Science – Essential concepts and knowledge to be covered during the unit.

Year 1/2

Year B

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| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Animals Including Humans – Amazing Me!  Year 1  · Be able to name and locate parts of the human body, including those relating to the senses.  To name the five senses and to perform simple tests to find out more about them  · To compare the stages of the human life cycle.  · To test the effects of exercise on the human body.  · To research and describe what animals, including humans, need to survive.  Year 2  · Know about the basic needs of animals, including humans, for survival.  · Describe the importance of exercise, balanced diet and hygiene for humans.  · Describe the main changes as young animals, including humans, grow into adults. | Seasonal Changes – Wild Weather  Year 1  · Understand and describe the main changes across the seasons.  · Understand weather associated with the seasons.  · Understand how day length varies across the year.  To understand how some animals, adapt in winter.  Year 2  · Learn about the weather for the season and consider if the weather they are expecting is typical.  · Understand more about the different seasons of the year, including the current season.  Report on the weather they have observed and learn how to measure the temperature  Observe wind direction over time and notice any patterns between rainfall and wind. | The Uses of Materials – Brilliant Builders  Year 1  · Recognise the difference between the name of an object and the material from which it is made.  · Identify a range of everyday materials including wood, plastic, glass, metal, water and rock.  · Describe the physical properties of everyday materials including hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/ not waterproof, absorbent/ not absorbent, opaque/ transparent.  · Understand how to group everyday materials according to their physical properties  Year 2  · Understand how everyday materials can be used for more than one thing.  · Understand how different everyday materials can be used for the same thing.  · Understand why the properties of materials make them suitable or unsuitable for particular purposes.  · Recognise that squashing, bending, twisting and stretching can change the shapes of solid objects made from some everyday materials. | Animals including Humans – Wild and Wonderful  Year 1  · Identify a variety of common animals (birds, fish, amphibians, reptiles, mammals, invertebrates)  Understand what they need to survive and what else they might need to be comfortable and happy  Understand the basic needs and habitats of some wild animals  Year 2  · Identify and discuss the characteristics of different animals  · Categorise them according to those features and characteristics  Discuss why they need certain things for survival, including food and water  Understand that animals, including humans, have offspring which grow into adults  Collate and discuss knowledge and information about a range of African animal | Plants – Growing Things  Year 1  · Be able to name a variety of different plants (including deciduous and evergreen trees).  · Understand and describe how plants are suited to different habitats.  · Understand and describe the structure of plants including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem.  Year 2  · Understand and describe the main changes as seeds and bulbs grow into mature plants.  · Understand and describe the basic needs of plants for water, light and a suitable temperature to grow and stay healthy. | Living Things and their Habitats – Food Chains  Year 1  · Understand what is meant by a food chain  · Understand that living things need other living things to survive    Year 2  · Recognise whether things are alive, dead or have never lived.  · Identify different plants and animals and recognize that they are suited to their different habitats, including micro-habitats.  · Recognise how different habitats provide for the basic needs of animals and plants.  · Understand that animals get their food from other animals and/or from plants.  · Recognise that a food chain is made of a series of plants and animals that eat each other and shows how energy is transferred from one organism to another via food. |

Year 3/4

Year B

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| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Forces and Magnets  · Understand that forces act in particular directions and can make an object start moving, stop moving, change shape or change direction.  The greater the force, the greater the movement or change in shape.  Know that pushes and pulls are examples of forces.  · Understand that forces do not always require contact between two objects – for example, magnetic forces can act without direct contact.  · Recognise that magnets attract or repel each other, and attract some materials and not others.  · Recognise that magnets have two ends (poles) and understand how the poles of two magnets behave towards each other. | Living things and their Habitats – a world of living things  · Recognise that living things can be grouped in a variety of ways that helps us to study and identify them.  · Recognise that classification keys can be used to help group, identify and name living things.  · Recognise that environments can change, often because of human activity, and that this can affect the survival of living things. | States of Matter  · Recognise the main properties of solids, liquids or gases:  Solids are fairly rigid and tend to keep their shape unless a force is applied.  Liquids will pour and flow into any shape.  Gases spread out to fill a space and will escape from an unsealed container.  · Recognise that materials change state when they are heated or cooled and that different materials will respond differently depending on the temperature.  Recognise that melting, evaporating, condensing and freezing are changes of state.  · Recognise that changes of state are crucial to our water cycle:  Evaporation of water changes it to a gas (water vapour). Bodies of water on Earth evaporate and put water vapour into the air. Recognise that evaporation requires heat energy and is faster at higher temperatures.  Condensation is the process by which water vapour in the air cools down and changes to drops of liquid. Water vapour in the cold air condenses into drops, which return water to the Earth as rain or snow. | Animals including Humans – fit for success  Recognise that animals, including humans, cannot survive without eating because food provides them with energy for survival and growth in the form of nutrients.  Recognise that animals need a balanced diet of nutrients and therefore of foods containing those nutrients.  Recognise that some animals have skeletons and muscles and understand that these are used for movement, support and protection.  Recognise that different types of animals may have different types of skeleton or no skeleton at all. | Plants – Feast of flowers, fruit and seeds  · Recognise that the main parts of a flowering plant are the roots, stem, leaves and flowers.  · Recognise that these parts are needed for the plant to grow and reproduce and that each has a specific job - roots and stems are needed for nutrition and support, leaves are needed for nutrition, and flowers are needed for reproduction· Recognise that all plants require air, light, water and nutrients (normally from the soil) but that different plants vary in their specific requirements for these resources.· Understand that plants make their own food, which is a source of energy to grow and reproduce  · Recognise that plants transport water from the roots through the stem to all parts of the plant  · Recognise that flowers contain the parts needed for the plant to reproduce and that the life cycle includes pollination, seed formation, seed dispersal and germination. | Sound  Identify how sounds are made, associating some of them with something vibrating, by identifying and explaining sound sources around school.  To find patterns between the volume of a sound and the strength of the vibrations that produced it.  To recognise that vibrations from sounds, travel through a medium to the ear.  Explore ways to change the pitch of a sound and investigate ways to absorb sound. |

Year 5/6

Year B

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| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Living Things and Their Habitats – illustrating life-cycles  Year 5  Understand that all animals and plants undergo life cycles involving birth, growth, and reproduction and that these differ between living organisms.  Describe the life cycles of some plants and animals.  Recognise that there are two types of reproduction, sexual and asexual.  Year 6  Recognise that classification across all living things is based upon observable characteristics, with organisms in the same group sharing a common set of characteristics that are unique to that group.  Recognise that classification based on specific characteristics is done for many reasons:  To help identify and organise the vast number of different living organisms  To help understand how living organisms are related to each other and how they have changed over time  To help scientists in their conservation efforts. | Light  · Recognise that light appears to travel in straight lines.  · Understand that we see things because our eyes receive light.  Understand that we see most objects because light from a light source travels to the object and then to our eyes, unless it is a light source in which case we see light that travels from it directly to our eyes.  · Develop a more advanced understanding about reflection and its uses:  that we can use mirrors to see round corners;  that mirrors reflect an image of any object because light bounces off a mirror in exactly the same pattern as it arrives;  that light is reflected by different amounts depending on the roughness and colour of an object (for example, a white object reflects more light than a dark object).  · Develop a more advanced understanding about shadows:  that shadows have the same shape as the objects that cast them because light travels in a straight line;  that light passes through some material (transparent) and not others (opaque), and how this affects the ability of an object to form shadows;  how the size of a shadow changes when the distance from the light source, or between the light source and the object, changes;  how the length and position of a shadow depends on the position of the Sun in the sky and that this will change depending on the time of the day and the time of the year.  · Recognise that when light travels through an object it can bend. This effect, known as refraction, can cause objects to appear distorted, for example, a pen at an angle in a glass of water. Refraction also explains why rainbows happen. | Electricity  Understand that electricity can flow through the components of an electrical circuit and will only flow if the circuit is closed i.e. has no gaps.  · Recognise that the components of a circuit will usually include an energy source such as a battery, something that uses energy such as a bulb or buzzer, connecting wires, and switches to open and close the circuit. All components must be connected into and made part of the circuit.  · Recognise that electricity can flow more easily through some materials than others.  Materials that electricity can pass through easily are called conductors and materials that electricity passes through poorly or not at all are called insulators. Recognise that all metals are good conductors and many plastics are insulators.  · Understand how changing the components in a circuit can affect how the components function. For example, adding more batteries in a circuit will increase the brightness of the bulb and the volume of the buzzer; lengthening the wires in a circuit will decrease both. | Properties of Materials  · Recognise that materials can be grouped on the basis of their properties and that some of these properties cannot be directly seen – for example, conductivity and response to magnets.  · Recognise that some materials can change their state, for example from a solid to a liquid or a liquid to a gas.  · Recognise that when a material changes its state, this is a reversible change because the material has changed physically but not chemically.  · Recognise that some changes of materials are irreversible and that this is because there have been chemical changes to the materials, resulting in the formation of new materials.  · Recognise that when a solid dissolves, it forms a solution in which it remains as a solid and has simply mixed with the liquid.  Recognise therefore that dissolving and melting are different processes. | Animals including Humans – the human species  Present the key stages of human foetal development as a labelled diagram.  Identify and present the key physical and emotional changes during male and female puberty in the form of a Venn diagram.  · Identify the impact of a heathy or unhealthy diet on the human body  · Identify the impact of exercise and lifestyle choices on the human body  · Identify the effects of drugs on the human body  Understand the composition of blood and the role it has to play in the human body. Explore the structure and function of the human heart.  Investigate diffusion and osmosis  · Understand how nutrients and water are transported through the body. | Animals including Humans  Science/PSHE/RSE  Year 5/6 Science  To describe the changes that people’s bodies go through during puberty and how we can look after our changing bodies.  To understand what periods are and I know what girls can expect when their first period starts.  To describe how thoughts and feelings may change during puberty and suggest how to deal with those feelings.  Year 6 PSHE/RSE  To understand what a sexual relationship is and who can have a ​ sexual relationship.  To describe the process of human reproduction, from conception ​ to birth. |