# Hudson Road Primary School

## Science

## Progression of Knowledge, Vocabulary and Skills Document

| | Early Years | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Unit of Study One**<br>Biology | | - Animals including Humans<br>- Plants | - Animals including Humans<br>- Plants<br>- Living Things and their Habitats | - Animals including Humans<br>- Plants | - Animals including Humans<br>- Living Things and their Habitats | - Animals including Humans<br>- Living Things and their Habitats | - Animals including Humans<br>- Living Things and their Habitats<br>- Evolution and Inheritance |
| **Unit of Study Two**<br>Chemistry | | - Everyday Materials | - Everyday Materials | - Rocks | - Changing States | - Everyday Materials | |
| **Unit of Study Three**<br>Physics | | - Seasonal Change | | - Forces and Magnets<br>- Light | - Sound<br>- Electricity | - Forces and Magnets<br>- Space | - Light<br>- Electricity |

| Biology—Animals Including Humans | | | |
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| | EYFS | Year 1 | Year 2 |
| Knowledge | **3&4**<br>Talk about what they see, using a wide vocabulary.<br>• Begin to understand the need to respect and care for the natural environment and all living things.<br>**Reception**<br>Describe what they see and hear while outside.<br>Understand the effect of changing seasons on the natural world around them.<br>Recognise some environments that are different to the one in which they live | **<u>Animals Including Humans</u>**<br>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.<br>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.<br>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals (including pets).<br>Identify, name, draw and label the basic parts of the human body and say which part of the body links with each sense. | **<u>Animals Including Humans</u>**<br>Notice that animals, including humans, have offspring which grow into adults.<br>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).<br>Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene. |
| Working Scientifically | **Reception**<br>Explore the natural world around them. | **<u>Animals Including Humans</u>**<br>**Use observations to compare and contrast animals at first hand or through videos and photographs.**<br>Describe how they identify and group animals.<br>Group animals according to what they eat.<br>**Use their senses to compare different textures, sounds and smells.** | **<u>Animals Including Humans</u>**<br>**Observe, through video or first-hand observation and measurement, how different animals, including humans grow.**<br>**Ask questions about what things animals need for survival and what humans need to stay heathy.**<br>**Suggest ways to find answers to their questions.** |
| Vocabulary | | Reptile<br>Mammal<br>Amphibian (+examples of all above)<br>Herbivore<br>Omnivore<br>Carnivore | Survival<br>Offspring<br>Exercise<br>Hygiene |

| Biology—Animals Including Humans | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Knowledge | **Animals Including Humans**<br>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food as plants do.<br>They get nutrition from what they eat.<br>Identify that humans and some other animals have skeletons and muscles for support, protection and movement. | **Animals Including Humans**<br>Describe the simple functions of the basic parts of the digestive system in humans.<br>Identify the different types of teeth in humans and their simple functions.<br>Construct and interpret a variety of food chains, identifying producers, predators and prey. | **Animals Including Humans**<br>Describe the changes as humans develop to old age. | **Animals Including Humans**<br>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.<br>Recognise the impact of diet, exercise, drugs and lifestyle on the way the human body functions.<br>Describe the ways in which nutrients and water are transported within animals, including humans. |
| Working Scientifically | **Animals Including Humans**<br>Identify and group animals with and without skeletons and observe and compare their movements.<br>Explore ideas about what would happen if humans did not have skeletons<br>Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat.<br>**Research different food groups and how they keep us healthy and design meals based on what they find out.** | **Animals Including Humans**<br>Compare the teeth of carnivores and herbivores, and suggest reasons for the differences.<br>Find out what damages teeth and how to look after them.<br>Draw and discuss their ideas about the digestive system and compare them with models or images. | **Animals Including Humans**<br>Research the gestation periods of other animals and compare them with humans<br>**Find out and record the length and mass of a baby as it grows.** | **Animals Including Humans**<br>Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs lifestyle and health.<br>**To research the work of scientists like David Attenborough or Jane Goodall.** |
| Vocabulary | Muscles, Contract, Relax, Joints, Invertebrates, Vertebrates, Nutrition, Nutrients, Carbohydrates, Protein, Fats, Fibre, Vitamins, Minerals | Digestive system, Small Intestine, Large Intestine, Colon, Saliva, Canine, Incisor, Molar, Producers, Predator, Prey | Foetus, Embryo, Womb, Gestation, Development, Puberty, Life Cycle, Fertilisation, Reproduce, Life Expectancy. | Skeletal, Muscle, Digest, Circulatory system, blood vessels, lifestyle, nutrients, substances |

| Biology—Plants | | | |
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| | EYFS | Year 1 | Year 2 |
| Knowledge | **3&4**<br><br>Talk about what they see, using a wide vocabulary.<br><br>• Understand the key features of the life cycle of a plant and an animal.<br>• Begin to understand the need to respect and care for the natural environment and all living things.<br>**Reception**<br><br>Describe what they see and hear while outside.<br><br>Understand the effect of changing seasons on the natural world around them.<br>Recognise some environments that are different to the one in which they live | **<u>Plants</u>**<br><br>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.<br><br>Identify and describe the basic structure of a variety of common flowering plants, including trees. | **<u>Plants</u>**<br><br>Observe and describe how seeds and bulbs grow into mature plants.<br><br>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. |
| Working Scientifically | Birth to 3<br>Explore and respond to different natural phenomena in their setting and on trips.<br>Repeat actions that have an effect.<br>• Explore materials with different properties.<br>Explore natural materials, indoors and outside.<br>**3&4**<br>Use all their senses in hands-on exploration of natural materials.<br>• Explore collections of materials with similar and/or different properties.<br>•Explore how things work.<br>Plant seeds and care for growing plants.<br>**Reception**<br>**Explore the natural world around them.** | **<u>Plants</u>**<br><br>Observe closely, perhaps using a magnifying glasses, and compare and contrast familiar plants.<br><br>Describe how they were able to identify and group them, and draw diagram showing the parts of different plants and trees.<br><br>**Keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.** | **<u>Plants</u>**<br><br>**Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth.**<br><br>**Set up a comparative test to show that plants need light and water to stay healthy.** |
| Vocabulary | | Deciduous<br><br>Evergreen<br><br>Blossom<br><br>Petals<br><br>Stem<br><br>Roots | Bulb<br><br>Temperature<br><br>Growth<br><br>Germination / Germinate<br><br>Photosynthesis |

| Biology—Plants | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Knowledge | **Plants**<br>Identify and describe the functions of the different parts of flowering plants: roots, stem/trunk, leaves and flowers.<br>Know 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.<br>Observe and know the way in which water is transported within plants.<br>Know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | **Plants** | **Plants** | **Plants** |
| Working Scientifically | **Plants**<br>Compare the effect of different factors on plant growth, for example, the amount of light and amount of fertiliser.<br>Discover how seeds are formed by observing the different stages of plant life cycles over a period of time.<br>**Look for patterns in the structure of fruits that relate to how the seeds are dispersed.**<br>**Observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.** | **Plants** | **Plants** | **Plants** |
| Vocabulary | Nutrients, Reproduction, Transportation, Transpiration, Dispersal, Pollination, | | | |

| Biology—Living things and their habitats | | | |
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| | EYFS | Year 1 | Year 2 |
| Knowledge | **3&4**<br><br>Talk about what they see, using a wide vocabulary.<br><br>• Understand the key features of the life cycle of a plant and an animal.<br>• Begin to understand the need to respect and care for the natural environment and all living things.<br>**Reception**<br><br>Describe what they see and hear while outside.<br><br>Understand the effect of changing seasons on the natural world around them.<br>Recognise some environments that are different to the one in which they live | **<u>Living things and their habitats</u>** | **<u>Living things and their habitats</u>**<br><br>Understand the difference between living, dead and that which was never alive<br><br>Know what a habitat is, how thee can be different or the same and how some animals and plants suit one habitat better than another.<br><br>Know names of key animals and plants from a variety of habitats e.g. a Cactus<br><br>Know the adaptation these plants and animals have to survive these habitats.<br><br>Know how these animals and plants can depend on each other for survival.<br><br>Know what a food chain is and why they are important.<br><br>Understand the interdependency of food chains, explained through diagrams, written and spoken presentation.<br><br>Understand what a food source is. |
| Working Scientifically | Birth to 3<br>Explore and respond to different natural phenomena in their setting and on trips.<br>Repeat actions that have an effect.<br>• Explore materials with different properties.<br>Explore natural materials, indoors and outside.<br>**3&4**<br>Use all their senses in hands-on exploration of natural materials.<br>• Explore collections of materials with similar and/or different properties.<br>•Explore how things work.<br>Plant seeds and care for growing plants.<br>**Reception**<br>**Explore the natural world around them.** | **<u>Living things and their habitats</u>** | **<u>Living things and their habitats</u>**<br><br>Sort and classify things according to whether they are living, dead or were never alive and recording their findings using charts.<br><br>Describe how they decided where to place things, exploring questions such as: Is a flame alive? Is a deciduous tree dead in winter? And talk about ways of answering their questions.<br><br>Construct simple food chains that include humans. E.g. grass, cow, human<br><br>**Describe the conditions in different habitats and micro-habitats (under a log, on a stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.** |
| Vocabulary | | | Living, Habitat, Energy, Food chain, Predator, Prey, Woodland, Desert, Source, Adapt. |

| Biology— Living things and their habitats | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Knowledge | **Living things and their habitats** | **Living things and their habitats**<br><br>Recognise that living things can be grouped in different ways.<br><br>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.<br><br>Recognise that environments can change and that this can sometimes pose dangers to living things. | **Living things and their habitats**<br><br>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.<br><br>Describe the life process of reproduction in some plants and animals. | **Living things and their habitats**<br><br>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including organisms, plants and animals.<br><br>Give reasons for classifying plants and animals based on specific characteristic. |
| Working Scientifically | **Living things and their habitats** | **Living things and their habitats**<br><br>Use and make simple guides or keys to explore and identify local plants and animals.<br><br>Make a guide to local living things.<br><br>Raise questions and answer questions based on their observations of animals and what they have found out about other animals they have researched. | **Living things and their habitats**<br><br>Observe and compare the life cycles of plants and animals in their local environment with other plants and animals around the world.<br><br>Ask pertinent questions and suggest reasons for similarities and differences.<br><br>Grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers and bulbs.<br><br>Observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. | **Living things and their habitats**<br><br>Use classification systems and keys to identify some animals and plants in the immediate environment.<br><br>Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. |
| Vocabulary | | Vertebrates<br><br>Invertebrates<br><br>Environment<br><br>Human impact | Life cycle, Mammal, Reproduction, Amphibian, Offspring | Classify, classification domain, species, characteristics, micro-organisms, organism, flowering, non-flowering. |

| Biology—Evolution and Inheritance | | | |
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| | EYFS | Year 1 | Year 2 |
| Knowledge | | | |
| Working Scientifically | | | |
| Vocabulary | | | |

| Biology—Evolution and Inheritance | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Knowledge | | | | **<u>Evolution and Inheritance</u>**<br><br>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago.<br><br>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.<br><br>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.<br><br>Have an understanding of who Charles Darwin was and his 'Theory of Evolution'. |
| Working Scientifically | | | | **<u>Evolution and Inheritance</u>**<br><br>**Observe and raise questions about local animals and how they are adapted to their environment.**<br><br>Compare how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels.<br><br>**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.** |
| Vocabulary | | | | Evolution, adaptation, inherited traits, adaptive traits, natural selection, inheritance, Charles Darwin, DNA, variation, offspring, fossil, fossilised. |

| Chemistry—Everyday Materials (including rocks) | | | |
|---|---|---|---|
| | EYFS | Year 1 | Year 2 |
| Knowledge | **3&4**<br>Talk about what they see, using a wide vocabulary.<br>**• Reception**<br>Describe what they see and hear while outside.<br>Understand the effect of changing seasons on the natural world around them. | **<u>Everyday Materials</u>**<br>Distinguish between an object and the material from which it is made.<br>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock<br>Describe the simple physical properties of a variety of everyday materials.<br>Compare and group together a variety of everyday material on the basis of their simple physical properties. | **<u>Everyday Materials</u>**<br>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, brick, rock, paper and cardboard for particular uses.<br>Find out how the shapes of solid objects made from some material can be changed by squashing, bending, twisting and stretching. |
| Working Scientifically | Birth to 3<br>Explore and respond to different natural phenomena in their setting and on trips.<br>Repeat actions that have an effect.<br>**• Explore materials with different properties.**<br>Explore natural materials, indoors and outside.<br>**3&4**<br>Use all their senses in hands-on exploration of natural materials.<br>• Explore collections of materials with similar and/or different properties.<br>•Explore how things work.<br>**Reception**<br>**Explore the natural world around them.** | **<u>Everyday Materials</u>**<br>**Perform simple tests to explore questions, for example: What is the best material for an umbrella? For lining a dog basket? For curtains? For a bookshelf?** | **<u>Everyday Materials</u>**<br>**Compare the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits and in stories rhymes and songs).**<br>**Observe closely, identifying and classifying the uses of different materials and recording their observations.** |
| Vocabulary | | Rough<br>Smooth<br>Stretchy<br>Stiff<br>Material<br>Property | Bending Fabrics<br>Twisting<br>Stretching<br>Elastic<br>Foil<br>Dull<br>Waterproof<br>Absorbent |

| Chemistry | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Knowledge | **<u>Rocks</u>**<br><br>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.<br><br>Describe in simple terms how fossils are formed when things are trapped within rocks.<br><br>Recognise that soils are made from rocks and organic matter. | **<u>Changing States</u>**<br><br>Compare and group materials together, according to whether they are solids. Liquids and gases.<br><br>**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.**<br><br>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. | **<u>Everyday Materials</u>**<br><br>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.<br><br>Know that some materials will dissolve in liquid to from a solution and describe how to recover a substance from a solution.<br><br>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.<br><br>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.<br><br>Demonstrate that dissolving, mixing and changing state are reversible changes.<br><br>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. | |

| Chemistry | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Working Scientifically | **<u>Rocks</u>**<br><br>Observe rocks, including those used in buildings and gravestones, and explore how and why they might have changed over time.<br><br>Use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.<br><br>**Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.**<br><br>**Explore different soils, identify similarities and differences between them and investigate what happens when rocks have been rubbed together or what changes occur when they are in water.**<br><br>**Raise and answer questions about the ay soils are formed.** | **<u>Changing States</u>**<br><br>Grouping and classifying a variety of different materials.<br><br>Exploring the effect of temperature on substances such as chocolate, butter, cream. E.g. Children could make chocolate crispy cakes or Ice cream.<br><br>**Research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid.**<br><br>**Observe and record evaporation over a period of time, form example, a puddle in the playground or clothes on a washing line, and investigate the effect of temperature on washing drying or snow/ snowmen melting.** | **<u>Everyday Materials</u>**<br><br>**Carry out tests to answer questions, for example, 'which materials would be the most effective for making a warm jacket or wrapping ice cream to stop it melting.**<br><br>Compare materials in order to make a switch in a circuit.<br><br>Observe and compare changes that take place, for example, when burning materials or baking bread or cakes.<br><br>**Research and discuss how chemical changes have an impact on our lives, for example, cooking and discuss the creative use of new materials such as polymers, super sticky and super thin materials.** | |
| Vocabulary | Fossils, Sandstone, Granite, Marble, Rock, Pumice, Crystals, Absorbent, Sedimentary, Organic Matter | Solid, Liquid, Gas, Evaporation, Condensation, Particles, Freezing, Solidify, Changing State, Degrees Celsius, Water Cycle, Water Vapour | Properties, Solubility, Transparency, Electrical Conductor, Thermal Conductor, Magnets, Dissolve, Solution, Separate, Separating, Reversible change, Dissolving, Evaporating, Filtering, Melting, Irreversible, Conductivity, Insulation,<br><br>Chemical | |

| Physics | | | |
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| | EYFS | Year 1 | Year 2 |
| Knowledge | Describe what they see, hear and feel outside.<br><br>Explore and talk about different forces they can feel. | **<u>Seasonal Change</u>**<br><br>Observe changes across the four seasons.<br><br>Observe and describe weather associated with the seasons and how day length changes. | |
| Working Scientifically | Explore and talk about different forces they can feel. | **<u>Seasonal Change</u>**<br><br>**Make tables and charts about the weather and make displays of what happens in the world around them, including day length, as the seasons change.** | |
| Vocabulary | | Seasons<br><br>Weather<br><br>Summer<br><br>Spring<br><br>Autumn | |

| Physics | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Knowledge | **Force and Magnets**<br><br>Compare how things move on different surfaces.<br><br>Notice that some forces need contact between two objects, but magnetic forces can act as a distance.<br><br>Observe how magnets attract or repel each other and attract some materials and not others.<br><br>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic material.<br><br>Describe magnets as having two poles.<br><br>Predict whether two magnets will attract or repel each other, depending on which poles are facing. | **Sound**<br><br>Identify how sounds are made, associating some of them with something vibrating.<br><br>Recognise that vibrations from sounds travel through a medium to the ear.<br><br>Find patterns between the pitch of a sound and features of the object that produced it.<br><br>Find patterns between the volume of a sound and the strength of the vibrations that produced it.<br><br>Recognise that sounds get fainter as the distance from the sound source increases. | **Forces and Magnets**<br><br>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the earth and the falling object.<br><br>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.<br><br>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. | **Light**<br><br>Recognise that light appears to travel in straight lines.<br><br>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.<br><br>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.<br><br>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. |

| Physics | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Working Scientifically | **<u>Forces and Magnets</u>**<br><br>Compare how different things move and then group them.<br><br>**Raise questions and carry out tests to find out how far things move on different surfaces and gather and record data to find answers to their questions.**<br><br>Explore the strengths of different magnets and find a fair way to compare them.<br><br>Sort materials into those that are magnetic and those that are not.<br><br>**Look for patterns in the way magnets behave in relation to each other and what might affect this.**<br><br>Identify how these properties make magnets useful in everyday items and suggest creative uses for different magnets. | **<u>Sound</u>**<br><br>**Find patterns in the sounds that are made by different objects, such as saucepan lids of different sizes or elastic bands of different thickness.**<br><br>Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound.<br><br>Make and play their own instruments by using what they have found out about pitch ad volume. | **<u>Forces and Magnets</u>**<br><br>**Explore falling paper cones or cup cake cases and design and make a variety of parachutes and carry out fair tests to determine which designs are the most effective.**<br><br>Explore resistance in water by making and testing boats of different shapes.<br><br>Design and make products that use levers, pulleys, gears and/or springs and explore their effects. | **<u>Light</u>**<br><br>Make and explore where to put rear-view mirrors on cars.<br><br>Design and make a periscope and use the idea that light appears to travel in straight lines to explain how it works.<br><br>**Investigate the relationship between light sources, objects and shadows by using shadow puppets.**<br><br>Extend their experience of light by looking at a range of phenomena including rainbows, colours in prisms, objects looking bent in water. (They do not need to explain why these phenomena occur yet). |
| Vocabulary | Magnetic<br><br>Force<br><br>Attract<br><br>Repel<br><br>Friction<br><br>Poles<br><br>Magnetic Poles | Vibration<br><br>Wave<br><br>Pitch<br><br>Tone<br><br>Percussion<br><br>Wood wind<br><br>Brass<br><br>Insulate | Gravity, Air resistance, Water resistance, Friction, Accelerate, Decelerate, Mechanism, Pulley, Gear, Spring, Theory of Gravitation, Galileo Galilei. Isaac Newton | Refraction, Reflection, Spectrum, Rainbow, Travels, Straight, Reflect, Light Source, Object, Shadows, Mirrors, Periscope, Filters.<br><br>(Also see Year 5 Earth and Space Vocabulary) |

| Physics | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Knowledge | **<u>Light</u>**<br><br>Recognise that they need light in order to see things and that dark is the absence of light.<br><br>Notice that light is reflected from surfaces.<br><br>Recognise that light from the sun can be dangerous and that there are ways to protects their eyes .<br><br>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.<br><br>Find patterns in the way that the size of shadows change. | **<u>Electricity</u>**<br><br>Identify common appliances that run on electricity.<br><br>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.<br><br>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.<br><br>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.<br><br>Recognise some common conductors and insulators and associate metals with being good conductors. | **<u>Space</u>**<br><br>Describe the movement of the Earth and other planets, relative to the Sun in the solar system.<br><br>Describe the movements of the moon relative to the Earth.<br><br>Describe the Sun, Earth and Moon as approximately spherical bodies.<br><br>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.<br><br>Know the order of the planets and some of their features. | **<u>Electricity</u>**<br><br>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit.<br><br>Compare and give reasons for variations in how components function, including brightness of bulbs, the loudness of buzzers and the on/off position of switches.<br><br>Use recognised symbols when representing a simple circuit in a diagram. |
| Working Scientifically | **<u>Light</u>**<br><br>**Look for patterns in what happened to shadows when the light source moves or the distance between light source and the object changes.** | **<u>Electricity</u>**<br><br>**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**. | **<u>Space</u>**<br><br>Compare the time of day at the different places on the Earth through internet links and direct communications; creating simple models of the solar system.<br><br>**Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day.**<br><br>**Find out why some people think that Stonehenge might have been used as astronomical clocks.** | **<u>Electricity</u>**<br><br>**Systematically identify 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.** |

| Physics | | | | |
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| | Year 3 | Year 4 | Year 5 | Year 6 |
| Vocabulary | Shadow<br>Light source<br>Reflective<br>Reflection<br>Natural<br>Artificial | Cells Insulators<br>Switches Complete circuit<br>Buzzers<br>Motor<br>Circuit<br>Series<br>Conductors | Earth, Sun, Moon, Orbit, Axis, Rotation, Spherical, hemisphere, Season, Tilt, Phases of the moon, Star, Constellation, Solar System, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto | Amps, Volts, Voltage, Cell, Circuit diagram, Symbols |

| Scientific Enquiry | | | |
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| EYFS | KS1 | LKS2 | UKS2 |
| Know about similarities and differences in relation to places, objects, materials and living things Children talk about the features of their own immediate environment and how environments might vary from one another Children describe shapes, spaces, and measures | **E1: ask simple questions and recognise that they can be answered in different ways**<br>**E2: observe closely, using simple equipment**<br>**E3: perform simple tests**<br>**E4: identify and classify**<br>**E5: use their observations and ideas to suggest answers to questions**<br>**E6: gather and record data to help in answering questions** | **E1: ask relevant questions and use different types of scientific enquiries to answer them**<br>**E2: set up simple practical enquiries, comparative and fair tests**<br>**E3: make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers**<br>**E4: gather, record, classify and present data in a variety of ways to help in answering questions**<br>**E5: record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**<br>**E6: report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**<br>**E7: use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**<br>**E8: identify differences, similarities or changes related to simple scientific ideas and processes E9: use straightforward scientific evidence to answer questions or to support their findings.** | **E1: plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**<br>**E2: take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate**<br>**E3: record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**<br>**E4: using test results to make predictions to set up further comparative and fair tests**<br>**E5: report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations**<br>**E6: identify scientific evidence that has been used to support or refute ideas or arguments** |

| Being a Scientist | | | |
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| Children make observations of animals and plants and explain why some things occur, and talk about changes Children use what they have learnt about media and materials in original ways, thinking about uses and purposes | **B1: Enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.**<br>**B2: They should be encouraged to be curious and ask questions about what they notice.**<br>**B3: They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.**<br>**B4: They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.** | **B1: Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them.**<br>**B2: They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys.**<br>**B3: They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.**<br>**B4: They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.**<br>**B5: They should learn how to use new equipment, such as data loggers, appropriately.**<br>**B6: They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.**<br>**B7: With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.**<br>**B8: With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.**<br>**B9: They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.**<br>**B10: Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.** | **B1: Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.**<br>**B2: They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.**<br>**B3: They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately.**<br>**B4: They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas.**<br>**B5: They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.**<br>**B6: They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.** |