Science Progression of Knowledge and Skills

Materials

Year R	Year 1		Year 2		Year 3	Year 4		Year 5		Year 6
	Children will learn that: ***Scientific Knowledge***	**Children will learn how to:** ***(Working scientifically)***	**Children will learn that:** **(Scientific Knowledge)**	**Children will learn how to:** **(Working scientifically)**		**Children will learn that:** **(Scientific Knowledge)**	**Children will learn how to:** **(Working scientifically)**	**Children will learn that:** **(Scientific Knowledge)**	**Children will learn how to:** **(Working scientifically)**	
	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		Not taught in Y3	**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.		Not taught in Y6
	Big Questions – What do aliens think of Earth? Can I describe the different materials objects are made from?		**Big Questions** – Why do we choose materials to do a certain job? What would Traction Man use to build our school?			**Big Questions –** How does the change in state of matter impact our water cycle?		**Big Question-** How do changes in states of matter benefit our lives today?		
This year is about <u>exploring materials.</u>	**This year is about *<u>properties of materials.</u>***		This year is about the **<u>suitability</u> of a material for its <u>purpose</u> and how objects <u>can change shape.</u>**			This year focuses on **<u>states of matter</u> <u>connected to the water cycle</u>**		This year is about ***<u>reversible and irreversible changes.</u>***		
In EYFS children will explore lots of different materials through their play. They will be introduced to vocabulary to describe what they feel and look like. They will learn to: - Talk about the differences between materials and changes they notice. - Use all their senses in hands on exploration of natural materials. - Explore collections of materials with similar and/or different properties.	1. **Prior learning recap, cultural capital** 2. Distinguish between an object and a material 3. Identify and name the materials that objects have been made from 4. Describe simple physical properties of materials. Link back to EYFS discovering if an object is hard/soft, stretchy/ shift, shiny/dull etc 5. Group materials together based on their properties. 6. Compare and suggest materials for uses linking to the three little pigs. *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.	Compare and identify objects and the materials they are made from *Sc1/1.4 -Identify and classify.* *Sc1/1.5 – Use observations to suggest answers to questions.*	1. **Prior learning recap, cultural capital** 2. Identify and compare the use of a variety of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. 3. Explore the uses of different materials (as above) 4. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting, and stretching. 5. Why are some things only made out of one material (e.g. coins made from metal) and others can be made from lots of different materials (e.g. cutlery- plastic, metal, wood) 6. Convince the Mayor of London that he needs to rebuild the houses which have been burnt down with ….., giving reasons why it is the best material.	Compare and identify objects and the materials they are made from *Sc1/1.4 - Identify and classify.* *Sc1/1.5 – Use observations to suggest answers to questions.*		1. Prior learning recap, cultural capital 2. Explore the different states of matter including the connection between particle density. 2. Compare and group materials based on whether they are solid, liquids or gas. 3. Observe that some materials change state when they are heated or cooled. 4. *Investigation* Measuring the point at which changes occur between states of matter – boiling kettle 5. Understand what is meant by condensation and evaporation 6. Link condensation and evaporation to the water cycle in order to answer our big question	Carry out and observe and investigation focusing on: *Sc4/1.5 Gathering and recording findings using simple scientific language, drawings and labelled diagrams.*	1. Prior learning recap, cultural capital 2. Compare and group together everyday materials on the basis of their properties. 3. Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution 4. Use knowledge of solids, liquids and gases to decide how mixtures might be separated through filtering, sieving and evaporating. 5. Give reasons based on evidence for from comparative and fair tests for the particular uses of everyday materials, including metals, woods and plastics. 6. 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.	Carry out tests to answer questions. Research and discuss how chemical changes can have an impact on our lives. *Sc5/1.1 Plan different types of scientific enquiries to answer questions.* *Sc5/ 1.5 Reporting and presenting findings from enquiries.*	
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:** 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 and rock***		***Key vocabulary:*** ***Squashing, bending, twisting and stretching***			***Key vocabulary:*** ***Solid, liquid, gas, evaporate, condensate, state of matter***		***Key vocabulary:*** ***Hardness, solubility, transparency, conductivity (electrical and thermal), response to magnets***		

Science Progression of Knowledge and Skills

Plants

Year R	Year 1		Year 2		Year 3		Year 4	Year 5	Year 6
	Children will learn that: *Scientific Knowledge*	Children will learn how to: *Working scientifically*	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Not taught in Y4	Not taught in Y5	Not taught in Y6
	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.**				
	Big Question – Where do plants come from?		**Big Question** – How are new plants made?		**Big Question** – What makes plants grow and flourish?				
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.***				
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.	**1. Prior learning recap, cultural capital** 2. Identify and name a variety of common and wild garden plants, including deciduous and evergreen trees 2. Identify and describe the basic structure of a variety of common flowering plants, including trees	Observing closely, comparing and contrasting familiar plants. *Sc1/1.2 observing closely, using simple equipment*	1. **Prior learning recap, cultural capital** 2. Observe and describe how seeds and bulbs grow into mature plants 3. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Investigate!	Observing and recording the growth of a variety of plants Observe similar plants at different stages. *Sc1/1.2 observing closely, using simple equipment* *Sc1/1.3 performing simple tests*	1. **Prior learning recap, cultural capital** 2. Identify and describe the function of different parts of flowering plants: roots, stem/trunk, leaves and flowers 3. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) 4. Investigate the way in which water is transported within plants. Celery investigation. 5.Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Compare the effect of different factors on plant growth Observe how water is transported in plants by putting white carnations into coloured water and observing how water travels up the stem to the flowers. *Sc4/1.2 setting up simple practical enquiries, comparative and fair tests* *Sc4/1.6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions* *Sc4/1.9 using straightforward scientific evidence to answer questions or to support their findings.*			
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*** ***Plant structures, petals, fruit, roots, bulb, branches, stem*** ***Names of plants and trees***		***Key vocabulary:*** ***bulb, mature, conditions*** ***Names of plants and trees***		***Key vocabulary:*** ***nutrients, pollination, seed dispersal, seed formation***				

Science Progression of Knowledge and Skills

Living things and their habitats

Year R	Year 1	Year 2		Year 3	Year 4		Year 5		Year 6	
		Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)		Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working cientifically)
		Prior Learning: Understanding and knowledge of a range of different animals.			**Prior Learning:** Understanding of what a habitat is. Able to identify if something is living, dead or has never been alive. Understanding of a simple food chain.		**Prior Learning:** Able to classify animals into different groups and understand that habitats and environments can change.		**Prior Learning: Year 4**-Understanding of classification and life cycles of living things including reproduction.	
		Big Questions – What is a habitat? Why would a dinosaur not make a good pet?			**Big Question** - How do animals adapt to their environments?		**Big Question-Do all lifecycles look the same?**		**Big Question – Are all bacteria harmful?**	
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 **life cycles** and **reproduction.**		This year is about **classifying** living things including microorganisms.	
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 learn how to: -Understand the key features of the life cycle of a plant and an animal -Make observations of 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.		**1. Prior learning recap, cultural capital** 2. Explore and compare the differences between things that are living, dead, and things that have never been alive 3. 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 4. Identify and name a variety of plants and animals in their habitats, including microhabitats 5. 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.	sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts *Sc1/1.4 Identifying and classifying*		**1. Prior learning recap, cultural capital** 2. Recognise that living things can be grouped in a variety of ways - classification 3. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment 4. Recognise that environments can change and that this can sometimes pose dangers to living things. Deforestation, global warming, ice caps. 5. Explore how living things adapt to their changing environments in order to survive.	Sc4/1.1 asking relevant questions and using different types of scientific enquiries to answer them Sc4/1.3 making systematic and careful observations	1. **Prior knowledge and cultural capital.** **Jane Goodall and David Attenborough** 2, Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird 3. Describe the life process of reproduction in some plants and animals	Grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs *Sc5/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary* *Sc5/1.5 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations*	1. **Prior knowledge and cultural capital.** **Carl Linnaeus** 2.Describe how micro-organisms are classified into broad groups according to common observable characteristics and based on similarities and differences, . 3. Describe how plants are classified into broad groups according to common observable characteristics and based on similarities and differences 4. Describe animals are classified into broad groups according to common observable characteristics and based on similarities and differences, 5. Give reasons for classifying plants and animals based on specific characteristics	Using classification systems and keys to identify some animals and plants in the immediate environment. Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system *Sc5/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs*
Future Learning: Y2- Different animals and plants live in different types of environment.		**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.	
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***	

Science Progression of Knowledge and Skills

Animals including humans

Year R	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
	Children will learn that: *Scientific Knowledge*	Children will learn how to: *Working scientifically*	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)
	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.		**Prior Learning:** Introduced to the main body parts associated with the digestive system and explore questions that help them to understand their special functions.		**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 Questions - How is a fish different to a mammal? What is the difference between a carnivore and a herbivore? Can you label the parts of the human body which help us with our senses?		**Big Question** – How can we stay healthy? Is the work that Florence Nightingale did important to the health of humans?		**Big Question –** Why do we have a skeleton?		**Big Question –** What journey does food go on?		**Big Question –** Why and how do our bodies change at different times in our lives? Why might these differ between people?		**Big Question –** Why is the heart the most important pump we own?	
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**		This year focuses on **human development** over time.		This year focuses on **circulation and healthy** lifestyle.	
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 : -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.	1. **Prior learning recap, cultural capital** 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 common animals 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.	*Sc1/1.2 observing closely* to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells	1. **Prior learning recap, cultural capital** 2. Notice that animals, including humans, have offspring which grow into adults 3. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) 4. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	*Sc1/1.1 asking simple questions and recognising that they can be answered in different ways* Asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.	1. **Prior learning recap, cultural capital** 2. 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 3. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons *Sc4/1.4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions*	1. **Prior learning recap, cultural capital** 2. Describe the simple functions of the basic parts of the digestive system in humans 3. Identify the different types of teeth in humans and their simple functions 4. Construct and interpret a variety of food chains, identifying producers, predators and prey	Comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them *Sc4/1.4 gat hering, recording, classifying and presenting data in a variety of ways to help in answering questions*	*1.* **Prior learning recap, cultural capital** 2. Describe the changes as humans develop to old age.	Researching the gestation periods of other animals and comparing them with human Finding out and recording the length and mass of a baby as it grows. *Sc5/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision* *Sc5/1.3 recordin g data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs*	1. **Prior learning recap, cultural capital** 2. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 3. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 4. Describe the ways in which nutrients and water are transported within animals, including humans.	*Sc5/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision*
Future learning: Y1- understand how to take care of animals taken from their local environment and the need to return them safely after	**Future Learning:** Y2- the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans		**Future Learning:** Y3- 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.		**Future Learning**: Y4- Introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions.		**Future 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.		**Future Learning**: Year 6- How to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body		**Future Learning**: Understanding of the human body as a foundation for Biology and secondary school.	

study. Pupils should become familiar with the common names of some animals including those that are kept as pets.						
	Key vocabulary: ***Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak***	***Key vocabulary:*** ***Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene***	***Key vocabulary:*** ***Movement, Muscles, Bones, Skull, Nutrition, Skeletons,***	***Key vocabulary:*** ***Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar***	***Key vocabulary:*** ***Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty;***	***Key vocabulary:*** ***Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration***

Science Progression of Knowledge and Skills

Understanding our World - Seasonal Changes/ Earth and Space/ Rocks/ Evolution

Year R	Year 1		Year 2	Year 3		Year 4	Year 5		Year 6	
	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)		Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)		Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working cientifically)
	Prior Learning: YR- We have different seasons and that it makes the world around us change.			**Prior Learning:** Y1- Digging for bones fossil topic.			**Prior Learning:** Y1-observe and talk about changes in the weather and the seasons.		**Prior Learning:** Rocks in Y4 and Fossils from Y1 History curriculum .	
	Big Question: What type of weather do we usually have in each season?			**Big Question:** What is the earth made from?			**Big Question –** Why is it hotter in the summer?		**Big Question – How does evolution happen?**	
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 topic focus is all about the **composition and formation of rocks and soil.**			This term focusses on the **movement of the planets** and why we have **night and day.**		This year focuses on how animals and plants **change over time to adapt** to their environments.	
In EYFS children will explore the world around them and will start to look at seasons and how the weather and environment changes. They will learn how to: - Understand the effect of changing seasons on the natural world around them. - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	1. Prior knowledge and cultural capital 2.Observe changes across the 4 seasons 3. Observe and describe weather associated with the seasons and how day length varies.			1. Prior knowledge and cultural capital Herbert Henry Thomas- first person to consider the development of Stone Henge but got it wrong! Shows how science develops to prove or disprove theories. https://www.historic-cornwall.org.uk/who-studied-stonehenge-geologists-or-anthropologists/#10 2. Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties 3. Describe in simple terms how fossils are formed when things that have lived are trapped within rock 4. Recognise that soils are made from rocks and organic matter	Observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed		1. Prior knowledge and cultural capital 2. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system 3. Describe the movement of the Moon relative to the Earth 4. Describe the Sun, Earth and Moon as approximately spherical bodies 5. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	comparing the time of day at different places on the Earth through internet links and direct communication	1. **Prior learning recap, cultural capital** 2. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 3. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents 4. Identify how animals and plants are adapted to suit their Environment in different ways and that adaptation may lead to evolution.	Observing and raising questions about local animals and how they are adapted to their environment. comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.
	Future Learning Y5- Why we have night and day and how movement of the planets changes the seasons.			**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** KS3- gravity forces between the Earth and Moon Lightyear as a unit of astronomical distance		**Future Learning** KS3- Natural selection. An understanding of DNA and heredity to transmit genetic information.	
	Key vocabulary: ***Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark***			***Key vocabulary:*** ***Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, sedimentary, metamorphic, igneous, absorbent/porous, durable, permeable, impermeable***			***Key vocabulary:*** ***Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, full, new, year, month,***		***Key vocabulary:*** ***Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics***	

Science Progression of Knowledge and Skills

Light and Sound

Year 3

Children will learn that: *Scientific Knowledge*	Children will learn how to: *Working scientifically*
Prior Learning: None for science. Sound learning through music	
Big Questions *– Why can you see your reflection in the mirror but not on the floor?*	
This year is about **sunlight** and **shadows**	
1. Prior knowledge and cultural capital 2. Recognise that they need light in order to see things and that dark is the absence of light 3. Notice that light is reflected from surfaces 4. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes 5. Recognise that shadows are formed when the light from a light source is blocked by an opaque object 6. Find patterns in the way that the size of shadows change	Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes
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.	
Key vocabulary: ***Light, Shadows, Mirror, Dark, Reflection,***	

Year 4

Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)
Prior Learning: Y3- What happens when light reflects off a mirror or other reflective surface	
Big Question – How is sound produced?	
This year is about **how sound is made**, **heard** and **how it travels**.	
1. Prior knowledge and cultural capital 2. Identify how sounds are made, associating some of them with something vibrating 3. Recognise that vibrations from sounds travel through a medium to the ear 4. Find patterns between the pitch of a sound and features of the object that produced it 5. Find patterns between the volume of a sound and the strength of the vibrations that produced it 6. Recognise that sounds get fainter as the distance from the sound source increases.	Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.
Future Learning Y6-exploring the way that light behaves, including light sources, reflection and shadows.	
Key vocabulary: ***Volume, Vibration, Wave, Pitch, Tone, Speaker***	

Year 6

Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)
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	
Big Question – Why does my shadow change length?	
This year is about **light travelling in straight lines**	
1. Prior knowledge and cultural capital 2. Recognise that light appears to travel in straight lines 3. 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 4. 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 5. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. Investigate the relationship between light sources, objects and shadows by using shadow puppets.
Future Learning: KS3:Transmission of light through materials and the difference between light waves and waves in matter.	
Key vocabulary: ***Reflective, ,light source, cast***	

Science Progression of Knowledge and Skills

Forces and Magnets

Year R	Year 1	Year 2	Year 3		Year 4	Year 5		Year 6
	Not taught in Y1	Not taught in Y2	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Not taught in Y4	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)	Not taught in Y6
			Prior Learning: Exploring with pushes and pulls.			**Prior Learning:** Magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary		
			Big Question – What affects magnetic strength?			**Big Question –** How and why do things move?		
This year is about **exploring** with **pushes and pulls**.			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**.		
In EYFS children will explore pushing and pulling and how they can move things around the environment. This continues as they go through KS1. They will learn how to: - Explore and talk about different forces they can feel.			1. Prior knowledge and cultural capital 2. Compare how things move on different surfaces 3. Notice that some forces need contact between two objects, but magnetic forces can act at a distance 4. Observe how magnets attract or repel each other and attract some materials and not others 5. Compare and group together everyday materials on whether they are attracted to a magnet 6. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.	Sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.		1.Prior knowledge and cultural capital- Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. 2. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object 3. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces 4. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	Designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. Explore resistance in water by making and testing boats of different shapes. Design and make products that use levers, pulleys, gears and/or springs and explore their effects.	
Future Learning: Magnetic forces can act without direct contact, unlike most forces, where direct contact is needed			**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: ***Push, Pull***			***Key vocabulary:*** ***Magnetic, Force, Contact, Attract, Repel, Friction, Poles,***			***Key vocabulary :Air resistance, Water, resistance, Friction, Gravity,Newton, Gears, Pulleys, lever,force, pivot (fulcrum)***		

Electricity

Year R / Year 1 / Year 2 / Year 3	Year 4		Year 5	Year 6	
	Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)		Children will learn that: (Scientific Knowledge)	Children will learn how to: (Working scientifically)
Not taught until Year 3.	**Prior Learning:**			**Prior Learning:** Construct a simple circuit. Draw a circuit as a pictorial representation	
	Big Question – What are electrical circuits and how to they work?			**Big Question –** How can electrical circuits be controlled?	
	This year focuses on c**onstructing** complete and simple **circuits.**			This year focuses on an understanding of **voltage** and c**ontrolling elements of** a circuit.	
	1. .Prior knowledge and cultural capital- 2. Identify common appliances that run on electricity 3. Construct a simple series circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 4. Identify whether or not a lamp will light in a simple circuit, based on whether the lamp is part of a complete loop with a battery. 5. Recognise that a switch opens/closes a circuit and associate this with whether a lamp lights in a circuit 6. Recognise some common conductors and insulators, and associate metals with being good conductors.	Observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit. *Sc5/1.4 using test results to make predictions to set up further comparative and fair tests*		1. .Prior knowledge and cultural capital- 2. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit 3. 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 4. Use recognised symbols when representing a simple circuit in a diagram.	Systematically identifying the effect of changing one component at a time in a circuit. Designing and making a set of traffic lights, a burglar alarm or some other useful circuit. *Sc5/1.4 using test results to make predictions to set up further comparative and fair tests*

	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,***