Sort materials based on different criteria. Sense bag- guess what is in there based on how it feels. Investigation 3 Little Pigs have delivered materials for us to build a house. Which can we use? Children to describe what it looks like using scientific terminology.	Problem solving ideas: the least crumbly? Which material absorb the most water? Which type of brick would be the easiest to drag to make a pyramid? Which material would be the strongest to use as a floor tile? Which fabric would make the softest blanket?	**Problem solving ideas:** Present children with a selection of rocks, using hand lenses etc, they can group them into sedimentary and igneous/metamorphic based upon if they have grains/crystals/fossils/metals inside them. Is there a way they could differentiate between the	Problem solving ideas: Classify solids, liquids and gases- include powders, gels, foams and bun tak/play dough. How do the amount of water added to flour affect its state? Put a series of liquids into order of viscosity. Spray perfume or water (children don't know which) at one end of the room and they raise their hands when they can smell it.	Problem solving ideas: Give a range of mixtures and ask children to say what substances they think are in each. If they can't tell, allow them to say that (Sensible mixtures: flour and currants, sand and stones, sand and salt, rice punch paper bits and sand, water and salt, water and oil). Place skittles in a shallow flat saucer so that water comes halfway up them.

		Which material would absorb the most? (nappies investigation) What liquid is the slipperiest? Which wrapping paper is the strongest? Waterproof investigation	Igneous and metamorphic rocks based on their visual properties? *Which rock type is the most porous?* *Which type of cliff would be best for a caveman's cave?* Take some soil from the grounds of the school or source from elsewhere. Place the soil into an empty 1.5 or 2-litre drinks bottle and add some water. Shake the bottle vigorously. Leave to settle for an hour and then use a magnifying glass to observe and describe the different layers of materials. Can they identify and find: grains for rock and larger grains (e.g., sand) and heavier stones? Can they explain why it settled into layers like this? Can they see any humus? Are there any creatures in there? *Which type of soil allows the most water to pass through it?*	They then **draw diagrams** of their choice to show what happened to the smell (gas) and **explain the pattern** of its movement. Water cycle- demonstrate by melting ice, heating water and showing the steam drip off of a cold surface. The council puts salt on ice and snow to melt it. How does the material sprinkled on ice and snow affect how quickly it melts? What is the freezing temperature of water? (Mixing ice and salt produce mixtures that can be as cold as -15°C and make good baths for freezing water in). Does the **volume** of water affect the temperature at which it freezes? Chocolate smugglers. Children have been trying to smuggle chocolate into class by putting it in their pockets, but it always ends up as a squidgy, liquid mess. What chocolate would be best to smuggle? How does the type of chocolate affect its melting temperature? Give children a range of substances and ask them to put them in order of what they think their melting temperatures may be. Include metals, rocks, and	Children predict what will happen. Set and leave without touching Wet clay ---> air-dried clay ---> fired clay. Flour and water ---> dough ---> bread Add sugar to fizzy water: it fizzes up. Has a new substance been made? (No, the gas was dissolved in the water and adding sugar made it become undissolved) Add baking powder to vinegar, it fizzes up. Has a new substance been made? (Yes, the gas was not in the vinegar as it wasn't fizzy, so it must have been made) Add water to instant snow. Use lemon juice as an invisible ink, heating gently makes the ink visible. Is this a new substance? When water is added to jelly and it is set, is it a new substance?  How does the amount of water used affect how much sugar will dissolve in it? Children will select the right separation technique for each of the following activity

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				oils. Can they estimate the melting temperatures? What is the melting temperature of ice and how does it compare with the freezing temperature of water? Is the melting temperature of wax the same as its freezing temperature? What do we think will happen to an ice cube if it is left out for a few days? What do we think would happen to a lump of wax and why is there a difference?	Plastic covered steel wire from strands of string and plastic. Separate out the bits of wood from stones and sand in soil. Get salt and sand from a salty sandy mixture Making a solar still to obtain clean water from dirty water. https://teachbesideme.com/simple-science-making-solar-still/ Warm weather is best or under hot lamps
Purpose is to understand materials and how they feel.	Future Learning: Compare two materials and decide which is the most suitable for a particular situation. Explore how the shapes of objects can be changed	Future Learning: Group materials into states of matter. Changes of states of matter. Observe and record evaporation and condensation	Future Learning Y5- Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets explain day and night Y6- Evolution of animals and plants	Future Learning: Reversible and irreversible changes and how these impact out lives.	Future Learning: Understand of materials and states of matter to form a basis for Chemistry in secondary school.
Key vocabulary: *object, material*	*Key vocabulary:* *wood, metal, plastic, glass, properties, ceramic, suitable, purpose*	*Key vocabulary:* *Squashing, bending, twisting, stretching, waterproof,*	*Key vocabulary:* *Fossils, Soils, Sandstone, Granite,* *Marble, Pumice, Crystals, sedimentary, metamorphic, igneous,* *absorbent/porous, durable, permeable, impermeable*	*Key vocabulary:* *Solid, liquid, gas, evaporate, condensate, state of matter*	*Key vocabulary:* *Hardness, solubility, transparency, conductivity (electrical and thermal), response to magnets*

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Electricity	
Year 4	Year 6
Prior Knowledge:	Prior Learning: Construct a simple circuit. Draw a circuit as a pictorial representation
This year focuses on constructing complete and simple circuits.	This year focuses on an understanding of voltage and controlling elements of a circuit.
Scientists Thomas Edison, Joseph Swan, Lewis Howard Latimer, Ronit Kanwar, William Kamkwamba, Kubera Igbot	Scientists Nikola Tesla, Alessandro Volta, Mildred Dresselhaus
Big Question – What are electrical circuits and how do they work?	Big Question – How can electric circuits be controlled?
Progression of Skills: 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	Progression of Skills: 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
Problem solving ideas: Identify and name devices and justify if it is mains or battery powered and if battery powered, find it. Give children a range of different battery powered devices and ask them to predict how the battery would need to be different- is there any relationship between device size and size /size /number of batteries needed First explicitly instruct children on how circuits are connected. Model this carefully using the same equipment they will use. Then give children some broken circuits and they have to identify what is wrong with each one and how they can make it work. Then challenge children to build a number of different circuits	Problem solving ideas: How does the number of lamps in a circuit affect how long a battery lasts? How does the length of time I leave the current flowing affect the brightness of the bulb? How does the length of a wire affect how bright a bulb is? Does the type of wire used in a circuit affect the resistance?

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Investigate how the number of batteries added to the circuit affects a device? Investigation question: *Does doubling the number of batteries in a circuit double the brightness of a bulb?* A lux meter could be used to collect data regarding brightness of bulbs as more batteries are added (Lux meters are found in the app store and are free) Provide children with a battery and a bulb and a selection of different materials that are insulators or conductors. Children will have to try and make a circuit to power the bulb using each material and create a list of those which they think are conductors and those which are not. Question them about and similarities between the groups, e.g., most conductors are metals, and most insulators are non-metals	
Future Learning: Y6- Draw simple circuits using recognised symbols Construct simple series circuits to help answer questions.	Future Learning: Understanding of electricity and circuits as a foundation to physics at secondary school.
Key vocabulary: Cells, Wires, Bulbs, Battery, Circuit,	*Key vocabulary: Series, Conductors, Insulators, brightness, Switches, Buzzers,*

Seasonal Changes and Earth and Space		
EYFS	Year 1	Year 5
	Prior Learning: YR- We have different seasons and that it makes the world around us change.	Prior Learning: Y1-observe and talk about changes in the weather and the seasons.
This year focuses on **exploring the world** around them.	*This year focuses on **naming the different seasons** and **how the weather changes** with them.*	This term focusses on the **movement of the planets** and why we have **night and day.**
Scientists	Jim Cantore	Claudius Ptolemaeus, Nicolaus Copernicus, Galileo Galilei, Johannes Kepler, Neil Armstrong, Margaret Hamilton, Caroline Herschel, Valentina Tereshkova, Mae Jamison, Dr Claudia Alexander, Maggie Adrein-Pocock, Helen Sharman and Tim Peake.
Big Question:	Big Question: Do seasons affect habitats?	Big Question – What is Earth's address in space?
Progression of Skills:	Progression of Skills: Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies	Progression of Skills: 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

Science Progression of skills 2025-26 Substantive knowledge

Problem solving ideas:	Problem solving ideas: What animals hibernate and why? Choose an area to study over time.	Problem solving ideas: redict and explain how the temperature of each planet may vary. Use calc to check and then consider which planets could possibly host life (it must contain liquid water for at least some time) Predict how long each planetary year might be and compare with data. Use the software below to show the solar system on screen. As children to consider why Pluto was changed from a planet to a dwarf plant in 2006 https://www.solarsystemscope.com/ How does the distance from a light source affect how much light hits an object? Apply this to the solar system and predict how much light each planet receives. Lux meters (free app from app store) could be used to take accurate measurements of light. Does having more moons result in more light hitting a planet? How could you test this idea? Investigate moon craters. How does the speed / size of a meteorite affect the size of a moon crater formed? Sand trays and balls work well. Craters should be measured purposely, and each size balled repeated. If the moon became nearer as a result of meteorite collisions what would happen to its position relative to the Earth? Imagine that somewhere in the universe is a vast (bigger than the solar system) cloud of dust of varying sizes but and varying distances apart. What might happen to this cloud over many years? (This can be modelled using a handful of pom poms of varying sizes randomly dropped onto a table) Consider a spacecraft travelling from the Earth to the moon. Predict the forces acting on the craft at various stages in its journey. (The mass of the earth is 80 x that of the moon) If the mass of the earth is 80x that of the moon, why is the gravity at the Earth's surface only 6 x greater than that at the surface of the moon?
Future Learning:	Future Learning Y5- Why we have night and day and how movement of the planets changes the seasons.	Future Learning KS3- gravity forces between the Earth and Moon Lightyear as a unit of astronomical distance

Science Progression of skills 2025-26 Substantive knowledge

Key Vocabulary	*Key vocabulary:* *Summer, Spring,* *Autumn, Winter, Sun,* *Day, Moon, Night,* *Light, Dark*	*Key vocabulary:* *Earth, Sun, Moon, Axis,* *Rotation, Day, Night, Phases of* *the Moon, star, constellation,* *waxing, waning, full, new,* *year, month,*

Science Progression of skills 2025-26 Substantive knowledge

Light and Sound			
EYFS	Year 3	Year 4	Year 6
Prior Knowledge:	**Prior Learning:** None for science. Sound learning through music	**Prior Learning:** Y3- What happens when light reflects off a mirror or other reflective surface	**Prior Learning:** Y3- What happens when light reflects off a mirror or other reflective surface Y4- How sound is formed and the pattern associated with volume
	This year is about **sunlight** and **shadows**	This year is about **how sound is made, heard** and **how it travels.**	This year is about **light travelling in straight lines**
Scientists	Scientists Percy Shaw	Scientists Aristotle, Isaac Newton	Scientists Euclid, Ibn Al-Haytham (Alhazen), Ibn Sahl.
Big Question:	**Big Question** – Why can you see your reflection in a mirror but not the floor?	**Big Question** – How is sound produced?	**Big Question** – Why does my shadow change length?
Progression of Skills:	Progression of Skills: • 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	Progression of Skills: Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sources 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	Progression of Skills: Recognise that light travels 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.
Problem solving ideas:	Problem solving ideas: The shiny coin problem. A coin is lost. What would be the best way to find it, turn out the lights and see it shine or use a torch to see it reflect? How does the distance from a light source affect how bright it looks? How does being in darkness affect your sense of hearing? Is this how **nocturnal** animals survive?	Problem solving ideas: Given a variety of objects (e.g., water in bottles, elastic bands, rulers, tuning forks, those wind-up music box things). Children try and change the pitch of the notes and try and summarise what they have found. How does the size of an ear trumpet affect the volume of sound detected? Investigate -How does the volume of sound change with distance? How does the type of material affect how well it blocks sound? How does the thickness of a material affect how well it blocks sound?	Problem solving ideas: Drawing upon ideas about light taught in years 3 or 4: a) How does the size of an object affect the size of the shadow? b) How does the distance between the light and the object affect the size of the shadow? c) How does the distance between the object and the screen affect the size of the shadow? How would a solar eclipse be different if:

Science Progression of skills 2025-26 Substantive knowledge

	Give children lots of objects and a torch and they decide if they are transparent, opaque, translucent or reflective (Do they notice that many materials exhibit more than one property or partial properties? Encourage them to think about how they might display this information). What colour would be best to make a safety jacket from? How does the colour of a material affect how reflective it is? How many pieces of tracing paper are as translucent as a single piece of white paper? Or How does the thickness or colour of a material affect how much light can pass through it? Linked to How does the thickness or colour of a material affect how much light can pass through it? How does the size of a candle affect its brightness? How does the shape of a mirror affect how the light reflects? How does polishing a piece of dirty metal affect how light behaves when it hits it?	Which materials make the best string telephone components? Tin cans, plastic cups, paper cups; or for the cable wire, string or elastic. Predict and test. Blow up a balloon with a 10p coin inside it. Swirl the balloon so the coin rolls around the inside (not slides). See clip https://www.youtube.com/watch?v=aAMW_3kWUhE Challenge children to use their knowledge of pitch and volume to investigate what made the squealing noise. Make a straw oboe. See clip https://www.youtube.com/watch?v=yCmXhDZhcKQ There are many exciting investigations this can be used for, a simple one is how does the length of the tube affect the pitch and volume? A frequency counter app is available in the app store for precise measurements of frequency. Partially fill a glass bottle (or use test tubes) with water. Tap it to make a sound and blow across it to make a sound. What is vibrating to make the sound in each case? Plan and carry out an investigation to find out.	a) The moon was a different size? b) The earth spun faster or slower? c) The sun was larger or smaller. d) If the earth and moon were the same size but further away in the solar system. Two trees in a field, one in front of the other as below.  Predict if where the shadows overlap will be darker, lighter or the same as where they don't and plan an investigation to find out. (Give them cards and a torch). To what extent is a solid card a good model for a tree? Adapt the experiment to make it a better model; does this affect your conclusion? How does the amount aluminium foil is scrunched affect how much light is scattered? How does the amount of polishing affect how well a piece of metal scatters light? How perfect are our mirrors? Do some scatter more light than others? What happens to light when it is shone through water? How is the affected by putting glitter in the water, or salt in the water, or talc in the water? How does the eye adapt to different light conditions? Predict how nocturnal animals are adapted to living in low light conditions, check predictions through research. Set up some mirrors so you can see a candle that is hidden behind several corners.

			Give children a periscope that doesn't work very well, they work out what is wrong and try to correct it.
Future Learning:	Future Learning: Y4-How sound is formed and the pattern associated with volume Y6-exploring the way that light behaves, including light sources, reflection and shadows.	Future Learning Y6-exploring the way that light behaves, including light sources, reflection and shadows.	Future Learning: KS3:Transmission of light through materials and the difference between light waves and waves in matter.
Key Vocabulary	Future Learning: KS3:Transmission of light through materials and the difference between light waves and waves in matter.	*Key vocabulary:* *Volume, Vibration, Wave, Pitch, Tone, Speaker*	*Key vocabulary:* *Reflective, light source, cast*

Forces and magnets		
EYFS	Year 3	Year 5
Prior Knowledge:	Prior Learning: Exploring with pushes and pulls. Investigate	Prior Learning: Magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary.

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	This year looks at the **behaviour** and **everyday uses of different magnets.**	This year looks at how **different forces** can cause the **speed of moving objects to change.**
	Scientists- - Leonardo Da Vinci, Eric Laithwaite	Scientists- Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. Archimedes and water resistance. George Cayley, Brahmagupta
Big Question:	**Big Question** – What is a magnet?	**Big Question** – How and why do things move?
Progression of Skills:	Progression of Skills: Compare how things move on different surfaces · Notice that some forces need contact between 2 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 2 poles · predict whether 2 magnets will attract or repel each other, depending on which poles are facing	Progression of Skills: 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
Problem solving ideas:	**Problem Solving** Magnet hunt Can I make a magnetic material non-magnetic? How far away does a magnet need to be before it attracts a magnetic material? Is repulsive force the same? How is the magnetic attraction or repulsion force affected by putting materials between the magnets? Are bigger magnets stronger? How could you use the magnets to measure the number of pages in a book?	**Problem Solving** How does the saltiness (salinity) of water affect water resistance? How does the length of a paper helicopter's wings affect the time it takes to fall? How does changing the shape of a piece of plasticine affect water resistance? How does adding holes to a parachute affect the time it takes to fall? How does the amount / depth of tread affect the friction between a shoe and a surface (**model this with a material they can change the tread on rather than a real shoe**)? Is the same conclusion reached if the surface is rough and smooth? Modern racing cars have very wide tyres; is this to improve grip? How does surface area affect friction? Putting small granules (cous cous is effective) under a block allows it to be dragged more easily. How does the amount of couscous affect the friction?

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		How does the type of liquid put between two surfaces affect the friction between them? How does the roughness of a surface affect the effectiveness of a lubricant in reducing friction? How can we use levers to lift heavy objects? How do see-saws work? Can you create a pulley system to lift a given load? Two single pulleys, cord (nylon if possible), force meter (measuring up to approximately 2.5 Newtons or 250g), weight (e.g., a 500 ml plastic bottle with about 200 mls of water in it to make it heavier), ruler, narrow round stick (e.g., bamboo or dowelling) to attach
Future Learning:	Future Learning: Y6-How different forces can cause the speed of moving objects to change.	Future Learning: KS3- Earth's magnetism, compass and navigation and the magnetic fields.
Key Vocabulary	*Key vocabulary:* *Magnetic, Force, Contact, Attract, Repel, Friction, Poles.*	*Key vocabulary :Air resistance, Water, resistance, Friction, Gravity,Newton, Gears, Pulleys, lever,force, pivot (fulcrum)*

Evolution and inheritance
Year 6
Prior Learning: Rocks in Y4 and Fossils from Y1 History curriculum Y1-observe and talk about changes in the weather and the seasons.
Scientists **Charles Darwin, Alfred Wallace, Nettie Stevens and Telma Laurentino.**
What is evolution and how did it happen?
Progression of Skills: · 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

Science Progression of skills 2025-26 Substantive knowledge

Problem solving ideas: Children could create a table of characteristics within their own class. Group themselves by height, hair colour, can they roll their tongue, do they have widow's peak, attached earlobes etc. They could then display this information as a poster on the variation within class butterfly etc.

Some traits are inherited, and others are not. Children do research to try and work out if the following traits are inherited or not: earlobe attachment, hand clasping (when you link your fingers in a hand clasp which thumb do you place over the other?), cheek dimples, cleft chin, ability to remember random numbers, how far you can stand jump, widows peak, tongue rolling.

Show children a picture of the human ancestor "Lucy" Australopithecus

Problem Solving

afarensis.

Lucy was the first of our ancestors to walk mostly on two legs. Ask children to develop ideas as to why walking on two legs would be an advantage and be selected for by Natural selection and still be with us today. (Actual answer is that it is more efficient so it saves energy which can be used for more reproduction and keeps population numbers up. But it also led to freeing up hands for tool development and the chest muscles to develop speech and language). Lucy is an example of a transitional fossil showing the evolution from ape to human

Then show pictures of the fossil Archaeopteryx.

Ask children to look closely at the features in the fossil. Is it a fossil of a bird or of a dinosaur? Draw out the ideas. You could show a photo of a bird skeleton and a dinosaur skeleton to aid this discussion.

Points to note are that it has features of both. It is another example of a transitional fossil. Showing how dinosaurs evolved into birds. It has teeth and a tail but also has feathers and a beak.

Children research and produce a display/oral presentation and different aspects of Darwin's Life.

Before Darwin- Lamarck's idea

Darwin's childhood and education

Darwin's 5-year voyage on The HMS Beagle

Darwin's home in Down and his family

Darwin and Alfred Wallace.

Darwin's Idea, his book and why it's a better explanation than Lamarck's

Science Progression of skills 2025-26 Substantive knowledge

Fossils

Construct a large timeline along the class wall covering the last 4.8 billion years. Add to this timeline key events eg., when life first appeared; when plants first appeared; when dinosaurs appeared and became extinct. Give groups an organism to research; how it has evolved and any fossil evidence for it and hang this information from the timeline.

Getting children to understand just how long geological time is, is tricky, but a good model is that if all of geological time was condensed to the height of an adult the length of time humans have been on Earth for would be the thickness of one hair on their head. Complex life wouldn't have appeared until around the top of the nose.

If you have some fossils, then get them out for children to look at closely. (If not print off some pictures of different fossils, (ammonites, trilobites.) Can they identify any features on them that are similar to animals/plants alive today? Have those features changed in today's animals? What type of fossil is it? A body part turned to stone or an imprint?

They could make drawings in their books (*linking science to art here as there is a bigger connection than most realise*) Show some real scientific drawings of fossils before they do theirs. They could research information about the fossil to annotate their drawing with.

The process of fossil formation can be modelled using plasticine and plaster of paris

Press seashells, pinecones and other objects into the plasticine to create the mould. Then fill the mould with plaster of paris and allow to set over the next 24 hours. Whilst doing this, children could create a flow diagram of this process of fossil formation and then compare it to other methods (whole body parts buried and turn to stone)

Give children a selection of images of animals, plants, fungi.

Ask them to sort them into major groups (note- most will include the fungi in with the plants. This is a common misconception and needs to be clearly addressed here with specific instruction about the major classification groupings and why fungi are not plants (they don't photosynthesise but consume other organic matter.

Then give children images of different animals; ask them to group them based upon their physical characteristics, eg., fur, feathers, scales, segmented bodies, internal/external skeletons.

Use this as the opportunity to then get feedback from them as to why they have chosen these animals in each group; explain that some physical features are hard to see on images or could be internal features.

Make sure children are taught clearly the major animal groups *invertebrates*, **mammals**, **birds**, **amphibians**, **reptiles** and *fish*.

Repeat this activity for the major plant groups (this will be harder and can have some great dialogue about the choices made but again, after activity use this to then instruct the major groups of plants- **flowering plants**, **ferns**, **conifers**, **moss**.

Finally show them images of **bacteria**. Ask them which group they would fit into? animal or plant, and which subgroup?

They should conclude that they can't fit into any group already seen and in fact have their own major grouping as they are completely different to all animals and plants are fungi.

Future Learning: **Future Learning**

KS3- Natural selection.

An understanding of DNA and heredity to transmit genetic information.

Key Vocabulary: ***Key vocabulary:***

Fossils, Adaptation, Evolution,

Characteristics, Reproduction,

Genetics