

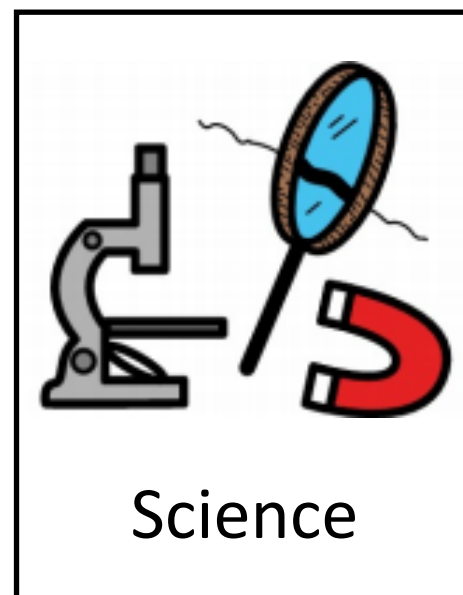
# Science Curriculum Overview

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**ST MARY  
QUEEN OF  
MARTYRS**  
VC ACADEMY



Science

## 1. Science Intent, Implementation and Impact Statement



### Intent:

At St Mary Queen of Martyrs, we aim to provide a science curriculum which enables pupils to explore and discover the world around them, so that they have a deeper understanding of the world we live in. Children in Y1-6 will meet the National Curriculum expectations in science through a progression of knowledge and skills, by studying science for a minimum of 2 hours per week. Within the EYFS Curriculum, science is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions, and talk about the world around them.

Children at St Mary Queen of Martyrs are given opportunities to experience learning beyond the classroom. Through the teaching of science, we scientifically incorporate the areas from our whole school qualities: ready and safe (to learn), love and respect (of God's world), independence, confidence and pride (in our work), and resilience (trial and error).

Children are inspired to follow a pathway towards a scientific career and to think like a Scientist! At St Mary Queen of Martyrs, we want our children to understand how Science is used in the wider world including career and allow this knowledge to inspire our children.

## 1. Science Intent, Implementation and Impact Statement



### **Implementation:**

At St Mary Queen of Martyrs, our science curriculum is carefully structured to ensure consistency, progression, and success for all children. Lessons are planned to be engaging and interactive, with problem-solving opportunities that encourage pupils to ask questions, investigate, and use their scientific skills to discover answers for themselves. Curiosity is nurtured and celebrated within the classroom.

Teachers deliver high-quality lessons using effective resources, precise questioning, and regular assessment to check understanding and address misconceptions. Both formative and summative assessments are used to ensure all children build securely on prior knowledge and make sustained progress.

As children move through school, they develop increasing confidence in selecting and using equipment, interpreting results, and forming evidence-based conclusions. Working Scientifically skills and scientific vocabulary are embedded throughout the curriculum, with new concepts introduced progressively to deepen understanding.

We enrich learning through outdoor opportunities, workshops, and visits from experts, enabling children to connect their scientific knowledge to the world around them. In this way, our pupils are supported to become confident, inquisitive learners who view science as meaningful, challenging, and inspiring.

## 1. Science Intent, Implementation and Impact Statement



### Impact:

The impact of our science curriculum is evident in the way children engage with their learning both inside and outside the classroom. Educational visits and enrichment opportunities have broadened their experiences, enabling them to articulate clearly how these opportunities have deepened their knowledge and understanding of the subject.

Children of all abilities and backgrounds achieve well in science through a carefully designed curriculum that is inclusive and ambitious for all. They speak with enthusiasm about their learning, demonstrating curiosity and a genuine eagerness to extend their knowledge as they progress into the next stages of their education.

Our pupils grow in confidence and resilience, developing the ability to think critically, question scientifically, and apply their knowledge to real-world contexts. They are encouraged to see themselves as scientists, and as a result, many are inspired to pursue scientific pathways in the future.

Furthermore, children develop an awareness of how Science shapes the wider world and the many careers it supports. They understand the relevance and application of scientific knowledge in everyday life and in society, preparing them to become informed citizens who can actively contribute to and engage with the world around them.

## 2. Subject on a page



### Lesson sequence – what does Science look like at SMQ?

**In Science books, you will see:** Topic Cover sheet with mind map to show pupils current knowledge on that topic. The date and 'I can' should be displayed in books.

Pupils will also be given a knowledge organiser which will be discussed.

**Retrieval Lesson:** Retrieval lesson focusing on what children have retained from prior objectives, alongside (explicit teaching of) retrieval vocabulary.

**Lessons:** Children are taught National Curriculum objectives, alongside explicit teaching of topic vocabulary. At times, children will focus upon a scientist.

**End of Topic Assessment:** Pupils will produce work which will show hexagons with key vocabulary, pictures of explanations. Pupils should make connections and explain why they have made these connections based on what they have learned.

### **Classroom environment:**

Topic name, Key vocabulary and Knowledge Organiser to be displayed.  
Displays promote curiosity. Children's work to be displayed.  
'Sticky Knowledge' to be added to working walls.

The children at St Mary Queen of Martyr's will study each of the following on a **2-year cycle**

**Chemistry Biology Physics**

Additionally, they will undertake studies of inspirational scientists throughout the year, which relate to each of the above categories of scientific field.

**Chemistry Biology Physics**

2025-2026: CYCLE 1 / CYCLE A

	Aut	Aut	Sp1	Sp2	Su1	Su2
Year 1/2	<b>Chemistry:</b> Uses of Everyday Materials Y2 <b>Scientist Focus:</b> Isambard Kingdom Brunel		<b>Biology:</b> Animals Including Humans Y2 <b>Scientist Focus:</b> George Washington Carver <b>No Scientist Focus:</b>	<b>Biology:</b> Plants Y2 <b>Scientist Focus:</b> George Washington Carver	<b>Biology:</b> Living Things and Life Cycles Y2 <b>No Scientist Focus:</b>	
	<b>Physics:</b> Seasonal Changes Y1 <b>Scientist Focus:</b> James Watson and Francis Crick <b>No Scientist Focus:</b>					
Year 3/4	<b>Chemistry:</b> Solids, Liquids and Gases (States of Matter) Y4 <b>Scientist Focus:</b> Alice Bell	<b>Physics:</b> Sound Y4 <b>No Scientist Focus:</b> <b>Scientist Focus:</b> Albert Einstein <b>No Scientist Focus:</b>	<b>Physics:</b> Electricity Y4 <b>Scientist Focus:</b> Michael Faraday <b>Scientist Focus:</b> Benjamin Franklin <b>No Scientist Focus:</b>	<b>Biology:</b> Animals Y3 <b>No Scientist Focus:</b> <b>Scientist Focus:</b> Charles Darwin <b>No Scientist Focus:</b>	<b>Biology:</b> Living Things and Their Habitats Y4 <b>Scientist Focus:</b> Jane Goodall <b>Scientist Focus:</b> Jane Goodall <b>No Scientist Focus:</b>	
Year 5/6	<b>Physics:</b> Light Y6 <b>No Scientist Focus:</b>	<b>Biology:</b> Living Things and Their Habitats/Classification Y6 <b>Scientist Focus:</b> Carl Linnaeus	<b>Biology:</b> Evolution and Adaptation Y6 <b>Scientist Focus:</b> Charles Darwin <b>Scientist Focus:</b> Charles Darwin <b>No Scientist Focus:</b>	<b>Physics:</b> Electricity Y6 <b>No Scientist Focus:</b> <b>Scientist Focus:</b> Benjamin Franklin <b>No Scientist Focus:</b>	<b>Biology:</b> Animals Including Humans/ Circulatory Y6 <b>No Scientist Focus:</b> <b>Scientist Focus:</b> Charles Darwin <b>No Scientist Focus:</b>	

### **Home links**

Knowledge organiser sent home via Google Classroom.

Homework tasks on half termly homework (Google Classroom), shared and celebrated in class.

### 3. Curriculum expectations



#### Teaching

Before the topic begins, children should complete a front topic sheet with a mind-map “What do I know?” and a Knowledge Organiser should be referred too and stored in the child’s own K.O folder. *Ideally*, a copy of this should also be sent home with the pupils/on Google Classroom.

Each unit starts with a retrieval lesson from previous learning. This is from a prior year group and this is undertaken in the first lesson.

Each topic includes learning points/objectives that need to be covered as these align with the National Curriculum.

New vocabulary to be explicitly taught is given, along with previously taught vocabulary.

Experiment (Working Scientifically) sessions are given, to ensure that there is a mix of skills across the year and that this builds year on year.

A minimum of one enquiry is undertaken per block, though more can be undertaken to respond to the needs of the class and content covered.

Completion of the enquiries should be undertaken in reference to the linked ‘working scientifically’ learning points/objectives.

At the end of the unit, a post-topic assessment should be completed, to ascertain retention.

Lessons should be taught as 2x mornings or 1 afternoon at a minimum.

Children should be told that the current topic is Physics, Biology or Chemistry.

#### Environment

A clear working wall should demonstrate the vocabulary used from the current unit.

The current topic and the knowledge organiser should be on display..

Photocopies/ photos of children’s work should be displayed as a celebration.

Key questions should be on the wall to prompt inquisitive learning.

## 4. Science Long term plan - EYFS

### EYFS Long Term Plan

	Cycle	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme		Superheroes	Celebrations	Frozen	Growing	Journeys	Underwater
Enquiries		All About Me/Jobs/People Who Help Us	Celebrations/Other Cultures/Harvest Bonfire	Farm Animals Changing of Seasons	Insects Environment Growth	Journeys Ways to Travel	Underwater animals Different places
WOW		Family Day Fire/Police Visit	Nativity		Caterpillars	Train Station	The Deep
Events		Starting School Birthdays	Bonfire night, Remembrance Day, Divali, Eid, Christmas	Chinese New Year Valentine's Day	Mother's Day, Easter, Pancake Day	Ramadan,	Sports day Transition
Literacy		Peace At Last	The Same But Different Too	Stick Man	Handa's Surprise	The Train Ride	Snail and the Whale
	Vocab						
		Owl Babies	Owl Babies	Little Penguins	Very Hungry Caterpillar	Runaway Train	Rainbow Fish
	Vocab						
	Outcomes	3-4: Make and describe marks. Rec: Oral retelling, drawing images, marking, initial sounds.	3-4: Make and describe marks. Rec: Oral retelling, draw images, captions for retell	3-4: Make and describe marks. Rec: Oral retelling, draw & write captions, innovation	3-4: Make and describe marks. Rec: Oral retelling, draw & write captions, innovation	3-4: Make and describe marks, initial sounds. Rec: Oral retelling, draw & write captions, innovation, short sentences.	3-4: Make and describe marks, initial sounds. Rec: Oral retelling, draw & write captions, innovation, short sentences.
	Other writing	Non-fiction: People who help us, label a family portrait	Non-fiction: Recount of bonfire, list of ingredients	Non-fiction: Facts about farm animals	Non-fiction: life cycle, labelling	Non-fiction: map work, labelling	
Reading	RWI	Fidelity to the RWI scheme Daily sound and blending work					
	Comp.	3-4: Sing a large repertoire of songs. Know many rhymes, be able to talk about familiar books, and be able to tell a long story. Enjoy listening to longer stories and can remember much of what happens. Understand the five key concepts about print Engage in extended conversations about stories, learning new vocabulary.			Rec: Learn new vocabulary. Engage in storytimes. Listen to and talk about stories to build familiarity and understanding. Retell the story, once they have developed a deep familiarity with the text, some as exact repetition and some in their own words. Listen carefully to rhymes and songs, paying attention to how they sound. Engage in non-fiction books		
Maths	3-4	Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Recite numbers up to 5 and beyond when ready. Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').	Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language:	Subitising Counting numbers past 5 and say each number in order Show 'finger numbers' up to 5.	Subitising Reciting numbers past 5 Show finger numbers up to 5 and linking numerals to amounts (e.g. if I have five fish can they point to the number 5?)	Continue to subitise (to 3 and then 5) Reciting numbers past 5 and saying them in order. 'Finger numbers' to 5	

		<p>Show 'finger numbers' up to 5. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Making, recognising and understanding AB patterns (e.g. +---+)</p> <p>Counting by rote up to 10 and speaking using positional language (e.g. up, under, next to).</p>		<p>'sides', 'comers'; 'straight', 'flat', 'round'. Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc. Combine shapes to make new ones – an arch, a bigger triangle, etc. Understand position through words alone – for example, "The bag is under the table," – with no pointing. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'. Continue to extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</p>	<p>Make comparisons between objects relating to size, length, weight and capacity. Extend and create ABAB patterns – stick, leaf, stick, leaf &amp; notice and correct an error in a repeating pattern. Continue to Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</p>	<p>Working on the composition of numbers to 5 (e.g. <math>2+3=5</math>, <math>1+3=4</math> etc) Talk about and explore 2D and 3D shapes. Describe a familiar route and order the things they have seen along the way.</p>	<p>Linking numerals to objects – e.g. 5 objects matching to the number 5 Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'comers'; 'straight', 'flat', 'round'. Understand position through words alone – for example, "The bag is under the table," – with no pointing. Describing a familiar route.</p>
	<b>Rec</b>	<p>Children in Maths will be reciting, and becoming more confident, in counting numbers past 10, in the correct order. They will be focusing on numbers 1-5 this half term,</p>	<p>We will be reciting, and becoming more confident, in counting numbers past 10, in the correct order. They will be focusing on numbers 6-10 this half term, learning about them in more detail.</p>	<p>Counting to and beyond 10. Subitising numbers. Automatically recalling number bonds from 0-5 and then some from 6-10. Linking number symbol (cardinal value e.g. 7) with</p>	<p>Counting to and beyond 10. Subitising numbers. Recalling number bonds from 6-10 – some automatically. Linking number symbol (cardinal value e.g. 7) with</p>	<p>Counting to and beyond 10, as well as comparing numbers using language such as 'more' or 'less'. Subitising numbers. Automatically recalling number bonds from 0-5 and then some from 6-10.</p>	<p>Continue to subitise. Count beyond ten (up to and beyond 50 for those children who can). Continue to explore the composition of numbers to 10.</p>



		<p>learning about them in more detail. They will be using language such as 'more than', 'less than' and 'equal to'. Children will be finding about what a number 'is' and also what a number 'isn't' (for example, when looking at the number 4, we will also explain why 5 objects isn't represented by the number 4). The children will be using concrete (physical materials), and pictures to learn about numbers. They will be learning to <u>subtise</u> numbers (being able to count quickly and making mathematical connections). We will be comparing numbers. Explain how a number is made up (for example, 4 can be made from 3 and 1, or 2 and 2). Discovering, making and understanding AB patterns. (e.g. ++++-)</p>	<p>They will be using language such as 'more than', 'less than' and 'equal to'. Children will be finding about what a number 'is' and also what a number 'isn't' (for example, when looking at the number 7, we will also explain why 5 objects isn't represented by the number 7). The children will be using concrete (physical materials), and pictures to learn about numbers. They will be continuing to <u>subtise</u> numbers 6-10 (being able to count quickly and making mathematical connections), as well as looking at previous numbers taught. We will be comparing numbers, using numbers the children have been taught so far. Explain how a number is made up (for example, 8 can be made from 4 and 4, or 3 and 5). Discovering, making and understanding ABC (<math>\Delta \diamond O</math> <math>\Delta \diamond O</math> <math>\Delta \diamond O</math>) Using positional language (such as next to, opposite, in front of, behind etc).</p>	<p>its cardinal representation (e.g. 7 dots) Select, rotate and manipulate shapes to develop special reasoning skills. Compose and decompose shapes so that children can recognize a shape can have different shapes <i>within</i> it. Find 2D shapes within 3D shapes. Make patterns with various rules (ABB and ABBC).</p>	<p>its cardinal representation (e.g. 7 dots) One more and one less than a given number Comparing height and length Learning the days of the week in the correct order Building and printing with 3D shapes</p>	<p>Linking number symbol (<u>cardinal</u> value e.g. 7) with its cardinal representation (e.g. 7 dots) with numbers over 10 (e.g. learning that 14 is made up of 10 and 4) Understanding the <i>one more than</i> and <i>one less than</i> relationship between consecutive numbers (e.g. 18 and 19) Select, rotate and manipulate shapes to develop special reasoning skills. Compose and decompose shapes so that children can recognize a shape can have different shapes <i>within</i> it. Find 2D shapes within 3D shapes, such as squares in cubes or triangles and rectangles in a triangular prism. Make patterns with numbers (e.g. <math>11 = 10+1</math>, <math>12 = 10+2</math> etc) as well as completing a pattern within a circle.</p>	<p>Recall number bonds to 5 and some number bonds to 10. Compare length, weight and capacity Finding and developing patterns (including those patterns in a circle that are continuous)</p>
Understanding the World	Science	<p>Learning about the senses Making and listening to sounds Describe how different things feels Learn about life cycle of people</p>	<p>Mixing ingredients Heating and cooling materials How do things change in liquids Playing and exploring in Autumn</p>	<p>Observing living things throughout the year Playing and exploring in Winter Nesting animals Name different animal parts.</p>	<p>Understanding of living things and how they grow/change Describe animals and their different habitats Life cycle of a caterpillar</p>	<p>Learn about space travel How do things work How do things move in water How can wind move objects Feel different forces</p>	<p>Exploring natural objects in the environment Explore that some materials absorb liquids.</p>

		Learn to look after yourself Describe people familiar to them To name body parts Know that we are similar and different	Explore Autumn resources in a Tuff Tray.		Explore plants and flowers in the surrounding environment. Name and describe small garden/home animals.	Compare different materials (stretchy, rigid)	
	The World	Explore our classroom Explore the school Look at features of our environment Create a class map	Locating where festivals are held around the world Food across the world	Explore and compare our environment with polar regions Ice exploration Winter walk around the school grounds to discuss what is found. Draw animals found in different parts of the world Compare life of Sami people.	Explore spring resources in a Tuff Tray. Look at Africa (linked to Handa's Surprise) Observe, question, and draw spring plants/spring growth. Spring walk around the school grounds. Compare and contrast their environment to African one. Exploring fruit from around the world.	Discover different parts of the world using atlases and the globes.	Exploring differences between seaside environment and their own.
	People, communities and Culture.	Talk about members of their immediate family. Ask questions to people to find out more. Different jobs roles in the school. Celebrating our achievements in our recent history.	Describe celebrations they and others have. Differences between life in in this country and that in others. Celebrate and experience Harvest, Christmas, New Year, Diwali. Explore Bonfire Night.	What is their role in looking after the environment?	Celebrating Pancake Day/Easter.	Who is helping us look after our environment? Transport – now and then. Where have children been in the local community? (Talking about where they have vis	Past and present – focus on what the seaside was like in the past.
	We will constantly be observing seasonal changes throughout the year						
PSHE/Jigsaw TenTen		Being Me in My World	Celebrating Different	Dreams and Goals	Healthy Me (Sandwich making linked to DT)	Relationships	Transition
EAD	Art & Design	Kandinsky Colour mixing, Select appropriate resources and adapting work where necessary.		Monet Looking at Spring time art, focus on using different materials to create different artistic effects.			Aboriginal Art Exploring what happens with colour mixing and selecting appropriate resources to create different effects.
	D & T		Puppet Making Safely use and explore different materials, using different tools and techniques, experimenting for colour. Explain the process.		Healthy Fruit Salad Looking at importance of healthy food choices. Use a range of small tools including scissors and cutlery.	Bird Feeders Safely use and explore different materials, using different tools and techniques, experimenting for colour. Explain the process.	

			3-4: Creating a design on their puppets <b>Rec</b> - Using a range of materials and techniques to make their puppets.		3-4: Peeling and chopping soft fruits, mixing. <b>Rec</b> : Cutting, grating and mixing hard and soft fruits.	3-4: Bird feeders by mixing, rolling and using different tools. <b>Rec</b> : Cutting and preparing food, creating an original feeder.	
	Music	Charanga Nursery Rhymes					
Physical Dev	Physical	<b>Introduction to PE</b> Moving around safely, running, jumping, throwing, following a path, sharing. Balance.	<b>Dance</b> Trying new challenges and performing in front of others, combining movements, spatial awareness, strength, balance and coordination.	<b>Fundamentals</b> Trying new challenges, follow instructions, play cooperatively, take turns, play games honestly, develop balance and coordination.	<b>Ball Skills</b> Negotiate space safely, perseverance, ball games and developing ball skills with competence and accuracy.	<b>Gymnastics</b> Combine movements, confidently use a range of small and large apparatus, follow instructions, develop strength, balance and coordination.	<b>Games</b> Play cooperatively and take turns, play games honestly, use ball skills with competence and accuracy, movement skills with balance and coordination.
	Self Care	Importance of hygiene and self-care Dental hygiene Getting dressed	Healthy eating Making good choices Respecting others	Challenge and resilience. Thing about others.  <b>Fine Motor : Hedgehog woodwork</b>	Keeping safe - road safety, stranger danger	Healthy eating Making good choices Respecting others	Keeping safe - sun safe, screen time

## 4. Science Long term plan - Cycle 1/Cycle A



**Chemistry** **Biology** **Physics**

**2025-2026: CYCLE 1 / CYCLE A**

	Au1	Au2	Sp1	Sp2	Su1	Su2
Year 1/2	<b>Chemistry</b> Uses of Everyday Materials Y2 <b>Scientist Focus:</b> Isambard Kingdom Brunel <b>CST 8 – Stewardship (Caring for God’s gifts)</b>		<b>Biology:</b> Animals Including Humans Y2 <b>No Scientist Focus</b> <b>CST 1 – Human Dignity and CST 8 - Stewardship</b>	<b>Biology:</b> Plants Y2 <b>Scientist Focus:</b> George Washington Carver <b>CST 7 – The Common Good</b>	<b>Biology:</b> Living Things and Life Cycles Y2 <b>CST 8 - Stewardship</b> <b>No Scientist Focus</b>	
<b>Physics:</b> Seasonal Changes Y1 <b>CST -3-Distributive Justice (Everyone should have access to their fair share of resource)</b>						
Year 3/4	<b>Chemistry:</b> Solids, Liquids and Gases (States of Matter) Y4 <b>Scientist Focus:</b> Alice Bell	<b>Physics:</b> Sound Y4 <b>No Scientist Focus</b> <b>CST- 2-Participation (We all have the right and duty to participate fully in society.)</b>	<b>Physics:</b> Electricity Y4 <b>Scientist Focus:</b> Michael Faraday <b>CST-3- Distributive Justice (Everyone should have access to their fair share of resource)</b>	<b>Biology:</b> Animals Y3 <b>No Scientist Focus</b> <b>CST- 5 Preferential option for the poor. (The needs of the poor and vulnerable people should be put first.)</b>	<b>Biology:</b> Living Things and Their Habitats Y4 <b>Scientist Focus:</b> Jane Goodall <b>CST – 7 Caring for the common Good (We are called to work for the good of each and of all)</b>	
Year 5/6	<b>Physics:</b> Light Y6 <b>No Scientist Focus</b> <b>CST 8 – Stewardship (Caring for God’s gifts)</b>	<b>Biology:</b> Living Things and Their Habitats/ Classification Y6 <b>Scientist Focus:</b> Carl Linnaeus <b>CST 8 – Stewardship (Caring for God’s gifts)</b>	<b>Biology:</b> Evolution and Adaptation Y6 <b>Scientist Focus:</b> Charles Darwin <b>CST 1- Human Dignity (We are all made in the likeness of God.)</b>	<b>Physics:</b> Electricity Y6 <b>No Scientist Focus</b> <b>CST-3- Distributive Justice (Everyone should have access to their fair share of resource)</b>	<b>Biology:</b> Animals Including Humans/ Circulatory Y6 <b>No Scientist Focus</b> <b>CST- 5 Preferential option for the poor. (The needs of the poor and vulnerable people should be put first.)</b>	

2/Cycle B

## 4. Science Long term plan - Cycle 2/Cycle B



**Chemistry** **Biology** **Physics**

**2025-2026: CYCLE 2 / CYCLE B**

	Au1	Au2	Sp1	Sp2	Su1	Su2
Year 1/2	<b>Biology:</b> Animals including Humans Y1 CST- 6 Solidarity (God created us as a global family called to support our brothers and sisters.)		<b>Chemistry:</b> Everyday Materials Y1 CST 8- Stewardship (We are guardians of God’s creation, living sustainably and enhancing the wellbeing of the planet)		<b>Biology:</b> Plants Y1 CST 7- Caring for the common Good (We are called to work for the good of each and of all)	
<b>Physics Seasonal Changes Y1</b> CST -3-Distributive Justice (Everyone should have access to their fair share of resource)						
Year 3/4	<b>Chemistry:</b> Rocks and Fossils Y3 Scientist Focus: Zhang Heng CST 8- Stewardship (We are guardians of God’s creation, living sustainably and enhancing the wellbeing of the planet.)	<b>Physics:</b> Forces and Magnets Y3 No scientist Focus CST 8 – Stewardship CST 7 – The Common Good	<b>Physics:</b> Light Y3 Scientist Focus: Hasan Ibn al-Haytham CST 8- Stewardship		<b>Biology:</b> Plants Y3 No Scientist Focus CST 7- The Common Good	<b>Biology:</b> Animals Including Humans Y4 No Scientist Focus CST- 6 Solidarity (
Year 5/6	<b>Physics:</b> Earth and Space Y5 Scientist Focus: Katherine Johnson CST 7 – The Common Good	<b>Physics:</b> Forces Y5 Scientist Focus: Sir Isaac Newton CST 7 – The Common Good	<b>Chemistry:</b> Properties and Changes of Materials Y5 Scientist Focus: Marie Maynard Daly CST 1 – Human Dignity		<b>Biology:</b> Living Things and Their Habitats (Animals including Humans) Y5 No Scientist Focus CST 8 - Stewardship CST 1- Human Dignity	

## 5. Science Progression of skills

Strand	Phase 1 (Y1/2)		Phase 2 (Y3/4)		Phase 3 (Y5/6)	
	Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2
<b>BIOLOGY</b>	<p><b>Animals including Humans (Y2)</b> To know the basic needs of animals (including humans). To know that animals (including humans) have offspring which grow into adults e.g. kittens into cats, puppies into dogs, babies into adults <u>(Preload for Year 6)</u> <u>Evolution and inheritance – note how offspring often look similar to parents.</u> To know the importance for humans of exercise, eating the right amounts of different food and hygiene.</p> <p><b>WS- Using their observations and ideas to suggest answers to questions. Eg, Bread and milk germs.</b></p>	<p><b>Animals including Humans (Y1)</b>  To know the names of a variety of animals and their groups (fish, amphibians, reptiles, birds and mammals) To know the difference between the different animal groups To know the difference between carnivores, herbivores, omnivores To know the features of different animals (body parts). To know the difference between the features of different animals (body parts). To know the names of different body parts and the names of the senses.</p>	<p><b>Animals including Humans (Y3)</b> To identify that humans get the nutrition they need from what they eat, and that a balanced diet is needed to keep healthy. To investigate which foods different animals eat. To explore human and animal skeletons To find out about how the skeleton supports and protects the body. To find out what muscles are and how skeletal muscles help us to move.</p> <p><b>WS- using straightforward scientific evidence to answer questions or to support their findings.</b> <b>WS- recording findings using</b></p>	<p><b>Animals including Humans (Y4)</b>  To be able to identify and classify carnivores, herbivores and omnivores Identify what an animal would eat based on its teeth. Classify animals into producers, predators and prey according to their place in the food chain To be able to construct and interpret a variety of food chains To identify the different types of teeth in humans and identify their functions Ask questions about the effect of diet on teeth. Use eggshell to investigate and answer these questions. To know the simple functions of the</p>	<p><b>Animals including Humans – circulatory system (Y6)</b>  Blood composition and function The heart To know the ways in which nutrients and water is transported To know the main parts of the human circulatory system, and the functions of the heart, blood vessels and blood. To know the impact of diet, exercise, drugs and lifestyle on the ways their bodies function</p> <p><b><u>WS</u></b> <b>Research including secondary sources.</b></p>	

		<p><b>WS</b>  <b>Asking simple questions</b>  <b>Grouping and classifying</b>  <b>Identifying and classifying</b></p>	<p><b>simple scientific language, drawings, labelled diagrams and tables.</b></p>	<p>basic parts of the digestion system in humans.</p> <p><u><b>WS</b></u>  <b>Identify differences, similarities or changes related to simple scientific ideas and processes.</b>  <b>Classify animals into producers, predators and prey according to their place in the food chain. (Grouping and Classifying)</b>  <b>WS- asking relevant questions and using different types of scientific enquiries to answer them. (Comparative test)</b>  <b>WS- using straightforward scientific evidence to answer questions or to support their findings. This could be achieved by researching what food the different types of animals eat and linking this with the range of teeth that each animal has. (Researching)</b></p>		
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	<p><b>Plants (Y2)</b></p> <p>To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>To understand the role of seeds in the life cycle of a plant- observe and sort a variety of seeds discovering the variety of shapes, sizes and colours. They then go on to investigate the conditions that are required for germination To understand that different seeds grow into different plants and to describe them.</p> <p>To understand that plants can be grown from bulbs</p> <p>To observe and describe how a plant changes from a seed, as it matures.</p> <p><b>WS- Asking simple questions and recognising they can be answered in different ways. (Observation over time and</b></p>	<p><b>Plants (Y1)</b></p> <p>To know the basic structure of a variety of common flowering plants including trees.</p> <p>To identify and describe garden plants.</p> <p>To identify and describe wild plants.</p> <p>To identify and describe a range of trees (including deciduous and evergreen).</p> <p><b>WS- Observing closely, using simple equipment (Grouping and classifying / Observation over time.</b></p>		<p><b>Plants (Y3)</b></p> <p><u>Retrieval:</u> observe and describe how seeds and bulbs grow into mature plants (y2). Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy (y2).</p> <p>To know the requirements of plants (air, light, water, nutrients from soil, and room to grow), and how they vary from plant to plant.</p> <p><u>(Preload States of matter – gases: explore the requirements of plants (oxygen, nitrogen, carbon dioxide).</u></p> <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p><b>WS- asking relevant questions and using different types of</b></p>		<p><b>Evolution and adaptation (Y6).</b></p> <p><u>Retrieval:</u> YR2 - 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. Y4- recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>To know 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>To know that living things produce offspring of the same kind, but normally offspring vary and are not identical to</p>
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	<p>comparative testing).</p> <p>WS- Perform simple tests.</p> <p>WS- Gathering and recording data to help in answering questions.</p>			<p>scientific enquiries to answer them.</p> <p>This could be achieved by children asking questions from their prior knowledge in year 2 about the requirements of plants for life. Pupils will complete a fair test to investigate these requirements e.g. light, water, temperature. (Fair testing and observing over time)</p> <p>WS- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>Pupils will draw conclusions from given data and use this to make conclusions about their own data. This will allow them to make predictions and raise further questions. (Pattern seeking)</p>		<p>their parents (Inheritance) DOG TASKS (2 breeds)</p> <p>To know how animals and plants adapted to suit their environment in different way.</p> <p>To know that that adaptation may lead to evolution. GIRAFE NECK</p> <p>WS- identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>This could be achieved by... showing children a range of images of parent birds and then they have, to identify possible offspring (including red herrings)</p> <p>Analyse the advantages and disadvantages of specific adaptations such as being on 2 feet rather than 4,</p>
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						<p>having a long or short beak, having gills or lungs, having tendrils on climbing plants, brightly coloured and scented flowers. (Research).</p> <p>BIRD BEAK EXPERIMENT</p> <p>WS- recording data and results of increasing complexity using scientific diagrams and labels</p> <p>Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by... giving children specific animals and get them to use labelled diagrams and to present information on how an animal is adapted to live in its environment.</p>
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						<b>Present findings on the work of Charles Darwin. (Research)</b>
	<p><u>Living Things and Life-cycles (Y2)</u>            To be able to identify things that are living, things that are dead and things that have never been alive            To understand that living things need to live in suitable habitats            To explore the plants and animals that live in one habitat compared to another. Preload Light – some animals come out in the daylight whilst others are nocturnal)            (Preload Sound – look at nocturnal animals and the importance of hearing )</p> <p>To be able to explore and describe a micro-habitat            To explore food chains in a habitat. (Preload- Animals inc humans – habitats provide basic needs for animals and plants (food – touch upon food chains)</p>		<p><u>Living Things and Habitats (Y4)</u>  <u>Retrieval:</u> Y2. explore and compare the differences between things that are living, dead, and things that have never been alive            Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other            Identify and name a variety of plants and animals in their habitats, including microhabitats            Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>		<p><u>Living Things and habitats/ Classification (Y6)</u>            To recap ways of grouping organisms according to their characteristics.            To explore ways of distinguishing between organisms that have similar characteristics (belong to the same broad group can be distinguished and further classified.)  <b>WS-To be able to classify plants according to their characteristics</b>            To find out about Carl Linnaeus and his classification system.            explore what micro-organisms are and how they can be grouped            To be able to identify and classify organisms in the local area</p>	<p><u>Living Things and habitats</u>  <u>Retrieval (Y4)</u>            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>To describe the process of sexual reproduction in flowering plants            To describe the process of asexual reproduction in plants            To describe the process of sexual</p>

	<p><b>WS- Identifying and classifying</b></p> <p><b>WS- Using their observations and ideas to suggest answers to questions</b></p> <p><b>WS- Observing closely, using simple equipment.</b></p>		<b>WS- Research</b>			<p>reproduction in animals.</p> <p>To observe and compare the life cycles of animals in our local environment with other animals around the world.</p> <p>To compare how different animals reproduce and grow</p> <p><b>WS- Group and classify</b></p>
<b>CHEMISTRY</b>	<p><b>Use of everyday materials (Y2)</b></p> <p>To be able to identify a variety of materials (including natural and man-made) and sort them according to a variety of criteria</p> <p>To identify that some materials can change shape by squashing, bending, stretching and twisting, and others can't</p> <p>To identify the suitability of metal</p>	<p><b>Everyday materials (Y1)</b></p> <p>To be able to identify (know and name) a variety of common materials- Wood, plastic, glass, metal, water, rock</p> <p>To be able to distinguish between an object and the material from which it is made.</p> <p>To be able to describe materials according to their properties</p> <p>To be able to describe why some</p>	<p>Solids, liquids and gasses (states of matter) (Y4)</p> <p><u>Retreival (Y2)</u> Uses of everyday material: identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses. Compare how things move on different surfaces. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and</p>	<p>Rocks and fossils (Y3)</p> <p>To be able to identify naturally occurring rocks and explore their uses/particular purposes.</p> <p>To be able to group rocks according to their characteristics</p> <p>To explore soil and how it is formed</p> <p>To explore what fossils are and how they are formed.</p>		<p><b>Properties and changes of materials (Y5)</b></p> <p><u>Retrieval: (Y4)</u> 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</p>

	<p>and plastic for a variety of purposes. To identify different products that can be made from wood and their features and purposes To identify different materials that are used for the same product. To know how the shape of some solid objects can be changed in different ways.</p> <p><b>WS- Gathering and recording data to help in answering questions</b>  <b>WS- Perform simple tests (Comparative testing).</b></p>	<p>materials suit certain objects better than others (different properties.)</p> <p><b>WS</b>  <b>Using their observations and ideas to suggest answers to questions.</b></p> <p><b>Identifying and classifying</b></p> <p><b>WS Perform simple tests (Comparative testing)</b></p>	<p>stretching. To compare and group materials together according to whether they are solids or liquids To identify and explore the properties of gases. To observe that materials change state when they are heated or cooled.</p> <p>To research the temperature in degrees Celsius (°C) at which materials change state To identify the part played by evaporation and condensation in the water cycle.  <u>(Preload Properties and changes of materials (Y5) -</u> When discussing the water cycle, explain that the changes of state that occur can be classed as reversible changes.</p> <p><b>WS- identifying differences, similarities or changes related to simple scientific ideas and processes</b>  <b>This could be achieved by observing different materials to discover</b></p>	<p><b>WS- recording and classifying to help answer questions</b>  <b>This could be extended to classifying the rocks based on properties. Children to experience a range of soils and label the different parts. Storyboard of the cycle of changes from rock to soil to demonstrate scientific processes. (Grouping and Classifying).</b></p> <p><b>WS- recording and classifying to help answer questions</b>  <b>This could be extended to classifying the rocks based on properties. Children to experience a range of soils and label the different parts. Storyboard of the cycle of changes from rock to soil to demonstrate scientific processes. (Grouping and Classifying).</b></p> <p><b>WS- identifying differences, similarities or changes related to</b></p>	<p>played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>To know that some materials will dissolve in liquid to form a solution To use knowledge of solids, liquids and gases to decide how mixtures and solutions might be separated.</p> <p>To identify when a change caused by heating or cooling is reversible or irreversible. Explain that some changes form new materials, and that these changes are not usually reversible.</p> <p>To investigate the materials needed for something to burn</p>
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			<p>whether it is a solid, liquid or gas and how they change state. (Observations)</p> <p>WS- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Use observations to identify the differences in the properties of solids, liquids and gases. Investigate at which temperature the material changes state e.g. ice cubes/ chocolate/ cheese. They might observe and record evaporation over a period of time, for example, a puddle in the playground or a washing line, and investigate the effect of temperature on washing or drying or a snowman melting.</p>	<p>simple scientific ideas and processes This would enable similarities and differences to be identified. Research how fossils are made, make their own fossils and label diagrams to record the changes. (Researching, Grouping and Classifying).</p>		<p>and the new materials formed by burning.</p> <p>To compare and group together everyday materials on the basis of their properties <u>Preload:</u> Light – discuss how light travels through different materials e.g. transparent, translucent and opaque Light – Discussion of how light travels through different states of matter. E.g. how light travels through liquids compared to some solids. Electricity – discuss particular materials suited to insulating or conducting electricity. E.g. Look at electrical plus/safety covers. Why do wires have plastic coating?</p> <p>WS:</p>
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			(Comparative testing and Observing over time).			Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Record data and results of increasing complexity using scientific diagrams and labels, tables and line graphs. Use test results to make predictions to set up further comparative and fair tests. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in written form.
<b>PHYSICS</b>	<p>Seasonal Changes (Y1)</p> <p>To know the changes across the four seasons. To know which weather types are associated with the seasons and how the length of 'day' changes.</p>	<p>Seasonal Changes (Y1)</p> <p>To know the changes across the four seasons. To know which weather types are</p>	<p>Sound (Y4)</p> <p><u>Retrieval: c/c</u></p> <p>CHARANGA</p> <p>To find out that sounds are made when objects and materials vibrate. To know that 'stronger' vibrations produce</p>	<p>Forces and magnets (Y3)</p> <p><u>Retrieval: D&amp;T TOYS</u></p> <p>To know how things move on different surfaces To know that some forces need contact between two objects,</p>	<p><u>Light (Y6)</u></p> <p>To know that everyday materials can be compared and grouped on the basis of whether they are attracted to a magnet, and identify</p>	<p><u>Earth and space (Y5)</u></p> <p>To describe the movements of the Sun, Earth and Moon To explore how the rotation of Earth</p>

	<p>To know how plants change across the four seasons and how some do not appear to change.</p> <p><b>WS- Gathering and recording data to help in answering questions</b>  <b>WS- Observing closely, using simple equipment.</b></p>	<p>associated with the seasons and how the length of 'day' changes.  To know how plants change across the four seasons and how some do not appear to change.</p> <p><b>WS- Gathering and recording data to help in answering questions</b>  <b>WS- Observing closely, using simple equipment.</b></p>	<p>greater volume.  To investigate whether sounds can travel through different materials/mediums  To explore the relationship between distance and volume.  To investigate how sounds can be different pitches and volumes.</p> <p><b>WS- Identify and classify</b>  <b>WS- Pattern seeking</b></p>	<p>but magnetic forces act at a distance.  To know that magnets have two poles.  To know whether two magnets will attract or repel each other depending on which poles are facing.  To know how magnetism attract or repel each other and attract some materials and not others.  (Preload Materials – attraction to magnets (include transparent)  To know that everyday materials can be compared and grouped on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <p><b>WS- setting up simple practical enquiries, comparative and fair tests - using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</b></p>	<p>some magnetic materials.</p> <p><b>WS- setting up simple practical enquiries, comparative and fair tests using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</b>  <b>WS- using straightforward scientific evidence to answer questions or to support their findings.</b></p>	<p>creates day and night  To learn about how Earth's tilt creates seasons  To learn about the phases of the Moon  <b>To discover how theories about our solar system have changed</b>  <b>Research: Theories and comparison.</b></p>
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				<p>This could be achieved by testing how e.g. a car moves on different surfaces and using results to answer given questions, suggest improvements and raise further questions. Use results to raise further questions e.g. Are all metals magnetic? (Fair testing)WS- using straightforward scientific evidence to answer questions or to support their findings. Use magnets to test a range of materials to test whether they are magnetic or not and use this to make conclusions about what magnetic materials have in common. Pupils could look for patterns in the way that magnets react to each other. (Pattern seeking)</p>		
			<p><a href="#">Electricity (Y4)</a>  <u>Retrieval:</u> C/C D&amp;T TOYS OVER TIME            To know the names of common appliances that run on electricity</p>	<p>Light (Y3)            To know how things move on different surfaces            To know that some forces need contact</p>	<p><a href="#">Electricity (Y6)</a>  <u>Retrieval Y4</u> - To know the names of common appliances that run on electricity.</p>	<p>Forces (Y5)            Retrieval- Y3 Forces and Magnets- notice that some forces need contact between 2 objects,</p>

			<p>To know what a circuit is To know the parts/components of a circuit To know what makes a circuit work To know how a switch works To know what conductors and insulators are. <u>(Preload for Electricity (Y6)</u> – look at what happens when more cells are added or more bulbs/buzzers. Brief discussion as to why.</p> <p>WS <b>WS- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</b> <b>Use knowledge of a circuit to make predictions about which appliances run on electricity. Use results from the enquiry into appliances to raise further questions.</b> <b>(Grouping &amp; Classifying)WS-</b></p>	<p>between two objects, but magnetic forces act at a distance. To know that magnets have two poles. To know whether two magnets will attract or repel each other depending on which poles are facing. To know how magnetics attract or repel each other and attract some materials and not others. (Preload Materials – attraction to magnets (include transparent)). <b>WS Pattern seeking Magnet and force</b></p>	<p>Recap our knowledge and understanding of circuits To be able to recognise and use conventional symbols for circuit diagrams To know the number of cells and voltage in the circuit and how it is associated with the brightness of a lamp/bulb or the volume of a buzzer. To be able to plan, carry out and evaluate an experiment to see how changing the wire in a circuit affects the brightness of a bulb. To create a simple device using a circuit- eg burglar alarms To create a simple device using a circuit- eg burglar alarms cont <b>WS- Pattern Seeking of brightness.</b></p>	<p>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. To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object To identify the effects of friction acting between moving surfaces. To identify and explain the effects of air and water resistance. To recognise that levers and pulleys allow a smaller force to have a greater</p>
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			<p>recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>This could be achieved by constructing a circuit and drawing a labelled diagram with non-standard images to record findings.</p> <p>(Observations)WS-reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Use a circuit to test whether materials are conductors or insulators, record information in tables and explain results.</p> <p>(Pattern seeking)</p>			<p>effectTo recognise that gears allow a smaller force to have a greater effect.</p> <p>WS- reporting and presenting findings from causal relationships.</p> <p>This could be achieved by measuring of time/distance of paper aeroplane to investigate air resistance, recording velocity. Reporting findings on the surface area of a spinner/ parachute and the time taken to fall to the ground. Presenting findings to class in a more formal style.</p> <p>(Pattern Seeking)WS- using test results to make predictions to set up further comparative and fair tests</p> <p>This could be achieved by... carrying out initial investigations into</p>
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						<p>air resistance and using results to create a new question related to water resistance (e.g. can findings from air resistance to applied to water resistance) to create new question to investigate. (Comparative and Fair Testing)</p>
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## 6. Science Progression of Vocabulary

	FS1	FS2	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 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 characteristic		variables evidence justify accuracy precision scatter graphs bar graphs line graphs argument (science) causal relationship	
BIOLOGY								
Animals including Humans	head eyes nose mouth ears hands fingers feet toes arm leg animal mini-beasts healthy	herbivore face carnivore hair omnivore leg human knee animal arm fish elbow birds back head toes ear hands eye fingers mouth nose bird features	Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak	Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene	Movement, Muscles, Bones, Skull, Nutrition, Skeletons,	Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty	Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration  Evolution: Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics
Plants	Tree leaf flower stem seed soil	tree petals trunk fruit branch roots leaves bulb flowers seed stem soil	Deciduous, Evergreen trees, Leaves, Flowers (blossom), Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem	Seeds, Bulbs, Water, Light, Temperature, Growth	Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower			

Living things and their habitats	bird/owl vocab lifecycle egg chick	shelter beaver natural man-made		Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert		Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats	Mammal, Reproduction, Insect, Amphibian, Bird, Offspring	Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects
CHEMISTRY								
Materials	material wood glass paper hard soft same different	material metal wood rock plastic hard glass soft paper fabric material smooth shiny rough light shines material water shadows	Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard, Soft, Bendy, Rough, Smooth measuring weight floating melting sinking	Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil	(Rocks) Rossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent	Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating	Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing	
PHYSICS								
Seasonal Change	Summer day Spring dark Autumn light Winter night Season Moon Sun	Summer day Spring dark Autumn light Winter night Season Moon Sun	Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark					
Light					Light, Shadows, Mirror, Reflective, Dark, Reflection Sound			Refraction, Reflection, Light, Spectrum, Rainbow, Colour,

Forces	Push pull	Push pull			Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull		Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys	
Electricity						Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators		Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts
Sound	Loud quiet	loud quiet volume sound				Volume, Vibration, Wave, Pitch, Tone, Speaker		
Earth & Space	Earth Moon Sun star	Earth Moon Planet space Sun star					Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation	

FS1/2 Child led and taught in both a subtle and specific way (Focus table). Not taught under the Headings, but rather within the statements in line with Development Matters Policy.

#### Science Vocabulary – National Curriculum, England

Children should be able to use the vocabulary (and derivations from the key words listed above) of preceding topics as well as those listed for their current science topic that in the English national curriculum is separated by year group. All the vocabulary listed here for Working Scientifically, is taken from the science curriculum or related subjects, such as mathematics.

# 7. Medium term plans – Cycle A / Cycle 1

## Phase 1



Seasonal Change Chemistry Year: 1/2 Term: Annual Cycle A		
Lesson	Success Criteria	Lesson Overview
Retrieval To identify seasons based on pictorial prompts.	Know the 4 seasons are spring, summer, autumn and winter	<ul style="list-style-type: none"> <li>Children look at different events from throughout the year. They place them in the right season.</li> <li>Children look at different items of clothing. They match them to the correct season.</li> <li>Children look at pictures of plants at different times of the year.</li> <li>Children make a seasons wheel showing the seasons across the months</li> </ul>
I can identify different seasons describe the weather for each.	Know what different seasons may look like. Rain/wind/sun using senses	<ul style="list-style-type: none"> <li>Weather detective games</li> <li>Sorting picture cards</li> <li>Poster</li> </ul>
I can find out about how animals and plants are affected by the seasons. <b>Working Scientifically</b> asking simple questions and recognising that they can be answered in different ways	Children know that some animals hibernate in winter • Children know that some trees lose their leaves in winter • Children know that flowers grow in summer	<ul style="list-style-type: none"> <li>Look at animals that grow thicker fur in winter</li> <li>Look at how to protect birds in winter</li> <li>Research where different animals go in winter and summer</li> <li>Watch Spring watch to see how animals behave in spring</li> <li>Use BBC clips to look at animals in different seasons</li> <li>Choose one animal and complete a timeline of the changes through the seasons</li> </ul>



I can understand how humans adapt their behaviour to survive during the changing seasons. (clothing, food, etc)	Know that the temperature varies during the different seasons.	<ul style="list-style-type: none"> <li>Engage with a Question: “What do you do differently in the winter than in the summer?”</li> <li>Create a four-column chart labelled Winter, Spring, Summer, Fall with the headings: Clothing, Activities, Shelter/Home changes, Food/Shopping habits.</li> <li>Design a “Season Survival Plan</li> </ul>
I can understand that not all places in the world have the same seasons at the same time as where we live.	Know that different parts of the world have their summer and winter at different times to us.	<ul style="list-style-type: none"> <li>Use a globe and show where your country is, show a country in the <b>Southern Hemisphere</b> (like Australia). Explain simply:  <b>“The Earth is tilted, so when we get more sunshine, it’s our summer. When we get less sunshine, it’s winter. On the other side of the world, it’s the opposite!”</b> Show seasonal photos (e.g., snow in UK December, beach in Australia December).  Sorting game: Winter here, Summer there?</li> </ul>
I can investigate weather during the different seasons. <b>Working Scientifically</b> observing closely, using simple equipment performing simple tests, gathering and recording data to help in answering questions.	Know that we have the longest periods of light in summer and shortest period of light in the winter.	<ul style="list-style-type: none"> <li>Make rain gauges and place them in different areas around the playground. Fill in a chart to show how full the gauge was each day.</li> <li>The results over a longer time period could be observed and discussed, with children creating a class display of the water collected for each month</li> <li>Daily weather diary</li> </ul>
I can construct a concept map to show what I know (end of unit		Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.

knowledge assessment.)		
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>• Weather vanes/ thermometer/ rain gage.</li> <li>• Scavenger walk- Spring , Autumn leaves etc.</li> <li>• East Park- conkers and changing tree status.</li> </ul>		
<b>Key vocabulary:</b> Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark.		

Everyday materials

Chemistry

Year: 1 /2

Term: Autumn 1 and 2 Cycle A

Lesson	Success Criteria	Lesson Overview
<p>Retrieval</p> <p>What are materials?</p> <p>I can identify materials</p>	<p>Know what a material is and name materials within the environment.</p>	<p>-Cover sheet to show what pupils already know.</p> <p>-Material hunt around school</p> <p>Challenge: What different materials are used for.</p>
<p>I can identify a variety of materials and sort them according to a variety of criteria.</p> <p><b>Working Scientifically Identifying and classifying</b></p>	<ul style="list-style-type: none"> <li>Children will be able to identify different materials</li> <li>Children will be able to label the properties (Y1)</li> <li>Children will be able to describe properties. (Y2)</li> <li>Children will be able to sort and group materials, identifying their own criteria for sorting.</li> </ul>	<ul style="list-style-type: none"> <li>Practical sorting/grouping</li> <li>Match pictures to names</li> <li>Group materials- explain groups</li> <li>Feely box</li> <li>Classify according to the property.</li> <li>Find objects to add to each category.</li> <li>Use simple scientific language to explain.</li> <li>Classify objects according to their properties</li> <li>Make a list of similarities in all materials made of wood, plastic, glass, cotton</li> </ul>
<p>I can identify natural and man-made materials.</p> <p><b>Working Scientifically Identifying and classifying</b></p>	<ul style="list-style-type: none"> <li>I can explain the differences between natural and man-made.</li> <li>I can identify and classify objects.</li> <li>I can use scientific vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>Watch a video explaining the meaning</li> <li>Story Starter: Read a story like "The Most Magnificent Thing" by Ashley Spires. Pause to talk about what materials the girl might use. <a href="https://www.youtube.com/watch?v=UM8oN4yzJqw">https://www.youtube.com/watch?v=UM8oN4yzJqw</a></li> <li>Sorting Task: In pairs, children sort pictures or real objects into "natural" and "man-made" categories on a sorting mat.</li> </ul>

<p>I can identify that some materials can change shape by squashing, bending, stretching and twisting, and others cannot.</p>	<ul style="list-style-type: none"> <li>• Children use their observations to compare objects and materials.</li> <li>• Children will know that applying forces to objects can change their shape (twisting, bending, stretching).</li> <li>• Using Scientific language</li> </ul>	<p>Testing through round robin</p> <ul style="list-style-type: none"> <li>• Allow the children to investigate whether they can squash, twist, bend and stretch each material. They can record this by ticking boxes in a table</li> <li>• Investigate the stretchiness of fabrics. Allow children to explore the different materials available. Talk about the properties, textures and possible uses of the different materials.</li> <li>• Children can make a prediction which materials will be the stretchiness and put them order of stretchiness.</li> </ul>
<p>I can describe why some materials are more suitable than others for specific uses</p> <p>May want to spread this across two lessons. Focusing on wood, plastic and metals.</p>	<ul style="list-style-type: none"> <li>• Children will be able to explain why a material might or might not be suitable for a specific job.</li> <li>• Children will be able to explain that objects are made of one or more materials that are chosen specifically because of their properties.</li> <li>• Wood, plastic and metal.</li> </ul>	<ul style="list-style-type: none"> <li>• Match material to object based on suitable and unsuitable</li> <li>• Look at how objects are made from more than one material</li> <li>• Use images of objects to describe why different objects are made from different materials</li> <li>• Draw a house and describe what materials are needed/why,</li> </ul>
<p>I can tell you why some materials are more suitable than others for specific uses</p> <p>Enquiry task – Full investigation and</p>	<ul style="list-style-type: none"> <li>• Children will be able to use their observations and testing to compare objects and materials.</li> <li>• Children will be able to record their</li> </ul>	<ul style="list-style-type: none"> <li>• Investigation into the most suitable material to make a raincoat</li> <li>• Investigation into the most suitable material for a coat for Bog Baby (read book first if unknown)</li> <li>• Investigation into the most suitable material for a tent</li> </ul>

conclusion Can you find the most suitable material to make a raincoat?	<p>observations through drawings and labelled diagrams.</p> <ul style="list-style-type: none"> <li>Children will be able to record their measurements using prepared tables</li> </ul>	
I can construct a concept map to show what I know (end of unit knowledge assessment.) HEXAGONS/SQAURES		<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>Make a raincoat or umbrella.</li> <li>Make a boat- float or sink.</li> </ul>		
<b>Key vocabulary:</b> Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil		

Animals including Humans  
Biology  
Year: 1/2  
Term: Spring 1 Cycle A

Lesson	Success Criteria	Lesson Overview
Retrieval I can tell that adults have offspring.	Know that adults have babies or young called offspring (animals and humans)	<ul style="list-style-type: none"> <li>Match, sort and group young animals and their adults (animal offspring.)</li> </ul>
I can find out how animals change as they grow into adults. (life-cycles)	Name and order the stages of a life-cycle	<ul style="list-style-type: none"> <li>Choose a specific animal and draw the lifecycle. Y1 to verbally describe the life cycle. Y2 to draw and label the lifecycle.</li> </ul>
I can compare how humans change as they grow into adults. <b>Working scientifically</b> Asking simple questions. Using own observations to answer questions.	Know the different stages of a human life cycle.	<ul style="list-style-type: none"> <li>Order/sequence the human lifecycle.</li> <li>Draw your own life cycle. You could imagine what you will look like for adulthood.</li> </ul>
I can describe the basic needs of animals, including humans, for survival (water, food and air).	Know what humans need to survive (including food and water) Children understand that animals need air, food, water, to survive.	<ul style="list-style-type: none"> <li>My Pet Stone- bring a pet rocks and look after them! Children paint a stone / pebble to represent a pet. It could be a spider, dog, fish cat etc. Make a home for their Pet Stone that includes what they need to survive.</li> <li>Think of an explorer packing to kind a new land. What would you pack to make sure your basic needs were met?</li> <li>Stuck on a desert island- make a home for yourself- write a diary of what you did on your first day.</li> </ul>

I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Perform simple tests.	Know what is meant by a balance diet.  Know why a balanced diet is important for humans.	<ul style="list-style-type: none"> <li>• Complete exercise task to see how our body reacts.</li> <li>• Sort foods into different food groups</li> <li>• Look at the nutritional information on the back of an unhealthy and a healthy food and compare.</li> <li>• Create a healthy plate</li> <li>• Create a booklet explaining the food groups and what they provide.</li> </ul>
I can investigate the importance of healthy eating and hygiene. Working Scientifically Perform simple tests. Observe closely, using simple equipment.	Know why exercise and good hygiene are important for humans.	<ul style="list-style-type: none"> <li>• Complete exercise task to see how our body reacts.</li> <li>• Talk about the concept of germs and disease. ways that can we protect ourselves against germs and disease.</li> <li>• Hygiene experiment. Why should we wash our hands with soap? Soap and glitter experiment. put a finger into a bowl of glitter. One with soap and one without. Record findings.</li> </ul>
I can construct a concept map to show what I know (end of unit knowledge assessment.)		Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>• Exercise diary</li> <li>• Weekly food diary</li> <li>• Make a Healthy Breakfast.</li> <li>• Bring in photographs of different generations of family</li> </ul>		

**Key vocabulary:** Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, (or related) Exercise, Hygiene

Plants  
Biology  
Year: 1/2  
Term: Spring 2 Cycle A

Lesson	Success Criteria	Lesson Overview
Retrieval To understand the basic different parts of a plant.	Know the basic structure of a plant (Eg, seed, seedling, stem, leaf, petal).	<ul style="list-style-type: none"> <li>Label different parts of a plant</li> <li>Y2: label and describe functions.</li> </ul>
I can explain what a plant needs to survive <b>Working scientifically</b> Observation over time	Know that plants need light, water, air and soil to survive.  Know how to set up a fair test to find out what plants need to survive.	Discuss/predict: What will happen to a plant if it does not get sunlight? What will happen if it has a lot of sunlight? P Plant/place plants in a variety of places – no light, some light, lots of light. Observe over time and fill in if plants are growing and healthy
I can understand that different seeds and bulbs grow into different plants and can describe them	Know that plants can be grown from seeds and bulbs. Know that seeds are different sizes, shapes and colours.  observe and describe how seeds and bulbs grow into mature plant	<ul style="list-style-type: none"> <li>Look at various seeds and bulbs, identify their similarities and differences.</li> <li>Match the seeds/ bulb to the common tree, plant</li> <li>Poster that shows how seeds/bulbs grow</li> </ul>



I can explain why we need trees on Earth	Know how important trees are for the environment.	<ul style="list-style-type: none"> <li>• <a href="https://www.youtube.com/watch?v=B13TXhXhf9w">https://www.youtube.com/watch?v=B13TXhXhf9w</a> watch video about importance of trees</li> <li>• Describe how trees help people, animals, and the planet/Share a way we can help look after trees</li> <li>• Create a class poster called "Trees Help Us!"</li> <li>• Tree Thank-You Craft - children draw or create a tree and add pictures of things it gives us: apples, animals, clean air, etc.</li> </ul>
I can identify common trees	Know the names of many of our most common trees by shape of leaf and shape of tree.	<ul style="list-style-type: none"> <li>• Tree Detective Walk</li> <li>• Tree Discovery Station" with leaf rubbings, bark textures, and matching cards</li> <li>• Do a leaf-matching game with pictures and real samples.</li> </ul>
I can construct a concept map to show what I know (end of unit knowledge assessment.)		Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>• Grow a runner bean, daffodil or cress-head.</li> <li>• Grow tomatoes with your relatives- whose will grow the tallest, the fastest?</li> </ul>		
<b>Key vocabulary:</b> Bulbs, Water, Light, Temperature, Growth, Seed, seedling, stem, leaf, petal		

Living things and Life-cycles.

Biology

Year: 1/2

Term: Summer 1 and 2 Cycle A

Lesson	Success Criteria	Lesson Overview
Retrieval To understand that animals live in different habitats to suit their own needs.	Match living things to their habitats.	Explore images of habitats- draw a number of animals that would live there and label
I can compare the differences between things that are living, dead and have never been alive. (Living, Dead, Never Alive.)	Explain how life processes can tell us if something is living, dead or has never been alive.	Have a collection of items that are living, dead and never alive: <ul style="list-style-type: none"> <li>• Prove it! Prove that objects are alive, dead, or have never been alive.</li> <li>• Draw around each other on the playground and annotate their outline with reasons which prove that they are alive. Do this for other objects.</li> <li>• Compare a real dog to a battery powered dog.</li> <li>• Sort it – sort objects/images into hoops and give reason for their choice</li> <li>• Create a set of rules about how to recognise when an object is living, dead or has never been alive.</li> <li>• Explore- Take children out into the school grounds to find items that are living, dead and never alive-you might need to prepare some objects</li> </ul>
I can identify and name a variety of plants and animals in their Local Habitats, world habitats and microhabitats.  <b>Working Scientifically</b> using their observations and ideas to suggest	Identify and name plants and animals in a range of habitats.	<ul style="list-style-type: none"> <li>• Identify local habitats in local area such as urban, coastal, rivers, ponds and woodland <b>habitats</b>. Draw a map of a local habitat.</li> <li>• World habitat sorting game: • Set out sorting mats for 3–4 habitats. Children are given cards or toy figures of plants and animals (e.g., cactus, polar bear, dolphin, monkey). As a class or in groups, match each one to the right habitat. Use simple language to reinforce: “The cactus grows in the desert because it doesn’t need much water.” “The polar bear lives in the Arctic where it’s cold and snowy.”</li> <li>• Children choose a habitat and draw or make a simple collage with animals and plants that belong there.</li> <li>• Microhabitat hunt on school field</li> </ul>

answers to questions  <b>Learning objective may take between 2-3 lessons.</b>		
I can identify how an animal is suited to its habitat and explain how living things in a habitat depend on each other. (Living, Dead, Never alive)	Know how a specific habitat provides for the basic needs of things living there.	<ul style="list-style-type: none"> <li>Animal Suitability Matching</li> </ul> <p>Show cards of animals in their natural habitats. For each, ask: “What body part helps this animal live here?” “What does it eat? Where does it get water or shelter?” Example talking points: <i>Penguin has thick feathers for cold water.</i> <i>Frog has sticky feet and wet skin for pond life.</i> <i>Camel stores water to survive in the desert.</i></p> <p><b>Habitat Dependency Game</b></p> <ul style="list-style-type: none"> <li>Use a <b>simple food chain puzzle</b> or story: <i>Sun → Grass → Rabbit → Fox</i></li> </ul> <p>Ask:</p> <ul style="list-style-type: none"> <li>“What happens if there’s no grass?”</li> <li>“What does the rabbit need to survive?”</li> </ul> <p>Emphasize that animals and plants depend on each other—they are part of a living community.</p>
I can explore the relationship between living things and their habitat.	<b>Working Scientifically Focused Assessment.</b> <b>Tike: Animal home build</b>	<p>Outdoor Habitat Investigation Go outside to a garden, school grounds, or a nearby park. Children work in small groups to:</p> <ul style="list-style-type: none"> <li>Look under stones, logs, in grassy areas, near trees or bushes.</li> <li>Record what they find (e.g., ant, worm, moss, snail).</li> <li>Use magnifying glasses to observe closely.</li> <li>Use tally charts or draw what they see and where they found it.</li> </ul> <p><b>Key question while exploring:</b> “Why do you think that creature was living there?”</p> <ul style="list-style-type: none"> <li>Use hoops or a table chart to group findings by: Habitat type (e.g., soil, tree, grass)</li> <li>Animal type (insect, bird, etc.)</li> </ul> <p>Ask:</p> <ul style="list-style-type: none"> <li>“What animals did we find in the grass?”</li> <li>“Why didn’t we find worms on the path?”</li> <li>“What do these animals need from their habitat?”</li> </ul>

<p>I can describe how animals get their food (food chains).</p> <p><b>Working Scientifically</b> asking simple questions and recognising that they can be answered in different ways</p>	<p>Name some different sources of food for animals.</p> <p>Know how living things find their food.</p>	<ul style="list-style-type: none"> <li>• Group foods into food from plants and food from animals</li> <li>• Identify what food comes from different animals and different plants.</li> <li>• Use images to make a food chain</li> </ul>
<p>I can construct a concept map to show what I know (end of unit knowledge assessment.)</p>		<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>
<p><b>Enrichment/Homework opportunities:</b></p> <ul style="list-style-type: none"> <li>• Habitat hunt for mini-beasts.</li> <li>• Trip to local farms, The Deep etc, Tophill Low Nature reserve, RSPB visit- Bempton Cliff</li> </ul>		
<p><b>Key vocabulary:</b> Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert, butterfly, frog</p>		

# 7. Medium term plans – Cycle A / Cycle 1

## Phase 2



Solids, Liquids and Gasses (States of Matter) Chemistry Year: 3/4 Term: Autumn 1		
Lesson	Success Criteria	Lesson Overview
Retrieval I can explain how materials can be changed.	To be able to identify which materials can be changed, and their changed state.	<p>“Material Change Mystery Stations”</p> <p>Set up 4–5 stations with simple, hands-on or observational tasks. At each, students identify:</p> <ul style="list-style-type: none"> <li>• What change occurred?</li> <li>• Is it reversible or irreversible?</li> <li>• What material was involved?</li> </ul> <p>Station Ideas:</p> <ol style="list-style-type: none"> <li>1. Melting chocolate (Use pre-melted chocolate or a demo – reversible)</li> <li>2. Mixing vinegar and bicarbonate of soda (Observe fizzing – irreversible)</li> <li>3. Stretching and squashing a sponge (Physical change – reversible)</li> <li>4. Toasting bread (show photos/video if live demo isn't safe) – irreversible</li> <li>5. Dissolving sugar in water – reversible</li> </ol>
I can identify that things are composed of a matter in one of three states of matter.	<ul style="list-style-type: none"> <li>• Children know that matter is what makes up the physical aspects of our universe. All matter exists in one of just three states.</li> <li>• Children know that solid matter holds its shape. For example,</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate in small groups how the particles are different in each state, using cheerios and large paper to represent the particles. Stick these on the working wall.</li> <li>• Explore a range of materials of the three states. Discuss the properties of each state throughout. Exploring a range of materials, use a three-way Venn diagram to group the materials. Include materials which can be more than one state (e.g., aerosol sprays, jelly, toothpaste). Children to identify what is the same/different about each state</li> </ul>

	<p>the solid form of water is ice; Liquid matter, such as water, forms a pool. It can flow or run but cannot be stretched or squeezed; Gas matter can expand, flow and be squeezed. If gas is in an unsealed container, it can escape. Steam is water's gas form.</p>	
<p>I can compare and group materials together, according to whether they are solids, liquids or gases.</p> <p><b>Working Scientifically</b> Grouping and Classifying</p>	<p>Know that certain materials can change state.</p> <p>Explain the difference between solids, liquids and gases.</p>	<ul style="list-style-type: none"> <li>• Particle Explanation: Use a simple diagram or video to show how particles behave in solids, liquids and gases. Explain using actions (get the class to act as particles).</li> <li>• Group Work Sorting Cards/Independent work: Give each group a set of material cards (or objects). Ask them to sort into 3 groups: Solids, Liquids, Gases Include trickier items like jelly, foam, syrup, shaving foam.</li> <li>• Golden Challenge question: Why did you group syrup as a liquid? Can gases be touched? What's tricky about classifying foam or shaving cream?</li> </ul>
<p>I can investigate gases and explain their properties.</p> <p>Working Scientifically setting up simple practical enquiries, comparative and fair tests</p>	<p>Know that certain materials can change state.</p>	<p>Station 1: Balloon and Bottle</p> <ul style="list-style-type: none"> <li>• Place a balloon over the neck of a bottle.</li> <li>• Add vinegar + baking soda inside the bottle.</li> <li>• Gas inflates the balloon – observe and explain.</li> </ul> <p>Station 2: Fizz Test</p> <ul style="list-style-type: none"> <li>• Drop a raisin into fizzy water.</li> <li>• Observe bubbles forming and lifting the raisin.</li> <li>• Discuss what the bubbles are and how gas lifts objects.</li> </ul> <p>Station 3: Air Power – Blow Race</p> <ul style="list-style-type: none"> <li>• Use straws to blow paper balls across the table.</li> <li>• Test how air (gas) moves things – compare short vs. long straws.</li> </ul>
<p>I can investigate materials as they change state when</p>	<p>Observe that some materials change state when they are heated or</p>	<ul style="list-style-type: none"> <li>• Investigate the rates that different sized pieces of chocolate melt (STEM activity).</li> <li>• Put chocolate. on your tongue and wait for it to melt!</li> <li>• What affects the melting rate of chocolate (size of pieces, temperature of water, type of chocolate)?</li> </ul>

they are heated or cooled. Working Scientifically making systematic and careful observations.	cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)	<ul style="list-style-type: none"> <li>Time different items to see which one melts the quickest. hot water container, stopwatch, foil cups and items that melt e.g. butter, chocolate (plain, white and milk), ice etc.</li> <li>Time how long the ice cubes take to melt near a radiator, in a fridge and on a desk</li> </ul>
I can explore how water can change it's state to a solid, liquid or a gas.	Know what the temperature of water is when it boils or freezes.	<ul style="list-style-type: none"> <li>Watch a video that shows what happens to water when it has been frozen. Discuss what temperature freezing point is.</li> <li>Melting Ice - Place ice cubes at room temperature or in warm water. Observe how ice melts and turns into water.</li> <li>Evaporating Water: Heat the water and observe as steam rises.</li> <li>Investigation Sheet Template with questions for each station.</li> </ul>
I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Know what is meant by the terms: condensation and evaporation.	<ul style="list-style-type: none"> <li>Children know the four stages of the water cycle: evaporation, condensation, precipitation and collection. Focus on evaporation and condensation. Using a diagram. Describe what evaporation and condensation is. Y4: Give examples.</li> <li>Water cycle in a bag investigation: <a href="https://www.123homeschool4me.com/water-cycle-in-a-bag-activity/">https://www.123homeschool4me.com/water-cycle-in-a-bag-activity/</a></li> </ul>
I can construct a concept map to show what I know (end of unit knowledge assessment.)		Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>GC Homework on Alice Bell</li> <li>Water waste survey</li> </ul>		

**Key vocabulary:** Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating

Sound  
Physics - Sound  
Year: 3/4  
Term: Autumn 2

Lesson	Success Criteria	Lesson Overview
Retrieval To go on a 'sound walk' through the school and identify which objects make sounds and consider how their properties may help them to do this.	Know which sounds are natural and man made.  Begin to know if the properties of the object affect the sound we hear.	<ul style="list-style-type: none"><li>Group natural and man-made sounds.</li></ul>
I can identify how sounds are made, associating some of them with something vibrating.	Children will know that sound is made when an object vibrates.  Children know that some of the energy from the vibrating object is transferred to the air which makes the air particles move.	<ul style="list-style-type: none"><li>Identify what body parts they use to receive/make certain types of energy (light = eyes, heat = skin) and then go on to how we make and hear sound.</li><li>Close eyes and identify different sounds</li><li>Provide the children with a carousel of activities which allow them to feel how sound vibrates (blown up balloons, tuning forks, feeling own throats, rice drum).</li><li>Draw labelled pictures to show what happened during each activity.</li></ul>
I can recognise that vibrations from sounds travel through a medium to the ear.	Knows how sound travels from it's source to the ear.	<ul style="list-style-type: none"><li>Draw diagram that shows how vibrations travel from an object to our ears. Explain the diagram</li><li>Experiment: Sound Through Different Materials. Place a ruler over the edge of a desk and plunk it to make a sound. Ask pupils to listen carefully to the sound. Next, place the ruler on a wooden block or a metal object. What do you notice about the sound? Is it louder or quieter?</li></ul>



I can find patterns between the pitch of a sound and features of the object that produced it.	Knows the correlation between pitch and the object producing the sound.	<ul style="list-style-type: none"> <li>Explore how a string instrument makes a sound. Using an ice cream tub, elastic bands, and Lego blocks, they create their own string instrument. They explore how adding more Lego blocks affects the pitch of each string (band).</li> <li>Children learn about the difference between pitch and volume. They carry out an investigation where they place 5 different water containers in order, depending on the pitch made when air is gently blown across the top of each. They attempt to find a pattern and explain their results. Group sounds based on whether they think they will produce a low or a high pitch.</li> <li>Show a video of pan pipes. Watch a video of them being played. Children will create their own pan pipes using straws. Once complete., create a labelled diagram, explaining how they created their pan pipes so that they can play sounds of different pitches <ul style="list-style-type: none"> <li>Make a drum with different 'tightness' of skins- notice they will make a higher-pitched sound if you tighten the drum skin.</li> <li>Complete a table with a description of how you can make particular sounds louder or quieter.</li> </ul> </li> </ul>
I can find patterns between the volume of a sound and the strength of the vibrations that produced it.	Knows the correlation between the volume of a sound and the strength of the vibrations that produced it.	<ul style="list-style-type: none"> <li>Demonstrate banging on a drum. Start with very soft hit and gradually increase the strength of the hit. Investigate with different objects how the volume can change. Use a decibel meter to measure the sound and record this on a table.</li> <li>Children investigate how dropping a weight from different heights on a drum affects the volume of the sound produced. Recognising the difficulty of measuring volume without equipment, children take each measurement 5 times and find the mean. Children create a line graph showing their results and attempt to explain the relationship between the height of the weight and the volume of the sound made</li> </ul>
I can recognise that sounds get fainter as the distance from the sound source increases.	Know how sound is made and what happens as sound travels away from it's source.	<ul style="list-style-type: none"> <li>Introduce Alexander Graham Bell. Explain that he was the inventor of the telephone. Explain that you are going to be creating your own string telephones and investigating what happens as the string size increases.</li> <li>Watch videos of sounds decreasing- aeroplane taking off and being in the air.</li> <li>Investigate what happens by going to the hall and measuring the volume of a sound as you move away from it. (record in a table using metres/decibels).</li> </ul>
I can construct a concept map to show what I know (end of unit knowledge assessment.)		Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>Percussion instrument band.</li> <li>Make a "telephone" with cups and string</li> <li>Sound generator- design and make their own simple stringed instrument</li> </ul>		

**Key vocabulary:** Volume, Vibration, Wave, Pitch, Tone, Speaker, object, sound

Electricity  
Physics  
Year: 3/4  
Term: Spring 1

Lesson	Success Criteria	Lesson Overview
Retrieval I can identify how many different electrical items produce sound.	Know that sound can be mechanical, in addition to natural.	<p>"Can you name something at home or in school that makes a sound and needs electricity to work?"</p> <p>Write their responses on the board. Encourage them to think about daily life: phones, fridges, electric bells, games consoles, etc.</p> <p>Set up <b>sound investigation stations</b> around the classroom with 5–6 different items that make noise when powered.</p> <p>Complete a worksheet noting:</p> <ul style="list-style-type: none"> <li>• The item name</li> <li>• Whether it makes sound</li> <li>• What kind of sound</li> <li>• What the sound is for (alert, fun, functional, etc.)</li> </ul>
I can identify common appliances that run on electricity and understand that electricity is a form of energy.	Know about common appliances that run on electricity.	<p><a href="https://www.youtube.com/watch?v=QulhZIG0Vio">https://www.youtube.com/watch?v=QulhZIG0Vio</a></p> <ul style="list-style-type: none"> <li>• Read the Little People Big Dreams book – Nikola Tesla. Learn the stem sentence – electricity is a form of energy. Create actions to remember the sentence.</li> </ul> <p><a href="https://www.stem.org.uk/resources/elibrary/resource/30647/things-use-electricity">https://www.stem.org.uk/resources/elibrary/resource/30647/things-use-electricity</a></p> <ul style="list-style-type: none"> <li>• Watch 'Things That Use Electricity Video' (STEM). Ask children to write down all the appliances that use electricity. Introduce the terms 'mains powered ad battery powered'.</li> <li>• Group a variety of appliance that are powered by mains or battery images into a Venn Diagram.</li> <li>• Watch a stem science video and children to make note of what appliances they see that run off electricity</li> <li>• Complete a walk around the school to identify electrical appliances.</li> </ul>
I can construct a simple series electrical circuit, identifying and naming its basic	Identify and name the basic parts of the circuit, including cells, wires, bulbs, switches and buzzers	<ul style="list-style-type: none"> <li>• Give each small group of children the following components: 2 wires with attached crocodile clips, a cell, a bulb holder and a bulb. Challenge them to use all the components to light the bulb. Ask the children to draw what they have made. Ensure that the components are labelled. Provide the children with a buzzer and ask them to incorporate this in their circuits</li> </ul>

parts, including cells, wires, bulbs, switches and buzzers.		
I can make predictions and test whether a lamp will light within a circuit and identify the function of a switch.	<p>Know that switch opens and closes a circuit.</p> <p>To recognise that a switch opens and closes a circuit and associates this with whether or not a lamp lights in a simple series circuit.</p>	Using 'Is it a circuit?' cards/show pictures, Predict whether the circuit will light the bulb. Test each circuit and record whether the circuits shown will light the bulb. Explain why it will or won't light up. Say what improvements could be made so it will light up.
I can 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.	Know how to construct a simple series electrical circuit.	<p>Option 1: Build and Test</p> <p>In small groups or pairs, pupils: Build different circuits with provided components. Test and record whether or not the lamp lights up. Use a recording sheet to tick whether the circuit is complete and explain why the lamp did or didn't light.</p> <p>Option 2: Circuit Detective (with Diagrams)</p> <p>Give pupils diagrams of different circuits. Some are complete loops, some are not.</p> <p>Pupils must decide: "Will the lamp light?"</p> <p>Then build the circuit to test their predictions.</p>
I can recognise some common conductors and insulators, and associate metals with being good conductors	Know about some common conductors and insulators.	Investigate which materials are electrical conductors or insulators. Provide the children with a range of materials to test in a circuit. Make a prediction whether each material will work or not and give a reason why. Record the results in a table. Use the results to form a conclusion. EXT: Why are insulators important? Look at how wires are or protected by plastic – explain why.
I can construct a concept map to show what I know (end of unit knowledge assessment.)		<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>

**Enrichment/Homework opportunities:**

- GC Homework on Michael Faraday
- Create a Spring card with light up LED feature.
- Test a lemon for electricity.
- Visit a wind farm locally.

**Key vocabulary:** Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators.

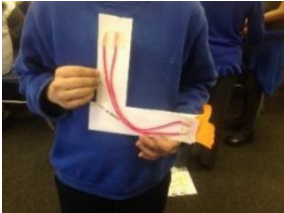
Animals including Humans

Biology

Year: 3/4

Term: Spring 2

Lesson	Success Criteria	Lesson Overview
<p>Retrieval</p> <p>I can identify which food items belong in which category.</p>	<p>Recall what it takes to produce a balanced plate.</p>	<p>Recap food groups.</p> <p>Option 1: Group Activity – Carousel Style</p> <p>Set up five stations, each representing one food group. Give each group a pile of mixed food picture cards. Pupils rotate around the stations and sort the food items. At each station, they check or add new items to that group.</p> <p>Option 2: Whole-Class Card Sort</p> <p>Hand out food cards randomly to pupils. Have large posters of the food groups displayed. Pupils take turns coming up to place their item on the correct poster. Class discusses whether it's correct and why.</p> <p>Pupils complete a worksheet where they:</p> <ul style="list-style-type: none"> <li>• Match or draw lines from food items to food groups.</li> <li>• Answer questions such as "Which group gives us energy?" "Name one food from each group."</li> </ul>
<p>I can sort foods into food groups and find out about the nutrients that different foods provide to differing animals.</p>	<p>Know that animals, including humans, need the right types and amount of nutrition, and that if they cannot make their own food; they get nutrition from what they eat.</p>	<ul style="list-style-type: none"> <li>• Sort images of things that do need food and things that don't.</li> <li>• Create a class mind map of why living things need food.</li> <li>• Sort foods into major food groups. Teach the names for the food groups,</li> <li>• Explore online resources such as the EatWell plate.</li> <li>• Identify components of a balanced diet and what would happen if you ate excess food groups.</li> <li>• Split the children into groups and ask them to research a different animal using the internet, books and fact sheets. Each group can present what they have found to the rest of the class.</li> <li>• Children could complete a simple comparison in their books.</li> </ul>
<p>I can sort animal skeletons into groups, discussing how skeletons are needed for support, protection and movement.</p>	<p>Know that internal skeletons are called endoskeletons which are needed for support, protection and movement.</p> <p>Know that some animals have an exoskeleton.</p>	<ul style="list-style-type: none"> <li>• Provide children with a range of images of animals (endoskeletons and exoskeletons) and ask them to classify these images using a Venn diagram.</li> <li>• Create your own animal and describe how its skeleton helps it in the environment</li> </ul>

<p>I can investigate the idea about how the human skeleton supports movement.</p>	<p>Know the names of the body parts associated with skeleton and muscles.</p>	<ul style="list-style-type: none"> <li>• Work in groups to create a model to show how a muscle moves.</li> </ul>  <p><b>Investigation – Build a Moving Limb (20–25 mins)</b> Pupils work in pairs to <b>build a simple "moving limb"</b> using:</p> <ol style="list-style-type: none"> <li>1. lolly sticks or rulers (bones)</li> <li>2. Elastic bands or string (muscles/tendons)</li> <li>3. A split pin or pipe cleaner (joint)</li> </ol> <p>Ask pupils to:</p> <ul style="list-style-type: none"> <li>• Predict what will happen when they pull the string.</li> <li>• Test how their model moves.</li> <li>• Record what happens and relate it to how their own arm moves.</li> <li>• Use a simple <b>worksheet</b> for: Labelling parts, drawing model and writing a sentence to explain how the skeleton helps with movement.</li> </ul>
<p>I can explain how bones and muscles work together to create support, protection and movement.</p>	<p>Children understand what joints are and why they're important. Children can identify the main joints of the human body. Children can explain that muscles have different jobs: They help pump blood around our body, help you lift things and work with your bones to help you move. Children know there are two types of muscles: voluntary and involuntary. Voluntary muscles are the muscles that we control (arms, legs etc) and involuntary muscles are the muscles</p>	<ul style="list-style-type: none"> <li>• Identifying bones and joints of the human body.</li> <li>• Label joints on a human body.</li> <li>• Introduce the <b>three main types of muscles</b> using images or a short video: <b>Skeletal muscles</b>: move your body. <b>Cardiac muscle</b>: your heart – pumps blood. <b>Smooth muscle</b>: inside organs (extension idea)</li> </ul> <p>Then, pupils <b>match muscle jobs to descriptions</b>: “Which muscle helps you lift your backpack?” → Skeletal. “Which muscle works all the time, even when you sleep?” → Cardiac. Pupils complete a simple matching or fill-in-the-gaps worksheet to reinforce the differences.</p>

	that move without controlling them (heart, eyelids etc)	
I can construct a concept map to show what I know (end of unit knowledge assessment.)		Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>• Bone Bingo- Jeans for Genes</li> <li>• Build a bionic hand made out of cardboard, strings, straws and rubber bands.</li> </ul>		
<b>Key vocabulary:</b> Movement, Muscles, Bones, Skull, Nutrition, Skeletons.		

Living Things and their habitats

Biology

Year: 3/4

Term: Summer 1 and 2

Lesson	Success Criteria	Lesson Overview
Retrieval I can explain life processes to younger children	Know the basic life processes of living things.	Create a poster on MRS GREN.
I can group living things in a range of ways, and use a range of methods to sort living things.	Know that that living things can be grouped in a variety of ways.  Children know 5 different groups of animals - fish, amphibians, reptiles, bird, and mammals - and how we can identify them from their body features, behaviour, and life cycles.	<ul style="list-style-type: none"> <li>• Sort animals into groups- Classifying – How can we classify different animals? Place hoops on the playground. In each one place a label of an animal group. Provide each group of children with a set of animal pictures, Call out a category and then the children have to place in that hoop an example of that group. Discuss the characteristics of each of the group</li> <li>• Fact file</li> <li>• Posters</li> <li>• Each group research a different group and presents to the class.</li> </ul>
I can explore and use classification keys to help group, identify and name a variety of living things in the wider environment	Know how to explore classification keys to help group, identify and name a variety of living things in their local and wider environment.	<ul style="list-style-type: none"> <li>• Explain and give examples of classification. Simple yes/no.</li> <li>• <b>Indoor Table Investigation</b></li> </ul> <p>Use printed images or trays with leaves/insects/shells. Pupils use classification keys to group and name each one. Provide a worksheet with: Space to record name of each item. Features observed. Steps taken on the key.</p>



I can use keys to identify invertebrates found in the local environment.	<p>Know how to use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Children know that invertebrates are animals that don't have a backbone. Some have soft bodies, like worms, slugs and jellyfish. Other invertebrates, like insects, spiders and crustaceans, have a hard outer casing called an exoskeleton. This protects their body a bit like a suit of armour.</p>	Pupils work in pairs or small groups. Explore the school grounds or garden with bug pots and magnifiers. Find and record 3–5 invertebrates using classification keys and a worksheet.
I can recognise positive and negative changes to the local environment and describe environmental dangers to endangered species.	Know the ways in which environments can change and that this can sometimes pose dangers to living things.	Explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation
I can construct a concept map to show what I know (end of unit knowledge assessment.)	<p>Know the basic life processes of living things</p> <p>Know that that living things can be grouped in a variety of ways</p> <p>Know how to explore classification keys to help</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>

	<p>group, identify and name a variety of living things in their local and wider environment</p> <p>Know how to use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Know the ways in which environments can change and that this can sometimes pose dangers to living things</p>	
<p><b>Enrichment/Homework opportunities:</b></p> <ul style="list-style-type: none"> <li>• GC Homework on Jane Goodall</li> <li>• Visit to the Deep</li> <li>• Farming Tales- CCI</li> <li>• Biofilm- James Hutton</li> </ul>		
<p><b>Key vocabulary:</b> Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats</p>		

# 7. Medium term plans – Cycle A / Cycle 1

## Phase 3



Subject: Science- Physics- Light Year: 5/6 Term: Autumn 1- Cycle A		
Lesson	Success Criteria	Lesson Overview
Retrieval I can explain the apparent movement of the sun across the sky.	Understand the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Use a globe and torch demonstration or short video clip to explain: <ul style="list-style-type: none"> <li>The Earth rotates once every 24 hours on its axis.</li> <li>The Sun appears to move from East to West because of this rotation.</li> <li>This is called the apparent movement — it looks like the Sun moves, but it doesn't.</li> </ul> In groups, pupils use a <b>torch</b> , a stick figure, and a flat surface to simulate the Sun's position throughout the day. Pupils draw the length and direction of shadows at morning, midday, and evening. Each group presents: <ul style="list-style-type: none"> <li>How did the Sun's position change?</li> <li>What did the shadows do?</li> <li>What does this tell us about the Sun's apparent movement?</li> </ul>
I can explain that light appears to travel in straight lines from light sources-our eyes and from light sources-object-eyes.	Know that light travels in straight lines.  Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.	<ul style="list-style-type: none"> <li>Use videos and images to explain how light travels in straight lines and that light travels faster than sound. Provide examples such as how we see lightning before we hear thunder.</li> <li>Draw how light would travel from a torch. Use this as an opportunity to address misconceptions.</li> <li>Use pieces of card and a torch to demonstrate how light travels in straight lines</li> <li>Create a model of how we can see an object.</li> <li>Draw an annotated diagram to show how we can see an object.</li> </ul>
I can understand how mirrors reflect light using the angles of incidence and reflection.	Understand that because light travels in straight lines objects are seen because they give out or reflect light into the eye.	<ul style="list-style-type: none"> <li>Provide a range of images to show reflections occur when a light beam changes direction on hitting a surface.</li> <li>Draw labeled diagrams to show this.</li> <li>Create a periscope to see round corners.</li> <li>Draw a diagram of what they made and write a short explanation about how a periscope works using their knowledge of light.</li> </ul>

I can investigate how refraction changes the direction of which light travels.	Understand how refraction can make objects look different to reality.	<p>Introduce the key parts of a ray diagram:</p> <ul style="list-style-type: none"> <li>Incident ray = incoming light</li> <li>Reflected ray = outgoing light</li> <li>Normal line = imaginary line at 90° to the mirror</li> <li>Angle of incidence = angle of reflection</li> </ul> <p>Provide pupils with <b>pre-drawn ray diagrams</b> missing one ray and ask them to:</p> <ul style="list-style-type: none"> <li>Draw the missing ray (incident or reflected).</li> <li>Add labels: <b>mirror, normal, incident ray, reflected ray</b>.</li> <li>Measure or estimate the angle of reflection.</li> </ul>
I can explore white light and a prism of simple and complex colours.	Know that light is made up of a myriad of colours.	<ul style="list-style-type: none"> <li>Shine a torch through a prism onto white paper.</li> <li>Rotate the prism to find the angle where colours appear.</li> <li>Record what colours they see and in what order.</li> <li>Use a <b>colour wheel</b> to match and name the colours.</li> </ul>
I can explain how shadows are formed and what affects their size, direction and shape.	Know that light travels in straight lines and therefore shadows have the same shape as the objects that cast them.	<ul style="list-style-type: none"> <li>Explore different objects and classify them into opaque, transparent and translucent.</li> </ul> <p>Comparative/ Fair Testing - Place an object at the centre of a sheet of paper, and use a torch to produce shadows of different length and direction. Children can change one factor and see what happens to the resulting shadows, e.g. the distance of the object from light source.</p>
I can construct a concept map to show what I know (end of unit knowledge assessment.)		<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>
<b>Enrichment/Homework opportunities:</b> Create a spectroscope Create a periscope Shadow puppet theatre		
<b>Key vocabulary:</b> Refraction, Reflection, Light, Spectrum, Rainbow, Colour		

Physics- Living Things and their habitats/ Classification Year: 5/6 Term: Autumn 2- Cycle A		
Lesson	Success Criteria	Lesson Overview
Retrieval To group, using, pictorial prompts into those living, dead and was never alive, giving reasons for their choices.	Be able to classify living things into broad groups based on similarities and differences.	Give pupils a set of animal and plant picture cards. They must: <ol style="list-style-type: none"> <li>Sort the pictures into broad groups (mammals, birds, reptiles, etc.)</li> <li>Use a Venn diagram or table to show how they've grouped them</li> <li>Explain why they grouped things a certain way</li> <li>Create or complete a simple branching key for their set</li> </ol> Support: Provide groups with labels for key features (e.g., "has feathers", "lays eggs", etc.) Extension: <ul style="list-style-type: none"> <li>Pupils research one unusual animal or plant (e.g., platypus, cactus, venus flytrap) and explain where it fits in classification.</li> </ul>
I can explain who Linnaeus was and use his classification system; understanding that they group according to similarities and differences. Working Scientifically: Report and present findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations.	Know who Carl Linnaeus was and his impact on classification systems.  Know how living things have been classified.	Tell the story of Carl Linnaeus (1707–1778). Visual Aid: Show the main levels of classification (simplified): <ul style="list-style-type: none"> <li>Kingdom → Class → Order → Family → Genus → Species</li> <li>Focus on Genus and Species (the scientific name)</li> </ul> Give each group 6–10 living things (images + fact cards) <ul style="list-style-type: none"> <li>Pupils sort them into groups based on observable features</li> <li>Then, use a simplified Linnaean chart to label them               <ul style="list-style-type: none"> <li>E.g. Kingdom: Animalia → Class: Mammal → Genus: <i>Panthera</i> → Species: <i>Panthera leo</i> (lion)</li> </ul> </li> <li>Pupils create their own "mini Linnaean chart" for 2–3 living things</li> </ul>

<p>I can identify similarities and differences between living things in order to determine their classification and use classification keys to sort living things according to observable characteristics.</p> <p>Working Scientifically: Record data and results of increasing complexity using classification keys.</p>	<p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Group task or independent work:</p> <ul style="list-style-type: none"> <li>• Give each group a set of animal and/or plant cards (with short fact info)</li> <li>• Pupils sort them into categories based on selected specific characteristics (e.g. vertebrate/invertebrate, flowering/non-flowering, lays eggs/live young, leaf type)</li> </ul> <p>Pupils must record:</p> <ul style="list-style-type: none"> <li>• The groups they made</li> <li>• The characteristics they used</li> <li>• A written explanation of why they sorted each group that way</li> </ul> <p>🔍 <b>Support:</b> Use pre-sorted groups or provide characteristics lists</p> <p>🔍 <b>Challenge:</b> Introduce less obvious animals/plants or ask pupils to create a classification key of their own.</p>
<p>I can design and test classification keys to classify leaves found in my local environment, giving reasons for my choices.</p>	<p>Be able to classify living things into observable characteristics and based on similarities and differences.</p> <p>Give reasons for classifying plants based on specific characteristics.</p>	<p>Pupils examine 6–8 different leaves (in groups or pairs)</p> <p>Note characteristics: shape, size, edge, colour, vein pattern, etc.</p> <p>Pupils create a branching classification key using yes/no questions. Ensure each leaf ends up with a unique identification. Use clear language and measurable features where possible. Test and Evaluate: Swap keys with another group. Try to classify the same leaves using the other group's key, identify any confusing questions, overlaps, or errors.</p>
<p>I can use descriptions of features, and online research, to describe their key characteristics and classify unusual living things.</p> <p>Working Scientifically:</p>	<p>Be able to classify living things into observable characteristics and based on similarities and differences</p>	<ul style="list-style-type: none"> <li>• Define what a microorganism is</li> <li>• Identify and describe different types of microorganisms (bacteria, fungi, viruses, etc.)</li> <li>• Classify microorganisms into helpful and harmful groups</li> <li>• Justify how and why they grouped the microorganisms</li> </ul>

Classification		
I can construct a concept map to show what I know (end of unit knowledge assessment.)		Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>Identify invertebrates in a local habitat</li> <li>Create a set of Top Trumps cards for mini-beast found in the local area.</li> </ul>		
<b>Key vocabulary:</b> Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects		

Biology- Evolution and Adaptation

Year: 5/6

Term: Spring 1- Cycle A

Lesson	Success Criteria	Lesson Overview
Retrieval I can explain what fossils, amber and coprolites are.	Identify fossils, trace fossils, amber and coprolite. (Y3)	<b>Use images or short videos</b> to explain fossils, amber and coprolites are. Discussing: <ul style="list-style-type: none"> <li>How each type forms</li> <li>What each tells us about prehistoric life</li> </ul> Pupils rotate around fact stations (or receive fact cards) for fossils, amber, and coprolites. Complete a recording sheet answering: What is it? How does it form? What can we learn from it?
I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents; and identify advantages and disadvantages of certain characteristics. Working Scientifically: Pattern-seeking	Know that living things produce offspring of the same kind.  Know that offspring vary and are not normally identical to their parents.	Use real-life or animal examples to demonstrate: <ul style="list-style-type: none"> <li>Inherited traits (e.g. eye colour, fur pattern, beak shape)</li> <li>Varied traits (e.g. size, markings, personality)</li> </ul> <ul style="list-style-type: none"> <li>Pupils match offspring to parents based on similar inherited traits. Discuss differences between siblings or variations in one species</li> </ul> “Inherited or Not?” – sort traits (e.g. scar = no, eye colour = yes) <ul style="list-style-type: none"> <li>Survival Traits Challenge (15 mins)</li> </ul> In groups, pupils are given an animal (real or invented) with varied traits (e.g. long legs, thick fur, short tail) They receive different environments (e.g. Arctic, jungle, desert, deep ocean) <ul style="list-style-type: none"> <li>Decide:</li> </ul> Which traits would be helpful or a disadvantage? Which offspring might survive better in this environment?
I can identify inherited and environmental characteristics.	Identify how animals and plants have adapted to suit their environment in different ways and that adaptation may lead to evolution.	Explain what the terms ‘inherited’ and ‘environmental’ characteristics are. Introduce the idea of a combined influence (eight may be inherited, but also influenced by diet).  Pupils work in pairs to sort trait cards into: <ol style="list-style-type: none"> <li>Inherited</li> <li>Environmental</li> <li>Both</li> </ol>



		Use a Venn diagram, pupils must write sentences justifying their answers.
I can explain who Charles Darwin was and his theory of evolution.	Know what Charles Darwin's theory of evolution was.	<ul style="list-style-type: none"> <li>• Write a short biography of Charles Darwin.</li> <li>• Interview 'Charles Darwin' using AI question and answer tools.</li> </ul>
I can use Charles Darwin's research to explain how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Working Scientifically: Research	<p>Know that living things have changed over time.</p> <p>Identify how animals and plants have adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>Retrieval: what evolution is. Charles Darwin theory of evolution. Look at Darwin's studies on the Galapagos Islands- looking at how he noticed plants and animals seemingly adapting to suit their local environment.</p> <ul style="list-style-type: none"> <li>• Look at the pictures of different animals and plants in their habitats (desert: desert snake and fennec fox, rainforest: buttress roots and squirrel monkey, ocean: sea turtle and dolphin, polar: penguin and arctic fox). What are the challenges in each of the habitats and how have the animals that live there adapted to survive?</li> <li>• Choose an animal or plant. Create a fact file on its evolutionary history and how it has adapted to suit its environment.</li> <li>• Are Humans Still Evolving? Research evidence that human beings continue to evolve today e.g. lack of wisdom teeth in some people.</li> <li>• Human of the Future - Ask the pupils which features they would like humans to evolve- design an adaptation, draw a human with it and explain its advantages and disadvantages</li> </ul>
I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Know the part that fossils play in helping us to understand more about living things that inhabited the Earth millions of years ago.	<ul style="list-style-type: none"> <li>• Use a diagram showing a simplified cross-section of rock to date 3 different organisms, work out when they appeared, when they died out, and how long they lived for.</li> <li>• Use fossil evidence, make their best guess at how the animal may have looked when alive.</li> </ul>
I can construct a concept map to show what I know (end of unit)	Know the part that fossils play in helping us to understand more about living things that inhabited the Earth millions of years ago.	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.</p>

knowledge assessment.)	<p>Identify how animals and plants have adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>Know that living things have changed over time. Know that living things produce offspring of the same kind.</p> <p>Know that offspring vary and are not normally identical to their parents</p> <p>Identify fossils, trace fossils, amber and coprolite.</p>	
<b>Enrichment/Homework opportunities:</b> Make Fossils Charles Darwin Bio fact-file Read folk tales on how animals adapted and consider the scientific reason ( <a href="https://www.gutenberg.org/files/2781/2781-h/2781-h.htm#link2H_4_0002">https://www.gutenberg.org/files/2781/2781-h/2781-h.htm#link2H_4_0002</a> )		

Physics- Electricity  
Year: 5/6  
Term: Spring 2- Cycle A

Physics- Electricity Year: 5/6 Term: Spring 2- Cycle A		
Lesson	Success Criteria	Lesson Overview
Retrieval I can define what electricity is and explain that it is a form of energy.	Know that electricity is a form of energy, there are different sources of energy and describe how electrical energy helps us in daily life.	<ul style="list-style-type: none"> <li>• Fact file</li> <li>• Poster</li> <li>• Question and interview partners</li> </ul>
I can use recognised symbols when representing a simple circuit in a diagram by observing and explaining the effect of different volts in a circuit.	<p>Use recognized symbols when representing a simple circuit in a diagram.</p> <p>Construct simple series circuits.</p>	<ul style="list-style-type: none"> <li>• Show the children the electrical symbols and the component that they stand for.</li> <li>• Game- Call out a particular component and the children draw the symbol.</li> </ul> <p>Use physical and interactive components to make series circuits (e.g. a circuit with a bulb and a cell)- then draw as a diagram with symbols.</p>
I can investigate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in the circuit by observing and explaining the effect of different volts in a circuit.	<p>Know that the brightness of a bulb is associated with the voltage.</p> <p>Be able to answer questions about what happens when they try different components, eg, switched, bulbs, buzzers and motors.</p>	<ul style="list-style-type: none"> <li>• Investigate the effect of changing the number and voltage of cells in an electrical circuit.</li> <li>• What affects the brightness of a bulb in a circuit?</li> <li>• Look at circuit diagrams. They predict how bright the bulbs will be in each circuit and place them in order of brightness. Using simple apparatus, they construct the circuits shown in the diagrams and test their predictions.</li> </ul>
I can compare and give reasons for variations in how components function, including the brightness of	<p>Compare and give reasons for variations in how components function</p> <p>Be able to answer questions about what happens when</p>	<ul style="list-style-type: none"> <li>• Children could choose what they want to investigate: What happens to the volume of a buzzer when you add additional components?</li> <li>• How does the number of bulbs affect the brightness of a bulb?</li> <li>• Does the length of wire make a difference?</li> <li>• Work in small groups to plan an investigation, focusing on which variables they will change/keep the same and why.</li> </ul>

bulbs. (This can be done over two lessons)	they try different components, eg, switched, bulbs, buzzers and motors.	
I can compare and give reasons for variations in how components function, including the on/off position of switches.	<p>Compare and give reasons for variations in how components function</p> <p>Be able to answer questions about what happens when they try different components, eg, switched, bulbs, buzzers and motors.</p>	<ul style="list-style-type: none"> <li>In pairs, pupils build simple circuits using battery, bulb, and switch. Test the circuit by toggling the switch on/off. Observe and note what happens to the bulb in each position.</li> <li>Experiment with Variations (15 mins) Pupils change components slightly, such as: Using a dimmer bulb or different battery strength Adding extra bulbs in series or parallel Using switches in different positions in the circuit Observe and record differences in how the bulb(s) behave (brightness, on/off).</li> </ul> <p>Pupils write or share explanations for the variations they observed, focusing on: How switch position affects the circuit and why bulbs can vary in brightness.</p>
I can construct a concept map to show what I know (end of unit knowledge assessment.)	<p>Be able to answer questions about what happens when they try different components, eg, switched, bulbs, buzzers and motors. Compare and give reasons for variations in how components function- on and off position of switches, loudness of buzzers and brightness of bulbs. Know that the brightness of a bulb is associated with the voltage. Use recognized symbols when representing a simple circuit in a diagram. Construct simple series circuits.</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available</p>

**Enrichment/Homework opportunities:**

Make a Spring greeting card with LED lighting element.

Dragons Den challenge- best electrical design

**Key vocabulary:** Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts

Biology- Animals including Humans/ Circulatory

Year: 5/6

Term: Summer 1 & 2- Cycle A

Lesson	Success Criteria	Lesson Overview
Retrieval I can use a variety of food labels to identify which ingredients are the healthiest for me and why.	To 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. (Y3)	Identify healthy food, how does this compare between rich and poor people. Can poorer people afford healthy foods?
I can identify the main parts of a human circulatory system.	Identify and name the main parts of a human circulatory system.	<ul style="list-style-type: none"> <li>• Correctly describe blood's circulation in the body.</li> <li>• Song: Do the Circulation! Do the Circulation with Schoolhouse Rock. Print out the lyrics and have students highlight opinions and facts.</li> <li>• A whole class simulation: Children represent red blood cells as they move around a classroom-simulating the dual circulation of blood. They may give oxygen to the organs then go back to the right side of the heart and flow to the lungs to get more oxygen. Then they flow to the left side of the heart to be pumped around the body.</li> <li>• Mold a Play-Doh circulatory system</li> </ul>
I can explore the composition of blood and the role it has to play in the human body.	Know the function of the heart, blood vessels and blood.	<ul style="list-style-type: none"> <li>• <a href="https://www.bbc.co.uk/bitesize/articles/zw8xb82">https://www.bbc.co.uk/bitesize/articles/zw8xb82</a></li> <li>• Create a pie chart showing the percentage of each component by volume in a typical sample of blood.</li> </ul>
I can explore the structure and function of the human heart	Know the function of the heart, blood vessels and blood.	<ul style="list-style-type: none"> <li>• Make a heart model - create an explanation text, showing how blood is pumped around the body.</li> <li>• Turn a plastic bag into an inflatable heart</li> <li>• The heart pumps about 1.3 gallons of blood per minute. Think you can keep up? Fill a container with water, then set a timer. Use a small cup to scoop water into another container as fast as you can. Can you beat your own heart?</li> <li>• Push a toothpick into a marshmallow and set it on your upturned wrist. Hold very still and you should see the toothpick bounce up and down along with your pulse</li> <li>• Use plastic bottles and drinking straws to make a working model that actually pumps "blood" from one chamber to the next.</li> </ul>

		<ul style="list-style-type: none"> <li>Tie different colours of wool together to represent the veins, arteries, and capillaries and see how they all function together.</li> </ul>
<p>I understand the ways in which nutrients and water are transported within animals, including humans.</p>	<ul style="list-style-type: none"> <li>Children will know different types of nutrients and what they provide us:  <b>Carbohydrates</b>- energy; <b>protein</b>-grow and repair; <b>fibre</b>- digestion; <b>fats</b>-energy; <b>vitamins</b>- healthy e.g. Vit C helps wounds heal; <b>minerals</b>- healthy e.g. calcium keeps teeth strong; <b>water</b>- cell functioning.</li> </ul> <p>Children will know nutrients and water are absorbed in the system in the stomach, small and large intestines. They enter the blood stream via the capillaries where they are passed through to the arteries. The blood is circulated throughout the body (including being oxygenated in the lungs and the heart).</p>	<ul style="list-style-type: none"> <li>Create diagrams explaining how nutrients and water are transported</li> </ul>

<p>I can discover the true impact (both visible and hidden) of diet, exercise and lifestyle on the human body.</p> <p>Working Scientifically</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Know the impact of diet, exercise, drugs and lifestyles on health.</p>	<ul style="list-style-type: none"> <li>• <a href="https://www.bbc.co.uk/bitesize/articles/zppvv4j">https://www.bbc.co.uk/bitesize/articles/zppvv4j</a></li> <li>• Investigate the effect of exercise on heart rate: measure their heart rate in beats per minute (bpm) by taking their pulse. Record their resting heart rate, then perform a vigorous exercise and measure their heart rate afterwards at an interval. Record their results in a table and transfer them to a line graph.</li> <li>• Look at made up people profiles- calculate whether each person is eating the right amount of food, and suggest ways in which they can improve their lifestyles.</li> </ul>
<p>Explore the truths and myths about the effects of drugs and alcohol on the human body</p> <p>Working Scientifically</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Know the impact of diet, exercise, drugs and lifestyles on health.</p>	<ul style="list-style-type: none"> <li>• Explain what counts as scientific evidence.</li> <li>• small groups, pupils are given 6–8 cards with common statements about alcohol and drugs. Pupils sort cards into True, Myth, or Need .</li> <li>• Give groups fact sheets or summaries of reliable information.</li> </ul> <p>Pupils go back to their cards and use evidence to <b>support or refute</b> each claim.</p> <p>Write a sentence next to each card:</p> <p>“This is a myth because scientific evidence shows...”</p> <p>“This is true because research shows...”</p>
<p>I can construct a concept map to show what I know (end of unit knowledge assessment.)</p>	<p>To identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available</p>



	<p>Identify and name the main parts of a human circulatory system</p> <p>Know the function of the heart, blood vessels and blood.</p> <p>Know the function of the heart, blood vessels and blood</p> <p>Know the ways in which nutrients and water are transported within animals, including humans</p> <p>Know the impact of diet, exercise, drugs and lifestyles on health.</p>	
<p><b>Enrichment/Homework opportunities:</b></p> <p>Fitbit challenge</p> <p>Active Lifestyles club</p>		
<p><b>Key vocabulary:</b>Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration</p>		

# 7. Medium term plans – Cycle B / Cycle 2

## Phase 1



Seasonal Change – Physics Year: 1/2 Term: annual- Cycle B		
Lesson	Success Criteria	Lesson Overview
I can understand why and how changes happen (growth and decay)- give examples.	Know the need to respect and care for the natural environment and all living things, from the beginning to end of their life-cycle.	<p>Resource ideas: Picture cards: baby → child → adult; apple → rotten apple; leaf → crumbled leaf. Real objects (if possible): a fresh fruit and a slightly mouldy fruit. Simple sorting worksheet (Grow / Decay). Word and picture mat with key terms: grow, change, rot, old, new, decay. Optional: time-lapse video of a growing plant or rotting food.</p> <ul style="list-style-type: none"> <li>Use real objects (e.g. apple vs mouldy apple) and pictures to model:                      “This apple is fresh – it looks good to eat.”                      “This apple is old – it’s going bad, it’s decaying.”                      Show a child’s shoe and an adult’s shoe or photos of a child growing:                      “When we grow, we get taller, bigger, stronger.”                      Repeat the pattern: Fresh vs Decaying, Small vs Grown</li> </ul> <p>Children sort picture cards into two trays or hoops:</p> <ol style="list-style-type: none"> <li>Grows over time</li> <li>Decays over time</li> </ol> <p>Examples: Plant, apple core, baby, rotting banana, seed, leaf pile, worm.</p>
I can find out about different seasons and how to describe them. Start- and readdress in Autumn, Winter, Spring and Summer.	Know the names of the four seasons.	<p>Use visuals and props for each season. For each one, discussing what you might see or wear in each season.</p> <p>Pupils sort real objects or picture cards into four season trays.</p>

<p>I can identify which weather types are associated with the seasons.</p> <p>Working Scientifically</p> <p>Gathering and recording data to help in answering questions</p>	<p>Know the type of weather normally associated with the four seasons.</p>	<p>Living in peace with nature.</p> <p>Human actions can cause climate change for extreme weather- drought etc. Look after the planet better then hopefully we will be peacemakers for the earth and us.</p>
<p>I can investigate how animals are affected by the seasons.</p>	<p>Know that the temperature varies during the different seasons.</p>	<p>Introduce some examples of how animals change with the seasons:</p> <ul style="list-style-type: none"> <li>• Hibernation – e.g., hedgehogs sleep during winter.</li> <li>• Migration – e.g., birds fly to warmer countries.</li> <li>• Camouflage/Coat changes – e.g., arctic foxes grow white fur in winter.</li> <li>• Food storing – e.g., squirrels collect nuts in autumn.</li> </ul> <p>Animal Investigation Sheet with 4 animals (e.g., hedgehog, swallow, arctic fox, squirrel).</p> <p>For each animal, they:</p> <ul style="list-style-type: none"> <li>• Match it to the correct season-related change.</li> <li>• Draw or write how the animal is affected by seasons.</li> <li>• Option for group discussion or matching cards to support pupils.</li> </ul>
<p>I can investigate how humans are affected by the seasons.</p>	<p>Know that different parts of the world have their summer and winter at different times to us.</p>	<ul style="list-style-type: none"> <li>• Show pictures or a short video of people in different countries during different seasons:</li> </ul> <p>UK Winter: coats, hats, dark early nights</p> <p>Australia in December: sunshine, Christmas on the beach</p> <p>India (Monsoon season): heavy rain</p> <p>Use a world map or globe to show where these countries are.</p> <p>Task showing four children from different countries (e.g., UK, Australia, India, Norway). For each child:</p> <ul style="list-style-type: none"> <li>• Match clothing to their weather.</li> <li>• Match an activity (e.g., snowball fight, swimming, carrying an umbrella).</li> <li>• Colour or draw what the season looks like for that child.</li> </ul>
<p>I can find out how the day length is affected by the seasons.</p> <p>Working Scientifically</p>	<p>Know that we have the longest periods of light in summer and shortest period of light in the winter.</p>	<p>Picture chart showing daylight hours in the UK across the seasons:</p> <ul style="list-style-type: none"> <li>• Summer – long days, early sunrise, late sunset</li> <li>• Winter – short days, late sunrise, early sunset</li> <li>• Spring and Autumn are in between.</li> </ul> <p>Images showing:</p>

Observing closely, using simple equipment.		<ul style="list-style-type: none"> <li>• A child walking to school in the dark/light</li> <li>• Sunset at 4pm vs. 9pm</li> <li>• Evening activities in light vs. dark</li> </ul> <p>Pupils match each image to the correct season (Winter, Spring, Summer, Autumn).</p>
I can construct a concept map to show what I know (end of unit knowledge assessment.)	<p>Know the need to respect and care for the natural environment and all living things, from the beginning to end of their life-cycle.</p> <p>Know that we have the longest periods of light in summer and shortest period of light in the winter.</p> <p>Know that different parts of the world have their summer and winter at different times to us.</p> <p>Know that the temperature varies during the different seasons.</p> <p>Know the names of the four seasons.</p> <p>Know the type of weather normally associated with the four seasons</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>
<b>Enrichment/Homework opportunities:</b> <ul style="list-style-type: none"> <li>• Setting up rain gauges to measure rainfall.</li> <li>• Using what they have learned to create a recorded weather forecast for the school website/GC.</li> </ul>		
<b>Key vocabulary:</b> Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark , season, Moon, sun		

Biology- Animals including humans-animals Year: 1/2

Term: Autumn 1 and 2 - Cycle B

Lesson	Success Criteria	Lesson Overview
<p>Retrieval</p> <p>I can name some common animal names.</p>	<p>Know some common animal names and identify their young.</p>	<p>Match an animal it's young/offspring e.g. a puppy to a dog, duck to duckling etc.</p>
<p>Animal</p> <p>I can describe and compare a variety of common animals.</p> <p><b>Include- fish, amphibians, reptiles, birds and mammals.</b></p> <p>Name some different animal's features. Say how animals are the same. Say how animals are different.</p>	<p>Know the difference between a mammal, reptile and amphibian.</p>	<ul style="list-style-type: none"> <li>• Show children a range of different animals. Talk about the key features that are unique to them.</li> <li>• Sort animals into groups based on their characteristics.</li> </ul> <p>Create a simple fact file – giving examples</p>
<p>I can name, identify and label the parts of the human body.</p>	<p>Know the names of all seen body parts above the shoulder.</p> <p>Know the names of all seen body parts below the shoulders and above the legs.</p> <p>Know the names of all seen body parts below the hips.</p> <p>Know which part of the body is associated with each sense.</p>	<p>Labelling a diagram to show parts of the body</p> <p>Identify which part of the body is associated with each sense.</p>
<p>I can name the five Human senses and to perform simple tests to find out more about them.</p>	<p>Know what the five senses are.</p> <p>Know what each of our senses does.</p>	<p>Include-Investigation using various objects (smells, sounds, tastes, touch) to test their senses.</p>

<p>Animal Diets</p> <p>I can identify, name and sort animals that are herbivores, carnivores and omnivores.</p> <p>Include-</p> <p>Explaining what herbivores, omnivores and carnivores eat. Identifying what different animals eat.</p> <p>Sorting animals into the diet groups they belong to.</p>	<p>Know the difference between carnivore, omnivore and herbivore.</p>	<p><a href="https://www.bbc.co.uk/bitesize/topics/zk4n9ty/articles/zfbntrd">https://www.bbc.co.uk/bitesize/topics/zk4n9ty/articles/zfbntrd</a></p> <ul style="list-style-type: none"> <li>• Provide cut-outs or a worksheet with pictures of different animals. Pupils work in pairs or groups to sort them into 3 categories: Use sorting hoops or make a class poster.</li> <li>• Design a scene using natural materials and place animals in the appropriate habitat. For example, a carnivore could be in a jungle with a lion, an herbivore in a grassy meadow with a rabbit, and an omnivore near a forest with a bear. After creating the diorama, each pupil explains why they put specific animals in the habitat based on what they eat.</li> </ul>
<p>Sorting animals- Classification</p> <p>I can sort animals according to criteria</p> <p>Include-</p> <p>Identifying different animals. Describing similarities and differences between animals. Children choosing their own ways to sort the animals.</p>	<p>Know how to classify by living, non living and never alive.</p> <p>Begin to know why certain animals live in certain areas.</p>	<ul style="list-style-type: none"> <li>• Show a collection of objects, including <b>pictures of animals, rocks, trees, and toys</b>.</li> </ul> <p>Ask: "What do you think is alive here? What makes something alive?"</p> <p><b>Living things</b> grow, need food, breathe, and reproduce (e.g., animals, plants).</p> <p><b>Non-living things</b> might change but are not alive (e.g., rocks, toys).</p> <p><b>Never alive things</b> were never alive, like plastic or metal objects.</p> <ul style="list-style-type: none"> <li>• Show pictures of a dog (living), a rock (non-living), and a plastic bottle (never alive).</li> </ul> <p>Ask the class to explain why each one fits into its category.</p> <ul style="list-style-type: none"> <li>• Pictures of animals, plants, toys, rocks, and man-made objects. Large whiteboard or flip chart for sorting</li> </ul>
<p>I can construct a concept map to show what I know (end of unit knowledge assessment.)</p>	<p>Know some common animal names and identify their young.</p> <p>Know the names of some common birds.</p> <p>Know the difference between a mammal, reptile and amphibian</p> <p>Know the names of all seen body parts above the shoulder.</p> <p>Know the names of all seen body parts below the shoulders and above the legs.</p> <p>Know the names of all seen body parts below the hips. Know the difference</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>

	<p>between carnivore, omnivore and herbivore.</p> <p>Know what the five senses are.</p> <p>Know what each of our senses does.</p> <p>Begin to know why certain animals live in certain areas.</p>	
<b>Enrichment/Homework opportunities:</b> Trip to East park/farm visit (in school option)		
<b>Key vocabulary:</b> energy, growth, habitat, fish, amphibian, reptile, bird, mammal, offspring, carnivore, herbivore, omnivore, vertebrate, skeleton, organ		

Everyday Materials- Chemistry

Year: 1/2

Term: Spring 1 and 2 - Cycle B

Lesson	Success Criteria	Lesson Overview
Retrieval I can identify (know and name) a variety of common materials- Wood, plastic, glass, metal, water, rock	Know the names of many types of materials.	<ul style="list-style-type: none"> <li>Collect objects in the classroom that are made from a given material and take them to a designated area.</li> <li>Make a table of similarities and differences of objects. E.g. are all objects made from wood hard?</li> </ul> <p>Provide children with images of different objects. Children to cut and stick the images into the correct material group</p>
I can distinguish between an object and the material from which it is made	Know the names of many types of materials. Know the names of various common objects.	<ul style="list-style-type: none"> <li>Play a game such as 'I Spy' – I spy an object that is made from wood etc. Use this as an opportunity to address any misconceptions and assess what the children know about materials.</li> <li>Complete a matching activity. Match the object to the material.</li> </ul> <p>Look at objects around the room. On one coloured post it write the name of the object and on another colour identify the material it is made from.</p>
I can describe materials according to their properties.	Know that plastics are easy to bend. Children can name the properties of materials including: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent	<ul style="list-style-type: none"> <li>Provide children with a range of objects in a feely bag. Take it in turns to choose an object and describe what they can feel. Encourage the use of language associated with the properties of materials</li> <li>Provide children with images of different objects and ask them to annotate (label) the properties of each object. Children to pick a material that would be good for a given job and explain why they have chosen it.</li> </ul>
I can distinguish between man-made and natural materials.	Know what materials in the environment are man-made and natural.	<ul style="list-style-type: none"> <li>Sorting Game – Man-Made vs. Natural</li> <li>Material Hunt - work in pairs or small groups to find and classify the materials into man-made or natural by writing or drawing what they find.</li> </ul>
To be able to describe why some materials suit certain objects better than others (different properties.)	Know that some materials are not useful for certain things.	What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard? for a nappy? For Plates? For a door mat?
I can investigate which materials are reflective.	<b>Working Scientifically- Focused Assessment</b> <b>Title: Ways to test reflectiveness</b>	Children work in small groups or pairs. Give each group a torch and a set of materials. Ask them to shine the torch onto each material and observe: Does the light bounce back?



		Can you see the light clearly? Record findings on the investigation sheet.
I can construct a concept map to show what I know (end of unit knowledge assessment.)	Know that there are many different types of materials. Know the names of many types of materials. Know the names of various common objects. Know that plastics are easy to bend. Know what we use glass, wood and bricks for. Know that some materials are not useful for certain things.	Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge
<b>Enrichment/Homework opportunities:</b> Building sandcastles -who could resist investigating the best mixture of sand and water for making sandcastles? Materials song- <a href="https://www.youtube.com/watch?v=xOKr462HLc0">https://www.youtube.com/watch?v=xOKr462HLc0</a>		
<b>Key vocabulary:</b> Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil, Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard, Soft, Bendy, Rough, Smooth measuring weight floating melting sinking		

Plants  
Biology  
Year: 1/2

Term: Summer 1 and 2- Cycle B

Lesson	Success Criteria	Lesson Overview
I can make observations of growing plants.	Know how to make observations over time (Working Scientifically)	Plant a seed. Over the term, observe how the plant grows. Complete a plant diary.
Retrieval I can understand the basic lifecycle of a plant, it's growth and decay.	Show and explain the concepts of growth, change and decay with natural materials.	Tell a simple story of a plant's life, using pictures or actions, stick the picture cards on the board as you tell the story. Group or Independent Work Children complete a cut-and-stick or draw-and-label worksheet: Stages: Seed → Sprout → Growing Plant → Flower → Decay They can draw arrows to show the cycle and write simple words or sentences. Show a wilting or decayed plant (if available) and ask: <ul style="list-style-type: none"> <li>• What's happening to this plant?</li> <li>• Is this part of the life cycle?</li> </ul> Explain that decay means the plant is breaking down and going back into the soil to help new plants grow.
I can identify what a "plant" is and is not. Working Scientifically Grouping and classifying  (Plant bulbs or seeds to observe throughout)	Know the names of some of the plants that grow in the local environment.	Set up stations or table groups with a mixture of items. In small groups: <ul style="list-style-type: none"> <li>• Children observe each item closely using magnifying glasses.</li> <li>• They discuss: Is it a plant? Why or why not?</li> <li>• Use sorting hoops/mats or a table to sort and record items under: Plant and Not a Plant</li> <li>• Encourage them to ask questions (e.g., "Does it grow?", "Is it alive?")</li> </ul>
I can identify and describe garden plants. Working Scientifically WS- Observing closely, using simple equipment	Know the names of a variety of common wild and garden plants.	<ul style="list-style-type: none"> <li>• Go on a hunt around our school to see which plants we can find - Identify plants on the school grounds</li> <li>• Look at pictures and plants in the area to identify them by name.</li> <li>• Grow sunflowers and measure each week-link to mathematics.</li> </ul>

		Try observe the seeds and predicting what they may be and if they are living or non-living.
I can identify and describe wild plants. Working Scientifically WS- Observing closely, using simple equipment	Know the names of a variety of common wild and garden plants.	<ul style="list-style-type: none"> <li>Go on a hunt around our school to see which plants we can find - Identify plants on the school grounds</li> <li>Look at pictures and plants in the area to identify them by name.</li> <li>Grow sunflowers and measure each week-link to mathematics.</li> </ul> <p>Try observe the seeds and predicting what they may be and if they are living or non-living.</p>
To identify and describe a range of trees (including deciduous and evergreen). Working Scientifically Focus WS- Observing closely, using simple equipment	<p>Know the names of a variety of common trees.</p> <p>Know the difference between deciduous and evergreen.</p>	<ul style="list-style-type: none"> <li>Look at image of evergreen and deciduous trees in different seasons</li> <li>Sing the song <a href="https://youtu.be/RJx2xQKlgXU">https://youtu.be/RJx2xQKlgXU</a></li> <li>Sorting deciduous and evergreen tree.</li> <li>Identify trees on the school grounds</li> </ul> <p>Leaf rubbings and then create a large piece of art on the playground floor.</p>
I can identify the basic structure of a variety of common flowering plants including trees.	Know the names of the different parts of a plant, including stem, root, petal and flower.	<ul style="list-style-type: none"> <li>Label and match the parts of plants. Including a different range of plants- flowers and trees.</li> <li>Identify, label and sketch growing plants.</li> <li>Children could observe the vegetable plants and identify which part of the plant we eat</li> <li>Show children a real life plant. Which part of the plant do you think they use to drink? How do we get energy? How do plants get energy? How do we stay standing? How do plants stay standing?</li> <li>Children make a 3D flower</li> </ul>
I can construct a concept map to show what I know (end of unit knowledge assessment.)	<p>Show and explain the concepts of growth, change and decay with natural materials</p> <p>Know the names of some of the plants that grow in the local environment</p> <p>Know the names of a variety of common wild and garden plants</p> <p>Know the names of a variety of common trees</p> <p>Know the difference between deciduous and evergreen</p>	Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge

	Know the names of the different parts of a plant, including stem, root, petal and flower	
<p><b>Enrichment/Homework opportunities:</b></p> <p>Visit to local garden centre/ Woodlands Trust.</p> <p>Leaf bingo – match leaves to their descriptions</p> <p>Leaf identification - use a guide to help identify leaves</p> <p>Measuring trees – take a bark rubbing, measure a tree and calculate its age</p> <p>Canopy area - measure the tree canopy area</p> <p><b>Key vocabulary:</b> Deciduous, Evergreen trees, Leaves, Flowers (blossom), Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem</p>		

# 7. Medium term plans – Cycle B / Cycle 2

## Phase 2



Chemistry-Rocks and Fossils Year: 3/4 Term: Autumn 1- Cycle B		
Lesson	Success Criteria	Lesson Overview
Retrieval I can explain what rocks are.	know rocks are solid material, and can be large or small. Small rocks are called 'pebbles' The <u>Earth's crust</u> is made up of lots of different types of rocks which form naturally over a long period of time.	Children are to look into rocks in their most basic sense. To play the structure of the Earth game and to look at that Pangea and how/why land mass has changed over time.
I can identify types of rocks. Include- A range of rock types. Igneous, sedimentary, metamorphic.	Know the difference between igneous, sedimentary and metamorphic rocks  Know that some crystals are very rare and valuable.	Compare different kinds of rocks based on their appearance in the context of understanding the difference between natural and human-made rocks.
I can classify and group rocks based on their properties. Include- A selection of igneous,	Group together different rocks according to different attributes.	Group together different kinds of rocks on the basis of their simple physical properties in the context of natural rocks. Making systematic and careful observations by examining different types of rocks.

sedimentary and metamorphic rocks.		
I can explain how fossils are formed.	Know how fossils are formed	Include- Describe in simple terms how fossils are formed when things that have lived are trapped within rock by explaining the fossilisation process and by comparing.
I can explain how soil is formed..	Know what a soil is.	Include- that soils are made from rocks and organic matter by explaining how soil is formed. The 4 processes of soil formation. Compost. Children could create mini compost bins using bottles.
Soil permeability I can investigate Soil permeability Working Scientifically Making systematic and careful observations. Recording findings using simple scientific language.	Know what a soil is.	Children are to use a range of equipment – include a range of soils, coffee filter papers to investigate the permeability of different soils.
I can construct a concept map to show what I know (end of unit knowledge assessment.)	Know rocks are solid material, and can be large or small. Small rocks are called 'pebbles' The <u>Earth's crust</u> is made up of lots of different types of rocks which form naturally over a long period of time. Know the difference between igneous, sedimentary and metamorphic rocks  Know that some crystals are very rare and valuable.	Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.

	<p>Group together different rocks according to different attributes</p> <p>Know how fossils are formed</p> <p>Know what a soil is</p> <p>know rocks are solid material, and can be large or small. Small rocks are called 'pebbles'</p> <p>The <u>Earth's crust</u> is made up of lots of different types of rocks which form naturally over a long period of time.</p>	
<b>Enrichment/Homework opportunities:</b> Fossils Research/comprehension homework task- Zhang Heng-Scientist focus		
<b>Key vocabulary:</b> extinction, particle, igneous, metamorphic, sedimentary, paleontologist, weathering, molten rock, crust, tectonic plates, scavengers, fossils, fossilisation, permeability		

Physics- Forces and Magnets

Year: 3/4

Term: Autumn 2- Cycle B

Lesson	Success Criteria	Lesson Overview
Retrieval I can describe the properties of some materials.	To know that objects can be made of metal. To know that roughness is a way of describing an object.	Carousel around the next 3 mini tasks. 1) Name and sort 2) Rough or smooth-convince me 3) Examples of friction
Pulls and Pushes I can identify forces.	Know that some forces need contact between two objects. To know that when 2 surfaces rub together this is friction. To name forces of push/pull/friction To know a force can make an object change shape	Include-Push./pull Speed-faster/slower Can children identify the force being applied and its direction. Teach-Impact forces (when two surfaces collide), frictional forces (when two surfaces are already in contact) and strain forces (when an elastic material is stretched or squashed)
Magnets I can investigate objects that are magnetic and non-magnetic. Include- Children to use magnets to sort/classify objects.	Know some magnetic materials.	Introduce magnets and the facts about attraction/ repelling each other. Explain the Earth is actually a magnet. Children to write a summary of how magnets work and demonstrate their knowledge of arrows to show attraction/ repel.
Magnets I can investigate the strength of magnets.	Know that magnets can repel and attract different magnetic materials	Include- Use a range of magnets to carry out investigation. (Repel/attract). Complete the fair test write up, with your prediction, then carry out the investigation. Record your results in a table, and represent your results on a bar chart. Then come to a conclusion to answer this question.



<p>Working Scientifically- <b>Fair Test- Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same</b></p>	<p>Know that magnetic forces can act at a distance.</p>	
<p>Magnetic Poles I can explore magnetic poles. Include- Attract/Repel. Working scientifically- <b>Prediction-make relevant predictions that will be tested in a scientific enquiry.</b></p>	<p>Know that a magnet has two poles.</p>	<p>Explore the poles of two magnets and feel them repel and attract. Take two magnets and place them so the two north poles are facing each other. Try to make them touch. What do you feel? Try this with the two south poles. What do you feel this time? You should feel the two magnets pushing away from each other – they are repelling each other. Now try to make the north pole of one magnet touch the south pole of another magnet. What do you observe this time? Use the force of magnetic attraction to make your own compass.</p>
<p>Magnet Games- Application I can use my knowledge of magnets to make a game.</p>	<p>Know that magnetic forces can act at a distance.</p> <p>Know that a magnet has two poles.</p>	<p>Include- Children using skills and knowledge to design and create their own magnetic game. Will it work?</p>

<p>I can construct a concept map to show what I know (end of unit knowledge assessment.)</p>	<p>To know that objects can be made of metal.          To know that roughness is a way of describing an object          Know that some forces need contact between two objects.          To know that when 2 surfaces rub together this is friction.          To name forces of push/pull/friction          To know a force can make an object change shape          Know some magnetic materials          Know that magnets can repel and attract different magnetic materials            Know that magnetic forces can act at a distance          To know a magnet has two poles.</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.          For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.          Challenges to deepen understanding will be available.</p>
<p><b>Enrichment/Homework opportunities:</b>          Magnets are often used in toys. Make a toy- a toy train set often has magnets that attach the carriages to each other.          Fridge magnets can be used to attach pictures to your fridge, or alphabet magnets to spell out words on your fridge. Make a fridge magnets.          Some pieces of jewellery have magnetic clasps to clip the ends together around your neck or arm. Children could make a piece of jewellery.</p>		
<p><b>Key vocabulary:</b>          magnetic, non-magnetic, pole, north, south, sliding friction, static friction, elastic, resist, attraction, repulsion, attract, repel, impact force, strain forces,</p>		

Physics- Light  
Year: 3/4  
Term: Spring 1 and 2- Cycle B

Lesson	Success Criteria	Lesson Overview
Retrieval I can explain how the sun helps us.	To recognise why we need daylight/sun (a link to Mrs Gren)	Do a round robin. Table 1: You will plant a seed and observe the changes. Table 2: You will sort the pictures. Table 3: You will categorise the types of light. Each table has 10 minutes each and then SS the activities.
I can recognise that we need light in order to see  Working Scientifically- <b>Research</b>	Know that we need light to see things.  Know what dark is (in relation to absence of light.)	Get everyone in a circle. Get the feely bag, there are 5 items inside. Block all of the openings to the sides and choose one student to look inside. Can we see any of the objects? No; because it is absent of light (darkness). Feel inside the bag and describe what you can feel. Can anyone guess the object from your description? Choose someone to peek inside using a small opening, letting in a little light. Was the guesser correct? Another's turn! Play again with the other objects Research- Hasan Ibn Al-Haytham
I can recognise that light from the sun can be dangerous and that there are ways to protect our eyes	Know the dangers of looking directly into the sun.	Work in a group to set up an investigation to see the effects of UV light and SS the activity. Follow the instructions to complete: Cut out several shapes from black card. Place them on a piece of coloured paper, and position them in a sunny spot for a week. When you take the shapes off, you will see that the paper around the shapes has changed colour slightly. The paper under the shapes will still look the same. The UV light will not be able to get to the paper under the shapes, so the paper under the shapes will not be damaged by the UV rays. Label the human body with the positive and negative effects the sun has on it. Design an appropriate sun screen product.
I can investigate what shadows are and why they are formed Working scientifically- <b>Prediction-make</b>	Know how a shadow is formed and why they change shape.	These next lessons can be combined to create a full investigative write-up. Go for a walk around the school, indoor and out (if possible) hunting for shadows. Take your jotters and note the size of the shadows, shape and which direction the light source is coming from (draw if you wish) to make the shadow.  Make a prediction. Think about what apparatus we need to conduct the investigation

relevant predictions that will be tested in a scientific enquiry.		
I can investigate how shadows behave (patterns) Working Scientifically- <b>Pattern Seeking</b>	Know how a shadow is formed and why they change shape.	Conduct the experiment as above. Look for patterns in the results table and explain.
I can investigate how the size of shadows change throughout the day.	Know how a shadow is formed and why they change shape.	Compare the above results to that of a pre-prepared example eg a shadow at midday. What is the same? What is the difference? Explain.
I can explore how light is reflected from surfaces. Working Scientifically- <b>Fair Test- Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same</b>	Know that light can be reflected.	Design a reflective book bag. We will test three different materials. We will use a reflection tester.

I can investigate how we use reflective materials in everyday life.	Know that light can be reflected.	Design a reflective book bag. We will test three different materials. We will use a reflection tester.  Combine with the above lesson.
I can construct a concept map to show what I know (end of unit knowledge assessment.)	To recognise why we need daylight/sun (a link to Mrs Gren) Know that we need light to see things. Know what dark is (in relation to absence of light.) Know the dangers of looking directly into the sun. Know how a shadow is formed and why they change shape Know that light can be reflected. Know how a shadow is formed and why they change shape.	Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.
<b>Enrichment/Homework opportunities:</b> Making shadow puppets Research about Hasan Ibn al-Haytham and the evidence from his scientific findings.		
<b>Key vocabulary:</b> Light, Shadows, Mirror, Reflective, Dark, Reflection Sound surfaces		

Biology- Plants

Year: 3/4

Term: Summer 1 - Cycle B

Lesson	Success Criteria	Lesson Overview
Retrieval I can explain what a plants needs to survive.	know the requirements of plants (air, light, water, nutrients from soil, and room to grow),	What are the requirements of plants and how does this vary from plant to plant? (air, light, water, nutrients from soil, and room to grow) Watch the clip from Zinnia, an alien from the distant Planet Dock 5. Make a class list on flipchart paper of everything you know plants need. Then research (chromebooks) some interesting and amazing facts about plants around the world to make a DID YOU KNOW flipchart
identify and describe the functions of the roots of flowering plants.	Know the function of the different parts of the flowering plant.	Your first job will be to choose one of the specimen plants to look at closely. study every detail with care: the size, shape and colour of the leaves; the way the stem divides and the texture and colour of the roots. Use a magnifying glass. Write some notes about the stem, roots leaves and flowers (if the plant has them). Use a ruler to draw a line from that part of the plant to the annotations.
I can investigate the way in which water is transported within plants . Working Scientifically- WS- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Know that light, air, <b>water</b> , nutrients from the soil are all important for plant growth.  Find out how water is transported in a plant.	Take celery (with leaves attached) or oriental cabbage, predict what will happen when the stalk is placed in the water. Ensure that the water contains food dye, and the celery is relatively fresh. Investigate, draw a conclusion. What went well, what did not go well? How can we improve the experiment? <a href="https://www.youtube.com/watch?v=akt8mjmOall&amp;t=30s">https://www.youtube.com/watch?v=akt8mjmOall&amp;t=30s</a>
I can identify and describe the functions of leaves in flowering plants.	Know the function of the different parts of the flowering plant	Go through the different types of roots e.g. large tree roots which break the soils surface to the thread-like roots of cress etc. Why do plants need leaves? What happens when they do not have leaves? Concept cartoons.

I can explore the part that flowers play in the life cycle of flowering plants, including pollination. Working scientifically-asking relevant questions and using different types of scientific enquiries to answer them	<p>Know the part that flowers play in in the life cycle of a flowering plant.</p> <p>Know about <b>pollination</b>, seed formation and seed dispersal.</p>	<p>Look through the different pollination types, wind/animal etc.</p> <p>Write the pollinations process in order.</p>
I can explore some of the ways in which flowering plants disperse their seeds.	<p>Know about pollination, <b>seed formation</b> and <b>seed dispersal</b></p>	<p>Share pictures of plants which have different ways of seed dispersal. In pairs, match the definition to the photo.</p> <p>Out to sea (coconut), explosive (Squirting cucumber), digested, fur &amp; feathers, fly (dandelion).</p> <p>How is the seed formed to enable each type of dispersal?</p> <p>Annotate the positive and negatives for each type.</p>
I can construct a concept map to show what I know (end of unit knowledge assessment.)	<p>know the requirements of plants (air, light, water, nutrients from soil, and room to grow),</p> <p>Know the function of the different parts of the flowering plant</p> <p>Know that light, air, <b>water</b>, nutrients from the soil are all important for plant growth.</p> <p>Find out how water is transported in a plant.</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit.</p> <p>For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge.</p> <p>Challenges to deepen understanding will be available.</p>

	Know the part that flowers play in in the life cycle of a flowering plant. Know about pollination, <b>seed formation</b> and <b>seed dispersal</b>	
<b>Enrichment/Homework opportunities:</b> Potato Growing competition		
<b>Key vocabulary: Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower</b>		

Biology- Animals including Humans Year: 3/4 Term: Summer 2- Cycle B		
Lesson	Success Criteria	Lesson Overview
Retrieval I can name a healthy breakfast, dinner, snack and tea.	To understand the need for the Eatwell Plate. Make a note of what we had for breakfast, dinner, tea and snacks and link to correct area of Eatwell Plate.	1.Label the food groups. 2.What did children eat yesterday? Fill a plate for breakfast, lunch, tea and snacks. Did they manage to hit 5-a-day? Explain.
I can classify animals into producers, predators and prey according to their place in the food chain	To identify and classify carnivores, herbivores and omnivores based on if they are producers, predators or prey.	Identify that <ol style="list-style-type: none"> <li>1. An animal that eats mostly meat or the flesh of other animals is a carnivore.</li> <li>2. A predator is an animal that hunts, kills and eats other animals.</li> <li>3. Some animals do not have any predators of their own. These animals are at the top of a food chain.</li> <li>4. An animal that is hunted and eaten by another animal is called prey.</li> <li>5. Many animals are both predator and prey.</li> </ol> <p><b>Pupils often think that all animals in a food chain are predators, or that all carnivores are predators.</b> Some animals can be carnivores but not predators. These animals are scavengers because they eat meat from animals they have found or that have been killed by other animals.</p>



I can construct and interpret a variety of food chains	Construct and use food chains to identify producers, predators and prey.	<ol style="list-style-type: none"> <li>1. The basic needs of animals for survival are water, food and air.</li> <li>2. Animals need food from plants and other animals to survive.</li> <li>3. A food chain is used to show the order in which living things depend on each other for food.</li> <li>4. A food chain can be drawn as a simple scientific diagram. The arrows represent 'is food for'.</li> </ol> <p><b>Common misconception</b>  Pupils often think the arrow in a food chain means “eats” and also that arrows should be drawn from predator to prey (rather than prey to predator).  This lesson reinforces the fact the the arrow in a food chain can be interpreted to mean 'is food for'.  Offer the children the opportunity to make their own food chain with pre-printed photos. (Oak academy)  Golden Challenge- match the food chains to the correct habitat.</p>
I can identify what an animal would eat based on its teeth.	Know and identify the different types of teeth in animals and match this with the food it eats.	Match the animals to their teeth. Use animals and skull photos.
I can identify the different types of teeth in humans and identify their functions	Know and identify the different types of teeth in humans.  Know the function of different human teeth.	Explain: we have different types of teeth in our mouth, and they help to break up food in different ways. Use their shape and structure to help you decide which picture is called which name. Label and colour code a human mouth to show the different tooth types.
I can explore the different ways to keep teeth healthy. Working Scientifically- Fair Testing	Know the need to brushing and good oral hygiene.	Egg shell as enamel- use different types of drinks. How can we make this a fair test? Leave it for a week and then evaluate.
I can identify the simple functions of the basic parts of the digestion system in humans.	Know and name the parts of the digestive system.  Know about the function of each organ of the digestive system.	Work in groups to draw round one person on the large paper and create a human body outline. Then, cut out the digestive organs and work together to place them in the correct location on the body- next, label/ name the organs.

<p>I can construct a concept map to show what I know (End of unit assessment)</p>	<p>To understand the need for the Eatwell Plate. Make a note of what we had for breakfast, dinner, tea and snacks and link to correct area of Eatwell Plate. To identify and classify carnivores, herbivores and omnivores based on if they are producers, predators or prey. Construct and use food chains to identify producers, predators and prey. Know and identify the different types of teeth in animals and match this with the food it eats. Know and identify the different types of teeth in humans. Know the function of different human teeth.</p> <p>Know and name the parts of the digestive system. Know about the function of each organ of the digestive system.</p>	<p>Produce hexagons/connections task to share the knowledge they have learnt during the unit. For lower attaining pupils / SEND learners scaffold should be used to support them to demonstrate their knowledge. Challenges to deepen understanding will be available.why they link.</p>
<p><b>Enrichment/Homework opportunities:</b> Trip to a local dentist <b>Key vocabulary:</b> Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar</p>		

# 7. Medium term plans – Cycle B / Cycle 2

## Phase 3



Physics- Earth and Space

Year: 5/6

Term: Autumn 1- Cycle B

Lesson	Success Criteria	Lesson Overview
Retrieval I can retrieve information about light, it's source and how this links to summer and winter.	To know that light travels in a straight line. To know that the Sun is a light/heat source. To know that light is energy. To know that days are longer in the summer and shorter in winter. To know that weather changes through the year, getting hotter in the summer and colder in the winter.	<p><b>PowerPoint or video</b> to cover:</p> <ul style="list-style-type: none"> <li>The Sun as the main source of light on Earth.</li> <li>Light travels in straight lines.</li> <li>The Earth rotates and orbits the Sun.</li> <li>The Earth is tilted on its axis.</li> <li><b>Link to seasons:</b> How tilt and orbit affect the amount of daylight in summer vs winter.</li> </ul> <p><b>"Information Retrieval Challenge"</b> Give pupils an <b>information sheet</b> or short text titled: <i>"Why Days Are Longer in Summer"</i>. Pupils complete a <b>retrieval grid</b> or <b>true/false quiz</b>, e.g.:</p> <ul style="list-style-type: none"> <li>What is the main source of light on Earth?</li> <li>What causes day and night?</li> <li>Why are days longer in summer?</li> <li>How is the Earth tilted?</li> </ul>
I can identify that the moon, Sun and Earth are spherical bodies.	Describe the Sun, Earth and Moon (using the term spherical)	<ul style="list-style-type: none"> <li>Discuss- What are the arguments for a flat Earth? What are the arguments for a spherical Earth?</li> <li>Introduce Aristotle. Explain that he found evidence that the earth was round.</li> <li>Read through the Shape Of The Earth Evidence Cards <a href="https://parkhilljunior.com/wp-content/uploads/2020/05/Year-5-Science-Week-8.pdf">https://parkhilljunior.com/wp-content/uploads/2020/05/Year-5-Science-Week-8.pdf</a></li> <li>Sort the evidence into two groups – one that supports the idea that the Earth is flat and the other that supports the idea that the Earth is a sphere.</li> <li>Use the internet and other secondary sources to find evidence which proves that the earth was spherical.</li> </ul>

Include-solar system, planets and that the sun is a star.		Imagine that you are a youtuber for kids, and create a video to prove that the Sun, Earth and Moon as spherical bodies.
I can describe the movement of the Earth and the planets in relation to the Sun.	Know about and explain the movement of the Earth and other planets relative to the Sun.  Know information about the planets.	<ul style="list-style-type: none"> <li>•Explain that Ptolemy was an astronomer who thought that the earth was in the centre of the solar system. Explain that Copernicus was another astronomer who thought that the sun was in the centre of the solar system. Ask the children who they think was correct before providing images/videos which show how the planets orbit the sun.</li> <li>•Children use secondary sources to research how many days each planet takes to orbit the sun. Children complete a table to show their findings. Is there a pattern between the size of a planet and the length of time it takes to orbit the sun? Children draw a conclusion using the evidence on their table to support their answer.</li> </ul>
I can describe the movement of the moon relative to Earth.	Know about and explain the movement of the Moon relative to the Earth	Include-Luna cycle Phases of the moon <ul style="list-style-type: none"> <li>•Use secondary sources to show what the moon is like. Ask the question: how does the shape of the moon appear to change over time?</li> <li>•Use videos to shoe how the moon orbits the earth.</li> <li>•In groups, model the movement of the earth, sun and moon using resources such as a lamp, balls etc</li> <li>•Children create a labelled diagram to show how the moon changes over time.</li> <li>•Children complete a diagram showing the eight phases of the Moon and why the Moon's appearance seems to change</li> </ul>
I can use the idea of Earth's rotation to explain day and night.	Know and demonstrate hoe night and day are created.	<ul style="list-style-type: none"> <li>•Using a split pin- create a moving model showing how the rotation of the Earth causes day and night. They move their model through a day and night cycle, using speech bubbles to explain what they would experience at each stage of the cycle.</li> </ul>
I can research Katherine Johnson and explain her key scientific findings.	Know who Katherine Johnson was, and about her significant contribution to the United States' achievements in space exploration.	Create a fact file. Working Scientifically Research including secondary sources
I can construct a concept map to show what I	To know that light travels in a straight line.	Make the hexagon connections using key vocabulary from the topic and picture prompts as appropriate for the class. Allow children to make meaningful connections within their book, detailing how and why they link.

<p>know (end of unit knowledge assessment.)</p>	<p>To know that the Sun is a light/heat source.          To know that light is energy.          To know that days are longer in the summer and shorter in winter.          To know that weather changes through the year, getting hotter in the summer and colder in the winter          Describe the Sun, Earth and Moon (using the term spherical          Know about and explain the movement of the Earth and other planets relative to the Sun.</p> <p>Know information about the planets          Know about and explain the movement of the Moon relative to the Earth          Know and demonstrate how night and day are created          Know who Katherine Johnson was, and about her significant contribution to the United States' achievements in space exploration</p>	
<p><b>Enrichment/Homework opportunities:</b>          Lunar moon diary          ISS videos/online tour</p>		
<p><b>Key vocabulary:</b>          planet, satellite, sphere, solar system, eclipse, star, universe, constellation, axis, celestial body, Moon, rotating, lunar, solar, telescope, rotation. Geocentric, Heliocentric</p>		

Physics- Forces  
Year: 5/6  
Term: Autumn 2 - Cycle B

Lesson	Success Criteria	Lesson Overview
Retrieval I can explain what forces are.	To know that a pull/push is a force To know that friction is a force when 2 surfaces rub together To know that applying a force can change the shape and size of an object.	Use ramps and toy cars to test different surfaces. Measure distances. Record results in a comparative table. <ul style="list-style-type: none"> <li>What variables stayed the same?</li> <li>How does friction help or hinder movement in real life?</li> <li>Where do we want <b>more</b> friction? Where do we want <b>less</b>?</li> </ul>
I can identify types of forces. Include-Using arrows to identify force being used and direction.	Explain how levers, pulleys and gears allow a smaller force to have a greater effect.	<ul style="list-style-type: none"> <li>Identify what levels, pulleys and gears are.</li> <li>Provide children with a selection of images. Ask them to work out which mechanism each object uses. Label objects with the name of the mechanism.</li> <li>Construct a simple pulley from 2 karabiner clips. They use a force meter to compare the force required to lift loads with and without the pulley. They record their results in a table and then transfer their results to a line graph showing two lines.</li> </ul>
I can explain and investigate gravity. Include-Key question to investigate. Newton meters. Working Scientifically Focus-Prediction/fair testing-variables	Know about Isaac Newton and his discovery of gravity.  Know what gravity is and it's impact on our lives.	<ul style="list-style-type: none"> <li>Introduce Isaac Newton. Explain that he was a scientist who developed the first description of the force of gravity.</li> <li>Draw out questions such as: Do all objects fall at the same rate? How does the shape of an object affect the time that an object takes to fall? Does the weight of an object affect how quickly it falls?</li> </ul> <p>Work in groups to plan an enquiry to answer their chosen question.</p>
I can investigate air resistance. Include-Key question Hypothesis (E.G: spinner length, parachute etc) Working Scientifically	<ul style="list-style-type: none"> <li>Know that air resistance is a type of friction between air and another material.</li> </ul> <p>Know that objects with a large surface area create more air resistance so they move more slowly through air.</p>	<ul style="list-style-type: none"> <li>Show examples of images and videos.</li> </ul> <p>Investigate the question: does the surface area of a parachute affect how long it takes to fall?</p>

Asking and answering questions. Results (using a range of equipment) and drawing conclusions		
I can investigate water resistance. Include-Key question Hypothesis (E.G: Does shape of a boat/object affect how quickly it sinks/floats) Working Scientifically Focus-Prediction/fair testing-variables	<ul style="list-style-type: none"> <li>Know that water resistance is the force acts in the opposite direction to an object moving through water.</li> <li>Know that of an object has a larger area, it will collide more with water particles and therefore have a bigger drag force.</li> </ul> <p>Know that different shaped objects have different levels of water resistance, streamlined shapes have less and can therefore move through water much more easily.</p>	<ul style="list-style-type: none"> <li>Show examples of images and videos.</li> <li>Investigate the question: do all objects fall through water in the same way? Test which plasticine shapes are the most and least water resistant using large cylindrical flasks of water.</li> </ul>
I can investigate Friction.	<p>Identify and know the effect of friction.</p> <ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Investigate different surfaces to find out which surface produces lots of friction and which produce not much friction.</li> <li>Tie the string around the heavy object and then attach it to the Newton meter. Place the object on one surface at a time. Pull the Newton meter until the object starts to move. Children investigate the best surface to place on a floor to prevent people from slipping. Include-Key Question-Hypothesis (E.G: Does surface affect speed/distance travelled down a ramp?)</li> </ul> <p>Working Scientifically Asking and answering questions. Results (using a range of equipment) and drawing conclusions</p> <ul style="list-style-type: none"> <li></li> </ul>
I can construct a concept map to show what I know (end of unit knowledge assessment.)	<p>Identify and know the effect of air resistance Identify and know the effect of water resistance Identify and know the effect of friction To know that a pull/push is a force To know that friction is a force when 2 surfaces rub together</p> <p>To know that applying a force can change the shape and size of an object</p>	<p>Make the hexagon connections using key vocabulary from the topic and picture prompts as appropriate for the class.</p> <ul style="list-style-type: none"> <li>Allow children to make meaningful connections within their book, detailing how and why they link.</li> </ul>

	<p>Explain how levers, pulleys and gears allow a smaller force to have a greater effect</p> <p>Know about Isaac Newton and his discovery of gravity.</p> <p>Know what gravity is and it's impact on our lives</p>	
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**Enrichment/Homework opportunities: #**

**Push and Pull:** Find 3 things at home you can push or pull; draw or write what happens.

**Gravity:** Drop 3 objects (safely) and describe how they fall.

**Friction:** Slide 2 objects on different surfaces; note which slides easier or harder.

**Magnets:** Find 3 objects that are attracted to a magnet and 3 that are not.

**Everyday Forces:** Take a photo or draw one example of a force you see at home

**Key vocabulary:**

acceleration, air resistance, buoyancy, effort, force meter, fulcrum, gravity, load, mass, mesh, Newton, pivot, rigid, streamlined, terminal velocity, unsupported, water resistance, weight, hypothesis



## Chemistry- Properties and Changes of Materials Year: 5/6

Term: Spring 1 and 2 - Cycle B

Lesson	Success Criteria	Lesson Overview
<p>Retrieval</p> <p>I can explain the water cycle using the terms Solid, liquid and gasses,</p>	<p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p> <p>To know, compare and group materials together, according to whether they are solids, liquids or gases.</p>	<ul style="list-style-type: none"> <li>Retrieval – explanation of states of matter – explain how these have been identified.</li> <li>Show a water cycle diagram. Explain how water changes state:  <i>Evaporation</i>: liquid water → water vapour (gas).  <i>Condensation</i>: water vapour → liquid water (clouds/rain).            Emphasise that the sun's heat speeds up evaporation.</li> <li>Practical Investigation            Experiment: "Which Puddle Dries First?"            Provide pupils with three shallow trays of water. Place one in a warm spot (e.g. by a radiator, under a lamp), one in the shade, and one outside if possible.            Pupils predict: "Which tray of water will evaporate fastest?"            Observe over the lesson/day and record results. Pupils draw and label the water cycle, adding arrows to show evaporation and condensation.</li> </ul>
<p>To know that some materials will dissolve in liquid to form a solution</p>	<p>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.</p>	<ul style="list-style-type: none"> <li>Fair test: salt, sugar, sand, flour, coffee and gravy. All solids and decide if these become solutions or are insoluble with sediment remaining.</li> </ul> <p>Dissolving. To ensure that children do not think that sugar disappears in water, allow them to mix sugar in a clean cup of water. Even though they can no longer see the sugar, they should be able to taste it. Hook - You can then create a context for their investigation – e.g. Teachers whinging in the staffroom that their sugar takes too long to dissolve!</p>
<p>To use knowledge of solids, liquids and gases to decide how mixtures and solutions might be separated.</p>	<p>Children know that mixtures can be separated by methods like sieving, filtering and evaporating.</p> <p>Children know that a mixture made of solid particles of different sizes, for example sand and gravel, can be separated by sieving.</p>	<ul style="list-style-type: none"> <li><a href="#">How can we clean our dirty water?</a></li> <li>Simple test – How can we separate mixtures of different solids? Give children an opportunity to separate some mixtures through using sieves with different sizes of mesh: lumps from flour, rice from salt, coffee from coffee beans, stones from soil, different size seeds, sugar from sugar lumps, buttons in a button box, etc</li> </ul>

	Children know tha you can separate a mixture of sand and water by passing it through a piece of filter paper.	
I can identify when a change caused by heating or cooling is reversible or irreversible.	<p>Know what a reversible and an irreversible change means.</p> <p>Give examples of reversible and irreversible changes.</p>	<ul style="list-style-type: none"> <li>• <a href="https://www.bbc.co.uk/bitesize/articles/zwj9r2p#zcx996f">https://www.bbc.co.uk/bitesize/articles/zwj9r2p#zcx996f</a></li> <li>• Test – What happens when we mix water with plaster of Paris? Can you separate them?</li> <li>• Test- Bicarb and soda- blow up a balloon or glove.</li> </ul>
I can identify when a change caused by heating or cooling is reversible or irreversible.	<p>Know what a reversible and an irreversible change means.</p> <p>Give examples of reversible and irreversible changes.</p>	<ul style="list-style-type: none"> <li>• Investigate - place blocks chocolate, wax, butter, playdough and an egg into hot water, at serval intervals record changes to the material. Noting- shape, state and colour. Once melted children to then place these into ice bath bowl to see how the process can be reversed.</li> </ul>
To compare and group together everyday materials on the basis of their properties Working Scientifically Grouping and classifying	<p>Know that properties are qualities that materials have including transparency, hardness, response to magnets, thermal conduction or insulation, electrical conduction or insulation, solubility and state of matter.</p> <p>Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p>	<ul style="list-style-type: none"> <li>• Use a Venn diagram to sort the properties</li> <li>• Look at key objects and explain why that material is best for that particular object.</li> <li>• Explain circumstances where the same object might be made out of a different material to suit its purpose. Football – Bowling ball.</li> <li>• Brief link to scientist William Gilbert – who used scientific methods to prove that the mineral found by the Greeks was useful and was Magnetic.</li> <li>• Children to investigate – using a variety of objects, which are magnetic and which are not. Present these in a Carrol Diagram..</li> </ul>

I can research Marie Maynard Dalyand.	Know of Marie Maynard Daly and be able to explain her key scientific findings.	Create a fact file. Working Scientifically Research including secondary sources
I can construct a concept map to show what I know (end of unit knowledge assessment.)	<p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p> <p>To know, compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution</p> <p>Know that materials can be grouped based on their properties</p> <p>Know what a reversible and an irreversible change means.</p> <p>Give examples of reversible and irreversible changes</p> <p>Use knowledge of solids, liquids and gasses to decide how mixtures might be separated, including through</p>	<p>Make the hexagon connections using key vocabulary from the topic and picture prompts as appropriate for the class.</p> <p>Allow children to make meaningful connections within their book, detailing how and</p>

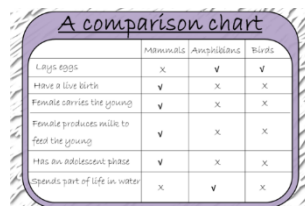

	filtering, sieving and evaporating Know that materials can be grouped based on their properties Know of Marie Maynard Daly and be able to explain her key scientific findings.	
<b>Enrichment/Homework opportunities:</b> Growing crystals- see STEM Creating casein (milk-pstic) badges.		
<b>Key vocabulary:</b> Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing , heat, cool, liquid		

Biology- Living things and their habitats (Animals Including Humans)

Year: 5/6

Term: Summer 1 and 2 - Cycle B

Lesson	Success Criteria	Lesson Overview
Retrieval - Recognise that living things can be grouped in a variety of ways.	Be able to classify living things into broad groups according to observable characteristics and based on similarities and differences.	<p>Work in pairs to sort the cards in different ways:</p> <ul style="list-style-type: none"> <li>• Vertebrates vs. invertebrates.</li> <li>• Mammals, reptiles, amphibians, fish, birds.</li> <li>• Flowering vs. non-flowering plants.</li> </ul> <ul style="list-style-type: none"> <li>• Pupils create their own classification key (branching diagram) for a set of living things.</li> </ul>
To describe the process of sexual reproduction in flowering plants	<p>Children will be describe how flowering plants reproduce.</p> <p>Children will know that reproduction is the production of offspring. There are two main forms: sexual and asexual reproduction.</p> <p>Children will know how plants reproduce sexually.</p> <p>Children will know the life process of reproduction in plants Children will know to reproduce, pollen from one flower must first be transferred to another flower, either by insects or the wind.</p> <p>Children will know the function of different parts of a flowering plant that support reproduction: <b>Petals, pollen, anther, filament, Sepal, stigma, style, ovary, ovule, stamen, carpel</b></p>	<ul style="list-style-type: none"> <li>• Find a flower that has prominent reproductive organs e.g. tulip or lily and show the children the different parts.</li> <li>• Dissect and label the parts of flower</li> <li>• Art- make their own flower: Sepals and petals: coloured paper/card, Filaments - pipe cleaners, straws, Anthers - cotton wool, small pieces of sponge, Pollen - rice stained yellow, Ovary - small water bottle (cap can be the stigma)</li> <li>• Label a diagram of a flower and carpel and complete an explanation showing how flowering plants reproduce</li> <li>• Create a comic strip showing the fertilisation of plants</li> </ul>
To describe the process of asexual reproduction in plants	<p>Children will know how plants reproduce asexually.</p> <p>Children will know that some plants create offspring using sexual reproduction, others do so using asexual reproduction.</p> <p>Children know the main difference is that whilst sexual reproduction needs 2 parent plants, asexual reproduction needs only one parent.</p>	<ul style="list-style-type: none"> <li>• Show children a sprouting potato and one that hasn't sprouted yet. Look carefully at the one that hasn't sprouted – can they see the “eyes” from where shoots would grow in the right conditions?</li> <li>• Research how gardeners asexually reproduce plants.</li> <li>• Complete your own Artificial Propagation or compare Propagation Methods: grow new plants from different parts of a parent plant, observe whether they grow roots/stem/ leaf/flower for example: Stem cutting e.g. geranium Root cutting e.g. oriental poppy Leaf cutting e.g. African violet Tuber e.g. potato Bulb e.g. daffodil</li> </ul>

	<p>Children know 3 important methods of asexual reproduction in plants: Runners - e.g. spider plant and strawberry. Tubers – potato and Bulbs.</p> <p>Children know humans can produce new plants asexually by artificial propagation.- cutting.</p>	<p>Runner (horizontal stem) e.g. spider plant</p>																												
<p>To know the life cycle of different living things, e.g. mammal, amphibian, insect and bird</p>	<ul style="list-style-type: none"><li>Children will know the life cycle of a mammal, amphibian, insect and bird</li><li>Children will be able to describe the similarities of differences of these lifecycles.</li></ul>	<ul style="list-style-type: none"><li>Have a Butterfly Garden Breeding Kit</li><li>Watch videos: <a href="https://www.bbc.co.uk/bitesize/topics/zgssgk7/articles/zwn6mnb">https://www.bbc.co.uk/bitesize/topics/zgssgk7/articles/zwn6mnb</a></li><li><a href="https://www.bbc.co.uk/teach/class-clips-video/science-ks2--ks3-the-life-cycles-of-different-organisms/zvh8qp3">https://www.bbc.co.uk/teach/class-clips-video/science-ks2--ks3-the-life-cycles-of-different-organisms/zvh8qp3</a>.</li><li>Learn about the life cycles of 2 different mammals, amphibians, insects and birds – create life cycle diagrams, adding their explanations.</li><li>Complete a Venn/table/diagram to</li><li>compare lifecycles</li></ul> <div></div> <table><caption>A comparison chart</caption><tr><th></th><th>Mammals</th><th>Amphibians</th><th>Birds</th></tr><tr><td>Lays eggs</td><td>x</td><td>✓</td><td>✓</td></tr><tr><td>Have a live birth</td><td>✓</td><td>x</td><td>x</td></tr><tr><td>Female carries the young</td><td>✓</td><td>x</td><td>x</td></tr><tr><td>Female produces milk to feed the young</td><td>✓</td><td>x</td><td>x</td></tr><tr><td>Has an adolescent phase</td><td>✓</td><td>x</td><td>x</td></tr><tr><td>Spends part of life in water</td><td>x</td><td>✓</td><td>x</td></tr></table>		Mammals	Amphibians	Birds	Lays eggs	x	✓	✓	Have a live birth	✓	x	x	Female carries the young	✓	x	x	Female produces milk to feed the young	✓	x	x	Has an adolescent phase	✓	x	x	Spends part of life in water	x	✓	x
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Has an adolescent phase	✓	x	x																											
Spends part of life in water	x	✓	x																											
<p>To describe the process of sexual reproduction in animals.</p>	<ul style="list-style-type: none"><li>Children know almost every animal uses sexual reproduction to produce offspring.</li><li>Children will know that male and female cells combine to form a single cell - this is called fertilization.</li><li>Children will know eggs contain female sex cells and sperm is the male sex cell.</li><li>Children know offspring produced sexually have 2 parents.</li><li>Children know fertilisation can happen outside or inside the female body.</li><li>Children will know how some animals produce offspring through external Fertilisation - most amphibians and fish, some invertebrates</li></ul>	<p>Research Project</p> <ul style="list-style-type: none"><li>Ask the children to choose 2 different animals e.g. a mammal and an amphibian. They should research the life cycle of their chosen animals, comparing how they reproduce and grow.</li><li>Produce an information page on the reproduction methods and life cycle of each animal,</li><li>Complete a comparison of their 2 animals</li></ul>																												

	Children know that for most animals which live on land (and some aquatic animals), offspring are fertilised inside the female's body – humans, birds, dolphin	
I can compare how different animals reproduce and grow Working Scientifically Grouping and classifying	<p>Know what the terms puberty, gestation and reproduction mean.</p> <p>Know that the length of time a mammal is pregnant is known as the gestation period.</p> <p>Know that the gestation period starts when the sperm from the male fertilises the female egg. It finishes when the baby animal is born.</p> <p>Know that mammals are formed in sexual reproduction.</p>	<ul style="list-style-type: none"> <li>• Pattern-seeking; Is there a relationship between the mass of adult animal and the length of the gestation period?</li> <li>• Complete a table using secondary sources of information which look at gestation period, average number of offspring and the life span of the animal. They then answer questions which look at patterns in the data and go on to predict the length of gestation and number of offspring for different sized animals.</li> <li>• Think think about the reasons why different animals have different gestation periods, by looking at both very short and very long gestation periods.</li> <li>• <a href="https://www.stem.org.uk/resources/elibrary/resource/35389/animal-gestation-periods">https://www.stem.org.uk/resources/elibrary/resource/35389/animal-gestation-periods</a></li> </ul>
I can describe and explain the life cycle of a human being.	<ul style="list-style-type: none"> <li>• Children will know about the size of a foetus at different stages of pregnancy: month by month, including organ development, the development of senses, and when hair and skin is formed.</li> </ul> <p>Children will know the importance of keeping healthy in pregnancy</p>	<p>Produce a detailed scientific diagram of the process of foetal development comparing this to the size of fruits.</p> <ul style="list-style-type: none"> <li>• Puberty: The NHS has recommended the following on their website: 'What's happening to me?' (girls) and 'What's happening to me?' (boys), published by Usborne Children's Book</li> <li>• Cut out the changes and arrange them into a Venn diagram, showing: which are changes in boys only, which are changes in girls only, and which are changes for both sexes.</li> <li>• Label diagrams to show where the changes happen for each sex.</li> </ul> <p>Have a questions box for anonymous questions to address any concerns/misconceptions.</p>
I can construct a concept map to show what I know (End of unit knowledge assessment.)	<p>Be able to classify living things into broad groups according to observable characteristics and based on similarities and differences.</p> <p>Know how living things have been classified</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Make the hexagon connections using key vocabulary from the topic and picture prompts as appropriate for the class.</p> <p>Allow children to make meaningful connections within their book, detailing how and</p>

	<p>Know who Carl Linnaeus was and his impact on classification systems</p> <p>Know what the terms puberty, gestation and reproduction mean.</p> <p>Know about the life cycle of a human being.</p> <p>Know about the life- cycle of different things; mammal, amphibian, insect and bird.</p> <p>Know about the reproduction in plants Know about the process of reproduction in animals</p>	
<p><b>Enrichment/Homework opportunities:</b></p> <p><b>Butterfly house. Nature walk-</b> look for evidence of plant reproduction such as flowers, seeds heads, berries and fruits.</p> <p>Explore practically some of the methods for growing new plants without seeds, including planting bulbs and propagating plants by taking cuttings.</p>		
<p><b>Key vocabulary:</b></p> <p>Mammal, Reproduction, Insect, Amphibian, Bird, Offspring, classification, asexual, sexual, propagating.</p>		



## 8. Key Progress Indicators - Phase 1

Year 1&2		
Biology Animals including Humans	Biology Parts of the Body	Chemistry Everyday Materials
<ul style="list-style-type: none"> <li>Know the difference between carnivore, omnivore and herbivore</li> <li>Know the difference between a mammal, reptile and amphibian</li> <li>Know how to classify by living, <u>non-living</u> and never alive</li> <li>Know the names of some common birds</li> <li>Begin to know why certain animals live in certain areas</li> </ul>	<ul style="list-style-type: none"> <li>Know the names of all seen body parts above the shoulders</li> <li>Know the names of the seen body parts below the shoulders and above the legs</li> <li>Know the names of all seen body parts below the hips</li> <li>Know what the five senses are</li> <li>Know what each of our senses does</li> </ul>	<ul style="list-style-type: none"> <li>Know that there are many different types of materials</li> <li>Know the names of many types of materials</li> <li>Know what we use glass, wood and bricks for</li> <li>Know that plastics are easy to bend</li> <li>Know that some materials are not useful for certain things</li> </ul>
Physics Seasonal Changes	Biology Plants	
<ul style="list-style-type: none"> <li>Know the names of the four seasons</li> <li>Know the type of weather normally associated with the four seasons</li> <li>Know that we have longest periods of light in summer and shortest periods of light in winter</li> <li>Know that different parts of the world have their summer and winter at different times to us</li> <li>Know that the temperature varies during the different seasons</li> </ul>	<ul style="list-style-type: none"> <li>Know the names of a variety of common wild and garden plants</li> <li>Know the name of the different parts of a plant, including stem, root, petal and flower</li> <li>Know the difference between deciduous and evergreen trees</li> <li>Know the names of a variety of common trees</li> <li>Know the names of some of the plants that grow in the local environment</li> </ul>	

Year 1&2	
<p><b>Biology</b> Animals and Habitats</p> <ul style="list-style-type: none"> <li>Identify and name plants and animals in a range of habitats</li> <li>Know how a specific habitat provides for the basic needs of things living there</li> <li>Match living things to their habitat</li> <li>Know how animals find their food</li> <li>Name some different sources of food for animals</li> </ul>	<p><b>Biology</b> Healthy Living</p> <ul style="list-style-type: none"> <li>Know why a balanced is important for humans</li> <li>Know what is meant be a balanced diet</li> <li>Know why exercise and good hygiene are also important for humans</li> <li>Know that the babies will grow into adults</li> <li>Know what humans need to survive (including food and water)</li> </ul>
<p><b>Biology</b> Plants</p> <ul style="list-style-type: none"> <li>Know that a plants needs light, water, air and soil to survive</li> <li>Know how important trees are for the environment</li> <li>Know that trees and shrubs take in water and a gas called carbon dioxide and give out a gas called oxygen</li> <li>Know how to set up a fair test to find out what plants need to survive</li> <li>Know the names of many of <u>out</u> most common trees by shape of leaf and shape of tree</li> </ul>	<p><b>Chemistry</b> Properties and uses of Materials</p> <ul style="list-style-type: none"> <li>Know why some materials are more suitable than others for specific uses</li> <li>Know why glass, wood, plastic, brick or paper would be used for certain jobs</li> <li>Know that some materials can be squashed, twisted or bent according to need</li> <li>Know why certain materials are suitable for many different uses</li> <li>Know about the lives of important people who have developed new things using materials.</li> </ul>

## 8. Key Progress Indicators - Phase 2

Year 3&4		
Biology Human Body	Physics Forces	Chemistry Rocks
<ul style="list-style-type: none"> <li>Know the names of the body parts associated with skeleton and muscles</li> <li>Know that the body parts have special functions</li> <li>Know what the function of muscles are</li> <li>Know what joints are and how they work</li> <li>Compare the diets of different groups of animals, including humans</li> </ul>	<ul style="list-style-type: none"> <li>Know that a magnet has two poles</li> <li>Know that magnets can repel and attract different magnetic materials</li> <li>Know that some forces need contact between two objects</li> <li>Know that magnetic forces can act at a distance</li> <li>Know some magnetic materials</li> </ul>	<ul style="list-style-type: none"> <li>Know how fossils are formed</li> <li>Know what soil is</li> <li>Know the difference between igneous, sedimentary and metamorphic rocks</li> <li>Group together different rocks according to different attributes</li> <li>Know that some crystals are extremely rare and valuable</li> </ul>
Physics Light		Biology Plants
<ul style="list-style-type: none"> <li>Know what dark is (in relation to absence of light)</li> <li>Know that we need light so we can see things</li> <li>Know that light can be reflected</li> <li>Know how a shadow is formed and why they change shape</li> <li>Know the dangers of looking directly at the Sun</li> </ul>		<ul style="list-style-type: none"> <li>Know the function of the different parts of the flowering plant</li> <li>Know that light, air, water, nutrients from soil are all important for plant growth</li> <li>Find out how water is transported within a plant</li> <li>Know the part that flowers play in the life cycle of a flowering plant</li> <li>Know about pollination, seed formation and seed dispersal</li> </ul>

## 8. Key Progress Indicators - Phase 2

Year 3&4	
<b>Biology</b> Digestive System <ul style="list-style-type: none"> <li>• Know and name the parts of the digestive system</li> <li>• Know about the function of each organ of the digestive system</li> <li>• Know and identify the different types of teeth in humans</li> <li>• Know the function of different human teeth</li> <li>• Construct and use food chains to identify producers, predators and prey</li> </ul>	<b>Physics</b> Sound <ul style="list-style-type: none"> <li>• Know how sound is made and what happens as sound travels away from its source</li> <li>• Know how sound travels from the source to the ears</li> <li>• Know to associate sound with vibration</li> <li>• Know the correlation between pitch and the object producing a sound</li> <li>• Know the correlation between the volume of a sound and the strength of the vibrations that produced it</li> </ul>
<b>Physics</b> Electricity <ul style="list-style-type: none"> <li>• Know about common appliances that run on electricity</li> <li>• Know how to construct a simple series electrical circuit</li> <li>• Identify and name the basic parts of the circuit, including cells, wires, bulbs, switches and buzzers</li> <li>• Know that a switch opens and closes a circuit</li> <li>• Know about some common conductors and insulators</li> </ul>	<b>Chemistry</b> States of Matter <ul style="list-style-type: none"> <li>• Know that certain materials can change state</li> <li>• Know what the temperature of water is when it boils or freezes</li> <li>• Know which materials, other than water, changes state</li> <li>• Explain the differences between solids, liquids and gases</li> <li>• Know what is meant by the terms: condensation, and evaporation</li> </ul>

## 8. Key Progress Indicators - Phase 3

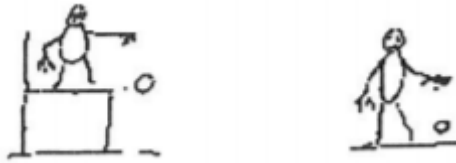
Year 5&6			
Biology Circulatory System		Biology Classification of all living things	
<ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system</li> <li>Know the function of the heart, blood vessels and blood</li> <li>Know the impact of diet, exercise, drugs and lifestyle on health</li> <li>Know the ways in which nutrients and water are transported in animals, including humans</li> <li>Know who William Harvey was</li> </ul>		<ul style="list-style-type: none"> <li>Be able to classify living things into broad groups according to observable characteristics and based on similarities and differences</li> <li>Know how living things have been classified</li> <li>Give reasons for classifying plants and animals based on specific characteristics</li> <li>Know who <u>Jane Goodhall</u> is and her impact on how we study living things.</li> <li>Know who Carl Linnaeus is and his impact on classification systems</li> </ul>	
Biology Evolution and inheritance		Biology Evolution and inheritance	
<ul style="list-style-type: none"> <li>Know that living things have changed over time</li> <li>Know the part fossils play in helping us understand more about living things that inhabited our Earth millions of years ago</li> <li>Know that living things produce off-spring of the same kind</li> <li>Know that off-spring vary and are not normally identical to their parents</li> <li>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul>			
Physics Electricity		Physics Light	
<ul style="list-style-type: none"> <li>Know that the brightness of a bulb is associated with the voltage</li> <li>Compare and give reasons for variations in how components function</li> <li>Use <u>recognised</u> symbols when representing a simple circuit in a diagram</li> <li>Construct simple series circuits</li> <li>Be able to answer questions about what happens when they try different components, for example; switches, bulbs, buzzers and motors</li> </ul>		<ul style="list-style-type: none"> <li>Know that light travels in straight lines</li> <li>Understand that because light travels in straight lines objects are seen because they give out or reflect light into the eye</li> <li>Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</li> <li>Know that light travels in straight lines and therefore shadows have the same shape as the objects that cast them</li> <li>Know how our eyes work</li> </ul>	

Year 5&6	
Biology Life Cycles	Chemistry Reversible and irreversible changes
<ul style="list-style-type: none"> <li>Know about the life cycle of a human being</li> <li>Know what the terms puberty, gestation and reproduction mean</li> <li>Know the life cycle of different living things, e.g. mammal, amphibian, insect and bird</li> <li>Know about the process of reproduction in plants</li> <li>Know about the process of reproduction in animals</li> </ul>	<ul style="list-style-type: none"> <li>Know that materials can be grouped based on their properties.</li> <li>Know what a reversible and an irreversible change means</li> <li>Give examples of reversible and irreversible changes</li> <li>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution</li> <li>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> </ul>
Earth Science / Physics Earth and Space	Physics Forces
<ul style="list-style-type: none"> <li>Know about and explain the movement of the Earth and other planets relative to the Sun</li> <li>Know about and explain the movement of the Moon relative to the Earth</li> <li>Know and demonstrate how night and day are created</li> <li>Describe the Sun, Earth and Moon (using the term spherical)</li> <li>Know information about the planets</li> </ul>	<ul style="list-style-type: none"> <li>Know what gravity is and its impact on our lives</li> <li>Identify and know the effect of air resistance</li> <li>Identify and know the effect of water resistance</li> <li>Identify and know the effect of friction</li> <li>Explain how levers, pulleys and gears allow a smaller force to have a greater effect</li> </ul>

Example: Bouncing ball investigations. Changing the height of the drop (independent variable) and measuring the height of bounce (dependent variable).


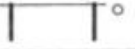




## 9. Progression in aspects of working scientifically – Developing tables, graphs and charts

EYFS



The pupil has observed and recorded what happens when the ball is dropped from different heights.

Year 1

Where we rolled it off	How high it bounced
	
	
	

The pupil completes a table constructed by the teacher.

Year 2

Where did you drop it	How high it bounced
Top of door	5 boxes
Bookshelf	4 boxes
Bottom of window	2 boxes
Table	2 boxes

The pupil completes a table constructed by the teacher.



Year 3

Where did you drop it	How high it bounced
Top of door	5 boxes
Bookshelf	4 boxes
Bottom of window	2 boxes
Table	2 boxes

The pupil constructs and completes the table.

Year 4

Height that we dropped it	How high it bounced
1m	0.38m
1.25m	0.59m
1.5m	0.68m
1.75m	0.76m

The pupil constructs the table, chooses the headings and the number of tests to carry out. The teacher suggests the heights from which the ball should be dropped.

Year 5

Height that we dropped it	How high it bounced
1m	0.38m
1.25m	0.59m
1.5m	0.68m
1.75m	0.76m

The pupil creates the table independently.



## Year 6

Height of drop	Height of bounce			Average
	1 <sup>st</sup> go	2 <sup>nd</sup> go	3 <sup>rd</sup> go	
1m	0.39	0.40	0.5	0.38m
1.25m	0.58	0.64	0.55	0.59m
1.50m	0.68	0.79	0.80	0.76m
1.75m	0.85	0.80	0.81	0.82m
2.00m	0.82	0.93	0.89	0.88m

The table is designed, constructed and completed independently.

### Progression in constructing and using graphs and charts

Example: Bouncing ball investigations. Changing the height of the drop (independent variable) and measuring the height of bounce (dependent variable).

EYF  
S

Standing on  
a chair

Big bounce

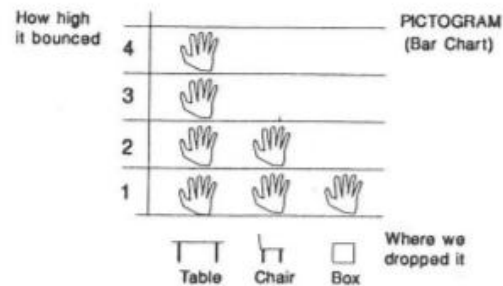
Standing on  
the floor

Little bounce

Independent and dependent variable described in words.

No graph drawn.

Year  
1



The height of the bounce has been measured in hands having marked the spot on a wall. The chart is prepared by the teacher.

Year  
2



Bar Chart

The pupil completes the bar chart where the labelling of the axes, with the independent and dependent variable, is prepared by the teacher, along with the numbers on the vertical axis.

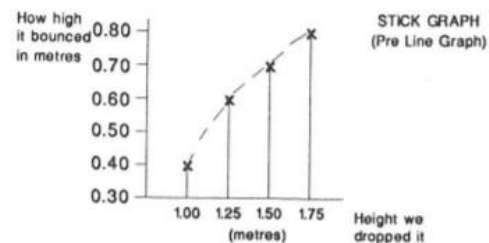
Year  
3



Bar Chart

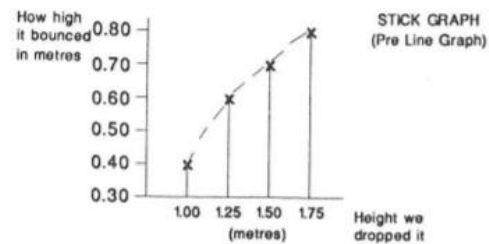
The pupil constructs the bar chart.

Year  
4



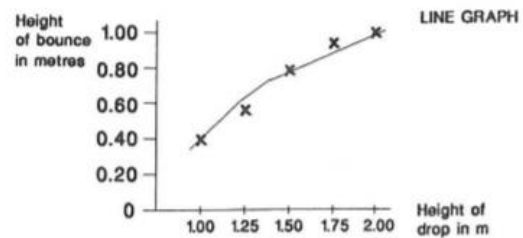
The teacher helps to decide on the scales for both axes. The pupil labels the axes and draws the sticks.

Year  
5



The pupil creates the stick graph independently.

Year  
6



Line graph completed independently, and line of best fit used to help predict the height of bounce for any drop within the range of values.