Science progression

Substantive Knowledge

Breadth of study			
Year 3	**Year 4**	**Year 5**	**Year 6**
• How plants and how they live and reproduce • Animals and how they move • Light and shadows • Magnets and forces • Rocks	• Classify living things • Digestion in humans • Sound and pitch • Electrical sources • States of matter	• Life cycles and reproduction patterns of plants and animals • Changes that happen to the human body • Gravity and friction • Reversible and irreversible changes • Earth and space	• Classifying animals • How the human body works and how to stay healthy • How light behaves • Electrical circuits • Evolution and inheritance
National Curriculum Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics			
Living things and how we see things			
Plants and how they live and reproduce	**Classify living things using keys**	**Life cycles and reproduction patterns of plants and animals**	**Classifying animals**
• Identify and describe functions of different parts of flowering plants: roots, stem/trunk, leaves, flowers • Explore 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 Investigate the	• 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	• 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.	• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals

way in which water is transported within plants • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	sometimes pose dangers to living things.		• Give reasons for classifying plants and animals based on specific characteristics.
Animals including humans			
Understanding animals	**Digestion in humans**	**Changes that happen to the human body**	**Understanding how my body works and how to stay healthy.**
• 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 • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	• 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.	• Describe the changes as humans develop to old age.	• 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, including humans.
Light and sound			
Light and shadows	**Sound and pitch**		**Understanding how light behaves**
• Recognise we need light to see things and that dark is the absence of light	• Identify how sounds are made, associating some of them with something vibrating	•	• Recognise that light appears to travel in straight lines • Use the idea that light travels in straight lines to

• 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 formed when the light from a light source is blocked by an opaque object • Find patterns in the way that the size of shadows change.	• Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produced it • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Recognise sounds get fainter as distance from sound source increases.		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 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.
Forces and electricity			
Magnets and forces	**Electrical sources**	**Gravity and friction**	**Electrical circuits**
• Compare how things move on different surfaces • Notice some forces need contact between two objects, but magnetic forces act at a distance • Observe how magnets attract or 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 magnetic materials	• 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 a circuit and associate this with	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	• 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.

• Describe magnets as having two poles • Predict whether two magnets will attract or repel each other.	whether or not a lamp lights in a simple series circuit • Recognise common conductors and insulators, and associate metals with being good conductors.		
Properties and changes in materials			
	States of matter	**Reversible and irreversible changes**	
	• Compare and group materials together, according to whether they are solids, liquids or gases • 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 (°C) • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• 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 materials, including metals, wood 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 that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	
Other concepts			
Rocks		**Earth and Space**	**Evolution and Inheritance**
• 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.		• 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 • Use the idea of the Earth's rotation to explain day and night and the apparent	• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents

		movement of the sun across the sky.	• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may