Progression of Substantive Knowledge in Science

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PLANTS	➢ Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. ➢ Identify and describe the basic structure of a variety of common flowering plants. ➢ Identify and name the roots, trunk, branches and leaves of a tree.	➢ Observe and describe how seeds and bulbs grow into mature plants. ➢ Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. ➢	➢ Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. ➢ Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. ➢ Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant. ➢ Know the way in which water is transported within plants. ➢			
ANIMALS INCLUDING HUMANS	➢ Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. ➢ Identify and name a variety of common animals that are carnivores, herbivores and omnivores. ➢ Identify, name and draw the basic parts of the human body and say which is associated	➢ Know that animals, including humans, have offspring which grow into adults ➢ Know the basic stages in a life cycle for animals, including humans. ➢ Find out and describe the basic needs of animals, including humans, for survival (water, food and air). ➢ Describe the importance	➢ Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. ➢ Know how nutrients, water and oxygen are transported within animals and humans. ➢ Know about the importance of a nutritious, balanced	➢ Describe the simple functions of the basic parts of the digestive system in humans. ➢ Identify the different types of teeth in humans and their simple functions. ➢ Construct and interpret a variety of food chains, identifying producers, predators and prey ➢ Explore and use classification keys,	➢ Describe the changes as humans develop to old age. ➢ *Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird.* ➢ *Know the differences between different life cycles.* ➢ *Know the process of reproduction in plants.* ➢ *Know the process of reproduction in animals.*	➢ Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. ➢ Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. ➢ Describe the ways in which nutrients and water are transported within animals,

	with each sense. ➢ Notice that animals including humans have offspring which grow into adults.	for humans of exercise, eating the right amounts of different types of food, and hygiene.	diet. ➢ Identify that humans and some other animals have skeletons and muscles for support, protection and movement: Know about the skeletal and muscular system of a human.	recognise that living things can be grouped in a variety of ways.		including humans.
LIVING THINGS AND THEIR HABITATS		➢ Explore and compare the difference between things that are living, dead and things that have never been alive. ➢ Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. ➢ Identify and name a variety of plants and animals in their habitats, including micro habitats. ➢ Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food. ➢		➢ Recognise that living things can be grouped in a variety of ways. ➢ Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. ➢ Recognise that environments can change and that this can sometimes pose danger to living things.	➢ Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. ➢ Describe the life process of reproduction in some plants and animals.	➢ Classify living things into broad groups according to observable characteristics and based on similarities and differences. ➢ Give reasons for classifying plants and animals based on specific characteristics.

EVOLUTION AND INHERITANCE	•	•		•		➢ Know about evolution and can explain what it is. ➢ Know how fossils can be used to find out about the past. ➢ Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ➢ Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

	Year 1	Year 2	➢ Year 3	Year 4	Year 5	Year 6

FORCES			➢ Compare how things move on different surfaces. ➢ Know how a simple pulley works and use making lifting an object simpler ➢ Notice that some forces need contact between two objects, but magnetic forces can act at a distance. ➢ Observe how magnets attract and repel each other and attract some materials and not others. ➢ Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magneticmaterials. ➢ Describe magnets as having two poles. ➢ Predict whether two magnets with attract or repel each other, depending on which poles are facing.	➢	➢ Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives. ➢ Identify the effects of air resistance, water resistance and friction, which act between moving surfaces. ➢ Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. ➢ Describe the movement of the Earth, and other planets, relative to the Sun in the solar system ➢ Describe the movement of the Moon relative to the Earth ➢ Describe the Sun, Earth and Moon as approximately spherical bodies ➢ Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	➢
LIGHT AND SOUND	• Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies.		➢ Recognise that they need light in order to see things and that dark is the absence of light. ➢ Notice that light is reflected from surfaces. ➢ Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. ➢ Recognise that shadows are	➢ Know how sound is made associating some of them with vibrating. ➢ Know what happens to a sound as it travels from its source to our ears. ➢ Know the correlation between the volume of a sound and the strength of the vibrations that produced it.		➢ Recognise that light appears to travel in straight lines. ➢ Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. ➢ Explain that we see things because light travels from light sources to our eyes or from light sources to objects

			formed when the light from a light source is blocked by a solid object. ➢ Find patterns in the way that the sizes of shadows change. ➢	➢ Know how sound travels from a source to our ears. ➢ Know the correlation between pitch and the object producing a sound. ➢		and then to our eyes. ➢ Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. ➢ Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc
ELECTRICITY	•	•		➢ Identify common appliances that run on electricity. ➢ Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. ➢ Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. ➢ Recognise that a switch opens and closes the circuit and associate this with whether or not a lamp lights in a simple series circuit. ➢ Recognise some common conductors and insulators, and associate metals with being good conductors. ➢ *Know the difference between a conductor and an insulator; giving examples of each.* ➢ *Safety when using electricity.*	•	➢ Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. ➢ Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. ➢ Use recognised symbols when representing a simple circuit in a diagram.

MATERIALS AND THEIR PROPERTIES	➢ Distinguish between and object and the material from which it is made. ➢ Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock, ➢ Describe the simple physical properties of a variety of everyday materials ➢ Compare and group together a variety of everyday materials on the basis of their simple properties. •		➢ Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ➢ Describe in simple terms how fossils are formed when things that have lived are trapped within rock ➢ Recognise that soils are made from rocks and organic matter. •	➢ Compare and group materials together, according to whether they are solids, liquids or gases. ➢ Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. ➢ Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. ➢ Compare and group materials together, according to whether they are solids, liquids or gases. ➢ Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation	➢ Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. ➢ Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. ➢ Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. ➢ Give reasons based on evidence from comparative and fair tests, for the particular uses of everyday	

				and condensation in the water cycle and associate the rate of evaporation with temperature. ➢ Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting. ➢ ➢	materials, including wood, metals and plastic. ➢ Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda. ➢	