

# Curzon Science Curriculum

## Our Intent

### Curzon specific aims of Science

Science is an awe-inspiring subject and our aim as a school is ignite children's curiosity into the natural world and how things work. We want our children to question the physical, chemical and natural world around them, be motivated to find the answers and relish creating a bank of knowledge. We want them 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 children 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 curriculum unique to Curzon:

### Using our local environment

Being set in an area of outstanding natural 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 children 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 children 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
<b>Seasonal changes</b>	Y1,2	Art- seasonal pictures Geography- local area
<b>Plants</b>	Year 1,2,3	Art – Recreating plants and the key features, either through sketching or modelling  Geography – Physical geography including biomes and vegetation belts, locating plants by their countries or regions-links to Rainforest topic.  English – Writing an information text about plants and flowers. Persuasive writing, save the rainforest plants.
<b>Animals, including humans</b>	Year 1,2 ,3, 4, 5 and 6	PSHE – SRE – 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
<b>Rocks</b>	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.
<b>Light</b>	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
<b>Forces and magnets</b>	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
<b>Living Things and their Habitats</b>	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
<b>States of Matter</b>	Year 4	Maths – Measuring changes in temperatures  Geography – The water cycle, Rivers  Design Technology –Food and change in state through temperature- cookery unit.
<b>Sound</b>	Year 4	Music - identify sounds with increasing aural memory (focus on instruments). Matching sounds in simple, class-made shakers, according to the contents.  Maths- Measuring how far away a drum can be heard (go onto the playing field).
<b>Electricity</b>	Year 4 and 6	Design Technology – 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

<b>Properties and Changes of Materials</b>	Year 1,2,5	Maths - Data handling  Design Technology – cookery unit, textiles and design ideas, structures and materials used Creating houses/ umbrellas out of different materials.
<b>Earth and Space</b>	Year 5	Art – Create/recreate images of Earth or space and the key features, either through sketching or modelling  Maths – Time including calendars  History – Ancient Greece
<b>Evolution and Inheritance</b>	Year 6	RE- Genesis
<b>Working scientifically</b>	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 children to respect all living things.

Courage- our curriculum is designed to give children 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.

### **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 children 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 carry out simple tests to help answer questions predict results (Y2 give reasons) use senses to compare objects, materials and living things	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	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

	<p>sort objects into groups explain how they have sorted objects into groups</p>		<p>use evidence from observations to suggest answers to questions Y2 use scientific language Y2 write simple conclusions with basic reasoning</p>
Year 3,4	<p>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</p>	<p>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</p>	<p>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</p>
Year 5,6	<p>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</p>	<p>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</p>	<p>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</p>

	select the most appropriate equipment to take accurate measurements and explain how to use the equipment	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
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## 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/non porous. 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 children to show their prior knowledge. In KS1, we start each unit with what the children already know, creating a mind map. As knowledge is learned, this mind map is updated during the unit. In KS2, units start with children choosing 5-6 questions to find out and end with a mind map summarising the knowledge learnt and the answer to the questions.

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 children and stimulating deeper thinking. These are now used in Science.

Key areas that we feel are important for our Curzon children 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 children are taught to use different equipment to do this. Older children are taught the importance of taking 3 measurements and reflecting on these to identify inaccuracies.

We are keen for our children 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 whole school “wonderland days” where pupils undertake a range of science activities in our local environment.

### **Assessment**

Teachers use the mind maps at the end of each unit to assess children’s learning over a unit. Strategies such as, true/false, thumbs up/down and low stakes quizzes are used to assess understanding during lessons. Teachers also observe and assess children’s investigative skills. Summative data for each term is recorded on Target Tracker and analysed by the subject leader.

## **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 children 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 children 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 Hamilton to ensure continuity and progression and have identified some specific Year 2 skills within our progression grid.

## YEAR A

Autumn	Spring	Summer	Skills KS1
<p><b>Animals, including humans – Amazing me!</b></p> <p>notice that animals, including humans, have offspring which grow into adults</p> <p>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p> <p>label parts of body</p>	<p><b>Materials – Brilliant Builders</b></p> <p>distinguish between an object and the material from which it is made</p> <p>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>describe the simple physical properties of a variety of everyday materials</p> <p>compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p><b>Animals- Wild and Wonderful Creatures</b></p> <p>identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>describe and compare the structure of a variety of common animals (fish, amphibians, reptiles,</p>	<p><b>Thinking like a scientist</b></p> <p>ask simple questions about the world</p> <p>make observations using senses</p> <p>carry out simple tests to help answer questions</p> <p>predict results (Y2 give reasons)</p> <p>use senses to compare objects, materials and living things</p> <p>sort objects into groups</p> <p>explain how they have sorted objects into groups</p>

<p>senses</p> <p><b>Seasonal Changes-Wild Weather</b>  observe changes across the 4 seasons  observe and describe weather associated with the seasons and how day length varies  shadows  make a rainfall gauge  wind direction  measure temperature</p>	<p>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses (2EM).  Three Little Pigs  <b>Plants – Growing Things</b>  identify and name a variety of common wild and garden plants, including deciduous and evergreen trees  grow potatoes, beans, cress</p>	<p>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  create a habitat in a bottle  create a tray safari  <b>Living things – Food Chains</b>  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  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.</p>	<p><b>Experimenting like a scientist</b>  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  <b>Finding answers like a scientist</b>  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</p>
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**YEAR B**

Autumn	Spring	Summer	Skills KS1
<p><b>Animals – People and Pets</b>            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 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</p> <p>investigate wood lice            design an imaginary pet</p> <p><b>Seasonal Changes- Weather Art</b>            observe changes across the 4 seasons            observe and describe weather associated with the seasons and how day length varies</p>	<p><b>Materials – Brilliant Builders</b>            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            umbrellas            absorbency and waterproofness</p> <p><b>Plants Art and Nature</b>            identify and name a variety of common wild and garden plants, including deciduous and evergreen trees            identify and describe the basic structure of a variety of common flowering plants, including trees</p>	<p><b>Materials - Exploring Changes</b>            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            investigate ice, puddles            create a wax resist picture</p>	<p><b>Thinking like a scientist</b>            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</p> <p><b>Experimenting like a scientist</b>            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</p> <p><b>Finding answers like a scientist</b></p>

<p>make a wind sock, wind spinner investigate light sources create a sundial</p>	<p>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 seed dispersal investigate inside of a flower leaf and bark rubbings</p>	<p><b>Living things – Habitats and Homes</b>  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 create a bug hotel</p>	<p>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</p>
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### Long Term Curriculum Planning for Science: Year 3

Autumn	Spring	Summer	Skills Lower KS2
<p><b>Rocks</b> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter</p>	<p><b>Animals including humans (nutrition and skeletons)</b> 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</p>	<p><b>Plants</b> 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</p>	<p><b>Thinking like a scientist</b> 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</p>

<p>observe rocks using magnifying glasses and microscope test rocks for their permeability know about Mary Anning</p> <p style="text-align: center;"><b>Forces &amp; Magnets</b></p> <p>compare how things move on different surfaces notice that 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 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</p>	<p>muscles for support, protection and movement types of skeletons joints</p> <p style="text-align: center;"><b>Light</b></p> <p>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 find patterns in the way that the size of shadows change</p>	<p>investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p> <p>Practice and consolidation time</p>	<p>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</p> <p style="text-align: center;"><b>Experimenting like a scientist</b></p> <p>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</p> <p style="text-align: center;"><b>Finding answers like a scientist</b></p> <p>describe results of investigations present the findings using a bar chart</p>
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			<p>present conclusions in a range of formats</p> <p>use scientific knowledge to explain the results of investigations and write a simple conclusion</p> <p>use conclusions from investigations to make simple predictions</p> <p>use scientific evidence to support conclusions</p> <p>use sources of information to try to answer questions that cannot be investigated</p> <p>describe the research and discoveries of famous scientists linked to my investigations</p>
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**Long Term Curriculum Planning for Science: Year 4**

<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>	<b>Skills Lower KS2</b>
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<p><b>Animals including humans (digestion, teeth)</b>  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</p> <p><b>Electricity</b>  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  construct simple series circuits</p>	<p><b>Sound</b>  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</p> <p><b>Living things &amp; their habitats</b>  recognise that living things can be grouped in a variety of ways  explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment  recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p><b>States of matter</b>  compare and group materials together, according to whether they are solids, liquids or gases  observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)  identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p> <p>Practice and consolidation time</p>	<p><b>Thinking like a scientist</b>  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</p> <p><b>Experimenting like a scientist</b>  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</p>
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			<p>use drawings and labelled diagrams to help explain investigations</p> <p>use tables to record the results of my investigations</p> <p>use a key for identification</p> <p><b>Finding answers like a scientist</b></p> <p>describe results of investigations</p> <p>present the findings using a bar chart</p> <p>present conclusions in a range of formats</p> <p>use scientific knowledge to explain the results of investigations and write a simple conclusion</p> <p>use conclusions from investigations to make simple predictions</p> <p>use scientific evidence to support conclusions</p> <p>use sources of information to try to answer questions that cannot be investigated</p> <p>describe the research and discoveries of famous scientists linked to my investigations</p>
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Autumn	Spring	Summer	Skills upper KS2
<p><b>Earth and Space</b>  describe the movement of the Earth and other planets relative to the sun in the solar system  describe the movement of the moon relative to the Earth  describe the sun, Earth and moon as approximately spherical bodies  use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p> <p><b>Properties and changes of materials</b>  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</p>	<p><b>Forces</b>  explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object  identify the effects of air resistance, water resistance and friction, that act between moving surfaces  recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</p> <p>Practice and consolidation time</p>	<p><b>Animals including humans (human development)</b>  describe the changes as humans develop to old age</p> <p><b>Living things &amp; their habitats (life cycles)</b>  describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird  describe the life process of reproduction in some plants and animals</p>	<p><b>Thinking like a scientist</b>  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</p> <p><b>Experimenting like a scientist</b>  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</p>

<p>particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda</p>			<p>know how to calculate average results</p> <p>produce own keys to help with classification and identification</p> <p><b>Finding answers like a scientist</b>  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</p> <p>select appropriate secondary sources to research ideas</p> <p>suggest improvements to an investigation</p>
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			<p>use relevant scientific language to communicate and justify scientific ideas</p> <p>explain how scientific ideas have changed over time</p>
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### Long Term Curriculum Planning for Science: Year 6

Autumn	Spring	Summer	Skills upper KS2
<p><b>Light</b></p> <p>recognise that light appears to travel in straight lines</p> <p>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</p> <p>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</p> <p>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p> <p><b>Electricity</b></p> <p>associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p>	<p><b>Living things and their habitats</b></p> <p>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</p> <p>give reasons for classifying plants and animals based on specific characteristics</p> <p><b>Evolution and Inheritance</b></p> <p>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p>	<p><b>Animals including humans (circulatory system)</b></p> <p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>describe the ways in which nutrients and water are transported within animals, including humans</p> <p>Practice and consolidation time</p>	<p><b>Thinking like a scientist</b></p> <p>Use scientific experiences to raise different kinds of questions</p> <p>select and plan the most appropriate type of scientific enquiry to answer a question</p> <p>make detailed and reasoned predictions based on prior scientific knowledge</p> <p>recognise how and when to set up comparative and fair test and explain which variables need to be controlled</p> <p>select the most appropriate equipment to take accurate measurements and explain how to use the equipment</p> <p><b>Experimenting like a scientist</b></p>

<p>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</p>	<p>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</p>		<p>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</p> <p>produce own keys to help with classification and identification</p> <p><b>Finding answers like a scientist</b>  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</p>
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			<p>use evidence to refute or support a scientific idea recognise when further tests and observations may need to be collected to reach a conclusion</p> <p>select appropriate secondary sources to research ideas</p> <p>suggest improvements to an investigation</p> <p>use relevant scientific language to communicate and justify scientific ideas explain how scientific ideas have changed over time</p>
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## Impact

Pupil voice shows that children enjoy science and are well motivated in this subject. Children review their mind maps/questions during units and are actively encouraged to reflect on the knowledge and skills they are learning. End of term Target Tracker 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