Curzon Science Curriculum

Our Intent

Curzon specific aims of Science

Science is an awe-inspiring subject and our aim as a school is ignite pupils' curiosity into the natural world and how things work. We want our pupils to question the physical, chemical and natural world around them, be motivated to find the answers and relish creating a bank of knowledge. We have mapped out how our science curriculum enhances our all our pupils' cultural capital.

We want Curzon pupils to develop respect for all living things and advocate caring for the environment. We aim that our pupils have the confidence to challenge themselves and lead investigations. Being a scientist involves being able to work with others, predict, carefully observe, record and conclude. These are all key skills that we aim to engender in our pupils.

We have high ambitions for all pupils. Our ethos is to enable all pupils to reach their potential. We do not place a ceiling on attainment. Through carefully designing our curriculum to include a range of different activities (e.g, paired work, different forms of recording), we ensure that all pupils, including SEND, can participate fully. Our curriculum is designed to ensure that higher attainers are challenged through deepening questions and being given the opportunities for more detailed research and reflection.

Whilst following the National Curriculum, we have chosen topics according to the following criteria and made our Science curricum unique to Curzon:

Using our local enviroment

Being set in an area of oustanding natrual beauty, we draw on our local surroundings throughout the school. For example, KS1 observe trees in different seasons. Year 3 investigate the school grounds for different types of rock. We teach our pupils to appreciate nature and the importance of caring for it. We hold whole school wonderland days based around science activities in our local environment.

Cross-curricular links

We emphasise cross-curricular links between science and other subjects as we aim that pupils retain their substantive and disciplinary knowledge by applying it in more than one curriculum area. This has led to improvements in both scientific knowledge and writing. The chart below shows some key cross-curricular links that we have designed:

Science topics and cross curricular links

Unit	Year	Cross-curricular links
Seasonal changes	Y1,2	Art- seasonal pictures Geography- local area
Plants	Year 1,2,3	Art – Recreating plants and the key features, either through sketching or modelling DT- sewing leaves Geography – Physical geography including biomes and vegetation belts, locating plants by their countries or regions-links to Rainforest topic. English –Persuasive writing, save the rainforest plants.
Animals, including humans	Year 1,2 ,3, 4, 5 and 6	PSHE – RSE – Reproduction, changes through age phases History – Stone Age to Iron Age, Ancient Greece, changes in medicine and medical understanding P.E – Fitness tests, use of muscles, heart rate/ pulse and how this is affected by exercise Cookery- nutrition
Rocks	Year 3	Geography – Physical geography, location of particular rock formations Literacy – Stone Age Boy, The World Beneath my Feet History – Stone Age Britain - uses of rocks/types of rocks used and suitability for job.

Light	Year 3 and 6	Maths – Data and statistics, change in shape, size, direction of shadows over time; change in size of shadow depending on closeness to light source. Art – Recreating images of light through sketching or modelling, spectrums of colour Geography – Time zones DT- Creating electrical Christmas decorations
Forces and magnets	Year 3 and 5	DT – Pulleys and gears, weight-bearing structures, how to stiffen and strengthen complex structures Geography – Poles of the earth, physical geography
Living Things and their Habitats	Year 1, 2, 4, 5 and 6	English –Fact files, creating questions Maths – Data handling including using different diagrams to record and sort information Geography – Human and physical geography, Biomes, Tropics and Equator, locating living species PSHE – RSE – Reproduction
States of Matter	Year 4	Maths – Measuring changes in temperatures Geography – The water cycle, Rivers Design Technology –Food and change in state through temperature- cookery unit.
Sound	Year 4	Music - Identify sounds with increasing aural memory (focus on instruments). DT- Designing and creating tuned musical instruments. Maths- Measuring how far away a drum can be heard.
Electricity	Year 4 and 6	DT- Creating an electrical circuit game such as a buzz wire game, Christmas lights designs using particular materials as insulators or conductors English – Information texts

		Geography – Y4 natural disasters- lightning PSHE – Keeping safe
Properties and Changes of Materials	Year 1,2,5	Maths - Data handling DT – Cookery unit, textiles and design ideas, structures and materials used Creating houses/ umbrellas out of different materials.
Earth and Space	Year 5	Art – Create/recreate images of Earth or space and the key features, either through sketching or modelling Maths – Time including calendars
Evolution and Inheritance	Year 6	RE- Genesis
Working scientifically	Year 3-6	Maths – Data handling and statistics, Measurements English – Writing reports, creating questions P.E – How the body works including changes during exercise PSHE – Keeping safe History - How what we know has changed over history, how scientists have built up on previous work

Our science curriculum promotes our key values and vision

Respect- our curriculum is designed to teach our pupils to respect all living things.

Courage- our curriculum is designed to give pupils the confidence to try out investigations and to persevere with retaking measurements/observations to improve accuracy.

How this links with our school vision: growing in wisdom and understanding how to apply knowledge for good causes. Developing curiosity and respect of the world around them. Becoming advocates for caring for the environment.

Promoting diversity

We aim to promote diversity and differences of opinion. We arrange for our local Baptist Minister, who is from a scientific background, to talk to Year 6 pupils about evolution theories and allow them to ask questions about his beliefs and experiences in order for them to frame their own views. We teach pupils about scientists such as Mary Anning and the female African- American astronaut, Mae C Jemison.

Knowledge and skills that we intend our pupils to achieve

We have identified three key skill strands and have mapped the development of each of these skills throughout the year groups, identifying what pupils in each year group need to attain in each of the strands by the end of each academic year. These show progression by phase. Within KS1, we have identified some key Year 2 skills to prepare pupils for KS2.

Year group	**Thinking like a scientist**	**Experimenting like a scientist**	**Finding answers like a scientist**
EYFS	ask simple questions about the world make observations using senses carry out simple tests to help answer questions and talk about their tests	explore the natural world around them explore floating and sinking and other physical phenomena draw pictures of animals and plants talk to an adult about what they notice	talk to an adult about what they notice start to find patterns in what they observe
KS1	ask simple questions about the world make observations using senses	gather evidence to help answer question (Y2 including from graphs and tables) record simple data to help answer questions	identify patterns in results (Y2 identify similarities and differences)

	carry out simple tests to help answer questions predict results (Y2 give reasons) use senses to compare objects, materials and living things sort objects into groups explain how they have sorted objects into groups	observe how things change over time use equipment to make measurements Y2 perform comparative tests	describe how some people use science in their jobs describe and explain what they have found out explain how they found things out use evidence from observations to suggest answers to questions Y2 use scientific language Y2 write simple conclusions with basic reasoning
	give detailed reasons for predictions using scientific language and knowledge plan simple tests to help answer questions make observations and decide how to record them to answer a question.	take accurate measurements checking carefully if the results seem odd organise equipment and think about controlling some elements (Y2) Record findings using scientific language, drawings, and labelled Diagrams(Y2)	use conclusions from investigations to make simple predictions and identify new lines of enquiry Make links to real life (Y2) Use evidence when evaluating the effectiveness of a test (Y2)
Year 3,4	ask appropriate scientific questions about the world use scientific knowledge to sort and classify objects, materials and living things suggest how to make a simple comparative test fair suggest how to investigate patterns they have observed plan an appropriate scientific investigation- predict and explain prediction select appropriate equipment to use during my investigation	carry out simple scientific experiments use simple practical tests to compare things make systematic and careful observations use equipment to take accurate measurements measure and record using standard units use simple scientific language to record my findings use drawings and labelled diagrams to help explain investigations use tables to record the results of my investigations use a key for identification	describe results of investigations present the findings using a bar chart present conclusions in a range of formats use scientific knowledge to explain the results of investigations and write a simple conclusion use conclusions from investigations to make simple predictions use scientific evidence to support conclusions use sources of information to try to answer questions that cannot be investigated

	suggest what data should be collected in an investigation suggest how to collect data in an investigation		
	can make scientific predictions based on their own scientific knowledge. They can apply their prediction using real life examples. set up their test confidently identifying the change factor. They understand the need to keep other variables the same. They are independent in the planning use subject knowledge, observations, or previous learning to make predictions. Can create further questions from enquiries to investigate.	Record findings using systematic and careful observational drawings Can spot anomalies	Appropriate scientific language is used Records results systematically and in an organised way. Create a (bar) chart using multiple data sets. Can decide on own scale for axis. write a comprehensive conclusion using own scientific knowledge and a range of scientific vocabulary. Use scientific language and illustrations to discuss, communicate and justify scientific Ideas. Suggest next steps based on the weakest aspects and state how this will help them or the test progress or give different results.
Year 5,6	Use scientific experiences to raise different kinds of questions select and plan the most appropriate type of scientific enquiry to answer a question make detailed and reasoned predictions based on prior scientific knowledge recognise how and when to set up comparative and fair test and explain which variables need to be controlled	measure and record accurate and precise results using a range of scientific equipment design own results tables to record results from a range of investigations select which observations to make, what measurements to use and how long to make them for	describe how famous scientists developed their ideas based on observation and experiment present the findings of investigations using scatter graphs and line graphs describe the results of my investigations, identifying patterns use evidence to produce a conclusion, using scientific knowledge to explain results

	select the most appropriate equipment to take accurate measurements and explain how to use the equipment	recognise when it is appropriate to take repeat readings and know how to calculate average results produce own keys to help with classification and identification	use evidence to refute or support a scientific idea recognise when further tests and observations may need to be collected to reach a conclusion select appropriate secondary sources to research ideas suggest improvements to an investigation use relevant scientific language to communicate and justify scientific ideas explain how scientific ideas have changed over time
	identify variables that are difficult to control Pupils understand the independent and dependent variable and have a clear understanding of why the other variables must not change. Pupils can pose and answer their own questions (controlling variables where necessary)	explain why/why not it is appropriate to take repeat measurements Pupils choose the type of enquiry needed to carry out their investigation Can identify a range of factors which may affect their investigation.	describe the results of investigations, identifying different casual relationships in data make suitable choices to present results to help in answering questions and assess the strength of evidence, deciding whether it is sufficient to support a conclusion can use multiple sets of data where mean average can be calculated. Can expand and develop on predictions, not based on results of a scientific Enquiry, but using own ideas and subject knowledge

			understand anomalies in results and can explain why.

Our Implementation

We plan carefully to ensure there is progression within each unit. E.g. Rocks Year 3 -Start by feeling and observing rocks. Compare rocks-scratch test and porous/nonporous. Then look at fossils. After rocks, we look at soil, which is made from rock and other organic material.

Electricity Year 6- Test to assess prior knowledge, recap key concepts (e.g. circuit needs to be complete), circuit diagrams, insulators/conductors, apply this knowledge to making Christmas decorations.

Each unit starts with an opportunity for pupils to show their prior knowledge. In KS1, we start each unit with what the pupils already know, creating a mind map. As knowledge is learned, this mind map is updated during the unit. In Key Stage 2, the pupils show their understanding by writing definitions for topic-related key vocabulary. These definitions are re-visited at the end of the topic and the pupils edit or re-write their definitions to show what they have learnt as well as include diagrams.

We plan our teaching carefully to ensure that key knowledge is clearly presented and retained. In each lesson, there are opportunities for revising and recapping key knowledge. Strategies used include chanting key facts, low stakes quizzes and paired discussion where one pupil teaches another.

The use of big questions in RE has been successful in motivating pupils and stimulating deeper thinking. These are now used in Science.

Key areas that we feel are important for our Curzon pupils are: scientific vocabulary, emphasis on working accurately and building on scientific investigations with exploration at home in KS2. Observations of our pupils shows that they often find it difficult to express themselves scientifically and lack skills in taking accurate measurements. To support this, we use vocabulary banks at the start of each unit, which are then kept live and referred to during the unit. Within units, accurate recording of measurements is modelled and pupils are taught to use different equipment to do this. Older pupils are taught the importance of taking 3 measurements and reflecting on these to identify inaccuracies.

We are keen for our pupils to try out practical activities at home and give optional holiday homework tasks for them to complete with their families. To promote enthusiasm in science, we hold special event days in conjunction with Science Oxford and opportunities for pupils to undertake a range of science activities in our local environment.

Progression of knowledge and skills in Science

We have mapped out the substantive knowledge for science and the skills needed to be a scientist. Pupils are explicitly taught these skills within the context of the units to build up their disciplinary knowledge of how we gain scientific substantive knowledge.

EYFS science is taught mainly through continuous provision covering the following key skills and following the same broad units at KS1:

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.

Our EYFS science curriculum also provides rich opportunities for pupils to develop skills in other areas e.g. listening and attention; speaking; self-regulation - working with others and turn taking; managing self (confidence, self-resilience and perseverance); gross motor skills (negotiating space in the outside environment and woods); fine motors skills (especially drawing skills); Literacy and maths skills (especially counting and subitising)

KS1-2

We follow the order of the 2014 National Curriculum whereby units build on each other e.g. light is taught in Year 3 where pupils investigate and learn about shadows and then in Year 6 where they extend this knowledge to how light travels.

Science in KS1 is taught on a two-year rolling programme. Topics are the same both Year 1 and Year 2 but taught at a different level depending on the year group. We use mixed aged planning from Plymouth Science to ensure continuity and progression and have identified some specific Year 2 skills within our progression grid.

YEAR A

Autumn	Spring	Summer	Skills KS1
Material World • 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 properties of a variety of everyday materials. • Compare and group together a variety of everyday materials on the basis of their simple properties.	**Animals, Humans and Staying Healthy** • Describe the importance for humans of exercise, eating the right amounts if different types of food and hygiene. (A.Y2) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (A.Y1) • 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. (A.Y2) • Notice that animals including humans have offspring which grow into adults. (L.Y2)	**Looking after Plants** • Identify and name a variety of common wild and green plants, including deciduous and evergreen trees (P.Y1) • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy (P Y2) • Observe changes across four seasons. (S. Y1) • Observe and describe weather associated with the seasons and how day length varies. (S. Y1)	**Thinking like a scientist** ask simple questions about the world make observations using senses carry out simple tests to help answer questions predict results (Y2 give reasons) use senses to compare objects, materials and living things sort objects into groups explain how they have sorted objects into groups **Experimenting like a scientist** gather evidence to help answer question (Y2 including from graphs and tables) record simple data to help answer questions observe how things change over time use equipment to make measurements Y2 perform comparative tests **Finding answers like a scientist** identify patterns in results (Y2 identify similarities and differences.)

			describe how some people use science in their jobs describe and explain what they have found out explain how they found things out use evidence from observations to suggest answers to questions Y2 use scientific language Y2 write simple conclusions with basic reasoning

- **YEAR B**

Autumn	Spring	Summer	Skills KS1
Uses of Everyday Materials **Changing materials** • Identify and name materials • Recognise and name everyday materials: wood, plastic, glass, metal, water, and rock. • Understand that objects are made from different materials. • Describe properties of materials • Use simple language to describe materials (e.g., hard, soft, rough, smooth, bendy, stiff, waterproof).	**Living Things and Their Habitats** **Animal Safari** • 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)	**Plants** **How Does Your Garden Grow?** • Identify and describe the basic structure of a variety of common flowering plants including trees. • Identify and name a variety of common wild and garden plants including deciduous and evergreen trees. • Observe and describe how seeds and bulbs grow into mature plants.	**Thinking like a scientist** ask simple questions about the world make observations using senses carry out simple tests to help answer questions predict results (Y2 give reasons) use senses to compare objects, materials and living things sort objects into groups explain how they have sorted objects into groups **Experimenting like a scientist** gather evidence to help answer question (Y2 including from graphs and tables)

• Understand how materials can change • Explore how materials can be shaped by squashing, bending, twisting, and stretching. • Compare and group materials • Group materials based on their simple physical properties.	• 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. • Notice that animals have offspring which grow into adults. • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).		record simple data to help answer questions observe how things change over time use equipment to make measurements Y2 perform comparative tests **Finding answers like a scientist** identify patterns in results Y2 identify similarities and differences. describe how some people use science in their jobs describe and explain what they have found out explain how they found things out use evidence from observations to suggest answers to questions Y2 use scientific language Y2 write simple conclusions with basic reasoning

Long Term Curriculum Planning for Science: Year 3

Autumn	Spring	Summer	Skills Lower KS2

Rocks	Animals including humans (nutrition and skeletons)	Plants	Thinking like a scientist
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 observe rocks using magnifying glasses and microscope test rocks for their permeability know about Mary Anning **Forces & Magnets** compare how things move on different surfaces notice that magnetic forces can act at a distance whereas some forces need contact between two objects 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	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 types of skeletons joints	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 **Light** 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 design reflector for book bag 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	ask appropriate scientific questions about the world use scientific knowledge to sort and classify objects, materials and living things suggest how to make a simple comparative test fair suggest how to investigate patterns they have observed plan an appropriate scientific investigation-predict and explain prediction select appropriate equipment to use during my investigation suggest what data should be collected in an investigation suggest how to collect data in an investigation **Experimenting like a scientist** carry out simple scientific experiments use simple practical tests to compare things make systematic and careful observations use equipment to take accurate measurements measure and record using standard units use simple scientific language to record my findings

predict whether 2 magnets will attract or repel each other, depending on which poles are facing sort materials carry out fair tests investigate friction create own magnetic game		find patterns in the way that the size of shadows change	use drawings and labelled diagrams to help explain investigations use tables to record the results of my investigations use a key for identification **Finding answers like a scientist** describe results of investigations present the findings using a bar chart present conclusions in a range of formats use scientific knowledge to explain the results of investigations and write a simple conclusion use conclusions from investigations to make simple predictions use scientific evidence to support conclusions use sources of information to try to answer questions that cannot be investigated describe the research and discoveries of famous scientists linked to my investigations

Long Term Curriculum Planning for Science: Year 4

Autumn	Spring	Summer	Skills Lower KS2
Animals including humans (digestion, teeth) 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 teeth investigation-acids understand how to care for our teeth to keep them healthy I can identify and compare teeth of carnivores, herbivores and omnivores. I can identify animal habitats in the locality and observe what they eat **Electricity** identify common appliances that run on electricity	**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 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 create instruments **Living things & their habitats** recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a	**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 Practice and consolidation time	**Thinking like a scientist** ask appropriate scientific questions about the world use scientific knowledge to sort and classify objects, materials and living things suggest how to make a simple comparative test fair suggest how to investigate patterns they have observed plan an appropriate scientific investigation –predict and explain prediction select appropriate equipment to use during my investigation suggest what data should be collected in an investigation suggest how to collect data in an investigation **Experimenting like a scientist** carry out simple scientific experiments

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 construct simple series circuits	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		use simple practical tests to compare things make systematic and careful observations use equipment to take accurate measurements measure and record using standard units use simple scientific language to record my findings use drawings and labelled diagrams to help explain investigations use tables to record the results of my investigations use a key for identification **Finding answers like a scientist** describe results of investigations present the findings using a bar chart present conclusions in a range of formats use scientific knowledge to explain the results of investigations and write a simple conclusion use conclusions from investigations to make simple predictions use scientific evidence to support conclusions

			use sources of information to try to answer questions that cannot be investigated describe the research and discoveries of famous scientists linked to my investigations

Long Term Curriculum Planning for Science: Year 5

Autumn	Spring	Summer	Skills upper KS2
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 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 **Properties and changes of materials** compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency,	**Forces** 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 Practice and consolidation time	**Animals including humans (human development)** describe the changes as humans develop to old age **Living things & their habitats (life cycles)** 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	**Thinking like a scientist** Use scientific experiences to raise different kinds of questions select and plan the most appropriate type of scientific enquiry to answer a question make detailed and reasoned predictions based on prior scientific knowledge recognise how and when to set up comparative and fair test and explain which variables need to be controlled select the most appropriate equipment to take accurate measurements and explain how to use the equipment **Experimenting like a scientist**

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			measure and record accurate and precise results using a range of scientific equipment design own results tables to record results tables from a range of investigations select which observations to make, what measurements to use and how long to make them for recognise when it is appropriate to take repeat readings and know how to calculate average results produce own keys to help with classification and identification **Finding answers like a scientist** describe how famous scientists developed their ideas based on observation and experiment present the findings of investigations using scatter graphs and line graphs describe the results of my investigations, identifying different casual relationships in data use evidence to produce a conclusion, using scientific knowledge to explain results

			use evidence to refute or support a scientific idea recognise when further tests and observations may need to be collected to reach a conclusion select appropriate secondary sources to research ideas suggest improvements to an investigation use relevant scientific language to communicate and justify scientific ideas explain how scientific ideas have changed over time

Long Term Curriculum Planning for Science: Year 6

Autumn	Spring	Summer	Skills upper KS2
Light 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	**Living things and their habitats** describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	**Animals including humans (circulatory system)** 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	**Thinking like a scientist** Use scientific experiences to raise different kinds of questions select and plan the most appropriate type of scientific enquiry to answer a question make detailed and reasoned predictions based on prior scientific knowledge

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 **Electricity** 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 create a light up Christmas decoration	give reasons for classifying plants and animals based on specific characteristics **Evolution and Inheritance** recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 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 discussion and debate with members of foundation Govs	describe the ways in which nutrients and water are transported within animals, including humans Practice and consolidation time	recognise how and when to set up comparative and fair test and explain which variables need to be controlled select the most appropriate equipment to take accurate measurements and explain how to use the equipment **Experimenting like a scientist** measure and record accurate and precise results using a range of scientific equipment design own results tables to record results tables from a range of investigations select which observations to make, what measurements to use and how long to make them for recognise when it is appropriate to take repeat readings and know how to calculate average results produce own keys to help with classification and identification **Finding answers like a scientist** describe how famous scientists developed their ideas based on observation and experiment

			present the findings of investigations using scatter graphs and line graphs describe the results of my investigations, identifying different casual relationships in data use evidence to produce a conclusion, using scientific knowledge to explain results use evidence to refute or support a scientific idea recognise when further tests and observations may need to be collected to reach a conclusion select appropriate secondary sources to research ideas suggest improvements to an investigation use relevant scientific language to communicate and justify scientific ideas explain how scientific ideas have changed over time

Impact

Assessment

Assessment of pupils' learning in Science is an ongoing monitoring of pupils' learning by the class teacher throughout lessons. As in all subjects, lessons start with a recap of previous learning. Teachers use quick fire formative assessment activities in lessons to check retention of knowledge, such as true/false, thumbs up/down and low stakes quizzes. This formative assessment is then used to inform support and challenge for each pupil and to make adaptations to future lessons. Teachers use the mind maps/vocabulary definitions at the end of each unit to assess pupils' learning over a unit. Teachers also observe and assess pupils' investigative skills. These inform summative data for each term which is recorded on Bromcom and analysed by the subject leader.

Impact

Pupil voice shows that pupils enjoy Science and are well motivated in this subject. Pupils review their mind maps/questions during units and are actively encouraged to reflect on the knowledge and skills they are learning. End of term summative assessments shows that pupils' attainment in Science is at least in line with attainment in core subjects in all year groups. Some SEND pupils who struggle with writing attain better in science than in literacy.

By the time our pupils leave Curzon they will:

- Show an understanding of the importance of our local eco systems and environment
- Advocate the importance of respecting and caring for our natural world
- Develop sound enquiry skills to plan, carry out and evaluate investigations
- Use a rich vocabulary to articulate their understanding of concepts
- Understand how science is important to many jobs and have high aspirations of themselves
- Possess the knowledge and skills needed for KS3 curriculum