Ditchling St Margaret's Primary and Nursery School

Kindness Respect Perseverance

'Living life in all its fullness' John 10:10

Science Curriculum

Science Curriculum at Ditchling CE Primary and Nursery School

Planned Curriculum

INTENT
The 2014 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 skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this At Ditchling, we encourage children to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group. The key knowledge identified by each year group is informed by the national curriculum and builds towards clear sequences of lessons and assessment opportunities including our unique 'Under the Microscope' challenges. Key skills are also mapped for each year group and are progressive throughout the school. These too ensure systematic progression to identified skills end points which are in accordance with the Working Scientifically skills expectations of the national curriculum. The curriculum is designed to ensure that children are able to acquire key scientific knowledge through practical experiences; using equipment, conducting experiments, building arguments and explaining concepts confidently. The school's approach to science takes account of the school's own context, ensuring access to people with specialist expertise and places of scientific interest as part of the school's commitment to learning outside the classroom. Cross-curricular opportunities are also identified, mapped and planned to ensure contextual relevance. Children are encouraged to ask questions and be curious about their surroundings and a love of science is nurtured through a whole school ethos and a varied science curriculum.

Enacted Curriculum

IMPLEMENTATION

Teachers create a positive and passionate attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

Each new unit of work begins with a recap of the previous related knowledge from previous years. This helps children to retrieve what they have learnt in the earlier sequence of the programme of study, and ensures that new knowledge is taught in the context of previous learning to promote a shift in long term memory. Key vocabulary for the new topic is also introduced as part of the sequence of learning and children are shown the dual-coded vocabulary and this is displayed on the working wall. This provides definitions and accompanying visuals for each word to ensure accessibility to all. This approach also means that children are able to understand the new vocabulary when it is used in teaching and learning activities and apply it themselves when they approach their work.

Once children know the new vocabulary for the unit and how it relates to previous learning, the children are asked what they already know specifically about the new topic. This provides the teacher with an insight into the children's 'starting points' for the topic, to enable the use of assessment to inform planning. The teacher is then able consolidate any of the key knowledge which is identified at this part of the process as not yet being secure.

Within all sequences of lessons, teachers plan a phase of progressive questioning which extends to and promotes the higher order thinking of all learners at Ditchling we call these 'Under the Microscope' challenges and 'We are Scientists' dialogic-based assessment discussion. Questions initially focus on the recall or retrieval of knowledge and then extend to promote application of the knowledge in a new situation to promote analytical thinking. Higher order questions focus on the children's own work and how they might change or create an outcome and justify a choice they have made which is based on their evaluation.

Through our planning, we involve problem-solving opportunities that allow children to apply their knowledge, and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up. Tasks are selected and designed to provide appropriate challenge to all learners, in line with the school's commitment to inclusion and quality first teaching.

We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in keeping with the topics.

Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.

Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.

Regular events, such as Science Week and STEM days, allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.

At the end of each topic, key knowledge is reviewed by the children and rigorously checked by the teacher and consolidated as necessary.

Assessed and Learned Curriculum

IMPACT
The successful approach at Ditchling results in a fun, engaging, high-quality science education that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Through various workshops, trips and interactions with experts and local charities, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn the possibilities for careers in science, as a result of our community links and connection with national agencies including the STEM association and CREST Award. They learn from and work with professionals, ensuring access to positive role models within the field of science from the immediate and wider local community. From this exposure to a range of different scientists from various backgrounds, all children feel they are scientists and capable of achieving. Children at Ditchling overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding. The school's science provision is such that we are offering our Key Stage children the opportunity to take part in the CREST Award for Years 5 and 6.

EYFS

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;

Year 1

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

The Human Body

+ Seasonal changes 1

Materials

+ Seasonal changes 2

Animals

+ Planting A

Caring for the planet +

Seasonal changes 3+
Planting B

Plants

+ planting C

Cooking and growing +
Seasonal changes

Year 2

Living things and their habitats

Plants

(Light and dark)

Materials +

Plastic sustainability

Animals' needs for Survival + Humans

Year 3

Plants

Growing up

Skeletons + Movement

Nutrition and Diet + Food waste

JOHN 10:10 LIFE IN ALL ITS FULLNESS

Substantive knowledge – Progression map

Scientific knowledge and conceptual understanding

Animals, including humans						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Explore the natural world around them making observations and drawings of animals.	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) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	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	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	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	Describe the changes as humans develop to old age	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Describe the ways in which nutrients and water are transported within animals, including humans

Living things and their habitats

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Know some similarities and differences about the natural world around them and contrasting environments, drawing on their experience and what they gave read in class.		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		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	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	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

Plants						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Explore the natural world around them making observations and drawings of plants.	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	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	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			

Materials						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	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	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			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 • 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	

States of Matter	
EYFS	**Year 3**
Understand some important processes and changes in the natural world around them, including changing states of matter.	• 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

Rocks	
EYFS	**Year 3**
	• 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

Earth and Space	
EYFS	**Year 5**
	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

Electricity		
EYFS	**Year 4**	**Year 6**
	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	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

Seasonal changes	
EYFS	**Year 1**
Understand some important processes and changes in the natural world around them, including the and changing states of matter.	• Observe changes across the 4 seasons • Observe and describe weather associated with the seasons and how day length varies

Sound	
EYFS	**Year 1**
	• 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

Light		
EYFS	**Year 3**	**Year 6**
	• 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.	• Recognise that light travels 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

Forces and Magnets		
EYFS	**Year 3**	**Year 5**
	• Compare how things move on different surfaces • Notice that some forces need contact between 2 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 2 poles	• 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

	• predict whether 2 magnets will attract or repel each other, depending on which poles are facing	

Evolution and Inheritance	
EYFS	**Year 6**
	• 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

Disciplinary knowledge map

Working scientifically

Knowledge of methods that scientists use to answer questions.						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Ask simple questions. • Answer simple questions. • Observe closely. • Verbally state what they are going to investigate.	• Ask simple questions and recognise that they can be answered in different ways. • Use their observations and ideas to suggest answers to questions. • Observe closely, using simple equipment. • Make simple predictions based on a question. • Identify what they will change and keep the same.	• Ask questions and understand there are different enquiry types they could use to answer them • Make simple conclusions. • Use results, findings or observations to answer questions. • Begin to use scientific equipment to make observations. Make relevant predictions. • Identify what they will change, observe and keep the same.	• Ask relevant questions and use different types of scientific enquiry to answer them. •Use straight forward scientific evidence to answer questions or to support their findings. • Use results to draw simple conclusions. • Begin to identify differences, similarities or changes related to simple ideas or processes. • Make systematic and careful observations.	• Ask scientific questions and begin to understand which questions would be best suited to each enquiry type. • Use scientific evidence to answer questions. • Make conclusions based on scientific evidence and from their own testing and findings. • Identify differences, similarities or changes related to simple ideas or processes. • Use a range of scientific equipment to make systematic	• Ask relevant scientific questions and choose which enquiry type would be best suited to answer them. • Use scientific evidence to answer questions. • Make conclusions based on scientific evidence and from their own testing and findings. • Identify scientific evidence that has been used to support or refute ideas or arguments. • Use a range of scientific equipment to make systematic

			• With support, set up simple practical enquiries.	• Make predictions based on simple scientific knowledge. • Identify what they will change, observe or measure and keep the same. • Set up simple practical enquiries, comparative and fair tests.	and careful observations. • Make predictions based on scientific knowledge. • With support, plan different types of scientific enquiry. Where appropriate, identify the dependent, independent and controlled variables	and careful observations with increased complexity • Make predictions based on scientific knowledge. • Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

Knowledge of apparatus and techniques, including measurement.						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Carry out simple tests using non-standard measurements when appropriate.	Perform simple tests using standard units when appropriate.	Carry out tests and simple experiments and take measurements using standard units.	Take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Take accurate measurements using a range of scientific equipment. Start to take repeat readings when appropriate.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

Knowledge of data analysis.						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Gather and record simple data. •Sort objects and living things into groups based on simple properties.	• Gather and record data to help in answering questions. • Identifying and classifying.	• Gather and record data in different ways to help answer questions. • Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables.	• Gather, record and classify data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	• Gather, record and classify data with increasing complexity to help in answering questions. • Record data using scientific diagrams and labels, classification keys, tables, bar and line graphs	• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

Knowledge of how science uses evidence to develop explanations						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Answer simple questions. • Explain what they found out to an adult or a partner	• Use their observations and ideas to suggest answers to questions. • Talk about what they have found out and how they found it out. (non-statutory)	• Make simple conclusions. • Use results, findings or observations to answer questions. • Suggest questions for further investigation. •Report on findings from enquiries, including oral and written explanations	• Use straight-forward scientific evidence to answer questions or to support their findings. • Use results to draw simple conclusions. • Begin to identify differences, similarities or changes related to simple ideas or processes. • Begin to make predictions for new values, suggest improvements and raise further questions • Report on findings from enquiries, including oral and written explanations, displays or	• Use scientific evidence to answer questions. • Make conclusions based on scientific evidence and from their own testing and findings. • Identify differences, similarities or changes related to simple ideas or processes • Make predictions for new values, suggest improvements and raise further questions. Report and present findings from enquiries, including conclusions.	• Use scientific evidence to answer questions. • Make conclusions based on scientific evidence and from their own testing and findings. • Identify scientific evidence that has been used to support or refute ideas or arguments • Use test results to make predictions to set up further comparative and fair tests. • Suggest investigation improvements including accuracy of results.

				presentations of results and conclusions.	• Begin to identify causal relationships in oral and written forms such as displays and other presentations.	• Provide some simple examples of how to extend the investigation. • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

Vocabulary progression document

Science Topic	Year 1- 2	Year 3 - 4		Year 5 - 6
Working Scientifically	experience observe changes patterns grouping sorting classifying compare identify (name) data measure record equipment questions test investigate explore magnifying glass / hand lens same different	develop enquiry practical enquiry fair test comparative test relationships conclusion accurate thermometer data logger estimate data diagram key (identifying) table chart	bar chart results predictions explanation reason similarity difference question evidence information findings criteria values properties characteristics	variables evidence justify accuracy precision scatter graphs bar graphs line graphs argument (science) causal relationship

Science Topic	Year 1 -2		Year 3 - 4	Year 5 - 6
Animals including humans	names of common animals: fish, amphibians, reptiles, birds, mammals carnivores herbivores omnivores human body senses see	feet fingers toes elbows knees hair teeth grow healthy offspring adults young	nutrition diet skeleton muscles protection support movement bones skull shell digestive system stomach	puberty gestation period circulatory system heart lungs blood vessels blood lifestyle disease water transportation nutrient transportation oxygen

	hear feel smell taste habitat local environment pet wild animal insect minibeast food eat head neck body arms legs ears eyes nose mouth tongue hands	water air survive exercise hygiene egg chick chicken caterpillar pupa moth butterfly tadpole frog frog spawn lamb sheep calf cow foal horse	small intestine large intestine oesophagus types of teeth: molar, premolar, incisor, canine saliva	air breathing exercise diet drugs

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Plants	plants wild plants garden plants evergreen trees deciduous trees common flowering plants flowers vegetables leaf/leaves flower blossom petal stem trunk branch root seed bulb bud growth grow habitat local environment leaf fall water light temperature healthy growth survive soil germinate stages of growt h	functions nutrients nutrition air transport (water) life cycle pollination seed formation seed dispersal reproduce fertiliser	

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Living things and their habitats	pond garden field park woodland sea shore river ocean forest rainforest stones rocks logs leaf litter habitat micro-habitat living dead not living alive healthy food food chain depend source of food shelter grow growth healthy	environment non-flowering plants ferns mosses flowering plants grasses vertebrate animals: fish, birds, mammals, amphibians, reptiles invertebrate animals: snails, worms, slugs, spiders, insects human impact – litter, deforestation, population increase, nature reserves	life cycles reproduction life processes sexual and asexual reproduction (plants) root cuttings classification microorganisms organisms evolution evolve adaptation variation inherit inheritance

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Materials	everyday materials wood paper plastic metal glass water rock brick stone fabric material foil elastic dough rubber card cardboard clay object make/made hard/soft shiny/dull stretchy/stiff rough/smooth bendy/not bendy waterproof/not waterproof transparent/opaque absorbent/not absorbent squash twist bend stretch		properties hardness solubility transparency electrical conductivity thermal conductivity magnetism dissolve solution substance separating mixing filtering sieving reversible change burning rusting reactions irreversible change

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Rocks and Soils		rock soil fossil organic matter grains crystals sedimentary rock	

Science Topic	Year 1 -2		Year 3 - 4	Year 5 - 6
States of Matter			solid liquid gas temperature heat (heating) cool (cooling) water cycle evaporation condensation melting freezing	

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Earth and Space	seasons seasonal change spring summer autumn winter weather sun sunshine rain snow sleet ice frost fog		solar system planets: Mercury, Venus, earth, Mars, Jupiter, Saturn, Neptune, Uranus moon stars spherical bodies rotation orbit satellite

	cloud hot cold storm sky earth night day		
Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Electricity		electricity simple circuit light bulb cell wire buzzer switch motor battery series circuit conductor insulator	voltage components symbols circuit diagram

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Forces		move movement surfaces forces push pull contact distance magnet bar magnet ring magnet horseshoe magnet attract repel	gravity air resistance water resistance friction levers pulleys gears springs

		poles (of magnets) magnetic materials	

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Sound		sound vibration vibrate pitch volume insulation	

Science Topic	Year 1 -2	Year 3 - 4	Year 5 - 6
Light		light dark (absence of light) reflect shadow opaque mirror reflective surface	light sources periscope

Nursery Science Provision:

Our Nursery provides a safe, caring, nurturing and stimulating learning environment where children grow in confidence and independence, while developing their interests, curiosity and skills through play in all areas of the Science curriculum. Adults provide this high-quality education through a balance of child-led and adult-led learning and enriching experiences that are meaningful to the children, and through high-quality interactions to move the learning forward. This purposeful learning allows children use what they have learned and apply it to a range of situations. This will allow for our children to make good progress across all seven areas of learning and development.

EYFS

Children in EYFS should Comment and asks questions about aspects of their familiar world such as the place where they live or the natural world.

- They talk about some of the things they have observed such as plants, animals, natural and found objects.
- They can talk about why things happen and how things work.
- They develop an understanding of growth, decay and changes over time.
- They show care and concern for living things and the environment
- They look closely at similarities, differences, patterns and change

EYFS: Early Learning Goals:

Children know about similarities and differences in relation to places, objects, materials and living things. They can talk about the features of their own immediate environment and how environments might vary from one another. They can make observations of animals and plants and explain why some things occur, and talk about changes, including in simple experiments.

Link to KS3

The Key Stage 2 (KS2) and Key Stage 3 (KS3) science curricula are closely linked, with KS2 laying the foundation for the more detailed and complex scientific understanding at KS3. At KS2, students are introduced to basic scientific concepts such as forces, materials, plants, animals, and the human body, as well as fundamental processes like photosynthesis and simple electrical circuits. They also begin developing key scientific skills, such as making observations, conducting experiments, and recording data.

This foundation is expanded in KS3, where students build on their KS2 knowledge by exploring these topics in greater depth. For instance, in biology, students move from basic plant and animal biology to studying cells, human body systems, and ecosystems. In physics, they progress from simple forces and motion to more advanced concepts such as energy, magnetism, and electricity. In chemistry, the study of materials evolves into an understanding of the periodic table, chemical reactions, and atomic structure. The scientific inquiry skills developed in KS2 continue to be honed in KS3, with a greater emphasis on hypothesis testing, analysis, and evaluation.

In summary, the KS2 science curriculum provides the essential knowledge and skills that KS3 builds upon, ensuring a smooth transition as students deepen their understanding of scientific concepts and processes.

Breakdown into topics

Biology

Plants
- Wild and Garden Plants -Y1
- Bulbs and Growth - Y2
- Basic Needs for Survival - Y3

Animals including Humans:
- Common Animals - Y1
- Basic Needs for Survival - Y2
- Skeletons and Muscles - Y3
- Teeth - Y4
- Growing and Changing - Y5
- Circulatory System - Y6

Living Things in Their Habitats
- Habitats - Y2
- Conservation - Y2/Y4
- Classification - Y4/Y6
- Life Cycles - Y5

Physics

- Weather and Seasons - Y1
- Forces and Magnets - Y3/5
- Light - Y3/Y6
- Sound - Y4
- Electricity - Y4/Y6

Chemistry

Materials
- Everyday Materials - Y1
- Purpose of Materials - Y2
- Rocks - Y3
- States of Matter - Y4
- Properties and Changes of Materials - Y5

Quality First Teaching in Science

Using the Learning Organisers to build working walls for Science. All vocabulary should be in Widget form on the working walls.

Practical Learning

Where applicable, lessons should include practical elements and investigations. These should all include both substantial and disciplinary knowledge linking to the current topic.

Each investigation should include specific success criteria taken directly from the disciplinary curriculum map.

SEND/EAL

Ensuring adaptive practice and access to learning for all is a fundamental and core element of inclusion. As such we plan and resource our learning, in line with our whole school EAL policies, to enable all pupils to make good and sustained progress in geography by ensuring that the challenge of learning opportunities always accords with the ability of each pupil. Therefore, throughout our adaptive practice we take due regard of factors such as classroom organisation, learning materials and the learning environment. We ensure inclusion through constructing enquiries which are graduated in 'bite size' steps allowing for the setting of personalised targets and a broad range of learning and teaching strategies including questioning and working with additional adults where appropriate.

- Dual coding word-banks
- Clear and obvious working walls with key points of learning

Encouraging higher thinking in Science

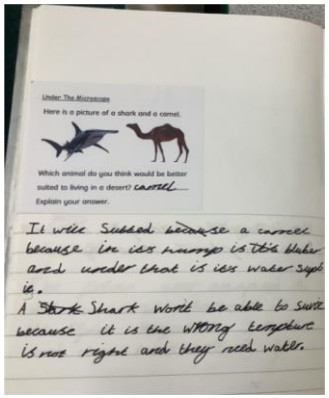
'Under the Microscope' cards

Extension tasks for pupils to access if they have completed the 'whole class tasks'.

Focus on reasoning and scientific thinking.

'We are Scientists' cards

Discussion-based cards are designed to promote scientific conservations between pupils about varying scientific concepts.

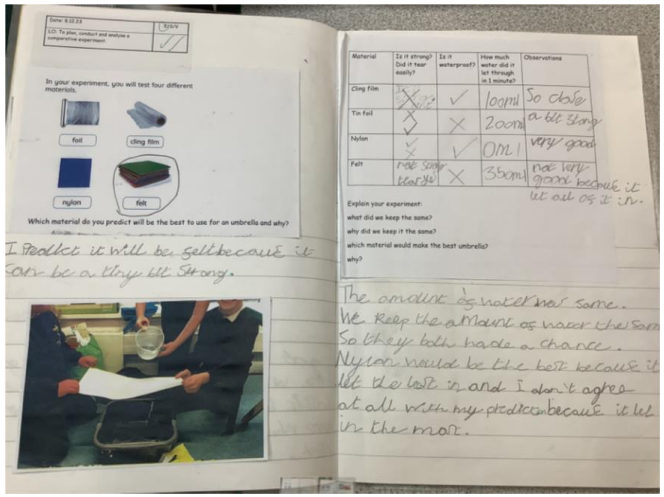


High Expectations in Science

The standard of written work in science should be in keeping with that of English lessons including a focus on gramma, punctuation and spelling.

Scientific language should be used where appropriate.

Science investigations should be set out over two pages to include all the different stages of an experiment including predictions, results tables and evaluations.



Assessment in Science

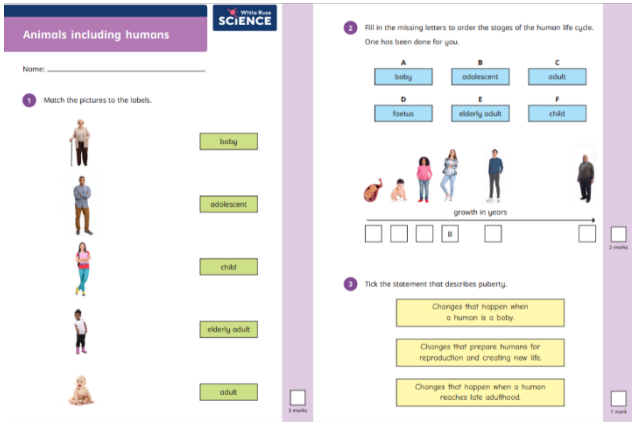
Assessment for learning is continuous throughout the planning, teaching and learning cycle. Assessment is supported by use of the following strategies using the end-points as an assessment framework:

- Observing children at work, individually, in pairs, in a group and in class during whole class teaching.
- Using differentiated, open-ended questions that require children to explain and unpick their understanding.
- Providing effective feedback, to which recognises successful aspects of the children's work, as well as informing subsequent dialogue to address errors and misconceptions.
- Book moderation and monitoring of outcomes of work, to evaluate the range and balance of work and to ensure that tasks meet the needs of different learners (with the acquisition of the pre-identified key knowledge of each topic being evidenced through the outcomes).
- Child and teacher review of both the agreed success criteria at the end of each lesson and the key knowledge at the end each key question, to inform focused consolidation where this is necessary.

There is a strong focus on developing the quality, presentation and content of children's written work across all subjects through our 'Beautiful books' standards.

Formative assessment

End of unit assessments can be undertaken at the end of each science unit. These should be used in addition to regular formative assessment in class.



Assessment Wheels:

Insight

As a school we are moving towards using Insight assessment for Science.

The aim of this will be to assess children as 'Working towards', 'Working at' or 'Greater Depth' in each unit of science.

Next steps: To develop a tool to assess disciplinary knowledge (science skills)

Enrichment in Science

Crest award for Year 5 and 6 Pupils

British Science Week

School Trips

Visits to Hurst Science Labs

Year 6 STEM days

Ogden Trust Partnership

Mid Sussex Science Week