Science New Knowledge Progression Document

Living Things: know how to identify living things, how they function and how they survive

Component 1: Know how to identify different plants and explain their structure

	Reception	Y1	Y2	Y3	Y4	Y5	Y6
Name and structure	Know plant types (tree, flower, grass)	Name and identify common plants (flowers, deciduous and evergreen trees)	Identify the similarities and differences between deciduous and evergreen				
	Know the basic parts of a flower (petals, stem, leaves, roots)	Know the basic structure of a plant (flowers, blossom, fruit, trunk, branches)	Know the basic structure of a plant (bulb, seed) Know that roots are not always at the bottom of a plant	Know different parts of flowering plants have different functions	Use the relationship between structure and function to explain how water is transported within plants		

Growth	Grow plants from seeds and seedlings		Know that there are different types of seeds and bulbs that grow into plants	Know the life-cycle of a plant Know the role of the flower for reproduction (pollination, seed formation, seed dispersal: explosion, animals, water or wind)	Explain the difference in reproduction between a variety of flowering plants Explain why an unpollinated flower will not reproduce	Describe the life processes of some plants (asexual and sexual reproduction)	Explain the similarities and differences between the life processes of some plants (asexual and sexual reproduction)
Requirements	Know plants need water and sunlight to survive		Identify the specific requirement of plants for growth and survival (water, light and a suitable temperature)	Identify the specific requirement of plants for life and growth (air, nutrients from soil, and room to grow)	Identify how specific requirements for life and growth varies from plant to plant		

Component 2: Know how to identify different animals including humans and how they function

	Reception	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Type	Know the name of common animals (pets,	Know common animals are either carnivores,	Know common animals are either fish, amphibians,				

	farm animals, wild animals)	herbivores or omnivores	reptiles, birds or mammals Name of some fish, amphibians, reptiles, birds and mammals				
Structure	Name animal parts (head, body, legs, arms, trotters, hooves, wings, beak)	Know the structure of humans (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth etc)	Know common animals (fish, amphibians, reptiles, birds or mammals) have different structures	Name the main bones, joints and muscles in humans (and some animals) Describe the role of the skeleton and muscles for support, protection and movement	Categorise muscle movement as relaxing or contracting Explain the relationship between muscle groups as they relax and contract		
		Know animals have 5 senses and different parts of the body are associated with different senses	Explain how animals including humans use their senses	Recognise types of teeth in humans and their simple functions (including oral hygiene) Label the basic parts of the	Compare the teeth of a human to a carnivorous animal Relate the human	Identify the main parts of the human circulatory system and know their function	Know the function of the heart, blood vessels and blood Know the role of veins, arteries and

				human digestive system and explain their function	digestive system to how humans get nutrition		capillaries in transporting nutrients and water within animals
Requirements	Know animals need food, water and shelter to survive Know we look after our bodies in different ways (staying clean, drinking water, eating our meals and brushing teeth)	Know animals including humans have basic needs (water, food and air) Know simple food chain (grass, cow, human)	Know animals get food from plants and other animals Explain the differences in a food chain for a herbivore and a carnivore Know the importance of exercise, the right amounts of different types of food and hygiene (including oral hygiene)	Know animals, including humans, cannot make their own food; they get nutrition from what they eat Name the parts of a food chain (producers, consumers, predators and prey) and describe them as herbivores, omnivores or carnivores	Know animals, including humans, need the right types and amount of nutrition Describe the flow of energy in food chains and identify patterns Demonstrate how all food chains start with light	Identify the importance of diet and exercise: observe and record the effects of exercise on heartbeat Describe some of the possible effects of poor exercise, poor diet and drug misuse on the function of the body	Explain the possible effect of too much sugar in a human's diet on the function of the body (including oral hygiene)

Growth	Know babies grow into adults (baby, child, adult/lamb, sheep) Know the life cycle of a butterfly (egg, caterpillar, pupa, butterfly)	Know the life cycle of a human (toddler, child, teenager, adult)	Know animals have offspring which grow into adults (through nurturing) Know the life cycle of a amphibian and a bird (egg, chick, chicken/ spawn, tadpole, frog)			Draw and describe life cycles of mammals, amphibians, insects and birds Know humans change as they develop to old age: the stages of growth and development including the changes experienced in puberty for humans and other animals	Explain the differences in the life cycles mammals, amphibians, insects and birds Describe how some animals reproduce (asexual and sexual reproduction)

Component 3: Know how to compare and classify living things and their habitats

Reception	Y1	Y2	Y3	Y4	Y5	Y6
Group animals (pets, farm	Group common animals based on their diet (carnivore,	Group common animals into fish, amphibians,	Group common animals based on their structure (vertebrate,	Use simple classification keys to identify	Classification has developed over time (Aristotle, Carl Linnaeus)	Propose the criteria for the creation of

animals, wild animals etc)	herbivore, omnivore) Describe and group things as living, dead or never been alive	reptiles, birds or mammals Explain and give evidence as to why some things have never been alive	invertebrate, exoskeleton, endoskeleton)	living things using given criteria	Use and make simple classification keys to identify animals	classification keys Subdivide broad groupings, such as micro-organisms, plants and animals
	Name of plants and animals in their habitat Know that a habitat is not a home	Know habitats are suited to living things/provide basic needs/depend on each other	Name and describe a range of habitats Identify changes to habitats (deforestation, melting ice caps)	Describe how a change to an environment (deforestation, melting ice caps) is a danger to some habitats		

Component 4: Know how evolution and inheritance has changed animals and plants

Reception	Y1	Y2	Y3	Y4	Y5	Y6
					Know living things have changed over time: fossils provide evidence of this	Know animals and plants adapt to suit their environment in different ways Adaptations may lead to evolution
					Know offspring are not identical to parents (inheritance)	

Materials: know how to identify everyday materials and explain how they change

Component 5: Know how to identify materials and their properties

	Reception	Y1	Y2	Y3	Y4	Y5	Y6
Name and properties	Know objects are made from different materials Describe how objects feel (hard, soft, rough, smooth)	Know the difference between an object and what it's made from Identify and name everyday materials (wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil) Describe the physical properties of everyday materials (hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof;	Know the difference between raw and synthetic materials (natural and man-made) and describe their physical properties	Name some rocks and identify their basic properties Know soils are made from rocks and organic matter	Know fossils are formed when things that have lived are trapped within rock		

		absorbent/not absorbent; opaque/transparent; man made/natural)					
					Know what a solid, liquid and gas is		
Compare	Sort objects based on the material they are made from	Compare/group everyday materials based on their properties	Identify and compare the suitability of a variety of everyday materials for particular uses Know some materials are used for more than one thing Know different materials are used for the same thing	Know how to compare and group rocks based on their properties	Know how to compare and group materials based on their properties; explain how groupings may change based on state of matter	Know how to compare and group materials based on their properties (hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets)	

Component 6: Know how to explain how materials change

Reception	Y1	Y2	Y3	Y4	Y5	Y6
Know how to change everyday materials through freezing, cooking, baking and melting (chocolate/jelly)	Know solid objects made from particular materials can be changed (by squashing, bending, twisting and stretching)	Know that not all solid objects made from particular materials can be changed in the same way		Explain how some materials change state when they are heated or cooled Know the part played by evaporation and condensation in the water cycle Know the link between the rate of evaporation with temperature	Know some materials will dissolve in liquid to form a solution	Know a substance can be recovered from a solution Know mixtures can be separated (filtering, sieving or evaporating) Know changes are reversible or irreversible

Physical processes: know how to identify a range of physical phenomena and how these affect the way that the world works

Component 7: Know how to identify a range of forces and explain their effect

Reception	Y1	Y2	Y3	Y4	Y5	Y6
			Know some forces need contact between two objects Know objects move differently on different surfaces	Know magnetic forces can act at a distance Know magnets have two poles which attract/repel each other Know magnets attract/do not attract some materials	Know unsupported objects fall towards the Earth because of the force of gravity Know the effects of air resistance, water resistance and friction, that act between moving surfaces	Know mechanisms (including levers, pulleys and gears) allow a smaller force to have a greater effect

Component 8: Know the seasonal changes and how they affect daily life

Reception	Y1	Y2	Y3	Y4	Y5	Y6
Identify the weather (including seasonal changes) and how this affects their day	Names of the four seasons and how they change	Explain how the weather changes throughout the seasons and how day length varies				

to day lives (warm, cold, hot, wet, windy etc)						

Component 9: Know how sound is produced

Reception		Y2	Y3	Y4	Y5	Y6
			Know sounds are made by vibrations travelling through a medium (gas and solids) to the ear Identify which solid allows sound to travel the most efficiently	Know that sound vibrations travel through liquid (aquatic animals) Compare the speed that sound travels through different mediums		
			Know that the pitch of a sound can be changed	Know that there is a link between the features of an object and the pitch of the sound it produces		
			Know the volume of a sound and the strength of the vibrations	Know sounds get fainter as the distance from		

			that produced it are linked	the sound source increases		

Component 10: Know how light is produced

Reception		Y2	Y3	Y4	Y5	Y6
			Know light from the sun can be dangerous Know sources of light can be natural or man-made Know light is needed to see and darkness is absence of light	Know light is reflected from surfaces	Know light travels in straight lines	Know objects are seen because they give out or reflect light into the eye Know we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
			Know shadows are formed when the light from a light source is blocked by an opaque or translucent object	Explain how to change the size of a shadow created by a torch	Know shadows have the same shape as the objects that cast them	Make links between the size of a shadow and the rotation of the Earth

Component 11: Know how to create electrical circuits and how to affect the way each component functions

	Reception	Y1	Y2	Y3	Y4	Y5	Y5/6
Appliances and danger				Identify common appliances that run on electricity (mains electricity/ battery electricity/both) Identify the dangers of electricity and know how to keep safe			
Function				Identify the names and function of the parts of a circuit (cells, wires, bulbs and buzzers)	Identify the name and function of a swich	Know the number and voltage of cells used in the circuit affects the function of the components	Compare and give reasons for variations in how components function (brightness of bulbs, loudness of buzzers and the on/off position of switches)
Construct				Construct complete simple series circuits and draw	Construct simple series circuits using a switch to open and close a circuit and draw	Construct simple series circuits with different cells and use	Construct simple series circuits to demonstrate the variation in

				pictorial representations Identify whether a circuit is complete	pictorial representations Identify whether a lamp will light based on a pictorial representation of a circuit	recognised symbols to draw circuit diagrams	how components function and use recognised symbols to draw circuit diagrams
Uses				Identify conductors and insulators of electricity	Know why particular materials are used for particular products		

Component 12: Know how the solar system affects our everyday life

Reception	Y1	Y2	Y3	Y4	Y5	Y6
					Know what the solar system is (name 8 planets) Know scientists have changed their view of the Solar System throughout history	Know the key features of the 8 planets

					Identify how the Earth moves relative to the Sun Identify how the moon moves relative to the Earth	Identify how other planets move relative to the Sun Know the Earth rotates and this is how day and night occur