



# Knowledge Progression in Science

## Key Knowledge Area:

### Foundation- Early Science

KUW- Children know about similarities and differences in relation to places, objects, materials and living things.

They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

### KS1 and KS2 - Biology

## Throughout their school career, a North Downs pupil will...

Foundation	Year 1	Year 2	Year 3	Year 4	Year5	Year 6
<p><b>Use all their senses with hands on exploration of natural materials (KUW)</b> Provide interesting natural environments for children to explore freely outdoors. Eg Foundation Garden, Science Area or Forest Schools.</p> <p><b>Talk about what they see, using a wide vocabulary. (KUW)</b> Provide a wide variety of equipment to support investigations and through frequent use children become experts at using them. Model</p>	<p><b>Plants</b> Identify and name a variety of common wild and garden plants. Identify deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p><b>Animals inc. Humans</b> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common</p>	<p><b>Plants</b> 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.</p> <p><b>Animals inc Humans</b> Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans,</p>	<p><b>Plants</b> Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.</p> <p>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 way in which water is transported within plants.</p>	<p><b>Animals inc. Humans</b> Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p><b>Animals inc Humans</b> Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood.</p> <p><b>Living Things and their Habitats</b> Explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p><b>Animals inc Humans</b> Describe the changes as humans develop from birth to old age.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p><b>Living Things and their Habitats</b> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p>

<p>observational and investigational skills. Asking out loud: “Can I...?” “If I...?” “What if?”</p> <p>Introduce new vocabulary, encouraging children to use it to discuss their findings and ideas confidently.</p>	<p>animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><b>Living Things and their Habitats</b> Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>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.</p> <p>Identify and name a variety of plants and animals in their habitats,</p>	<p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p><b>Animals inc Humans</b> 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.</p> <p>Identify that humans and some animals have skeletons and muscles for support, protection and movement.</p>	<p><b>Living Things and their Habitats</b> Identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>		<p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p><b>Evolution &amp; Inheritance</b> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>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.</p>
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		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 different sources of food.				
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**Key Knowledge Area:**

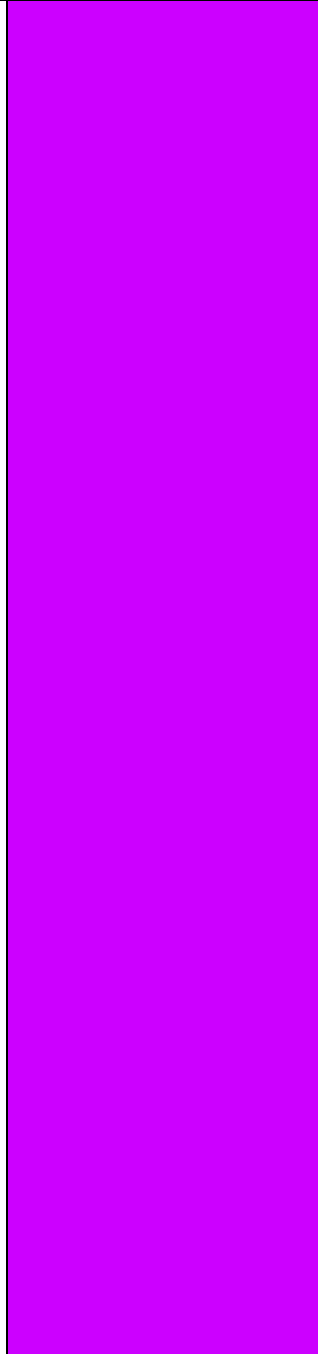
**Foundation- Embedding Science**

KUW- Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

**KS1 and KS2 - Chemistry**

**Throughout their school career, a North Downs pupil will...**

Foundation	Year 1	Year 2	Year 3	Year 4	Year5	Year 6
<p><b>Explore the natural world around them. (KUW)</b> Provide children with frequent opportunities for outdoor play and exploration.</p> <p>Encourage interactions with the outdoors that will foster curiosity and give children the freedom to use their senses (touch, smell and hear) in the natural world</p>	<p><b>Everyday Materials</b> Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p>	<p><b>Everyday Materials</b> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials</p>	<p><b>Rocks</b> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made</p>	<p><b>States of Matter</b> Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>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).</p>	<p><b>Properties and Changes of Matter</b> Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p>	

<p>during hands-on experiences.</p> <p>Enable opportunities to discuss how we care for the natural world around us.</p> <p>Describe what they see, hear and feel whilst outside. (KUW) Encourage focused observation of the natural world.</p> <p>Encourage positive interaction with the outside world, offering children a chance to take supported risks, appropriate to themselves and the environment within which they are in.</p> <p>Name and describe some plants and animals children are likely to see in their surrounding environments.</p> <p>Create opportunities to work together to develop and</p>	<p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>can be changed by squashing, bending, twisting and stretching.</p>	<p>from rocks and organic matter.</p>	<p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>Understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>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</p>	
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appreciate others creative ideas.					reversible, including changes associated with burning and the action of acid on bicarbonate of soda	
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**Key Knowledge Area:**

**Foundation- (Practical Activities/Ideas)**

KUW- Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

**KS1 and KS2 - Physics**

**Throughout their school career, a North Downs pupil will...**

Foundation	Year 1	Year 2	Year 3	Year 4	Year5	Year 6
<p>Suggestions: Contrasting pieces of bark, different types of leaves and seeds, different types of rocks, different shells and pebbles from the beach Magnifying glasses or a tablet with a magnifying app, Petri dishes.</p> <p>Be able to talk about what they see.</p> <p>Observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through</p>	<p><b>Seasonal Changes</b> Observe changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>		<p><b>Light</b> Notice that light is reflected from surfaces.</p> <p>Find patterns that determine the size of shadows.</p> <p><b>Forces &amp; Magnets</b> Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and</p>	<p><b>Sound</b> Identify how sounds are made, associating some of them with something vibrating.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p><b>Electricity</b> Identify common appliances that run on electricity.</p>	<p><b>Earth &amp; Space</b> 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.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night.</p> <p><b>Forces &amp; Magnets</b> Explain that unsupported</p>	<p><b>Light</b> Understand that light appears to travel in straight lines.</p> <p>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.</p> <p>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.</p> <p>Use the idea that light travels in</p>

<p>transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water.</p> <p>Describe and commenting on things they have seen whilst outside, including plants and animals.</p> <p>Recognise familiar plants and animals whilst outside. Similarities and differences in cultures looking specifically at places objects and materials from those places and could include the backgrounds of children and their families as they start school.</p>			<p>identify some magnetic materials.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs.</p>	<p>straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes.</p> <p><b>Electricity</b> Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>
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**Key Knowledge Area: KS1 & 2 Working Scientifically**

Throughout their school career, a North Downs pupil will...

Foundation	Year 1	Year 2	Year 3	Year 4	Year5	Year 6
	Ask simple questions and recognising that they can be answered in different ways.		Ask relevant questions and using different types of scientific enquiries to answer them.			Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

	<p>Observe closely, using simple equipment.</p> <p>Perform simple tests. Identifying and classifying.</p> <p>Use their observations and ideas to suggest answers to questions.</p> <p>Gather and recording data to help in answering questions.</p>	<p>Set up simple practical enquiries, comparative and fair tests.</p> <p>Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Gather, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Use straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Use test results to make predictions to set up further comparative and fair tests reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p>
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