

## NORTHWICK MANOR PRIMARY SCHOOL

*Knowing more.....remembering more..... Connecting learning.....*

### Science Curriculum Overview

#### Science Intent:

Isaac Newton (1642-1727), who is widely recognised as one of the most influential scientists of all time stated, *“This world is grand and there lies an ocean of undiscovered findings that are waiting for eager and curious minds.”*

Sally Ride (1951-2012), an American astronaut and physicist, claimed: *“Science is fun. Science is curiosity. We all have natural curiosity. Science is a process of investigating. It’s posing questions and coming up with a method. It’s delving in.”*

Northwick Manor’s Science curriculum stimulates children’s curiosity and **aspiration** so they are **empowered** to ask scientific questions and suggest methods to investigate this curiosity. We provide them with the **opportunity** to discover new findings.

Rosalind Franklin (1920-1958), an English chemist and X-ray crystallographer whose work was central to the understanding of the molecular structures of DNA, stated that, *“Science and everyday life cannot and should not be separated”*. At Northwick Manor Primary School, we recognise the importance of Science in every aspect of daily life. What is important to remember is, that by the time our pupils leave school, there will be jobs and careers that have not been invented yet.

At Northwick, Science is fundamental to equipping children with the necessary skills and ambition that they can adapt and apply in order to fulfil their potential. A role model must surely be Professor Sarah Gilbert who created the Oxford vaccine for Covid-19.

We have chosen to look at the specific disciplines of Biology, Chemistry, Physics and Earth Science, so that children are made aware of the breadth, depth and importance of learning in Science.

Our curriculum is in conjunction with the aims of the National Curriculum which provides breadth and ambition. In Science our intent is for pupils to:



- Develop an enthusiasm and enjoyment of scientific learning and discovery;
- Develop scientific knowledge and conceptual understanding through purposeful, investigative activities;
- Nurture a curiosity of nature, to raise and answer scientific questions about the world around them;
- Be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future;
- Be able to communicate their learning in a range of ways using a broad, scientific vocabulary.

We fulfil the National Curriculum requirements at Northwick Manor Primary School by teaching Science through the five disciplines of Scientific enquiry and investigation; foundations of Biology; foundations of Chemistry; foundations of Physics and foundations of Earth Science. We provide all pupils regardless of ethnic origin, gender, class, aptitude or disability with a broad and balanced Science curriculum


The National Curriculum for Science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics;
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them;
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

The ‘big questions’ outlined below are the driving factors for Science and occur with our three curriculum drivers in mind: aspiration, ambition; opportunity and pupil power.

	<b>Scientific enquiry and investigation</b>	<i>Our curriculum enables pupils to get better at developing enquiry questions and conducting scientific investigations.</i>
<i>During the primary years, children develop the skills required to apply their growing knowledge to practical investigations. They ask and refine questions, explore the substance of their questions through experimentation and investigation, becoming increasingly systematic and accurate as they do so. They record their findings, drawing on their observations to develop explanations. They learn to evaluate how they have gone about their investigation so that they can improve the validity of their work. As they progress, children study the work of selected scientists to understand the contribution to the growth of human knowledge and to the quality of human life which scientists have made, to build their knowledge of the scientific method of enquiry and to understand how scientists grapple with dilemmas as they look to find better answers to fundamental questions.</i>		
	<b>Foundations of Biology</b>	<i>Our curriculum enables pupils to get better at observing, describing, explaining and understanding the life processes of organisms.</i>
<i>During the primary years, children begin to address three ‘big questions’ which are fundamental to their understanding of biology and life sciences: “What kinds of life are there?”, “How do living things survive and grow?” and “What makes life go on?” Children observe and study the diversity of living things, building their knowledge of characteristics and classification of the animal and plant kingdoms. They learn that all</i>		

living things adapt to their environments and that change and diversity is a result of evolution. They observe and study the life processes in living things which are essential for survival and reproduction, and the factors which affect healthy life cycles.

 **Foundations of Chemistry** Our curriculum enables pupils to get better at observing, describing, explaining and understanding the properties of materials and how they can be changed.

During the primary years, children begin to address two 'big questions' which are fundamental to their understanding of chemistry and the science of materials: "What are things made from?" and "How can form change?" Children investigate different materials and their properties, and how materials are selected and created to suit their purpose. They develop understanding of the action of change of temperature on how materials change and change their state. They observe and study how reversible change differs from non-reversible change.










 **Foundations of Physics** Our curriculum enables pupils to get better at observing, describing, explaining and understanding forces and energy.

During the primary years, children begin to address three 'big questions' which are fundamental to their understanding of physics and the study of natural phenomena: "What makes objects move?", "How does energy make things happen?" and "How can forces be changed and controlled?" Children observe, describe and begin to explain manifestations of fundamental laws of physics relating to forces and energy: the motion of objects, the action of magnetic force, simple electrical circuits, how light travels and behaves and how sound is created and travels.

 **Foundations of Earth science** Our curriculum enables pupils to get better at observing, describing, explaining and understanding the composition of the Earth and its planetary properties.

During the primary years, children begin to address two 'big questions' which are fundamental to their understanding of Earth science: "What is the Earth made from?" and "How does the Earth's position in the solar system dictate its climate and conditions for life?" Children investigate rocks and soils and learn about the structure of the Earth's surface. They study the position of the Earth in the solar system, explaining the phenomena of day and night, seasonal change and the phases of the Moon.

**Key Learning: What will pupils get better at?**

	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
 <b>Throughout the Year</b>  	 <b>Working Scientifically</b> Explaining similarities and differences between the natural world around them and contrasting environments Throughout the year, Forest School Exploring seasons, changes in climate, length of day, plants and animals.	 <b>Working Scientifically</b> Making observations about what they see, touch, smell, hear or taste.	 <b>Working Scientifically</b> Using simple equipment to help them make observations.	 <b>Working Scientifically</b> Planning and setting up a simple fair test to make comparisons.	 <b>Working Scientifically</b> Planning a fair test, isolating variables, explaining why it was fair and which variables have been isolated.	 <b>Working Scientifically</b> Planning and carrying out a scientific enquiry to answer questions, including recognising and controlling variables where necessary.	 <b>Working Scientifically</b> Planning and carrying out an investigation by controlling variables fairly and accurately.


























**Key Golden Nuggets**

What do we want the pupils to know and what do we want the pupils to be able to do by the end of this unit?

<ul style="list-style-type: none"> <li>Know the seasons are Spring, Summer, Autumn, Winter</li> <li>Know that there is more daylight in the summer and that winters are colder and wetter and summer is warmer and drier.</li> </ul>	<ul style="list-style-type: none"> <li>Know that the 5 senses are taste touch, smell hear and taste.</li> <li>Know how to describe taste in terms of sweet, sour, bitter, salty.</li> </ul>	<ul style="list-style-type: none"> <li>Know how to use magnifiers to look closely at plants and insects.</li> <li>Know that a thermometer records temperature.</li> <li>Know how to read a thermometer.</li> <li>Know how to read the capacity in ml on measuring cylinders</li> </ul>	<ul style="list-style-type: none"> <li>Know that tests can be kept fair by keeping factors of a test the same but changing the factor that you want to test. e.g., testing the strength of a magnet</li> <li>Keep the magnet the same, but change the amount being added each time</li> </ul>	<ul style="list-style-type: none"> <li>Know that a variable is an aspect of a test which can be changed to measure its impact. E.g., Evaporation-change the temperature the liquid is stored at or its surface area.</li> </ul>	<ul style="list-style-type: none"> <li>Know that a controlled variable is something that you do not change. The height of the slope, the car, the unit of timing. minutes and length of slope</li> </ul>	<ul style="list-style-type: none"> <li>Know how to control a variable in order to</li> <li>carry out a fair investigation.</li> </ul>
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**Connecting Learning**

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<b>Autumn 1</b>	 <b>Animals including humans</b> All About Our Bodies <b>Labelling</b> body parts and <b>senses</b> .	 <b>Animals, including humans</b> <b>'Me and You'</b> Developing an <b>awareness and understanding</b> of humans- the human body, body parts. <b>Investigating and deepening</b> their knowledge of the 5 senses.	 <b>Animals including humans</b> Understand the basic needs for <b>survival</b> by <b>investigating</b> a range of given scenarios. Investigate how to stay healthy and the importance of a <b>balanced diet and regular exercise</b> .	 <b>Animals including humans</b> Develop a <b>deepening knowledge and understanding</b> of the types and functions of <b>skeletons</b> (animals and humans) Be able to identify and name different bones in the human <b>skeleton</b> Know the 3 types of <b>joint</b> and how they work. Explore how <b>muscles</b> work in pairs.	 <b>States of matter</b> Knowing the properties <b>3 states of matter</b> . <b>Classifying materials</b> accordingly. <b>Investigating and explaining the processes of evaporation and condensation</b> .	 <b>Forces</b> Explaining the <b>force of gravity</b> between the Earth and falling objects Exploring the effects of <b>air</b> and <b>water resistance</b> . Explaining that <b>levers, pulleys and gears</b> allow a smaller <b>force</b> to have a greater effect.	 <b>Living things and their habitats</b> Describing how living things are <b>classified</b> into groups.
<b>Connecting Learning</b>							
 <b>Year 1</b> Knowing body parts and senses.	 <b>EYFS</b> body parts and senses. <b>Year 3</b> Skeletons and muscles <b>Year 6</b> Circulatory and digestive system.	 <b>Year 3</b> Food groups <b>Year 6</b> impact of diet, exercise and drugs.	 <b>EYFS and Year 1</b> Body parts <b>Year 6</b> Circulatory and digestive systems.	 <b>Year 2</b> Properties of materials. <b>Year 5</b> Separating materials.	 <b>Year 3</b> Forces on moving objects.	 <b>EYFS</b> Mini beasts <b>Year 2</b> Differences between living things.	
<b>Key Golden Nuggets</b>							
<b>What do we want the pupils to know and what do we want the pupils to be able to do by the end of this unit?</b>							
	<ul style="list-style-type: none"> <li>Know and locate head, arms, chest, legs, feet, arms</li> <li>Know that we have 5 senses that help us to be aware of the surrounding environment.</li> <li>Know that the senses are</li> <li>Taste, touch, hearing, smell, sight.</li> <li>Know that animals such as hedgehogs hibernate in the winter</li> </ul>	<ul style="list-style-type: none"> <li>Know which body parts are associated with each sense:</li> </ul> Tongue- taste Ears-hearing Eyes- sight Hands (body) touch Nose- smell	<ul style="list-style-type: none"> <li>Know that humans need the following to survive:</li> </ul> Air(oxygen) Water Warmth Shelter Food <ul style="list-style-type: none"> <li>Know how exercise affects the human body</li> <li>Know that a balanced diet consists of foods from different food groups.</li> <li>Know the main food groups and some of the foods within them</li> </ul>	<ul style="list-style-type: none"> <li>Know how many bones make up the human skeleton</li> <li>Know the names of the main bones that make up the human skeleton</li> <li>Know that the skeleton has 3 major functions, to protect, move and support.</li> <li>Know that there are 3 types of joints</li> <li>Know how the joints work</li> <li>Know that muscles work in pairs and that when one contracts, the other relaxes.</li> </ul>	<ul style="list-style-type: none"> <li>Know that there are 3 states of matter- solid, liquid, gas</li> <li>Know how to identify each state of matter.</li> <li>Know that condensation is when Condensation is the <b>process by which a gas (water vapour) turns back into a liquid</b>, due to a reduction in the energy of its particles. The vapour in the air cools, when the vapour cools, it's transformed back into a liquid. This is the opposite of evaporation.</li> <li>Know that evaporation is when <b>water (liquid) is heated, it changes to water vapour (gas)</b></li> </ul>	<ul style="list-style-type: none"> <li>Know that Gravity is a <b>pulling force that works across space</b>. That is, objects do not have to touch each other for the force of gravity to affect them. For example, the Sun, which is millions of miles from Earth and the other planets and objects in the solar system.</li> <li>Know that Air resistance is a type of <b>friction between air and another material</b>. <b>Water Resistance</b>. If you go swimming, there is friction between your skin and the water particles.</li> </ul>	<ul style="list-style-type: none"> <li>Know that Animals can be <b>divided into</b> groups or 'classified' by looking at the similarities and differences between them.</li> <li>Animals that have a <b>backbone</b> are called <b>vertebrates</b>. Animals that don't have a <b>backbone</b> are called <b>invertebrates</b>.</li> <li>Know that Vertebrates and invertebrates are divided into smaller groups. Vertebrates, for example, are divided into fish, amphibians, reptiles, birds and mammals.</li> <li>Know that There are many different groups of invertebrates too.</li> </ul>
<b>Autumn 2</b>	 <b>Seasonal Changes 'Autumn'</b> Looking at trees through the <b>seasons</b> .	 <b>Animals, including humans</b> <b>'Me and You'</b> Developing an <b>awareness and understanding</b> of humans- the human body, body parts. <b>Investigating and deepening</b> their knowledge of the 5 <b>senses</b> .	Understand the basic needs for <b>survival</b> by <b>investigating</b> a range of given scenarios. Investigate how to stay healthy and the importance of a <b>balanced diet and regular exercise</b> .	 <b>Forces and Magnets</b> Through practical work, be able to <b>identify</b> the forces acting upon moving objects. <b>Identify forces</b> as either pushes or pulls Know that magnets have <b>2 poles</b> and the <b>forces of attraction and repulsion</b> Investigate <b>magnetic forces, and materials</b> .	 <b>Sound</b> Explaining that <b>sounds</b> are made through <b>vibrations</b> Examining <b>pitch and volume</b> And reasons for differences in these.		 <b>Evolution and inheritance</b> <b>Identifying</b> how animals and plants have <b>adapted</b> over time to suit their <b>environment</b> in different ways and that <b>adaptation</b> may lead to <b>evolution</b> . Recognising that living things produce <b>offspring</b> of the same kind and link their understanding to <b>genes and genetics</b> .
<b>Connecting Learning</b>							
 <b>EYFS</b> Spring 2 <b>Year 1</b> Key parts of plants. Types of trees.	 <b>EYFS</b> body parts and senses. <b>Year 3</b> Skeletons and muscles <b>Year 6</b> Circulatory and digestive system.		 <b>EYFS</b> Floating and sinking. <b>Year 2</b> (Materials) investigating effects of pushes and pulls on	 <b>Sound –</b> <b>Year 2</b> Characteristics of materials		 <b>EYFS &amp; Year 1</b> body parts and senses <b>Year 4</b> Endangered species.	



the shape of some materials.  
Year 5 gravity, air and water resistance.

**Key Golden Nuggets**

**What do we want the pupils to know and what do we want the pupils to be able to do by the end of this unit?**



- Know that leaves appear on deciduous trees in the spring and change colour and fall in the Autumn

- Know which body parts are associated with each sense  
Tongue- taste  
Ears-hearing  
Eyes- sight  
Hands (body) touch  
Nose- smell

- Know that humans need the following to survive Air(oxygen), Water, warmth, shelter and food.
- Know how exercise affects the human body
- Know that a balance diet consists of foods from different food groups.
- Know the main food groups and some of the foods within them

- Know that pushes and pulls are the 2 main types of forces.
- Know that magnets have a north and south pole
- Know that like poles repel and opposite poles attract.
- Know that not all metals are magnetic.
- Know that magnetic metals include iron, nickel, cobalt,

- Know that sounds are made through vibrations.
- Know that pitch is **the way that a noise may sound high or low.**
- Know that **volume is how loud or quiet the sound is.**

- Know that evolution is the process by which living things can gradually change over time
- Know that adaptation is a very gradual process which happens within a population rather than to an individual

**Spring 1**

**Forces**  
Floating and sinking linked with water transport.

**Materials**  
Naming a widening range of materials and their properties.  
Grouping and comparing everyday materials based on their properties.

**Materials**  
Exploring how the characteristics of a range of materials ensure they are suitable for specific uses.  
Investigate how forces such as pushing and pulling can change the shape of some materials and not others e.g. pipe cleaner, plastic bag, metal spoon.

**Rocks**  
Understanding the different types of rock, their formation and features.  
Grouping and classifying rocks according to their properties.  
Describing how fossils are formed  
Investigating different types of soil and their different compositions and properties.

**Electricity**  
Constructing simple electrical circuits and naming the components.  
Exploring which materials conduct electricity and which are insulators and why this is important.

**Earth and Space**  
Explaining that night and day are caused by the earth rotating around the sun and on its axis.  
Describing the movement of the moon relative to the earth.  
Explaining that the movement of the earth around the sun creates day and night.

**Animals, including humans**  
Explaining the main parts of the human circulatory, respiratory and digestive systems.  
Explaining the impact of diet, exercise, drugs and lifestyle on the body.

**Connecting Learning**

**Year 2**  
Pushes and pulls.

**Year 2**  
characteristics of materials

**Year 3** forces- pushes and pulls  
**Year 5** changes in materials.

**Year 3-** vocabulary associated with materials e.g. hard, soft, rigid.  
*History* The stone Age.

**Year 6**  
Investigating increasingly complex circuits

**Year 1** Seasonal changes  
**Year 6** Shadows.

**Year 2** Balanced diet and exercise  
**Year 3** healthy living.

**Key Golden Nuggets**

**What do we want the pupils to know and what do we want the pupils to be able to do by the end of this unit?**



- Know that floating is when an object is suspended in water or air.
- Know how to investigate and sort a range of objects that sink or float

- Know that Materials are the **matter or substance that objects are made from.** We use a wide range of different materials every day. These might include: metal; plastic; wood; glass; ceramics; synthetic fibres; composites (made from two or more materials combined together)

- Know that different materials have different properties. For example, waterproof materials repel water.
- Know the forces of pushing and pulling can change the shape of some materials.
- Know how they can test the properties of materials (Ice troll experiment)
- Know the definitions of opaque, translucent, transparent,
- Know that some materials are naturally occurring and some are not
- Know some naturally occurring materials








- Know that the three main rock types are igneous, sedimentary, and metamorphic.
- Know how the rock cycle has an impact on how the different types of rocks are formed.

- Know how to assemble wires, a battery and bulb/buzzer to create a working circuit.
- Know that a battery is a source of energy which provides a push - a voltage - of energy to get the current flowing in a circuit.
- Know that A bulb uses the electrical energy provided by the battery
- Know that Conductors are substances that an electric charge can pass through without difficulty.
- Know that insulators materials do not allow







- Know that Earth rotates on its axis and that it does a full rotation once in every 24 hours.
- Know that at the same time it is orbiting the sun.
- Know that it takes a little more than 365 days to orbit the sun.
- Know that daytime occurs when the side of the Earth is facing towards the sun and night occurs when the side of the Earth is facing away from the sun.

- Know that the circulatory system is the **network of organs and vessels** which allow blood and the materials carried by the blood to circulate around the body.
- Know that the circulatory system is made up of the heart, blood vessels and blood.
- Know that the circulatory system ensures that oxygen is delivered to all areas of the body and waste is transported away.
- Know the functions of some of the main parts of the digestive system e.g.
- The stomach is an important organ in the digestive system. After food has been chewed in the mouth and swallowed, it enters the stomach via the oesophagus. The stomach produces **strong acid.** This kills many harmful

					<p>electricity to pass through them. These materials are known as electrical <b>insulators and include materials such as glass and wood.</b></p>		<p>microorganisms that might have been swallowed along with the food. It also contains special chemicals called <b>enzymes.</b></p>
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<p><b>Spring 2</b></p>	<p> <b>Plants</b></p> <p><b>Labelling</b> parts of a <b>plant.</b></p> <p>What plants need to grow? <b>Life cycle</b> of a plant.</p> <p> <b>Animals including humans.</b> 'Great Pet Sale' Care and needs of animals.</p>	<p> <b>Animals, including humans</b></p> <p>Understanding that there are a range of animal <b>groups.</b> <b>Categorising</b> animals according to chosen and given <b>criteria.</b> Following lines of <b>enquiry</b> e.g. What conditions does a woodlouse prefer?</p>		<p><b>Plants</b></p> <p>Locating and explaining the different parts of a plant and their <b>function.</b> <b>Investigating</b> the <b>conditions</b> plants need to <b>germinate</b> and grow. <b>Exploring</b> and explain how water travels through plants. <b>Exploring</b> the <b>life cycle</b> of plants e.g. <b>pollination, seed dispersal and seed formation.</b></p>	<p> <b>Animals, including humans</b></p> <p><b>Teeth</b> Explaining the <b>function</b> of different types of <b>teeth</b> in humans.</p> <p> <b>The digestive system</b> Understanding the <b>digestive system</b> and the <b>function</b> of the basic parts.</p>	<p> <b>Materials</b> Exploring which <b>materials</b> will <b>dissolve</b> to form a <b>solution.</b> <b>Investigating</b> methods to <b>separate mixtures of materials.</b></p> <p>Examining which changes are <b>reversible</b> and <b>irreversible</b> and their reasons for this.</p>	<p> <b>Light</b> <b>Investigating</b> how light travels in <b>straight</b> lines and how we see things. Investigating the size and shape of <b>shadows</b> by blocking a light source with <b>opaque</b> objects.</p>
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**Connecting Learning**

<p> <b>Year 1</b></p> <p>Knowing parts of a plant and how they grow. <b>Year 2</b> Functions of the different parts of a plant. <b>Year 3</b> Investigating conditions for germination. and seed dispersal.</p>	<p> <b>EYFS Mini beasts</b> <b>Y3 Nutrition</b> <b>Y4 Food chains.</b></p>		<p> <b>Year 1</b> Knowing parts of a plant and how they grow. <b>Year 2</b> Key parts of plants, life cycle of a flowering plant</p>	<p> <b>Animals, including humans</b> <b>Year 1</b> body parts <b>Year 6</b> circulatory and digestive systems.</p>	<p> <b>Year 1</b> Knowing a widening range of materials and their names <b>Year 2</b> Characteristics of materials <b>Year 4</b> States of matter.</p>	<p> <b>Year 3</b> How light travels; light sources and shadows.</p>
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**Key Golden Nuggets**

**What do we want the pupils to know and what do we want the pupils to be able to do by the end of this unit?**

	<ul style="list-style-type: none"> <li>Know that the roots of a plant act as an anchor, fixing the plant into the ground. They also absorb water and minerals to help the plant to grow.</li> <li>Know that the stem of a plant grows above the ground.</li> <li>Know that the leaves and flowers grow from it.</li> <li>Know the stem is</li> </ul>	<ul style="list-style-type: none"> <li>Know that: Carnivores eat other <b>animals</b>, herbivores eat plant material including fruit, leaves, vegetables, omnivores eat a mixture of meat and plant material</li> <li>Know that mammals have fur and give birth to live young</li> <li>Know that birds have feathers and lay eggs</li> <li>Know that reptiles have a dry, scaly skin and lay eggs</li> <li>Know that fish live in water, lay eggs, have gills.</li> <li>Know that insects have 6 legs, most have wings</li> </ul>		<ul style="list-style-type: none"> <li>Know that a <b>plant's</b> roots sit below the soil and the stem grows above it.</li> <li>Know that the stem carries water and nutrients to different parts of the plant. It also provides support and keeps the plant standing upright.</li> <li>Know that leaves make food for the plant using sunlight and carbon dioxide from the air.</li> </ul>	<ul style="list-style-type: none"> <li><i>Know that Humans</i> have three main types of teeth: 1. Incisors: help you bite off and chew pieces of food; Canines These teeth are used for tearing and ripping food; Molars These help you crush and grind food</li> </ul> <p><u>Digestion</u></p> <ul style="list-style-type: none"> <li>Know that the food we eat has to be <b>broken down</b> into other substances that our bodies can use. This is called digestion.</li> <li>Know that without digestion, we could not <b>absorb</b> food into our</li> </ul>	<ul style="list-style-type: none"> <li>Know that some substances <b>dissolve</b> when you <b>mix</b> them with <b>water.</b></li> <li>Know that when a substance <b>dissolves</b>, it might look like it has disappeared, but it has mixed with the water to make a transparent (see-through) liquid called a <b>solution.</b></li> <li>Know that A change is called irreversible if it cannot be changed back again.</li> <li>Know that changes can be made by mixing, heating burning.</li> <li>Know that a reversible change is a change that can be undone or reversed.</li> <li>Know that A reversible change might change how a material looks or feels, but it doesn't</li> </ul>	<ul style="list-style-type: none"> <li>Know that <b>light</b> travels in straight lines; it can travel through transparent or translucent materials.</li> <li>Know that if an opaque object gets in the way of the light, a shadow is formed as the light rays cannot get through. The shadow will be the same shape as the object.</li> </ul>
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	<p>also used to transport water and minerals around the plant.</p> <ul style="list-style-type: none"> <li>• Know how to handle an animal gently</li> <li>• Know that an animal needs food, water and a home.</li> <li>• Know that a vet is a person who cares for animals.</li> </ul>			<ul style="list-style-type: none"> <li>• Know that some plants have flowers. These are involved in reproduction and produce seeds from which new plants grow.</li> </ul> <p><b>Know that Pollination</b> in plants is the process where pollen is transferred from the anther, the male part of a flower, to</p> <ul style="list-style-type: none"> <li>• the stigma, the female part of a flower.</li> <li>• <b>Know that Seed dispersal is the way seeds get away from the parent plant to a new place.</b></li> <li>• <b>Know that seed formation is when</b> Pollen from the male part of one flower travels to the female part of another flower where the seeds are made.</li> </ul>	<p>bodies and use it.</p> <ul style="list-style-type: none"> <li>• Know that digestion happens in the <b>digestive system</b>. This is a series of organs that break the food down so it can be absorbed into our bloodstream.</li> <li>• Know the names of some of the organs that are part of the digestive system e.g. <b>Mouth; Oesophagus; Liver; Duodenum; Tongue; Small intestine; Stomach; Large intestine; Teeth</b></li> </ul>	<p>create new materials.</p> <ul style="list-style-type: none"> <li>• Know that Examples of reversible reactions include dissolving, evaporation, melting and freezing.</li> </ul>	
<b>Summer 1</b>	 <p><b>Living things and their habitats</b> Mini Beasts <b>Observational</b> drawings and bug hunt in forest school.</p>	 <p><b>Seasonal Changes</b> <b>Observing</b> changes across the four <b>seasons</b> including <b>weather</b> and day length.</p>	 <p><b>Plants</b> Describing what each key part of a <b>plant</b> is and the <b>functions</b> of different parts of <b>flowering</b> plants. <b>Investigating</b> the requirements of plants for life and growth. Explaining the <b>life cycle</b> of <b>flowering</b> plants.</p>	 <p><b>Light</b></p> <ul style="list-style-type: none"> <li>• Explaining what <b>light</b> is and know that the sun is a <b>light source</b>.</li> <li>• Examine how light is <b>reflected</b> from some surfaces and not others.</li> <li>• Investigating how light travels.</li> <li>• Investigate how the size of <b>shadows</b> change and the causes of this</li> </ul>	 <p><b>Living things and their habitats</b> Identifying different <b>habitats</b> and how they change throughout the year. <b>Classifying</b> living things into different groups Identifying what can be done to help <b>endangered</b> animals</p>	 <p><b>Living things and their habitats</b> Comparing life cycles of plants and animals. Investigating growing plants in different ways from different parts of the parent plant.</p>	 <p><b>Electricity</b> Investigating increasingly complex circuits to compare and infer reasons for variations in: the brightness of bulbs, the loudness of buzzers and the on / off positions of switches. Representing circuits that they've made by using recognised symbols in diagrams.</p>
<b>Connecting Learning</b>							
	 <p><b>Year 2</b> Animal groups <b>Year 5</b> Life Cycles</p>	 <p><b>EYFS</b> Seasonal Autumn Looking at trees through the seasons.</p>	 <p><b>Year 1</b> Knowing parts of a plant and how they grow. <b>Year 3</b> Investigating conditions for germination and Seed dispersal.</p>	 <p><b>Year 6</b> Light travels in straight lines. Investigating size and shape.</p>	 <p><b>EYFS</b> Mini beasts <b>Year 2</b> Animal groups <b>Year 3</b> Nutrition. <b>Year 5</b> Life Cycles</p>	 <p><b>EYFS</b> Mini beasts <b>Year 2</b> Animal groups <b>Year 3</b> Nutrition. <b>Year 4</b> Habitats</p>	 <p><b>Year 4:</b> Constructing simple circuits</p>
<b>Key Golden Nuggets</b>							
<b>What do we want the pupils to know and what do we want the pupils to be able to do by the end of this unit?</b>							



- Know the names of some minibeasts found around the school grounds
- Know how to look for minibeasts and how to care for them.

- Know that four seasons are spring, summer, autumn and winter.
- Know that colder weather comes in autumn and winter. Warmer weather comes in spring and summer.
- Know that a rain gauge measures how much rain has fallen.
- Know that a wind vane shows which way the wind is blowing.
- Know that a thermometer measures the temperature.
- Know that Our days of sunlight are longest in the summer and shortest in the winter.

- Know that the **life cycle** of a plant is as follows
  - Seed – The plant life cycle starts with a seed
- Germination
- Know that when a seed is sown into moist soil, it begins to grow;
- Seedling
- Know that every young plant that grows after germination is called a seedling.
- Adult Plant
- Know that when a plant becomes mature, it starts to grow /flower.

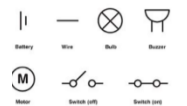
- Know that a source of **light** make s **light**.
- Know that light is needed to see.
- Know that the Sun and other stars, fires, torches and lamps all make their own **light** and so are examples of sources of **light**.
- **Know how to explore** shadows and learn how shadows are formed when a **light** source is blocked by an opaque item.

Know that **light** is **reflected** from surfaces.

- Know that habitat is natural environment that an animal/plant lives in.
- Know that a habitat provides animals with 3 important things: a safe place to raise their young, find food and shelter.
- Know that habitats can be hot/cold, wet/dry.
- Know how to classify animals into the mammals, birds etc


- Know how to describe the life cycle of a plant.
- Know how to describe the life cycle of a mammal.


- Know that there are a range of components of an increasingly complex circuit and know how to draw them using these symbols




- Know how to change a circuit


## Summer 2

 Plants  
Naming and identifying a range of plants including **trees**.  
Knowing and labelling the parts of a plant (e.g. root, stem, petal, leaves)  
Becoming aware of how plants grow by growing their own e.g. chitted potatoes.


 Living things and their habitats  
Comparing  
the differences between **living things**, dead **things** and things that have **never been alive**.  
Understanding that there are **7 life processes** and naming them.  
Explaining how a **habitat** provides basic needs for **plants** and **animals**.  
Understanding and representing simple **food chains**.


 Animals Including humans  
(Healthy living)  
Explaining that humans do not make their own food and get **nutrition** from the food they eat.  
Knowing the different **food groups** and their role.

 Animals, including humans  
Food chains  
Constructing **food chains** and identifying the **producer**, **predator** and **prey**.

 Living things and their habitats  
Describing the differences in the **life cycles** of a **mammal**, an **amphibian**, an **insect** and a **bird**.  
Describing the **life process** of **reproduction** in some plants (e.g. the function of the stigma, style, anther and stamen) and animals.  
Animals including Humans  
Describing the changes as humans develop to old age.

### Connecting Learning

 EYFS What do plants need to grow?  
Year 2 characteristics of materials  
Year 3 Investigating conditions for germination and Seed dispersal.

 Year 4 identifying different habitats.  
Classification  
Year 5 Comparisons of life cycles.

 EYFS Mini beasts  
Year 2  
Exercise and a balanced diet  
Year 4 Food chains.

 EYFS Mini beasts  
Year 2 Animal groups  
Year 3 Nutrition.  
Year 5 Life Cycles

 EYFS Mini beasts  
Year 2 Animal groups  
Year 3 Nutrition.  
Year 4 Habitats

### Key Golden Nuggets

**What do we want the pupils to know and what do we want the pupils to be able to do by the end of this unit?**

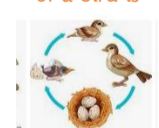



- Know that that bulbs and seeds can grow into mature plants.
- Know the name and appearance of daffodils, sunflowers, roses
- Know the names and identify Oak trees, sycamore trees, horse chestnut trees

- Know that a living thing Moves, reproduces, shows sensitivity, needs nutrition, respire, grows.
- Know that there are many types of habitats and name them desert, meadow, woodland, grassland, forest, seashore, ocean.

- Know that there are food groups: **Fruit and vegetables**, for example, apples, bananas and broccoli, give us **vitamins** to keep our bodies working and help our immune system and **fibre** to help our digestion.
- **Carbohydrates**, like pasta, bread and rice, keep our **energy** levels up.
- **Proteins**, such as meat, beans, and

- Know that a **predator** is an animal that hunts, catches, and eats other animals.
- Know that **prey** is an animal that is hunted and killed for food by another animal.
- Know plants get their energy from the Sun. They are called **producers** because they make their own food.

- Know that the life cycle of a bird is
- 
- Know that the life cycle of a mammal is
  - know that the life cycle of an amphibian is
- 
- Know that the life cycle of an insect is

- Know that there are six stages in the human life cycle: **Foetus** At this time, a baby is growing inside its mum's womb. **Baby** A baby is born after spending nine months inside the womb. **Childhood** At this stage, you learn to walk and

				<p>eggs, <b>build healthy muscles</b> and allow our bodies to <b>grow</b> and <b>repair</b>.</p> <ul style="list-style-type: none"><li>• <b>Dairy</b>, like milk, cheese and yoghurt, gives us <b>calcium</b> for strong teeth and bones.</li><li>• <b>Fats and oils</b>, for example olive oil and butter, act as an <b>energy store</b>.</li></ul>		<p>talk. <u>Adolescence</u> Children become teenagers. Adulthood Your body is fully developed. <u>Old age</u> the last stage in the life cycle of a human.</p>	
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