

The intent of our Science Curriculum at Threshfield Primary School

Our high-quality science education at Threshfield Primary School aims to provide all learners with the foundations for understanding the world through the specific disciplines of biology, physics and chemistry, as well as develop a sense of excitement and curiosity about natural phenomena within every pupil.

The aims for implementation of our curriculum for science at Threshfield Primary School

To ensure that all pupils:

develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics;

understand 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.

Chemistry

Biology

Physics

Each of the 5 types of scientific enquiry will be focused upon throughout the year

Pattern seeking

Research

Fair testing

Identifying and classifying

Observation over time

The enquiries listed below are examples and maybe changed but they will always fit the type of scientific enquiry colour coded and the working scientifically listed.

Preschool		
Communication and Language	Personal, Social and Emotional Development	Understanding the World
<ul style="list-style-type: none"> Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" 	<ul style="list-style-type: none"> Make healthy choices about food, drink, activity and tooth brushing. 	<ul style="list-style-type: none"> 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.

Reception		
Communication and Language	Personal, Social and Emotional Development	Understanding the World
<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. 	<p>Know and talk about the different factors that support their overall health and wellbeing:</p> <ul style="list-style-type: none"> • regular physical activity • healthy eating • tooth brushing • sensible amounts of 'screen time' • having a good sleep routine • being a safe pedestrian 	<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.

Year 1		
Topic: Animals including Humans	Topic: Seasonal changes	Topic: Plants
<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> • using their senses to compare different textures, sounds and smells. • using their observations to compare and contrast animals at first hand or through videos and photographs • describing how they identify and group them • grouping animals according to what they eat 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> • making tables and charts about the weather; • making displays of what happens in the world around them, including day length, as the seasons change. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> • observing closely, using magnifying glasses, and comparing and contrasting familiar plants; • describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. • keeping records of how plants have changed over time, for example the leaves falling off trees and buds opening; • compare and contrast what they have found out about different plant

Topic: Everyday materials		
<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none">• distinguish between an object and the material from which it is made• identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock• describe the simple physical properties of a variety of everyday materials• compare and group together a variety of everyday materials on the basis of their simple physical properties. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none">• predict/suggest outcomes, performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?• Identify and classify everyday materials		

Year 2		
Topic: Plants	Topic: Animals including humans	Topic: Uses of everyday materials
<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> 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>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth setting up a comparative test to show that plants need light and water to stay healthy. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> notice that animals, including humans, have offspring which grow into adults find out about and describe the basic needs of animals, including humans, 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>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> observing, through video or first-hand observation and measurement, how different animals, including humans, grow asking questions about what things animals need for survival and what humans need to stay healthy suggesting ways to find answers to their questions. Set up a comparative test to show the effect of good hand hygiene. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs) observing closely, identifying and classifying the uses of different materials, and recording their observations.

		Topic: Living things and their habitats
		<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none">• explore and compare the differences between things that are living, dead, and things that have never been alive• 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• identify and name a variety of plants and animals in their habitats, including microhabitats• 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>Pupils will work scientifically by:</p> <ul style="list-style-type: none">• <i>sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts.</i>• describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions.• <i>construct a simple food chain that includes humans (e.g. grass, cow, human)</i>• <i>Research a variety of habitats</i>

- describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.

Year 3		
Topic: Animals including humans	Topic: Forces and magnets	Topic: Animals including humans
<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> identify that humans and some other animals have skeletons and muscles for support, protection and movement <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> identifying and grouping animals with and without skeletons and observing and comparing their movement exploring ideas about what would happen if humans did not have skeletons. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> 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>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. research different food groups and how they keep us healthy and design meals based on what they find out.

- looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another;
- identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.

Topic: Rocks	Topic: Plants	Topic: Light
<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. researching and discussing the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. exploring different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed. 	<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser discovering how seeds are formed by observing the different stages of plant life cycles over a period of time looking for patterns in the structure of fruits that relate to how the seeds are dispersed. observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers. 	<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. <p>Pupils will work scientifically by:</p> <p>looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</p>

Topic: Practical skills		
<p>Pupils should be taught to:</p> <ul style="list-style-type: none">• Identify and know the different types of variable in a fair test.• Know the value of a quality scientific diagram and how to construct one.• Write a concise and accurate method.• Know how to collect and process data appropriate to an investigation.• Communicate results appropriate to the investigation.• Write up a complete investigation including a conclusion.• Complete a full fair test investigation and full write up		

Year 4		
Topic: Sound	Topic: States of matter	Topic: Living things and their habitats
<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> • finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses • making earmuffs from a variety of different materials to investigate which provides the best insulation against sound • making and playing their own instruments by using what they have found out about pitch and volume. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> • compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> • grouping and classifying a variety of different materials; • exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). • researching the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> • recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> • using and making simple guides or keys to explore and identify local plants and animals; • making a guide to local living things; • raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.

- observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.

Topic: Animals, including humans	Topic: Electricity	
<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them; draw and discuss their ideas about the digestive system and compare them with models or images. 	<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit. 	

Year 5		
Topic: Living things and their habitats	Topic: Animals including humans	Topic: Earth and space
<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. trying to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. observing changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> researching the gestation periods of other animals and comparing them with humans; finding out and recording the length and mass of a baby as it grows. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> describing the movement of the Earth, and other planets, relative to the Sun in the solar system describing the movement of the Moon relative to the Earth describing the Sun, Earth and Moon as approximately spherical bodies using the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Topic: Forces	Topic: Properties and changes of material	Topic: Properties and changes of material
<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> exploring falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. exploring resistance in water by making and testing boats of different shapes. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' comparing materials in order to make a switch in a circuit. 	<p>National Curriculum objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> observing and compare the changes that take place, for example, when burning different materials or baking bread or cakes. researching and discussing how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.

Topic: Practical Skills Recap

Pupils should be taught to:

- Identify and know the different types of variable in a fair test.
- Know the value of a quality scientific diagram and how to construct one.
- Write a concise and accurate method.
- Know how to collect and process data appropriate to an investigation.
- Communicate results appropriate to the investigation.
- Write up a complete investigation including a conclusion.
- Complete a full fair test investigation and full write up

Year 6		
Topic: Animals including humans	Topic: Electricity	Topic: Animals including humans
<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. 	<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> systematically identifying the effect of changing one component at a time in a circuit. 	<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood describe the ways in which nutrients and water are transported within animals, including humans. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> reporting and presenting 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.

Topic: Light	Topic: Living things and their habitats	Topic: Evolution and inheritance
<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 that light is made up of lots of colours. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> Investigating the relationship between light sources, objects and shadows by using shadow puppets. 	<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals give reasons for classifying plants and animals based on specific characteristics. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> using classification systems and keys to identify some animals and plants in the immediate environment. researching unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. 	<p>National Curriculum objectives</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. <p>Pupils will work scientifically by:</p> <ul style="list-style-type: none"> observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. analysing the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

