

Science Curriculum – 2 Year Cycle - Years 3/4



Intent

Learning is a change to long term memory. Our aim is to ensure that our students experience a wide breadth of study based on the national curriculum and have, by the end of each key stage, long-term memory of curriculum knowledge.

We aim to inspire in pupils a curiosity and fascination of the world through Biology, Chemistry and Physics. Teaching will equip children with scientific knowledge, methods, processes and uses of science so that they can explain what is occurring, predict how things will behave, and analyse causes.

Through the continued development of oracy skills, we will expand pupil's scientific vocabulary which will deepen as they progress through school. Through our science curriculum, we intend to inspire pupils to develop a fascination of science and an enquiring mind to answer their own questions.

Implementation

Science is taught through the 'Threshold Concept' of Working Scientifically. The threshold concept is delivered through the knowledge categories of Biology, Chemistry and Physics. Deliberate practise of these, whereby knowledge will be revisited, will enable a gradual deepening of their understanding.

Teachers will utilise investigations, purposeful experiences through visits and visitors, and a range of teaching styles in order to develop their understanding of science so that it is in their long-term memory.

Teachers will provide knowledge for children to use to plan investigations, make predictions, carry out observations, collect data and develop hypotheses, in order to deepen children's understanding.

Impact

Because learning is a change to long term memory it is impossible to see impact in the short term. However, we do use probabilistic assessment based on deliberate practise. This means that we look at the practices taking place to determine whether they are appropriate, related to our end of key stage goals. We use comparative judgements against Milestone statements, in the tasks we set (POP tasks) and in tracking students' work over time. We use lesson observations to see if the pedagogical style matches our depth expectations.

Impact is also measured through key questioning skills built into lessons, progress tests and child-led assessment against the objective (WAGBA), and summative assessments aimed at targeting next steps in learning.

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Year Group	Cycle	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
3/4	A	<p>States of Matter (Y4)</p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Observe that some materials change state when they are heated or cooled and measure the temperature at which this happens in °C.</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>Animals Including Humans (Y3)</p> <p>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>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Sound (Y4)</p> <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p>	<p>British Science Week (2wks)</p> <p>Project Week (2 wks)</p> <p>Remaining 2 weeks begin Summer topic</p>	<p>Animals Including Humans (Y4)</p> <p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>Plants (Y3)</p> <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow).</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>
		Essential – there must be at least one experiment per term and this needs to be evidenced in books.					

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	B	Rocks (Y3)	Forces (Y3)	Living Things and their Habitats (Y4)	British Science Week (2wks) Project Week (2 wks)	Electricity (Y4)	Light (Y3)
		<p>Compare and group together different types of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within the rock.</p> <p>Recognize that soils are made from rocks and organic matter.</p>	<p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between 2 objects but magnetic forces can act at a distance.</p> <p>Forces/Magnets – Observe how magnets attract/repel each other and attract some materials and not others (3) Describe magnets as having 2 poles.</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local/wider environment</p> <p>Recognize that environments can change and this can sometimes pose dangers to living things</p>		<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way the size of shadows change.</p>
<p>Essential – there must be at least one experiment per term and this needs to be evidenced in books.</p>							

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Years 3/4 Teaching Sequence for Science (Milestone 2) CYCLE A <i>Threshold Concepts</i>			
Weeks	Autumn Term	Spring Term	Summer Term
Topic Title:	States of Matter (Y4) <i>Investigate materials</i> <i>Work scientifically</i> Animals Including Humans (Y3) <i>Understand animals and humans</i> <i>Work scientifically</i>	Sound (Y4) <i>Investigate sound and hearing</i> <i>Work scientifically</i> British Science Week <i>Work scientifically</i>	Animals Including Humans (Y4) <i>Understand animals and humans</i> <i>Work scientifically</i> Plants (Y3) <i>Understand plants</i> <i>Work scientifically</i>
1	What do we know? – Cold Task States of Matter: Compare and group materials together, according to whether they are solids, liquids or gases	What do we know? – Cold Task Sound: Identify how sounds are made, associating some of them with something vibrating.	What do we know? – Cold Task Animals: Describe the simple functions of the basic parts of the digestive system in humans
2	Retrieval – last lesson States of Matter: Compare and group materials together, according to whether they are solids, liquids or gases	Retrieval – last lesson Sound: Identify how sounds are made, associating some of them with something vibrating.	Retrieval – last lesson Animals: Describe the simple functions of the basic parts of the digestive system in humans
3	Retrieval – Comparison States of Matter: Observe that some materials change state when they are heated or cooled and measure the temperature at which this happens in °C.	Retrieval – vibrations Sound: Recognise that vibrations from sounds travel through a medium to the ear.	Retrieval – Digestion Animals: Identify the different types of teeth in humans and their simple functions
4	Experiment – Changes in State	Retrieval – ear Sound: Recognise that vibrations from sounds travel through a medium to the ear.	Retrieval – Teeth Animals: Construct and interpret a variety of food chains, identifying producers, predators and prey.
5	Retrieval – last lesson States of Matter: Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with	Experiment – Sound	Retrieval – Food Chains Animals: Construct and interpret a variety of food chains, identifying producers, predators and prey.

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	temperature		<i>It's time to shine!</i>
6	Retrieval – evaporation/condensation States of Matter: Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	POP Task – Sound	POP Task – Animals including humans
7	POP Task – States of Matter	British Science Week Work	What do we know? – Cold Task Plants: Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
8	What do we know? – Cold Task Animals including humans: 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.	British Science Week Work	Retrieval – Functions of parts Plants: Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow).
9	Retrieval – last lesson Animals including humans: 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.	Class chosen Science project <i>Include an experiment</i>	Retrieval – Functions of parts Plants: Investigate the way in which water is transported within plants.
10	Retrieval – nutrition Animals including humans: Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Class chosen Science project <i>Include an experiment</i>	Retrieval – Water transportation Plants: Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Experiment – Plants
11	Retrieval – last lesson Animals including humans: Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Any catch up / Consolidation	Experiment – Plants
12	POP Task – Animals including Humans	Begin Summer term's work	POP Task – Plants

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Years 3/4 Teaching Sequence for Science (Milestone 2) CYCLE B <i>Threshold Concepts</i>			
Weeks	Autumn Term	Spring Term	Summer Term
Topic Title:	Rocks (Y3) <i>Investigate materials</i> <i>Work scientifically</i> Forces (Y3) <i>Understand movement, forces and magnets</i> <i>Work scientifically</i>	Living Things and their Habitats (Y4) <i>Investigate living things</i> <i>Work scientifically</i> British Science Week <i>Work scientifically</i>	Electricity (Y4) <i>Understand electrical circuits</i> <i>Work scientifically</i> Light (Y3) <i>Understand light and seeing</i> <i>Work scientifically</i>
1	What do we know? – Cold Task Rocks: Compare and group together different types of rocks on the basis of their appearance and simple physical properties.	What do we know? – Cold Task Living Things: Recognise that living things can be grouped in a variety of ways	What do we know? – Cold Task Electricity: Identify common appliances that run on electricity.
2	Retrieval – Comparison Rocks: Relate the simple physical properties of some rocks to their formation (igneous or sedimentary).	Retrieval – Last lesson Living Things: Recognise that living things can be grouped in a variety of ways	Retrieval – Appliances Electricity: Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
3	Retrieval – last lesson Rocks: Describe in simple terms how fossils are formed when things that have lived are trapped within the rock.	Retrieval – Grouping Living Things: Explore and use classification keys to help group, identify and name a variety of living things in their local/wider environment	Retrieval – simple circuit Electricity: Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
4	Retrieval – Fossils Rocks: Recognize that soils are made from rocks and organic matter	Retrieval – Last lesson Living Things: Explore and use classification keys to help group, identify and name a variety of living things	Retrieval – series circuits Electricity: Identify whether or not a lamp will light in a simple series circuit, based on whether

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		in their local/wider environment	or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
5	POP Task – Rocks	Retrieval – Classification Living Things: Recognize that environments can change and this can sometimes pose dangers to living things	Retrieval – open/closing circuits Electricity: Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
6	What do we know? – Cold Task Forces	POP Task – Living Things and their Habitats	Retrieval – open/closing circuits Experiment – Electricity Electricity: Recognise some common conductors and insulators, and associate metals with being good conductors.
7	Experiment – Forces Forces: Compare how things move on different surfaces.	British Science Week Work	POP Task – Electricity
8	Retrieval – Different Surfaces Forces: Notice that some forces need contact between 2 objects but magnetic forces can act at a distance. Observe how magnets attract/repel each other and attract some materials and not others..	British Science Week Work	What do we know? – Cold Task Light: Recognise that they need light in order to see things and that dark is the absence of light
9	Retrieval – Last lesson Forces: Describe magnets as having 2 poles Predict whether 2 magnets will attract or repel each other, depending on which poles are facing	Class chosen Science project Include an experiment	Retrieval – Light sources Light: Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.
10	Experiment – Magnets Forces: Compare and group together a variety of everyday materials on the basis of whether	Class chosen Science project Include an experiment	Retrieval – reflection / protection Light: Recognise that shadows are formed when the light from a light source is blocked by an

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	they are attracted to a magnet, and identify some magnetic materials.		opaque object.
11	POP Task – Forces	Any catch up / Consolidation / You can begin the summer units	<i>Retrieval – shadows</i> Experiment – Light Light: Find patterns in the way the size of shadows change.
12	Any catch up / Consolidation	Any catch up / Consolidation / You can begin the summer units	POP Task – Light

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