

Science



HIGHER FAILSWORTH PRIMARY SCHOOL

Science Intent

Our intent in teaching Science at Higher Failsworth Primary School is to enable our children to:

- Increase their knowledge and understanding of the world
- Develop the skills associated with Science as a process of enquiry
- To foster their natural curiosity and develop enquiring minds
- To encourage respect for living organisms and the physical environment
- To provide opportunities for critical evaluation of evidence
- To build an understanding of the importance of science in modern life.

We want pupils at Higher Failsworth to become:

- Able to ask and answer specific questions.
- Able to plan and carry out scientific investigation, using equipment, including computers correctly.
- Competent in their knowledge and understanding of the life processes of materials, electricity, light, sound and natural forces.
- Knowledgeable about the nature of the solar system, including the earth.
- Able to evaluate evidence and present their conclusions clearly and accurately.





HIGHER FAILSWORTH PRIMARY SCHOOL



Science Implementation

Science is taught weekly in Key Stage One and Key Stage Two. A range of teaching and learning styles are used within our science lessons. Working scientifically is embedded into all science lessons. The notes and guidance within the National Curriculum provides examples of how this can be done. It focuses on the key features of scientific enquiry in order for children to learn to use a variety of approaches to answer relevant scientific questions. The types of scientific enquiry should include:

- Observing over time
- Pattern seeking, identifying, classifying and grouping.
- Comparative and fair testing (controlled investigations).
- Researching using secondary sources.
- Seeking answers to questions through collecting, analysing and presenting data.

We ensure our pupils receive:

Activities that are accessible by all children of different scientific abilities by matching the challenge of the task to the ability of the child. We achieve this in our school by providing tasks that are:

- Open ended and accept a variety of responses.
- Use classroom assistants to support the work of individual children or groups.
- Having mixed ability groups for discussions.



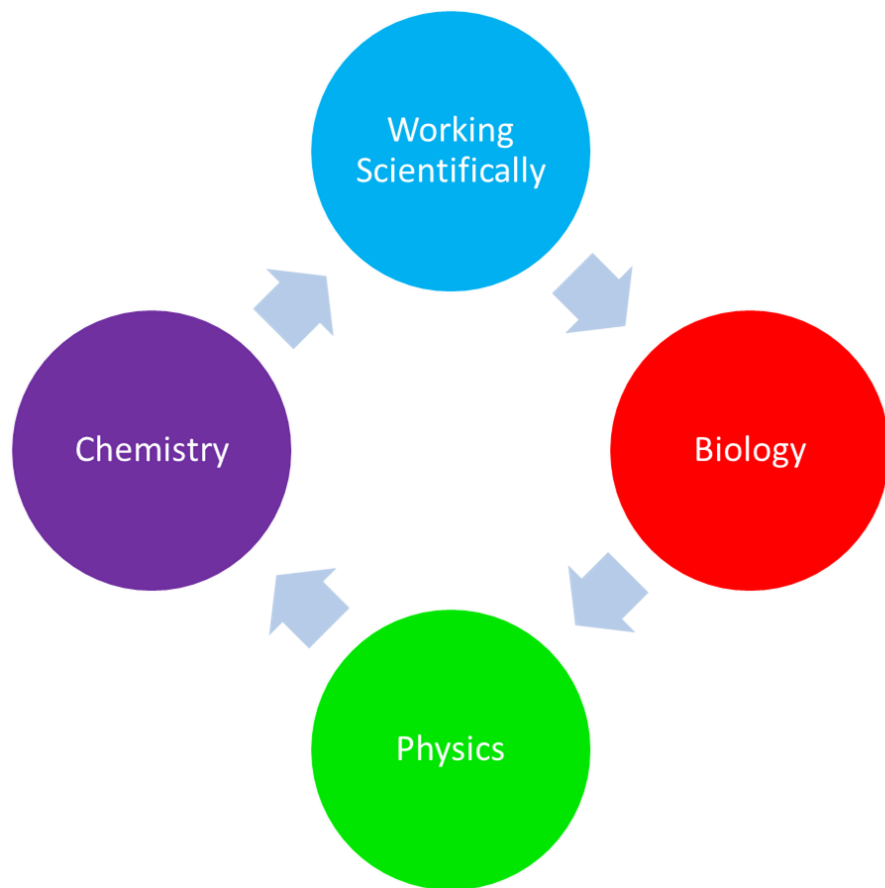


Science Impact



The impact of our science curriculum will lead to outstanding progress over time across key stages relative to a child's individual starting point and their progression of skills. Children will therefore be expected to leave Higher Failsworth Primary School reaching at least age-related expectations for Science. A quality science experience provides strong foundations and a good understanding of the world through the specific disciplines of biology, chemistry, and physics. Science has been and continues to be a vital part of our lives as well as the world's future prosperity. All children should gain skills in the essential aspects of the knowledge, methods, processes and uses of science. Children should be provided with opportunities to encourage recognition of the power of rational thinking and explanation whilst achieving a sense of love, excitement, and curiosity about our natural world. Children should learn to understand the ways in which science can be used to explain what is occurring, predict how things will behave and analyse causes.





Aims 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.



EYFS Early Learning Goals for Science

<u>Three and Four-Year-Olds</u>	<u>Communication and Language</u>	Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	<u>Personal, Social and Emotional Development</u>	Make healthy choices about food, drink, activity and toothbrushing
	<u>Understanding the World</u>	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Begin to make sense of their own life-story and family's history. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice



EYFS Early Learning Goals for Science

<u>Reception</u>	<u>Communication and Language</u>	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.
	<u>Personal, Social and Emotional Development</u>	Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian
	<u>Understanding the World</u>	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.



EYFS Early Learning Goals for Science

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	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. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.



Working Scientifically

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
I can ask simple questions and recognise that they can be answered in different ways I can observe closely, using simple equipment I can perform simple tests I can identify and classify I can use observations and ideas to suggest answers to questions I can gather and record data to help in answering questions	I can ask simple questions and recognise that they can be answered in different ways. I can observe closely, using simple equipment. I can perform simple tests. I can identify and classify. I can use observations and ideas to suggest answers to questions. I can gather and record data to help in answering questions.	I can ask relevant questions and use different types of scientific enquiries to answer them I can set up simple practical enquiries, comparative and fair tests. I can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers I can gather, record, classify and present data in a variety of ways to help in answering questions I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions I can identify differences, similarities or changes related to simple scientific ideas and processes I can use straightforward scientific evidence to answer questions or to support my findings.	I can ask relevant questions and use different types of scientific enquiries to answer them I can set up simple practical enquiries, comparative and fair tests. I can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers I can gather, record, classify and present data in a variety of ways to help in answering questions I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions I can identify differences, similarities or changes related to simple scientific ideas and processes I can use straightforward scientific evidence to answer questions or to support my findings.	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs I can use test results to make predictions to set up further comparative and fair tests I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations I can identify scientific evidence that has been used to support or refute ideas or arguments.	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs I can use test results to make predictions to set up further comparative and fair tests I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations I can identify scientific evidence that has been used to support or refute ideas or arguments.



Biology:

Animals Including Humans

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
- I can identify and locate parts of my body and say which part relates to which sense. - I can name common animals from each group. - I can describe and compare the structure of animals - I can describe an animal as a carnivore, herbivore or omnivore.	- I can explain that animals and humans have babies that grow into adults - I can find out about what animals and humans need to live - I can explain why exercise, a healthy diet and hygiene is important in humans.	- I can describe an adequate and varied diet for humans and animals because they can't make their own food. - I can explain that animals and humans get nutrition from what they eat. - I can identify that humans and some animals have skeletons and muscles for support, protection and movement.	- I can describe the simple functions of the basic parts of the digestive system in humans. - I can identify the different types and functions of teeth in humans - I can make and read food chains, identifying the producer, predators and prey.	I can describe the changes as humans develop from birth to old age.	- I can identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood. - I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function - I can describe the ways in which nutrients and water are transported within animals, including humans.



Biology:

Living Things and their Habitats

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
	- I can compare things that are living, dead and things that have never been alive. - I can match an animal to their habitat and explain why it likes to live there. - I can explain how animals and plants depend on each other. - I can name plants and animals in their habitats - I can use a simple food chain.		- I can name and identify a variety of living things in the environment using classification keys. - I can explain how environments can change and that this can pose a danger to living things.	- I can explain the differences in the life cycle of a mammal, an amphibian, an insect and a bird. - I can describe the life process of reproduction in some plants and animals.	- I can classify all living things into broad groups according to common characteristics. - I can give reasons for classifying plants and animals based on specific characteristics.



Biology: Plants

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
• I can name some plants • I can observe and identify the leaf, root, stem and flower • I know that plants need water to grow	• I know that flowering plants produce seeds that grow into new plants • I can describe what I observe as new plants grow • I can find out and describe what plants need to grow.	• I can identify and describe the function of different parts of a plant. • I can explore the part that flowers play in the life cycle of flowering plants. • I know that plants need healthy leaves, roots and stems in order to grow well. • I can investigate how water moves around a plant.	• I can name and identify a variety of living things in the environment using classification keys. • I can explain how environments can change and that this can pose a danger to living things.	• I can explain the differences in the life cycle of a mammal, an amphibian, an insect and a bird. • I can describe the life process of reproduction in some plants and animals.	• I can classify all living things into broad groups according to common characteristics. • I can give reasons for classifying plants and animals based on specific characteristics.



Biology: Inheritance and Evolution

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
• 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. • Notice that animals, including humans, have offspring which grow into adults.		• Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • Recognise that environments can change and that this can sometimes pose dangers to living things.		• Describe the life process of reproduction in some plants and animals. • 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. • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	



Chemistry:

Investigating Materials & States of Matter

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
- I can name everyday materials - I can describe common objects and materials in terms of my observations eg. bendy, hard - I can group everyday materials and compare them, saying what they are made from.	- I can name and compare how suitable of a variety of everyday materials are for certain jobs. - I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	- I can name and give characteristics of several different rocks. - I can describe how fossils are formed when living things get trapped within rock. - I know that soil is formed partly from rock	- I can describe, compare and group materials together depending on their state. - I can describe melting and dissolving liquids and give every day examples of each - I can name some materials that will and some that will not dissolve in water - I understand that although it is not possible to see a dissolved solid it remains in the solution - I can identify and describe the part played by condensation and evaporation in the water cycle and link rate of evaporation with temperature.	- I can group together everyday materials based on evidence from tests - I can identify materials that will dissolve in a liquid to form a solution, and describe how to recover the substance. - I can use my knowledge of solids, liquids and gases to decide how mixtures might be separated. - I can identify reversible changes - I can explain that some changes result in a new formation of a new material.	- 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.



Physics: The Earth, Sun and Moon

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.		Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		- 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 movement of the sun across the sky.	



Physics: Seasonal Changes

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.		• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.		• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	



Physics: Light and Sound

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
- I can observe how light makes shadows and reflections - Make observations of how sounds can be made at different volumes and pitches using a variety of instruments.		- Recognise that they need light in order to see things and that dark is the absence of light 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. - Identify how sounds are made, associating some of them with something vibrating - 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 that sounds get fainter as the distance from the sound source increases.		- Recognise that light appears to travel in straight lines - 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 - 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. - Recognise how animals have adapted ears for hearing.	



Physics: Forces and Magnetism

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Notice that things fall down and require a force (push/pull) in order to move.		- Compare how things move on different surfaces - Notice that some forces need contact between two objects, but magnetic forces can 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 - Describe magnets as having two poles - Predict whether two magnets will attract or repel each other, depending on which poles are facing.		- 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.	



Physics: Electricity

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Identify common appliances that run on electricity and observe that they can be switched on and off		- 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 whether or not a lamp lights in a simple series circuit - Recognise some common conductors and insulators, and associate metals with being good conductors.		- Use recognised symbols when representing a simple circuit in a diagram. - 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 - Link electrical conductors/ insulators to thermal conductors/ insulators	



Whole School Long Term Plan Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery		Light and Seasonal Changes		Healthy Eating and Seasonal Changes		Animals and Plants and Seasonal Changes
Reception	Colour Ourselves	Celebrations Nativity	People who help us	Growing	Animals	Animals and Plants
Year 1	Animals including humans (body and senses)	Materials	Performance	Plants	Animals including humans	seasonal changes
Year 2	Performance	Materials	Living things and their habitats	Plants		Animals including Humans
Year 3	Rocks	Performance	Animals including Humans	Forces and magnets	Light	Plants
Year 4	Sound	Animals including Humans	States of Matter	Electricity	Performance	Living Things and Their Habitats
Year 5	Space	Forces	Living things and their habitats	Performance	Properties of Materials	Animals including Humans
Year 6	Animals (Incl. humans)	Electricity	Living Things and Their Habitats	Evolution and Inheritance	Light	Performance

