LITTLE BOWDEN
PRIMARY SCHOOL

'Working together to love learning'

THE Science CURRICULUM: A PROGRESSION

Intent

At Little Bowden Primary School, science plays a central role within the curriculum which aims to stimulate a pupil's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought, including a STEM approach to allow pupils to make cross curricular links in their learning. Pupils are encouraged to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national and global level.

The Little Bowden Primary School science curriculum aims to ensure that all pupils can ask and answer scientific questions about the world around them, using investigative methods and equipment whilst simultaneously allowing them to think scientifically through our enquiry skills-based approach. It also allows children to know and understand the process of living things and the physical processes of materials, electricity, light, sound and natural forces. Children are taught to evaluate, evidence and present their conclusions clearly and accurately, and can use and understand a range of scientific vocabulary appropriate for their phase.

Implementation

We use a variety of teaching and learning styles in science lessons and where possible link teaching and learning through our Collins Connect scheme. The scheme allows for progression from year group to year group, building on prior learning. This ensures complete coverage of the National Curriculum; it also helps to verify that required key skills are being taught and pupils are increasingly challenged as they move up through the school.

Our principal aim is to develop a pupil's enquiry skills, knowledge and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the pupils in an enquiry-based research activity. We encourage the pupils to ask scientific questions and encourage them to explore and discover answers independently or in small groups. They have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs. They take part in role-play and discussions to be able to explain and justify their findings. They engage in a wide variety of problem-solving activities making cross curricular links through STEM initiatives. Wherever possible, we involve the pupils in 'real' scientific activities; for example, researching a local environmental problem or carrying out a practical experiment and analysing the results. We also use our local environment where possible through fieldwork in the local community/environment.

Recording methods vary depending on activity but could include within books, photographs or videos. We encourage pupils to enjoy science to develop a love of the subject and become inquisitive about the world around them.

We recognise that there are pupils of widely different scientific abilities in all classes, and we ensure that we provide suitable learning opportunities for all pupils, including those with SEND and Disadvantaged, by matching the challenge of the task, to the ability of the child. The Collins Connect scheme supports this by providing three adapted activities.

Early Years Foundation Stage

We teach science in EYFS classes as an integral part of the topic work covered during the year. Through the Collins Connect scheme we relate the scientific aspects of pupils work to the objectives set out in the Early Learning Goals (ELGs), which underpin the curriculum planning for pupils aged three to five. Science makes a significant contribution to the objectives in the ELGs of developing a pupil's knowledge and understanding of the world. Recording investigation through photographic evidence and learning journey books.

Impact

We assess pupils' work in science though on-going formative assessment as we observe them during lessons and following completed work in their books. At the end of a unit of work, teachers make a summary judgement about the work of each pupil in relation to the attainment of key skills for the topic. We use the Collins Connect assessment tool to input the data, which supports teachers in identifying areas to further develop in subsequent units. A summative assessment of each pupil's scientific knowledge and skills is made termly.

Leaders monitor the quality and impact of the Science Curriculum through analysis of teacher assessments, regular pupil voice and the extent to which pupils know more and remember more.

By the time pupils leave Little Bowden Primary, they will become competent, knowledge-rich scientists with a desire to further develop their skills.

Whole school science progression map

At Little Bowden Primary School, science plays a central role within the curriculum which aims to stimulate a pupil's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought, including a STEM approach to allow pupils to make cross curricular links in their learning. Pupils are encouraged to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national and global level.

Our scientific progression is developed using the National Programme of Study for science as detailed below. Access to scientific knowledge and skills begins in the Early Years and pupils build upon a range of skills as they progress through the school, that enhance their knowledge of scientific concepts and ways of working scientifically.

Science in the Early Years

The seven areas of learning within the EYFS framework mean that it is structured differently to the National Curriculum. Broadly, science is aligned to the Understanding the World – the natural world area, however pupils are able to access science learning through other areas. Such as, literacy and communication and language, whereby pupils will ask questions and verbalise their learning through play.

Working together to love learning

At Little Bowden we Market Harborough STEM partnership to provide pupils with additional opportunities and experiences to raise the profile of science within our school in order to develop a passion for science.

UNDERSTANDING THE WORLD: Progress through Reception

The natural world

Baseline Checkpoint	End of Autumn Term Checkpoint	End of Spring Term Checkpoint	End of Summer Term Checkpoint
Children can: *Identify the lifecycle of an animal. *Identify some features of animals i.e. horse has hooves.	**<u>Learning to be secure by the end of Autumn Term:</u>** Children should be working at a level which sees them: *Understanding that some objects/things are alive and some have never been alive; Knowing differences between natural and man-made objects**;** *Knowing that there are different environments in the natural world and be able to describe them using simple vocabulary *Talking about some of the things they have observed such as plants, animals, natural and found objects; * Developing an awareness of seasonal change.	**<u>Learning to be secure by the end of Spring Term:</u>** Children should be working at a level which sees them: *Naming and describing the seasons; *Identifying hot and cold habitats; *Sorting animals into different types; *Matching baby animals to their mothers; *Describing what they see, hear and feel whilst outside**.**	**<u>Children at the expected level of development will:</u>** *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.

UNDERSTANDING THE WORLD: Progress through Reception

The natural world

Early learning goal	End of Year 1 expectation
*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.	*Know the name of parts of the human body that can be seen; *Know about the five senses and link them with parts of the body; *Know and name a variety of common wild and garden plants; *Know and classify animals by what they eat (carnivore, herbivore and omnivore); *Know how to sort by living and non-living things; *Know how to classify a range of animals by amphibian, reptile, mammal, fish and bird; *Know and name the petals, stem, leaves and roots of a plant; *Know and name the roots, trunk, branches and leaves of a tree.

Science progression in KS1 and KS2 (Green Biology Yellow chemistry, blue physics)

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1	**Seasonal changes** Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	**Human body and senses** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	**Seasonal changes** Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	**Animals (vertebrates)** 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	**Animals (vertebrates)** Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	**Identifying plants and their parts** 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 tree
	Naming and describing materials 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		**Properties and uses of materials** Compare and group together a variety of everyday materials on the basis of their simple physical properties		**Seasonal changes** Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	

2	**Choosing materials** Identify and compare the suitability of a variety of everyday materials, including wood, glass, brick, rock, paper and cardboard for particular uses	**Changing materials** find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	**Growing up (animals and humans)** 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	**Growing seeds and bulbs** Observe and describe how seeds and bulbs grow into mature plants	**Growing Healthy Plants** find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	**Local habitats** 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 micro-habitats Describe how animals obtain their food from plants and other animals, using

						the idea of a simple food chain and identify and name different sources of food
3	**Rocks, soils and fossils** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	**Rocks, soils and fossils** Recognise that soils are made from rocks and organic material Describe in simple terms how fossils are formed when things have lived trapped within rock	**Movement and nutrition for the human body** 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 Identify that humans and some other animals have skeletons and muscles for support, protection and movement	**Light and shadows** 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 is blocked by a solid object	**Flowering plants and plant growth** 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	**Forces, friction and magnets** 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

				Find patterns in the way that the size of shadows change	**Flowering plants lifecycle** explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	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
4	**Sound** 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	**Changes of state** Compare and group materials together, according to whether they are solids, liquids or gasses Observe that some materials change when they are heated or research the temperature at which this happens degrees Celsius Identify the part played by	**Electricity: circuits** Identify common appliances that run on electricity Construct a simple series electrical circuity, identifying and naming 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	**Digestion and food chains** 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	**Classification of plants and animals** 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	**Human impact on the environment** recognise that environments can change and that this can sometimes pose dangers to living things

	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 increase	evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	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	producers, predators and pre		
5	**Earth and space** 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	**Properties and uses of materials** Compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and	**Forces and mechanisms** Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and falling objects.	**Plant and animal lifecycles** describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of	**Separating mixtures and changing materials** know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	**Human growth** describe the changes as humans develop to old age

	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	thermal) and response to magnets Give reason, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Identify the effects of air resistance, water resistance and friction that act between moving surfaces Recognise that some mechanisms, including levers and pulleys and gears allow a smaller force to have a greater effect	reproduction in some plants and animals	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating 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	
6	**What does light do** Recognise that light appears to travel in straight lines	**Evolution and inheritance** Recognise that living things have changed over time and that	**Electricity – changing circuits** Associate the brightness of a lamp or the volume of a	**Human circulation** Identify and name the main parts of the human circulatory system, and	**Classification of living things** Describe how living things are classified into broad groups	**Body health** Recognise the impact of diet, exercise, drugs and

	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	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 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	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	describe the functions of the heart, blood vessels and blood Describe the ways in which nutrients and water are transported within animals, including human	according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics	lifestyle on the way their bodies function

When is content taught?

Seasons, Animals including humans, Living things, Materials, Rocks, Light, Forces, States of matter, Electricity, Space, Inheritance and evolution

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**Seasons** **Materials Naming and describing materials**	**Animals including humans (Human body and senses)**	**Seasons** **Materials Properties of materials**	**Animals including humans (Vertebrates)**	**Animals including humans (Vertebrates)**	**Living things Plants (identifying their parts)**
Year 2	**Materials Choosing materials**	**Materials Changing materials**	**Animals including humans Growing up**	**Living things Plants- Growing seeds and bulbs**	**Living things Plants Growing healthy plants**	**Living things Local habitats**
Year 3	**Rocks, soils and fossils**	**Rocks, soils and fossils**	**Animals including humans (movement and nutrition for the human body)**	**Light Light and shadows**	**Living things Plants- Flowering plants and plant growth**	**Forces- Friction and magnets**
Year 4	**Sound**	**States of matter Changes of state**	**Electricity Circuits**	**Animals including humans Digestion and food chains**	**Living things Classification of plants and animals**	**Animals including humans Human impact on the environment**

Year 5	**Space** **Earth and space**	**Materials** **Properties and uses of materials**	**Forces** **Forces and mechanisms**	**Living things** **Plant and animal life cycles**	**States of matter** **Separating mixtures and changing materials**	**Animals including humans** **Human growth**
Year 6	**Light** **What else do light do?**	**Evolution and inheritance**	**Electricity** **Changing circuits**	**Animals including humans** **Human circulation**	**Living things** **Classification of living things**	**Animals including humans** **Body health**