

Linchfield Community Primary School

Learning Ladders

Science



Intent	Implementation	Impact
<p>Early years Foundation Stage: In EYFS the framework is organised across 7 areas of learning rather than subject areas. As part of this document we have planned how the skills taught across EYFS feed into the national curriculum and which statements from the 2020 Development Matters are prerequisite skills for science within the National Curriculum.</p> <p>KS1 and KS2: In KS1 and KS2 the science curriculum has been designed to cover all of the skills, knowledge and understanding as set out in the National Curriculum. The National Curriculum states that ‘a high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world’s future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.’</p> <p>To ensure that pupils develop a secure knowledge that they can build on, our science curriculum has been mapped out using the specific disciplines.</p> <p>When covering each of these strands, the content will be carefully organised by each year group through our subject overview.</p> <p>Content knowledge, vocabulary and skills will then be planned for at a greater level of detail in the Year group Frameworks.</p> <p>Science is delivered through subject specific teaching organised into blocks under a theme. Meaningful links with other subjects are made to strengthen connections and understanding for pupils.</p>	<p>The Early years Foundation Stage (EYFS) follows the ‘Development Matters’ in the EYFS guidance. In EYFS science is taught as part of ‘Understanding of the World’ and will be seen as part of the continuous and adult lead provision across the classroom, not as a discrete subject.</p> <p>In KS1 and KS2, science is taught as a discreet subject every week to allow time to embed skills in the subject.</p> <p>All learning will start by revisiting prior knowledge. This will be scaffolded to support children to recall previous learning and make connections. Staff will model explicitly the subject-specific vocabulary, knowledge and skills relevant to the learning to allow them to integrate new knowledge into larger concepts.</p> <p>Learning will be supported through the use of knowledge organisers that provide children with scaffolding that supports them to retain new facts and vocabulary in their long-term memory. Knowledge organisers are used for pre-teaching, to support home learning and also as a part of daily review.</p>	<p>Impact is measured through regular learning walks, lesson visits, work scrutiny and pupil voice.</p> <p>Work will show that a range of topics are being covered as well as progression across each unit of work in every year group and across year groups.</p> <p>Children will be able to talk about the skills and knowledge they have acquired, through pupil voice, and will be engaged in lessons and want to find out more.</p> <p>Teachers will use Assessment for Learning to ensure all lessons are relevant and will help to plan for next steps.</p> <p>Subject coordinators will be given regular time to ensure resources are kept up to date, to monitor their subject across the school, create action plans and impact reports and to provide subject feedback to SLT as appropriate.</p>

Breadth of study

Breadth of Study EYFS:

Reception	Communication and Language		<ul style="list-style-type: none"> Learn new vocabulary. Ask questions to find out more and to check what has been said to them. Articulate their ideas and thoughts in well-formed sentences. Describe events in some detail. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. Use new vocabulary in different contexts.
	Personal, Social and Emotional Development		<ul style="list-style-type: none"> Know and talk about the different factors that support their overall health and wellbeing: <ul style="list-style-type: none"> - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian
	Understanding the World		<ul style="list-style-type: none"> Explore the natural world around them. Describe what they see, hear and feel while they are outside. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them.
ELG	Communication and Language	Listening, Attention and Understanding	Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development	Managing Self	Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	The Natural World	<ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>

Breadth of study Key Stage 1:

Pupils should be taught about:

BIOLOGY		CHEMISTRY	PHYSICS
<p>Plants</p> <ul style="list-style-type: none"> Look at the function of parts of flowering plants, requirements of growth, water transportation in plants, life cycles and seed dispersal. <p>Evolution and inheritance</p> <ul style="list-style-type: none"> Look at resemblance in offspring. Look at changes in animals over time. Look at adaptation to environments. Look at difference in offspring. Look at adaptations and evolution. Look at changes to the human skeleton over time. 	<p>Animals and humans</p> <ul style="list-style-type: none"> Look at nutrition, transportation of water and nutrients in the body and the muscle skeleton system of humans and animals. Look at the digestive system in humans. Look at teeth. Look at the human circulatory system. <p>All living things</p> <ul style="list-style-type: none"> Identify and name plants and animals. Look at classification keys. Look at the life cycle of animals and plants. Look at the classification of plants, animals and micro-organisms. Look at reproduction in plants and animals and human growth and changes. Look at the effect if diet, exercise and drugs 	<p>Materials</p> <ul style="list-style-type: none"> Identify, name, describe, classify and compare properties and changes. Look at the practical uses of everyday materials. 	<p>Forces</p> <ul style="list-style-type: none"> Describe basic movements. <p>Earth and Space</p> <ul style="list-style-type: none"> Observe seasonal changes.

Breadth of study Key Stage 2:

Pupils should be taught about:

BIOLOGY	CHEMISTRY	PHYSICS
<p>Plants</p> <ul style="list-style-type: none"> Look at the function of parts of flowering plants, requirements of growth, water transportation in plants, life cycles and seed dispersal. <p>Evolution and inheritance</p> <ul style="list-style-type: none"> Look at resemblance in offspring. Look at changes in animals over time. Look at adaptation to environments. Look at difference in offspring. Look at adaptations and evolution. Look at changes to the human skeleton over time. Look at the life cycle of animals and plants. Look at the classification of plants, animals and micro-organisms. Look at reproduction in plants and animals and human growth and changes. Look at the effect if diet, exercise and drugs. <p>Animals and humans</p> <ul style="list-style-type: none"> Look at nutrition, transportation of water and nutrients in the body and the muscle skeleton system of humans and animals. Look at the digestive system in humans. Look at teeth. Look at the human circulatory system. <p>All living things</p> <ul style="list-style-type: none"> Identify and name plants and animals. Look at classification keys. 	<p>Rocks and Fossils</p> <ul style="list-style-type: none"> Compare and group rocks and describe the formation of fossils. <p>States of matter</p> <ul style="list-style-type: none"> Look at solids, liquids and gases, change of state, evaporation, condensation and the water cycle. <p>Materials</p> <ul style="list-style-type: none"> Examine the properties of materials using various tests Look at solubility and recovering dissolved substances Separate mixtures. <p>Examine changes to materials that create new materials that are usually not reversible.</p>	<p>Light</p> <ul style="list-style-type: none"> Look at sources, seeing, reflections and shadows. Explain how light appears to travel in straight lines and how this affects seeing and shadows. <p>Sound</p> <ul style="list-style-type: none"> Look at sources, vibration, volume and pitch. <p>Electricity</p> <ul style="list-style-type: none"> Look at appliances, circuits, lamps, switches, insulators and conductors. <p>Forces and Magnets</p> <ul style="list-style-type: none"> Look at contact and distant forces, attraction and repulsion, comparing and grouping materials. Look at poles, attraction and repulsion. Look at the effect of gravity and drag forces. Look at transference of forces in gears pulleys, levers and springs. <p>Earth and Space</p> <ul style="list-style-type: none"> Look at movement of the Earth and the Moon. Explain day and night

Threshold Concepts			
Working Scientifically	Biology	Physics	Chemistry
<p>This concept involves learning the methodologies of the discipline of Science.</p>	<p>Understand plants- This concept involves becoming familiar with different types of plants, their structure and reproduction.</p> <p>Understand animals and humans- This concept involves becoming familiar with different types of animals, humans and the life processes they share.</p> <p>Investigate living things- This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.</p> <p>Understand evolution and inheritance- This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.</p>	<p>Understand movement, forces and magnets- This concept involves understanding what causes motion. Understand the Earth's movement in space- This concept involves understanding what causes seasonal changes, day and night.</p> <p>Investigate light and seeing- This concept involves understanding how light and reflection affect sight.</p> <p>Investigate sound and hearing- This concept involves understanding how sound is produced, how it travels and how they are heard.</p> <p>Understand electrical circuits- This concept involves understanding circuits and their role in electrical applications.</p>	<p>Investigate materials- This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.</p>
Knowledge Categories			
	Plants	Light	Materials
	Animals and humans	Sound	
	Living things	Earth & Space	
	Evolution and inheritance	Forces & Magnets	
		Electricity	

Working Scientifically

(to be delivered through teaching of subject content and not to be taught separately)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology: Plants	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees</p>	<p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, 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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>		N/A	N/A
Biology: Animals Including Humans	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common 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>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p>	<p>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 other animals have skeletons and muscles for support, protection and movement</p>	<p>Describe the simple functions of the basic parts of the digestive system in 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>	Describe the changes as humans develop to old age	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p> <p>Evolution and Inheritance 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</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology: Living Things and their Habitat	<u>N/A</u>	<p>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</p> <p>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, including microhabitats</p> <p>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</p>	<u>N/A</u>	<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>Describe 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>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>Give reasons for classifying plants and animals based on specific characteristics</p>
Chemistry: Materials	<p>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>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>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 can be changed by squashing, bending, twisting and stretching</p>	<p>Rocks</p> <p>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</p> <p>Recognise that soils are made from rocks and organic matter</p>	<p>States of matter</p> <p>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>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>Properties and changes of materials</p> <p>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</p> <p>Know 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</p> <p>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</p>	<u>N/A</u>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics: Light and Sound	N/A	N/A	<p>Light</p> <p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows changes</p>	<p>Sound</p> <p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</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>Recognise that sounds get fainter as the distance from the sound source increases</p>	N/A	<p>Light</p> <p>Recognise 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 straight lines to explain why shadows have the same shape as the objects that cast them</p>
Physics: Earth and Space	<p>Seasonal Changes</p> <p>Observe changes across the 4 seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>	N/A	N/A	N/A	<p>Describe the movement of the Earth and other planets relative to the sun in the solar system</p> <p>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 and the apparent movement of the sun across the sky</p>	N/A

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physics: Forces & Magnets	N/A	N/A	<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having 2 poles</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing</p>	N/A	<p>Explain that unsupported 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>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</p>	N/A
Physics: Electricity	N/A	N/A	N/A	<p>Identify common appliances that run on electricity</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>	N/A	<p>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>

SCIENCE OVERVIEW:

	Autumn		Spring		Summer	
Year 1	Animals including Humans	Animals including Humans Seasonal Changes	Everyday materials Seasonal Changes	Everyday materials Seasonal Changes	Plants	Seasonal Changes
Year 2	Animals including Humans	Animals including Humans	Uses of everyday materials	Uses of everyday materials	Plants	Living things and their Habitats
Year 3	Forces	Magnets	Materials – Rocks	Light	Plants	Animals including Humans
Year 4	Electricity	Sound	States of Matter	States of Matter	Animals including Humans	Living things and their Habitats
Year 5	Earth and Space	Forces	Properties and changes of materials	Properties and changes of materials	Animals Including humans	Living Things and Their Habitats
Year 6	Electricity	Light	Evolutions and Inheritance	Evolutions and Inheritance	Animals Including Humans	Living Things and Their Habitats