

# St Anselm's Science Curriculum Map 2022-23



## Intent

At St Anselm's we provide a high-quality science curriculum that builds a foundation for children to confidently explore and foster an appreciation for the world around them; both for living and non-living things. We aim to explore science from the lens of our Catholic faith to ensure children become positive contributors to the future of our world as God's stewards.

Our curriculum exposes children to a diverse selection of key scientists in order to build cultural capital and to challenge the stereotypes that children may see. We believe this will inspire children to break down stereotypes and learn that they, no matter their background or abilities, can achieve in science.

Through careful consideration to the sequence of topics, children build on previous knowledge, skills and vocabulary each year to ensure that learning is progressive. Consequently, their acquisition of key concepts is meaningful and they understand the relevance of such concepts to their lives. This is also underpinned through the incorporation of appropriate scientific enquiries into lessons to develop children's abilities to work scientifically.

At St Anselm's all science lessons follow the national curriculum for science, which aims to ensure that all pupils:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.


**N.B. This document has been adapted from PLAN to reflect the learning at St. Anselm's.**

# St Anselm's Science Curriculum Map 2022-23

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Reception</b>	Humans Seasonal Changes		Living Things and Their Habitats Animals excluding Humans Seasonal Changes		Materials including Changing Materials Forces Seasonal Changes	
	Note: Some topics within Reception may appear and be revisited throughout the year.					
<b>Year 1</b>	Animals including Humans	Seasonal Changes (Autumn and Winter)	Materials	Materials	Plants	Seasonal Changes (Spring and Summer)
<b>Year 2</b>	Animals including Humans	Everyday Materials (Uses of)	Living Things and Their Habitats	Living Things and Their Habitats	Plants	Plants
<b>Year 3</b>	Rocks and Fossils	Animals including Humans	Light	Plants	Plants	Forces and Magnets
<b>Year 4</b>	Animals including Humans	Living Things and Their Habitats	Electricity	Electricity	States of Matter	Sound
<b>Year 5</b>	Forces	Earth and Space	Properties and Changes of Materials	Properties and Changes of Materials	Living Things and Their Habitats	Animals including Humans
<b>Year 6</b>	Light	Electricity	Evolution and Inheritance	Living Things and Their Habitats	Animals including Humans	Animals including Humans

# Reception

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	Reception	<b>Topic</b>	Animals, excluding humans
	<b>Understanding the World</b>			
	<ul style="list-style-type: none"> <li>Recognise some environments that are different to the one in which they live.</li> </ul>			
	<b>Links with other areas of learning</b>			
	<p><b>Physical Development</b></p> <ul style="list-style-type: none"> <li>Revise and refine the fundamental movement skills they have already acquired: rolling; crawling; walking; jumping; running; hopping; skipping; climbing.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Understand the key features of the life cycle of a plant and an animal. (Nursery)</li> <li>Begin to understand the need to respect and care for the natural environment and all living things. (Nursery)</li> </ul>	<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 – Animals, including humans)</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 – Animals, including humans)</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)</li> </ul>

## CREATING APPROPRIATE EXPERIENCES TO INITIATE LEARNING

What adults might provide	What adults might do
<p><b>Opportunities to learn about animals from a different habitat</b></p> <ul style="list-style-type: none"> <li>Sharing books about animals in the local area and animals in other countries e.g. jungle, polar regions, desert, ocean</li> <li>Looking at pictures of animals in different habitats</li> <li>Watching videos of animals in different habitats</li> <li>Playing games involving matching animals to their habitats</li> <li>Playing with small world animals in different habitats</li> <li>Visiting the zoo, focusing on animals that live in different habitats</li> <li>Caring for pets from a different habitat e.g. tropical fish</li> <li>Creating pictures of animals in their habitats</li> <li>Pretending to be animals</li> <li>Naming and describing animals they see in books, pictures, videos or while on a trip</li> <li>Describing different habitats</li> </ul>	<ul style="list-style-type: none"> <li>Encourage children to name and describe animals that live in different habitats while reading books, watching videos, looking at pictures or playing matching games.</li> <li>Encourage children to ask questions about different animals and the habitats they live in.</li> <li>Encourage children to describe habitats.</li> <li>Encourage children to talk about how animals are cared for when they live outside their natural habitat.</li> <li>Encourage children to move like different animals.</li> </ul> <p style="text-align: center;"><b>Encouraging scientific enquiry</b></p> <p><i>Classification</i></p> <ul style="list-style-type: none"> <li>Sort animals according to where they live.</li> </ul>

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	<p><i>Researching using secondary sources</i></p> <ul style="list-style-type: none"> <li>• Learn how animals from a different habitat are cared for.</li> <li>• Learn about animals in a different habitat.</li> </ul>
<b>Vocabulary</b>	<b>Common misconceptions</b>
<p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> <li>• names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice</li> </ul> <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> <li>• environment, polar regions, ocean, camouflage</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• animals are furry and have four legs</li> <li>• a bee is not an animal because it is an insect</li> <li>• animals adapt to their surroundings, e.g. a brown bear turns white and becomes a polar bear</li> <li>• animals living in the soil breathe by coming to the surface</li> <li>• dragons and other mythical creatures are real animals.</li> </ul>
<b>Linked texts</b>	<b>Linked careers</b>
<p><i>Other texts</i></p> <ul style="list-style-type: none"> <li>• Lost and Found by Oliver Jeffers</li> <li>• Shark in the Park by Nick Sharratt</li> <li>• One Day on our Blue Planet: In the Antarctic by Ella Bailey</li> <li>• Poles Apart by Jeanne Willis</li> <li>• Monkey with a Bright Blue Bottom by Steve Smallman</li> <li>• Walking through the Jungle by Julie Lacombe</li> <li>• How many legs? by Kes Gray</li> <li>• What do you do with a tail like this? by Steve Jenkins</li> <li>• The Rainbow Bear by Michael Morpurgo</li> <li>• We're Going on a Bear Hunt by Michael Rosen and Helen Oxenbury</li> <li>• Bears by Sally Morgan</li> <li>• Usborne Beginners Bears by Helen Helbrough</li> </ul>	<p><b>Opportunities in the role-play corner to care for animals that live in different environments</b></p> <ul style="list-style-type: none"> <li>• Zookeeper</li> <li>• Safari centre</li> <li>• Aquarium</li> <li>• Explorer/Naturalist</li> </ul>

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## HOW CHILDREN MIGHT SHOW THEIR LEARNING

### Characteristics of effective teaching and learning

- Playing and exploring – children investigate and experience things, and 'have a go'
- Active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- Creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things

### Demonstrating skills and showing understanding

#### What a child might be doing

**Children ask questions, make observations and talk about what they have found out about:**

- animals from a different habitat.


**Children sort:**

- animals.

#### Possible evidence of learning

- Can name and describe animals that live in different habitats.
- Can describe different habitats.

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	Reception	<b>Topic</b>	Humans
	<b>Understanding the World</b>			
	<ul style="list-style-type: none"> <li>• Talk about members of their immediate family and community.</li> <li>• Name and describe people who are familiar to them.</li> </ul>			
	<b>Links with other areas of learning</b>			
	<p><b>Personal, Social and Emotional Development</b></p> <ul style="list-style-type: none"> <li>• See themselves as a valuable individual.</li> <li>• Manage their own needs.</li> </ul> <p><b>Physical Development</b></p> <ul style="list-style-type: none"> <li>• Know and talk about the different factors that support their overall health and wellbeing: regular physical activity; healthy eating; toothbrushing; sensible amounts of 'screen time'; having a good sleep routine; being a safe pedestrian.</li> <li>• Further develop the skills they need to manage the school day successfully: lining up and queuing; mealtimes; personal hygiene.</li> </ul> <p><b>Mathematics</b></p> <ul style="list-style-type: none"> <li>• Compare length, weight and capacity.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Use all their senses in hands-on exploration of natural materials. (Nursery)</li> <li>• Begin to make sense of their own life-story and family's history. (Nursery)</li> <li>• Understand the key features of the life cycle of a plant and an animal. (Nursery)</li> <li>• Begin to understand the need to respect and care for the natural environment and all living things. (Nursery)</li> </ul>	<ul style="list-style-type: none"> <li>• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 – Animals, including humans)</li> </ul>

CREATING APPROPRIATE EXPERIENCES TO INITIATE LEARNING	
What adults might provide	What adults might do
<p><b>Opportunities to describe people who are familiar to them</b></p> <ul style="list-style-type: none"> <li>• Talking about themselves, friends, family and community using photographs</li> <li>• Using mirrors to look at their faces</li> <li>• Creating pictures or collages of themselves, friends, family and community</li> <li>• Making hand and footprints using paint</li> <li>• Making fingerprints using ink pads</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to look at photographs of different people and to describe them.</li> <li>• Encourage children to describe their friends and family using photographs to help them.</li> <li>• Encourage children to talk about how their friends and family are the same and different.</li> <li>• Encourage children to compare themselves to characters in books.</li> </ul>

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<ul style="list-style-type: none"> <li>Using a 'magic' mirror which shows everything about them and getting children to describe themselves and how they are special</li> <li>Sharing books about different types of families</li> </ul> <p><b>Opportunities to learn about how to take care of themselves</b></p> <ul style="list-style-type: none"> <li>Demonstrating and talking about how they look after themselves</li> <li>Talking about other people that look after them</li> <li>Talking to a dentist, nurse, meal supervisor/school cook, road crossing supervisor etc.</li> <li>Sharing videos of people who care for us and how we look after ourselves</li> </ul>	<ul style="list-style-type: none"> <li>Encourage children to compare their hand, foot and fingerprints with their friends.</li> <li>Encourage children to talk about the people who look after them, both within their family and the wider community e.g. teachers, doctors, dentists etc.</li> <li>Encourage children to ask a dentist, nurse, meal supervisor/school cook, road crossing supervisor etc. questions.</li> </ul> <p style="text-align: center;"><b>Encouraging scientific enquiry</b></p> <p><i>Classification</i></p> <ul style="list-style-type: none"> <li>Sort images of people according to their characteristics.</li> </ul> <p><i>Researching using secondary sources</i></p> <ul style="list-style-type: none"> <li>Find out information from visitors (dentist, nurse etc.).</li> </ul> <p><i>Pattern seeking</i></p> <ul style="list-style-type: none"> <li>Are taller children faster?</li> <li>Are taller children stronger?</li> </ul>
<b>Vocabulary</b>	<b>Common misconceptions</b>
<p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> <li>hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman</li> </ul> <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> <li>bald, elderly, wrinkles, male, female, freckles</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>sons look like their fathers and daughters look like their mothers.</li> </ul>
<b>Linked texts</b>	<b>Linked careers</b>
<p><i>Other texts</i></p> <ul style="list-style-type: none"> <li>I Love My Hair by Natasha Anastasia Tarpley</li> <li>What I Like About Me by Alia Zobel-Nolan</li> </ul>	<p><b>Opportunities in the role-play corner to show how people take care of them</b></p> <ul style="list-style-type: none"> <li>Doctor</li> <li>Nurse</li> <li>Dentist</li> <li>Optician</li> </ul>



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## HOW CHILDREN MIGHT SHOW THEIR LEARNING

### Characteristics of effective teaching and learning

- Playing and exploring – children investigate and experience things, and 'have a go'
- Active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- Creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things

### Demonstrating skills and showing understanding

#### What a child might be doing

**Children ask questions, make observations using simple equipment and talk about what they are doing and have found out while carrying out a range of activities, such as:**

- describing people who are familiar to them
- learning about how to take care of themselves.

**Children sort:**

- humans by their characteristics.


**Children record their observations when:**

- drawing themselves, their family, friends and community.

#### Possible evidence of learning

- Can describe themselves, family, friends and community.
- Can create pictures of themselves, family, friends and community and identify their distinguishing features.
- Can talk about what they see when using a mirror.
- Can compare hand, foot and fingerprints and talk about how they are different.
- Can talk about how they look after themselves and how other people look after them.

# St Anselm's Science Curriculum Map 2022-23

	Year	Reception	Topic	Living things and their habitats
	Understanding the World			
	<ul style="list-style-type: none"> <li>• Draw information from a simple map.</li> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel whilst outside.</li> <li>• Recognise some environments that are different to the one in which they live.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Use all their senses in hands-on exploration of natural materials.</li> <li>• Explore collections of materials with similar and/or different properties.</li> <li>• Begin to understand the need to respect and care for the natural environment and all living things.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 – Plants)</li> <li>• Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 – Plants)</li> <li>• Explore and compare the differences between things that are living, dead, and things that have never been alive. (Y2 – Living things in their habitat)</li> <li>• Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 – Living things in their habitat)</li> </ul>

CREATING APPROPRIATE EXPERIENCES TO INITIATE LEARNING	
What adults might provide	What adults might do
<p><b>Opportunities to explore the plants in the surrounding natural environment</b></p> <ul style="list-style-type: none"> <li>• Taking photographs of the plants they find in the school grounds</li> <li>• Observing closely and drawing the plants in the school grounds</li> <li>• Finding plants in the school grounds to match with photographs of them</li> <li>• Looking at aerial views to count the number of trees in the school grounds</li> <li>• Using a map of the school grounds, with pictures of where specific plants can be found, to find those plants</li> <li>• Creating a map to show how to find their favourite plants in the school grounds</li> </ul> <p><b>Opportunities to explore the animals in the surrounding natural environment</b></p> <ul style="list-style-type: none"> <li>• Finding minibeasts in the school grounds</li> <li>• Taking photographs of the minibeasts they find in the school grounds</li> </ul>	<ul style="list-style-type: none"> <li>• Support children to identify different plants e.g. trees, bushes, flowers, vegetables, herbs.</li> <li>• Ensure children are careful when exploring the plants and do not damage them in any way.</li> <li>• Encourage children to touch and smell the plants, when appropriate.</li> <li>• Encourage children to talk about the plants they find.</li> <li>• Support children to name the plants they find.</li> <li>• Encourage children to find the same plant in a different place.</li> <li>• Ensure children are careful when observing minibeasts and return them to where they found them.</li> <li>• Encourage children to talk about the minibeasts they find.</li> <li>• Support children to name the minibeasts they find.</li> </ul>

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<ul style="list-style-type: none"> <li>• Matching the minibeasts they find to pictures that identify them</li> <li>• Observing the minibeasts closely, using a magnifying glass or app on a tablet</li> <li>• Drawing pictures of the minibeasts</li> <li>• Creating a map to show where they found each type of minibeast</li> <li>• Sharing books about minibeasts</li> <li>• Playing with small world minibeasts</li> <li>• Building minibeast homes</li> </ul> <p><b>Opportunities to explore plants and animals in a contrasting natural environment</b></p> <ul style="list-style-type: none"> <li>• Visiting a contrasting natural environment e.g. forest, beach, etc.</li> <li>• Finding and taking photographs of plants and animals in the contrasting natural environment</li> <li>• Sharing non-fiction and fiction books about the contrasting natural environment visited</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to identify similarities and differences between the plants and animals they find in the surrounding natural environment and the contrasting one they visit.</li> <li>• Encourage children to ask questions about the plants and animals they find.</li> </ul> <p style="text-align: center;"><b>Encouraging scientific enquiry</b></p> <p><i>Classification</i></p> <ul style="list-style-type: none"> <li>• Name and describe plants and animals they find in the school grounds.</li> </ul> <p><i>Pattern seeking</i></p> <ul style="list-style-type: none"> <li>• Look for minibeasts in different areas of the school grounds.</li> <li>• Look for plants in different areas of the school grounds.</li> </ul>
<p><b>Vocabulary</b></p>	<p><b>Common misconceptions</b></p>
<p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> <li>• plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment e.g. beach, forest</li> </ul> <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> <li>• environment</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• trees are not plants</li> <li>• trees are not living as they do not seem to change or grow</li> <li>• weeds are bad plants.</li> </ul>
<p><b>Linked texts</b></p>	<p><b>Linked careers</b></p>
<p><i>Traditional stories and nursery rhymes</i></p> <ul style="list-style-type: none"> <li>• Incey, Wincey Spider</li> <li>• Ladybird, Ladybird Fly Away Home</li> </ul> <p><i>Other texts</i></p> <ul style="list-style-type: none"> <li>• Bad-Tempered Ladybird by Eric Carle</li> <li>• Mad About Minibeasts by David Wojtowycz &amp; Giles Andreae</li> <li>• Ben Plants a Butterfly Garden by Kate Petty</li> <li>• Norman the Slug with the Silly Shell by Sue Hendra</li> <li>• Aargh a Spider by Lydia Monks</li> <li>• Insects: A Close-up Look by Peter Seymour</li> </ul>	<p><b>Opportunities in the role-play corner to explore and compare plants and animals in the surrounding natural environment and a contrasting one</b></p> <ul style="list-style-type: none"> <li>• Botanist</li> <li>• Naturalist</li> <li>• Entomologist</li> <li>• Ecologist</li> <li>• Environmentalist</li> <li>• Environmental scientist</li> <li>• Beekeeper</li> </ul>

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<ul style="list-style-type: none"> <li>• Down at the Cool of the Pool by Tony Mitton</li> <li>• Over and Under the Pond by Kate Messner</li> <li>• Red Knit Cap Girl by Naoko Stoop</li> </ul>	
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## HOW CHILDREN MIGHT SHOW THEIR LEARNING

### Characteristics of effective teaching and learning

- Playing and exploring – children investigate and experience things, and ‘have a go’
- Active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- Creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things

### Demonstrating skills and showing understanding

#### What a child might be doing

**Children ask questions, make observations using simple equipment and talk about what they are doing and have found out while carrying out a range of activities, such as:**

- exploring the plants in the surrounding natural environment
- exploring the animals in the surrounding natural environment
- exploring plants and animals in a contrasting natural environment.


**Children record their observations when:**

- drawing plants and animals they find.

#### Possible evidence of learning

- Can name and describe plants and animals in the school grounds and their environment.
- Can talk about how another environment is different to their surrounding natural environment.
- Children do not damage the living things they encounter in the natural environment.

# St Anselm's Science Curriculum Map 2022-23

	Year	Reception	Topic	Seasonal changes
	Understanding the World			
	<ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel whilst outside.</li> <li>• Understand the effect of changing seasons on the natural world around them.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants &amp; Animals, excluding humans)</li> </ul>	<ul style="list-style-type: none"> <li>• Observe changes across the four seasons. (Y1 – Seasonal changes)</li> <li>• Observe and describe weather associated with the seasons and how day length varies. (Y1 – Seasonal changes)</li> </ul>

## CREATING APPROPRIATE EXPERIENCES TO INITIATE LEARNING

What adults might provide	What adults might do
<p><b>Opportunities to play and explore outside in all seasons and in different weather</b></p> <ul style="list-style-type: none"> <li>• Playing in the rain and snow</li> <li>• Drawing around puddles</li> <li>• Catching rain and hail in buckets</li> <li>• Catching snowflakes on frozen black paper and looking at them with magnifying glasses or an app on a tablet</li> <li>• Making icicles</li> <li>• Using scarves or pinwheels to explore the strength and direction of the wind</li> <li>• Looking at photographs of different seasons and types of weather</li> <li>• Sharing books about different seasons and types of weather</li> </ul> <p><b>Opportunities to observe living things throughout the year</b></p> <ul style="list-style-type: none"> <li>• Sharing books about the seasons</li> <li>• Going on seasonal walks to observe key features of the seasons</li> <li>• Making artwork with seasonal found objects</li> <li>• Visiting a canal or pond to look for birds and their young in spring</li> <li>• Visiting a farm to see the young animals in the spring</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to talk about how they feel in different types of weather/seasons.</li> <li>• Encourage children to talk about the clothes they wear in different seasons and why.</li> <li>• Encourage children to talk about the weather throughout the year.</li> <li>• Encourage children to find shelter or make shelters to keep themselves dry in the rain or shade themselves when it is sunny.</li> <li>• Encourage children to talk about how the ground changes when it rains.</li> <li>• Encourage children to measure the size of puddles using their feet after it rains.</li> <li>• Encourage children to talk about how puddles change over time after it rains.</li> <li>• Encourage children to talk about the animals and plants that they find in different seasons.</li> <li>• Encourage children to ask questions about the weather and seasonal changes.</li> </ul>

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<ul style="list-style-type: none"> <li>• Finding minibeasts in the school grounds at different times in the year</li> <li>• Taking photographs of the minibeasts they find in the school grounds at different times in the year</li> <li>• Looking for birds and other animals throughout the year using binoculars</li> <li>• Sharing books and videos about animals that migrate or hibernate over winter, gather food in autumn, build nests and lay eggs in spring etc.</li> <li>• Taking photographs of the plants they find in the school grounds at different times in the year</li> <li>• Observing closely and drawing the plants in the school grounds at different times in the year</li> <li>• Matching animals and plants they find to pictures that identify them</li> </ul>	<p style="text-align: center;"><b>Encouraging scientific enquiry</b></p> <p><i>Classification</i></p> <ul style="list-style-type: none"> <li>• Which clothes are suitable for each season?</li> </ul> <p><i>Observing over time</i></p> <ul style="list-style-type: none"> <li>• How does a puddle change over time?</li> <li>• How does a snowman change as it melts?</li> <li>• How does the natural world change with the seasons?</li> </ul> <p><i>Researching using secondary sources</i></p> <ul style="list-style-type: none"> <li>• Find out about how animals behave in different seasons.</li> <li>• Find out about the weather and seasons.</li> </ul>
<p><b>Vocabulary</b></p>	<p><b>Common misconceptions</b></p>
<p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> <li>• spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers</li> </ul> <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> <li>• hibernate, migrate, snowflake</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• it always snows in winter</li> <li>• it is always hot in the summer</li> <li>• all babies and young animals are born in spring</li> <li>• plants only have flowers in the spring and summer</li> <li>• animals sleep during winter</li> <li>• it rains to help the plants grow</li> <li>• when it is hotter, it is because the Sun is closer</li> <li>• God controls the weather.</li> </ul>
<p><b>Linked texts</b></p>	<p><b>Linked careers</b></p>
<p><i>Traditional stories and nursery rhymes</i></p> <ul style="list-style-type: none"> <li>• Rain, Rain Go Away</li> <li>• Rain on the Green Grass</li> <li>• It's Raining, It's Pouring</li> <li>• I Hear Thunder</li> </ul> <p><i>Other texts</i></p> <ul style="list-style-type: none"> <li>• Seasons by Anna Pang</li> <li>• Autumn is Here by Heidi Pross Gray</li> <li>• Spring is Here by Will Hillenbrand</li> <li>• One Springy Day by Nick Butterworth</li> <li>• WOW! It's Night-time by Tim Hopgood</li> <li>• Tree - Seasons Come, Seasons Go by Britta Teckentup</li> </ul>	<p><b>Opportunities in the role-play corner to talk about the weather throughout the year</b></p> <ul style="list-style-type: none"> <li>• Meteorologist</li> <li>• Weather presenter</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<ul style="list-style-type: none"> <li>• The Snowy Day by Ezra Jack Keats</li> <li>• The Snowman by Raymond Briggs</li> </ul>	
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## HOW CHILDREN MIGHT SHOW THEIR LEARNING


### Characteristics of effective teaching and learning

- Playing and exploring – children investigate and experience things, and ‘have a go’
- Active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- Creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things

### Demonstrating skills and showing understanding

What a child might be doing	Possible evidence of learning
<p><b>Children ask questions, make observations using simple equipment and talk about what they are doing and have found out while carrying out a range of activities, such as:</b></p> <ul style="list-style-type: none"> <li>• playing and exploring outside in all seasons and in different weather</li> <li>• observing living things throughout the year.</li> </ul> <p><b>Children use equipment to measure when:</b></p> <ul style="list-style-type: none"> <li>• exploring the size of puddles.</li> </ul> <p><b>Children sort:</b></p> <ul style="list-style-type: none"> <li>• clothes for different seasons.</li> </ul> <p><b>Children record their observations when:</b></p> <ul style="list-style-type: none"> <li>• observing plants, animals and puddles.</li> </ul>	<ul style="list-style-type: none"> <li>• Can talk about different types of weather.</li> <li>• Can talk about the four seasons.</li> <li>• Can talk about the living things they see in the playground and on visits during each season.</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	Year	Reception	Topic	Materials, including changing materials
	Understanding the World			
	<ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel whilst outside.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Use all their senses in hands-on exploration of natural materials. (Nursery)</li> <li>• Explore collections of materials with similar and/or different properties. (Nursery)</li> <li>• Talk about the differences between materials and changes they notice. (Nursery)</li> </ul>	<ul style="list-style-type: none"> <li>• Distinguish between an object and the material from which it is made. (Y1 – Everyday materials)</li> <li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 – Everyday materials)</li> <li>• Describe the simple physical properties of a variety of everyday materials. (Y1 – Everyday materials)</li> <li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 – Everyday materials)</li> </ul>

## CREATING APPROPRIATE EXPERIENCES TO INITIATE LEARNING

What adults might provide	What adults might do
<p><b>Opportunities to explore a range of materials in a sensory way, including natural materials</b></p> <ul style="list-style-type: none"> <li>• Looking for dew, ice, icicles and frost in the playground</li> <li>• Using their senses to explore natural materials in the environment, such as stones, twigs, leaves, feathers, seeds, flowers etc.</li> <li>• Gathering natural materials to make collections</li> </ul> <p><b>Opportunities to make objects from different materials, including natural materials</b></p> <ul style="list-style-type: none"> <li>• Making pictures using natural materials they have gathered from the environment</li> <li>• Making dens, nests, bug hotels etc. using natural materials</li> <li>• Making ice pictures by putting water in a shallow tray and adding natural objects gathered from the environment and then leaving them outside to freeze or putting them in the freezer</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to talk about the natural materials they explore, using their senses.</li> <li>• Encourage children to talk about the materials they are using when making pictures.</li> <li>• Encourage children to choose from a range of materials, including natural materials, when making models and identify a key property that was required.</li> <li>• Encourage children to reuse materials and talk about what can be recycled to care for the natural world.</li> <li>• Support children to list the properties the material has.</li> <li>• Encourage children to test that their model is fit for purpose and that the materials are suitable.</li> <li>• Encourage children to compare and describe how materials change over time and in different conditions.</li> </ul>



# St Anselm's Science Curriculum Map 2022-23

<ul style="list-style-type: none"> <li>• Making junk models with a range of materials, including natural materials they have gathered from the environment</li> </ul> <p><b>Opportunities to compare how materials change</b></p> <ul style="list-style-type: none"> <li>• Making popcorn in a microwave and on a fire</li> <li>• Making pizza dough with different flours</li> <li>• Baking bread in different tins or for different times to compare the outcome</li> <li>• Baking cupcakes and removing one after every five minutes</li> <li>• Choosing where to put ice cubes in the playground and observing how quickly they melt</li> <li>• Observing how a large block of ice changes over time, using string to measure around it</li> <li>• Putting wax crayons in different areas of the playground and observing how they change</li> <li>• Making a snowman and observing how it changes over time</li> <li>• Making snowballs and putting them in different parts of the playground and observing how they change over time</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to take photographs or draw pictures to record how materials change.</li> <li>• Encourage children to measure how objects change when they melt.</li> <li>• Encourage children to ask questions about materials and how they change.</li> </ul> <p style="text-align: center;"><b>Encouraging scientific enquiry</b></p> <p><i>Comparative testing</i></p> <ul style="list-style-type: none"> <li>• How does popcorn made in a microwave compare to popcorn made on a fire?</li> <li>• How quickly do ice cubes melt in different areas of the playground?</li> <li>• How are pizza bases different when made with different flours?</li> <li>• How does a loaf cook differently in different tins?</li> <li>• How do cupcakes cook if they have different amounts of mixture?</li> </ul> <p><i>Observing over time</i></p> <ul style="list-style-type: none"> <li>• How does the block of ice change over time?</li> <li>• How does a snowman change over time?</li> <li>• How does cake mixture/bread dough change as it is cooked?</li> </ul>
<p><b>Vocabulary</b></p>	<p><b>Common misconceptions</b></p>
<p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> <li>• ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back</li> </ul> <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> <li>• solid, liquid, gas, most suited</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• material only means fabric</li> <li>• all plastic/wood etc. is the same.</li> </ul>
<p><b>Linked texts</b></p>	<p><b>Linked careers</b></p>
	<p><b>Opportunities in the role-play corner to compare materials and explore how they change</b></p> <ul style="list-style-type: none"> <li>• Recycling centre worker</li> <li>• Product designer</li> <li>• Builder</li> <li>• Chef</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

## HOW CHILDREN MIGHT SHOW THEIR LEARNING

### Characteristics of effective teaching and learning

- Playing and exploring – children investigate and experience things, and 'have a go'
- Active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- Creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things

### Demonstrating skills and showing understanding

#### What a child might be doing

**Children ask questions, make observations using simple equipment and talk about what they are doing and have found out while carrying out a range of activities, such as:**

- exploring a range of materials in a sensory way, including natural materials
- making objects from different materials, including natural materials
- comparing how materials change.

**Children use equipment to measure when:**

- observing how objects melt.

**Children sort:**

- materials, including natural materials.


**Children record their observations when:**

- materials are changing over time or in different conditions.

#### Possible evidence of learning

- Can name the material they are using and why.
- Can talk about multiple properties of the material and why it is suited for its purpose.
- Can observe changes in their natural world and say why it is different now or will change in the future.
- Can compare and describe how materials change over time and in different conditions.

# St Anselm's Science Curriculum Map 2022-23

	Year	Reception	Topic	Forces
	Understanding the World			
	<ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel whilst outside.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Explore how things work. (Nursery)</li> <li>• Explore and talk about different forces they can feel. (Nursery)</li> <li>• Talk about the differences between materials and changes they notice. (Nursery)</li> </ul>	<ul style="list-style-type: none"> <li>• Compare how things move on different surfaces. (Y3 – Forces and magnets)</li> <li>• Observe how magnets attract or repel each other and attract some materials and not others. (Y3 – Forces and magnets)</li> <li>• 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. (Y3 – Forces and magnets)</li> <li>• Describe magnets as having two poles. (Y3 – Forces and magnets)</li> <li>• Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 – Forces and magnets)</li> <li>• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (Y5 – Forces)</li> <li>• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. (Y5 – Forces)</li> </ul>

CREATING APPROPRIATE EXPERIENCES TO INITIATE LEARNING	
What adults might provide	What adults might do
<p><b>Opportunities to explore how to change how things work</b></p> <ul style="list-style-type: none"> <li>• Adapting objects to see if they can be made to float or sink e.g. cutting and peeling fruit and vegetables, reshaping plasticene etc.</li> <li>• Testing how many small objects different foil containers can hold before sinking</li> <li>• Testing how toy cars move down ramps and gutters</li> <li>• Testing how wheels turn when sand or water is poured through them</li> <li>• Testing how objects fall with and without a parachute attached</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to talk about how they changed objects to make them float or sink.</li> <li>• Encourage children to count and record how small objects different 'boats' can hold before they sink.</li> <li>• Encourage children to talk about how they changed how the cars rolled down ramps/gutters.</li> <li>• Encourage children to talk about what happened when they poured sand/water through wheels and down gutters and how they changed this.</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<ul style="list-style-type: none"> <li>• Testing how different balls bounce</li> <li>• Making and testing paper aeroplanes</li> <li>• Designing different marble runs or routes for water/sand to travel down gutters or pipes</li> </ul> <p><b>Opportunities to explore how objects move in air</b></p> <ul style="list-style-type: none"> <li>• Identifying objects being blown around outdoors</li> <li>• Observing how different objects fall e.g. scarves, feathers</li> <li>• Observing how toys/objects move in the wind e.g. streamers, balloons, pinwheels, bubbles etc.</li> <li>• Comparing the movements of a ball and a balloon when bouncing or throwing and catching</li> </ul> <p><b>Opportunities to explore how objects move in water</b></p> <ul style="list-style-type: none"> <li>• Exploring how a marble moves through different liquids in sealed bottles</li> <li>• Observing how sailing boats move through water</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to compare how objects fall, including with or without parachutes.</li> <li>• Encourage children to explore and talk about how they changed how different balls bounced.</li> <li>• Encourage children to make different aeroplanes and compare how far they fly by marking where they land.</li> <li>• Encourage children to describe how sand or water moves down pipes or gutters, or marbles travel down a marble run, and how they changed this.</li> <li>• Encourage children to notice and talk about the objects in the playground that are moved by the wind.</li> <li>• Encourage children to explore and talk about what they observe when turning bottles filled with different liquids and a marble upside down.</li> <li>• Encourage children to ask questions about forces, such as “What happens if I ...”</li> </ul> <p style="text-align: center;"><b>Encouraging scientific enquiry</b></p> <p><i>Comparative testing</i></p> <ul style="list-style-type: none"> <li>• How many cubes/small plastic animals can fit in different ‘boats’?</li> <li>• Compare how cars move down ramps/gutters.</li> <li>• Compare how wheels turn when sand or water is poured through.</li> <li>• Compare how objects fall.</li> <li>• Compare how objects fall with and without parachutes.</li> <li>• Compare how different balls bounce.</li> <li>• Compare how things move when blown.</li> <li>• Compare how a marble moves through different liquids.</li> <li>• Compare how different paper aeroplanes fly.</li> </ul>
<p><b>Vocabulary</b></p>	<p><b>Common misconceptions</b></p>
<p>Model and encourage children to use vocabulary such as:</p> <ul style="list-style-type: none"> <li>• float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce</li> </ul> <p>Expose children to supplementary vocabulary such as:</p> <ul style="list-style-type: none"> <li>• force, rotate, solid, liquid, gravity</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• all light objects float and all heavy objects sink</li> <li>• objects made of the same material will always float or sink.</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

Linked texts	Linked careers
<p><i>Traditional stories and nursery rhymes</i></p> <ul style="list-style-type: none"> <li>Billy Goats Gruff</li> <li>Gingerbread Man (<i>making boats to cross the river</i>)</li> </ul> <p><i>Other texts</i></p> <ul style="list-style-type: none"> <li>Mr Gumpy's Outing by John Burningham</li> <li>Mr Archimedes' Bath by Pamela Allen</li> <li>Who sank the boat? by Pamela Allen</li> <li>Stickman by Julia Donaldson</li> <li>Flotsam by David Wiesner</li> <li>Blown Away by Rob Biddulph</li> </ul>	<p><b>Opportunities in the role-play corner to explore how to change how things work</b></p> <ul style="list-style-type: none"> <li>Boat builder</li> <li>Aircraft engineer</li> <li>Rocket designer</li> <li>Engineer</li> </ul>

## HOW CHILDREN MIGHT SHOW THEIR LEARNING

### Characteristics of effective teaching and learning


- Playing and exploring – children investigate and experience things, and 'have a go'
- Active learning – children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- Creating and thinking critically – children have and develop their own ideas, make links between ideas, and develop strategies for doing things

### Demonstrating skills and showing understanding

What a child might be doing	Possible evidence of learning
<p><b>Children ask questions, make observations and talk about what they are doing and have found out while carrying out a range of activities, such as:</b></p> <ul style="list-style-type: none"> <li>exploring how to change how things work</li> <li>exploring how the wind can move objects</li> <li>exploring how objects move in water.</li> </ul> <p><b>Children use equipment to measure when:</b></p> <ul style="list-style-type: none"> <li>pouring water and sand.</li> </ul> <p><b>Children record their observations when:</b></p> <ul style="list-style-type: none"> <li>testing boats and aeroplanes.</li> </ul>	<ul style="list-style-type: none"> <li>Can talk about how they changed objects to make them float or sink.</li> <li>Can talk about how they changed how cars move down ramps or gutters.</li> <li>Can talk about how they changed how wheels turn when sand or water is poured through them.</li> <li>Can talk about how they changed how balls bounce.</li> <li>Can compare how different boats and aeroplanes performed.</li> <li>Can describe how objects fall with and without a parachute.</li> <li>Can describe how a marble moves through different liquids.</li> </ul>

# Year 1

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	1	<b>Topic</b>	Plants
	<ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. (Early Learning Goal)</li> </ul>	<ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)</li> <li>Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)</li> <li>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants)</li> <li>Investigate the way in which water is transported within plants. (Y3 Plants)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key Learning	Impact
<p>Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.</p>	<ul style="list-style-type: none"> <li>Can name trees and other plants that they see regularly</li> <li>Can describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom</li> <li>Can point out trees which lost their leaves and those that kept them the whole year</li> <li>Can point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green</li> </ul>
Key vocabulary	
<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area</p>	

# St Anselm's Science Curriculum Map 2022-23

## Common misconceptions

Some children may think:

- plants are flowering plants grown in pots with colored petals and leaves and a stem
- trees are not plants
- all leaves are green
- all stems are green
- a trunk is not a stem
- blossom is not a flower.

## Apply knowledge in familiar related contexts, including a range of enquiries

### Activities

- Make close observations of leaves, seeds, flowers etc.
- Compare two leaves, seeds, flowers etc.
- Classify leaves, seeds, flowers etc. using a range of characteristics. **(Grouping & Classifying)**
- Identify plants by matching them to named images.
- Make observations of how plants change over a period of time. **(Observing over time)**
- When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them.

### Impact

- Can sort and group parts of plants using similarities and differences
- Can use simple charts etc. to identify plants
- Can collect information on features that change during the year
- Can use photographs to talk about how plants change over time

### Key Scientists


Beatrix Potter, John Ray

### Enrichment/ Curriculum Links/ Diversity/ BTK

- Local area plant/flower/tree hunt
- BTK - Caring for God's planet



# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	1	<b>Topic</b>	Animals, including humans
	<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</li> <li>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. (Early Learning Goal)</li> </ul>	<ul style="list-style-type: none"> <li>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. (Y2 - Living things and their habitats)</li> <li>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. (Y6 - Living things and their habitats)</li> <li>Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them.</p> <p>Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals.</p> <p>Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body.</p>	<ul style="list-style-type: none"> <li>Can name a range of animals which includes animals from each of the vertebrate groups</li> <li>Can describe the key features of these named animals</li> <li>Can label key features on a picture/diagram</li> <li>Can write descriptively about an animal</li> <li>Can write a What am I? riddle about an animal</li> <li>Can describe what a range of animals eat</li> <li>Can play and lead 'Simon says'</li> <li>During PE lessons, can follow instructions involving parts of the body</li> </ul>

# St Anselm's Science Curriculum Map 2022-23


<p style="text-align: center;"><b>Key vocabulary</b></p> <ul style="list-style-type: none"><li>• Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</li><li>• Names of animals experienced first-hand from each vertebrate group</li><li>• Parts of the body including those linked to PSHE teaching (see <a href="#">joint document produced by the ASE and PSHE Association</a>)</li><li>• Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue</li></ul> <p><b>N.B.</b> The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics.</p> <p>The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animals, not just meat.</p> <p>Although we often use our fingers and hands to feel objects, the children should understand that we can feel with many parts of our body.</p>	<ul style="list-style-type: none"><li>• Can label parts of the body on pictures and diagrams</li><li>• Can explore objects using different senses</li></ul>
<b>Common misconceptions</b>	
<p>Some children may think:</p> <ul style="list-style-type: none"><li>• only four-legged mammals, such as pets, are animals</li><li>• humans are not animals</li><li>• insects are not animals</li><li>• all 'bugs' or 'creepy crawlies', such as spiders, are part of the insect group</li><li>• amphibians and reptiles are the same.</li></ul>	

# St Anselm's Science Curriculum Map 2022-23

Apply knowledge in familiar related contexts, including a range of enquiries

Activities	Impact
<ul style="list-style-type: none"> <li>• Make first-hand, close observations of animals from each of the groups.</li> <li>• Compare two animals from the same or different groups.</li> <li>• Classify animals using a range of features. <b>(Grouping &amp; Classifying)</b></li> <li>• Identify animals by matching them to named images.</li> <li>• Classify animals according to what they eat. <b>(Grouping &amp; Classifying)</b></li> <li>• Make first-hand close observations of parts of the body e.g. hands, eyes.</li> <li>• Compare two people.</li> <li>• Take measurements of parts of their body.</li> <li>• Compare parts of their own body.</li> <li>• Look for patterns between people e.g. Do people with big hands have big feet? <b>(Comparative &amp; Fair Test)</b></li> <li>• Classify people according to their features. <b>(Grouping &amp; Classifying)</b></li> <li>• Investigate human senses e.g. Which part of my body is good for feeling, which is not? Which food/flavours can I identify by taste? Which smells can I match?</li> <li>• Research into the structure of different animal classifications <b>(Researching)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Can sort and group animals using similarities and differences</li> <li>• Can use simple charts etc. to identify unknown animals</li> <li>• Can create a drawing of an imaginary animal labelling its key features</li> <li>• Can use secondary resources to find out what animals eat, including talking to experts e.g. pet owners, zookeepers etc.</li> <li>• Can use first-hand close observations to make detailed drawings</li> <li>• Can name body parts correctly when talking about measurements and comparisons e.g. "My arm is x straws long." "My arm is x straws long and my leg is y straws long. My leg is longer than my arm." "We both have hands, but his are bigger than mine." "These people have brown eyes and these have blue."</li> <li>• Can talk about their findings from investigations using appropriate vocabulary e.g. "My fingers are much better at feeling than my toes" "We found that the crisps all taste the same."</li> </ul>
<b>Key Scientists</b>	Jane Goodall, Joan Beauchamp Procter
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• PE – Provide instructions involving body parts</li> <li>• Outdoor learning space - senses investigation</li> <li>• Diversity – Women in science (Joan Beauchamp Procter &amp; Jane Goodall)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	1	<b>Topic</b>	Everyday materials
	<ul style="list-style-type: none"> <li>• Distinguish between an object and the material from which it is made.</li> <li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</li> <li>• Describe the simple physical properties of a variety of everyday materials.</li> <li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. (Early Learning Goal)</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</li> <li>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons.</p> <p>Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties.</p>	<ul style="list-style-type: none"> <li>• Can label a picture or diagram of an object made from different materials</li> <li>• Can describe the properties of different materials</li> </ul>
Key vocabulary	
<p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p>	

# St Anselm's Science Curriculum Map 2022-23

## Common misconceptions

Some children may think:

- only fabrics are materials
- only building materials are materials
- only writing materials are materials
- the word 'rock' describes an object rather than a material
- 'solid' is another word for hard.

## Apply knowledge in familiar related contexts, including a range of enquiries

### Activities

- Classify objects made of one material in different ways e.g. a group of object made of metal. **(Grouping & Classifying)**
- Classify in different ways one type of object made from a range of materials e.g. a collection of spoons made of different materials. **(Grouping & Classifying)**
- Classify materials based on their properties. **(Grouping & Classifying)**
- Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters. **(Comparative & Fair Test)**

### Impact

- Can sort objects and materials using a range of properties
- Can choose an appropriate method for testing an object for a particular property
- Can use their test evidence to answer the questions about properties e.g. "Which cloth is the most absorbent?"


### Key Scientists

Charles Mackintosh, Ole Kirk Christiansen

### Enrichment/ Curriculum Links/ Diversity/ BTK

- Materials hunt around our school including in our outdoor learning space
- Literacy links - the story of 'The Three Little Pigs'

# St Anselm's Science Curriculum Map 2022-23

	Year	1	Topic	Seasonal changes
	<ul style="list-style-type: none"> <li>• Observe changes across the four seasons.</li> <li>• Observe and describe weather associated with the seasons and how day length varies.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. (Early Learning Goal)</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 – Light)</li> <li>• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 – Earth and space)</li> <li>• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.</p> <p>The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.</p>	<ul style="list-style-type: none"> <li>• Can name the four seasons and identify when in the year they occur</li> <li>• Can describe weather in different seasons over a year</li> <li>• Can describe days as being longer (in time) in the summer and shorter in the winter</li> <li>• Can describe other features that change through the year</li> </ul>


# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>		
<ul style="list-style-type: none"> <li>• Weather (sunny, rainy, windy, snowy etc.)</li> <li>• Seasons (winter, summer, spring, autumn)</li> <li>• Sun, sunrise, sunset, day length</li> </ul>		
<b>Common misconceptions</b>		
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• it always snows in winter</li> <li>• it is always sunny in the summer</li> <li>• there are only flowers in spring and summer</li> <li>• it rains most in the winter.</li> </ul>		
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>		
<b>Activities</b>	<b>Impact</b>	
<ul style="list-style-type: none"> <li>• Collect information about the weather regularly throughout the year.</li> <li>• Present this information in tables and charts to compare the weather across the seasons.</li> <li>• Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans.</li> <li>• Present this information in different ways to compare the seasons.</li> <li>• Gather data about day length regularly throughout the year and present this to compare the seasons. <b>(Observing over time)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Use the evidence gathered to describe the general types of weather and changes in day length over the seasons.</li> <li>• Use their evidence to describe some other features of their surroundings, e.g. themselves, animals, plants that change over the seasons</li> <li>• Demonstrate their knowledge in different ways e.g. making a weather forecast video, writing seasonal poetry, creating seasonal artwork</li> </ul>	
<b>Key Scientists</b>	George James Symons, Anders Celsius	
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Local environment walks to observe how things in the local area change with the seasons.</li> <li>• Diversity – Opportunities for children to explore how seasons look in areas of the world that they and their families come from.</li> </ul>	

# Year 2



# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	2	<b>Topic</b>	Living things and their habitat
	<ul style="list-style-type: none"> <li>• Explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>• 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</li> <li>• Identify and name a variety of plants and animals in their habitats, including micro-habitats</li> <li>• 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</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)</li> <li>• Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)</li> <li>• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)</li> <li>• Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans)</li> <li>• Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)</li> <li>• Observe changes across the four seasons. (Y1 - Seasonal changes)</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats)</li> <li>• Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats)</li> <li>• Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)</li> <li>• Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

## WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

### Show understanding of a concept using scientific vocabulary correctly

Key learning	Impact
<p>All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.)</p> <p>An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels).</p> <p>Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water.</p> <p>Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain.</p>	<ul style="list-style-type: none"> <li>• Can find a range of items outside that are living, dead and never lived</li> <li>• Can name a range of animals and plants that live in a habitat and micro-habitats that they have studied</li> <li>• Can talk about how the features of these animals and plants make them suitable to the habitat</li> <li>• Can talk about what the animals eat in a habitat and how the plants provide shelter for them</li> <li>• Can construct a food chain that starts with a plant and has the arrows pointing in the correct direction</li> </ul>
<p style="text-align: center;"><b>Key vocabulary</b></p>	
<ul style="list-style-type: none"> <li>• Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed</li> <li>• Names of local habitats e.g. pond, woodland etc.</li> <li>• Names of micro-habitats e.g. under logs, in bushes etc.</li> </ul>	

# St Anselm's Science Curriculum Map 2022-23

## Common misconceptions

Some children may think:

- an animal's habitat is like its 'home'
- plants and seeds are not alive as they cannot be seen to move
- fire is living
- arrows in a food chain mean 'eats'.

## Apply knowledge in familiar related contexts, including a range of enquiries

### Activities

- Explore the outside environment regularly to find objects that are living, dead and have never lived.
- Classify objects found in the local environment. **(Grouping & Classifying)**
- Observe animals and plants carefully, drawing and labelling diagrams.
- Create simple food chains for a familiar local habitat from first-hand observation and research.
- Create simple food chains from information given e.g. in picture books (Gruffalo etc.).
- Observing animals grow over time. **(Observing over time)**

### Impact

- Can sort into living, dead and never lived
- Can give key features that mean the animal or plant is suited to its micro-habitat
- Using a food chain can explain what animals eat
- Can explain in simple terms why an animal or plant is suited to a habitat e.g. the caterpillar cannot live under the soil like a worm as it needs fresh leaves to eat; the seaweed we found on the beach cannot live in our pond because it is not salty


### Key Scientists

Sylvia Earle, Sir Ernest Shackleton

### Enrichment/ Curriculum Links/ Diversity/ BTK

- Trip - Kew Gardens
- Diversity – Women in science (Sylvia Earle)
- Outdoor learning space - Identify living, dead and things that were never alive  
- Construct simple food chains from the school environment

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	2	<b>Topic</b>	Plants
	<ul style="list-style-type: none"> <li>• Observe and describe how seeds and bulbs grow into mature plants.</li> <li>• Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)</li> <li>• Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants)</li> <li>• Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. (Y3 - Plants)</li> <li>• Investigate the way in which water is transported within plants. (Y3 - Plants)</li> <li>• Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.	<ul style="list-style-type: none"> <li>• Can describe how plants that they have grown from seeds and bulbs have developed over time</li> <li>• Can identify plants that grew well in different conditions</li> </ul>
Key vocabulary	
As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy	

# St Anselm's Science Curriculum Map 2022-23

## Common misconceptions

Some children may think:

- plants are not alive as they cannot be seen to move
- seeds are not alive
- all plants start out as seeds
- seeds and bulbs need sunlight to germinate.

### Apply knowledge in familiar related contexts, including a range of enquiries

#### Activities

- Make close observations of seeds and bulbs.
- Classify seeds and bulbs. **(Grouping & Classifying)**
- Research and plan when and how to plant a range of seeds and bulbs. **(Research)**
- Look after the plants as they grow – weeding, thinning, watering etc.
- Make close observations and measurements of their plants growing from seeds and bulbs. **(Observing over time)**
- Make comparisons between plants as they grow.
- Do plants with bigger seeds grown taller? What do plants need to grow? **(Comparative & Fair Test)**

#### Impact

- Can spot similarities and difference between bulbs and seeds
- Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants


#### Key Scientists

Jane Colden, Agnes Arber

#### Enrichment/ Curriculum Links/ Diversity/ BTK

- Local Harrow walk to explore plants in the local are
- Diversity – Women in science (Jane Colden)
- BTK – Discuss how we should treat God's planets and His creations
- Maths links – measuring

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	2	<b>Topic</b>	Animals, including humans
	<ul style="list-style-type: none"> <li>• Notice that animals, including humans, have offspring which grow into adults.</li> <li>• Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</li> <li>• Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)</li> <li>• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>• 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 - Animals, including humans)</li> <li>• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats)</li> <li>• Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)</li> <li>• Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles.</p> <p>All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise.</p> <p>Good hygiene is also important in preventing infections and illnesses.</p>	<ul style="list-style-type: none"> <li>• Can describe how animals, including humans, have offspring which grow into adults, using the appropriate names for the stages</li> <li>• Can state the basic needs of animals, including humans, for survival</li> <li>• Can state the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> <li>• Can name foods in each section of the <a href="#">Eatwell Guide</a></li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	
<b>Common misconceptions</b>	
Some children may think:	
<ul style="list-style-type: none"> <li>• an animal's habitat is like its 'home'</li> <li>• all animals that live in the sea are fish</li> <li>• respiration is breathing</li> <li>• breathing is respiration.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>• Ask people questions and use secondary sources to find out about the life cycles of some animals. <b>(Researching)</b></li> <li>• Observe animals growing over a period of time e.g. chicks, caterpillars, a baby. <b>(Observing over time)</b></li> <li>• Ask questions of a parent about how they look after their baby.</li> <li>• Ask pet owners questions about how they look after their pet.</li> <li>• Explore the effect of exercise on their bodies.</li> <li>• Classify food in a range of ways, including using the <a href="#">Eatwell Guide</a>. <b>(Grouping &amp; Classifying)</b></li> <li>• Investigate washing hands, using glitter gel.</li> </ul>	<ul style="list-style-type: none"> <li>• Can describe, including using diagrams, the life cycle of some animals, including humans, and their growth to adults e.g. by creating a life cycle book for a younger child</li> <li>• Can measure/observe how animals, including humans, grow.</li> <li>• Show what they know about looking after a baby/animal by creating a parenting/pet owners' guide</li> <li>• Explain how development and health might be affected by differing conditions and needs being met/not met</li> </ul>
<b>Key Scientists</b>	Maria Sibylla Merian, Louis Pasteur
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Visit to Harrow School farm.</li> <li>• BTK – God's provision of all things on earth that are needed for living things.</li> <li>• Diversity – Women in science (Maria Sibylla Merian)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	2	<b>Topic</b>	Uses of everyday materials
	<ul style="list-style-type: none"> <li>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</li> <li>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)</li> <li>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)</li> <li>Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)</li> <li>Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)</li> </ul>	<ul style="list-style-type: none"> <li>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks)</li> <li>Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)</li> <li>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials)</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials.</p> <p>Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.</p>	<ul style="list-style-type: none"> <li>Can name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use</li> <li>Can label a picture or diagram of an object made from different materials</li> <li>For a given object can identify what properties a suitable material needs to have</li> </ul>




# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>		<ul style="list-style-type: none"> <li>• Whilst changing the shape of an object can describe the action used</li> <li>• Can use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those that cannot</li> <li>• Can recognise that a material may come in different forms which have different properties</li> </ul>
<p>Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard</p> <p>Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid</p> <p>Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>		
<b>Common misconceptions</b>		
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• only fabrics are materials</li> <li>• only building materials are materials</li> <li>• only writing materials are materials</li> <li>• the word rock describes an object rather than a material</li> <li>• solid is another word for hard.</li> </ul>		
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>		
<b>Activities</b>		<b>Impact</b>
<ul style="list-style-type: none"> <li>• Classify materials. <b>(Grouping &amp; Classifying)</b></li> <li>• Make suggestions about alternative materials for a purpose that are both suitable and unsuitable</li> <li>• Test the properties of materials for particular uses e.g. compare the stretchiness of fabrics to select the most appropriate for Elastigirl's costume, test materials for waterproofness to select the most appropriate for a rain hat. <b>(Comparative &amp; Fair Test)</b></li> </ul>		<ul style="list-style-type: none"> <li>• Can sort materials using a range of properties</li> <li>• Can explain using the key properties why a material is suitable or not suitable for a purpose</li> <li>• Can begin to choose an appropriate method for testing a material for a particular property</li> <li>• Can use their test evidence to select appropriate material for a purpose e.g. Which material is the best for a rain hat?</li> </ul>
<b>Key Scientists</b>	John Dunlop, Robert Gair	
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Local walk around Harrow to explore the materials used to build houses in the local area.</li> </ul>	

# Year 3

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	3	<b>Topic</b>	Plants
	<ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers.</li> <li>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</li> <li>Investigate the way in which water is transported within plants.</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)</li> </ul>	<ul style="list-style-type: none"> <li>Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)</li> <li>Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.</p>	<ul style="list-style-type: none"> <li>Can explain the function of the parts of a flowering plant</li> <li>Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination</li> <li>Can give different methods of pollination and seed dispersal, including examples</li> </ul>
Key vocabulary	
<p>Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)</p>	

# St Anselm's Science Curriculum Map 2022-23

## Common misconceptions

Some children may think:

- plants eat food
- food comes from the soil via the roots
- flowers are merely decorative rather than a vital part of the life cycle in reproduction
- plants only need sunlight to keep them warm
- roots suck in water which is then sucked up the stem.

## Apply knowledge in familiar related contexts, including a range of enquiries

### Activities

- Observe what happens to plants over time when the leaves or roots are removed. **(Observing over time)**
- Observe the effect of putting cut white carnations or celery in coloured water.
- Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space. **(Comparative & Fair Test)**
- Spot flowers, seeds, berries and fruits outside throughout the year.
- Observe flowers carefully to identify the pollen.
- Observe flowers being visited by pollinators e.g. bees and butterflies in the summer.
- Observe seeds being blown from the trees e.g. sycamore seeds.
- Research different types of seed dispersal. **(Researching)**
- Classify seeds in a range of ways, including by how they are dispersed. **(Grouping & Classifying)**
- Create a new species of flowering plant.
- Observe coloured water travelling up plant stem. **(Observing over time)**

### Impact

- Can explain observations made during investigations
- Can look at the features of seeds to decide on their method of dispersal
- Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal


### Key Scientists

Stephen Hales, Anna Atkins

### Enrichment/ Curriculum Links/ Diversity/ BTK

- Outdoor learning space – growing fruits and vegetables.
- Maths links – measuring units
- Diversity – Women in science (Anna Atkins)

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	3	<b>Topic</b>	Animals, including humans
	<ul style="list-style-type: none"> <li>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.</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 – Animals, including humans)</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 – Animals, including humans)</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)</li> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 – Animals, including humans)</li> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 – Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans. (Y4 – Animals, including humans)</li> <li>Identify the different types of teeth in humans and their simple functions. (Y4 – Animals, including humans)</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 – Animals, including humans)</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 – Animals, including humans)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients.</p> <p>Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.</p>	<ul style="list-style-type: none"> <li>Can name the nutrients found in food</li> <li>Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>		<ul style="list-style-type: none"> <li>• Can name some bones that make up their skeleton, giving examples that support, help them move or provide protection</li> <li>• Can describe how muscles and joints help them to move</li> </ul>
Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints		
<b>Common misconceptions</b>		
Some children may think:		
<ul style="list-style-type: none"> <li>• certain whole food groups like fats are 'bad' for you</li> <li>• certain specific foods, like cheese are also 'bad' for you</li> <li>• diet and fruit drinks are 'good' for you</li> <li>• snakes are similar to worms, so they must also be invertebrates</li> <li>• invertebrates have no form of skeleton.</li> </ul>		
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>		
<b>Activities</b>		<b>Impact</b>
<ul style="list-style-type: none"> <li>• Classify food in a range of ways. <b>(Grouping &amp; Classifying)</b></li> <li>• Use food labels to explore the nutritional content of a range of food items.</li> <li>• Use secondary sources to find out the types of food that contain the different nutrients.</li> <li>• Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks?</li> <li>• Plan a daily diet to contain a good balance of nutrients. <b>(Researching)</b></li> <li>• Explore the nutrients contained in fast food.</li> <li>• Use secondary sources to research the parts and functions of the skeleton. <b>(Researching)</b></li> <li>• Investigate patterns asking questions such as: <b>(Pattern Seeking)</b> <ul style="list-style-type: none"> <li>▪ Can people with longer legs run faster?</li> <li>▪ Can people with bigger hands catch a ball better?</li> </ul> </li> <li>• Compare, contrast and classify skeletons of different animals. <b>(Grouping &amp; Classifying)</b></li> </ul>		<ul style="list-style-type: none"> <li>• Can classify food into those that are high or low in particular nutrients</li> <li>• Can answer their questions about nutrients in food, based on their gathered evidence</li> <li>• Can talk about the nutrient content of their daily plan</li> <li>• Use their data to look for patterns (or lack of them) when answering their enquiry question</li> <li>• Can give similarities e.g. they all have joints to help the animal move, and differences between skeletons</li> </ul>
<b>Key Scientists</b>	Wilhelm Rontgen, Ibn Sina "Avicenna"	
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• PE links – investigating how the skeleton helps us to move.</li> <li>• Diversity – Scientists from different cultural backgrounds (Ibn Sina)</li> </ul>	

# St Anselm's Science Curriculum Map 2022-23

	Year	3	Topic	Rocks
	<ul style="list-style-type: none"> <li>• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</li> <li>• Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</li> <li>• Recognise that soils are made from rocks and organic matter.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)</li> <li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)</li> <li>• Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)</li> <li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)</li> <li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)</li> <li>• The composition of the Earth. (KS3)</li> <li>• The structure of the Earth. (KS3)</li> <li>• The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. (KS3)</li> </ul>


WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.</p> <p>Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.</p>	<ul style="list-style-type: none"> <li>• Can name some types of rock and give physical features of each</li> <li>• Can explain how a fossil is formed</li> <li>• Can explain that soils are made from rocks and also contain living/dead matter</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil	
<b>Common misconceptions</b>	
Some children may think: <ul style="list-style-type: none"> <li>rocks are all hard in nature</li> <li>rock-like, man-made substances such as concrete or brick are rocks</li> <li>materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural'</li> <li>certain found artefacts, like old bits of pottery or coins, are fossils</li> <li>a fossil is an actual piece of the extinct animal or plant</li> <li>soil and compost are the same thing.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>Observe rocks closely.</li> <li>Classify rocks in a range of ways, based on their appearance. <b>(Grouping &amp; Classifying)</b></li> <li>Devise a test to investigate the hardness of a range of rocks. <b>(Comparative &amp; Fair Test)</b></li> <li>Devise a test to investigate how much water different rocks absorb. <b>(Comparative &amp; Fair Test)</b></li> <li>Observe how rocks change over time e.g. gravestones or old building. <b>(Observing over time)</b></li> <li>Research using secondary sources how fossils are formed. <b>(Researching)</b></li> <li>Observe soils closely.</li> <li>Classify soils in a range of ways based on their appearance. <b>(Grouping &amp; Classifying)</b></li> <li>Devise a test to investigate the water retention of soils. <b>(Comparative &amp; Fair Test)</b></li> <li>Observe how soil can be separated through sedimentation.</li> <li>Research the work of Mary Anning. <b>(Researching)</b></li> </ul>	<ul style="list-style-type: none"> <li>Can classify rocks in a range of different ways, using appropriate vocabulary</li> <li>Can devise tests to explore the properties of rocks and use data to rank the rocks</li> <li>Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily</li> <li>Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc.</li> <li>Can identify plant/animal matter and rocks in samples of soil</li> <li>Can devise a test to explore the water retention of soils</li> </ul>
<b>Key Scientists</b>	Mary Anning, Florence Bascom
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>Outdoor learning space – Where can rocks be seen and what are their purposes? <ul style="list-style-type: none"> <li>Exploring types of soil</li> </ul> </li> <li>Diversity – Women in science (Mary Anning, Florence Bascom)</li> </ul>



# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	3	<b>Topic</b>	Light
	<ul style="list-style-type: none"> <li>Recognise that they need light in order to see things, and that dark is the absence of light.</li> <li>Notice that light is reflected from surfaces.</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li> <li>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</li> <li>Find patterns in the way that the size of shadows change.</li> </ul>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines. (Y6 - Light)</li> <li>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. (Y6 - Light)</li> <li>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. (Y6 - Light)</li> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (Y6 - Light)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective.</p> <p>The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light.</p> <p>Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.</p>	<ul style="list-style-type: none"> <li>Can describe how we see objects in light and can describe dark as the absence of light</li> <li>Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses</li> <li>Can define transparent, translucent and opaque</li> <li>Can describe how shadows are formed</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	
<b>Common misconceptions</b>	
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• we can still see even where there is an absence of any light</li> <li>• our eyes 'get used to' the dark</li> <li>• the moon and reflective surfaces are light sources</li> <li>• a transparent object is a light source</li> <li>• shadows contain details of the object, such as facial features on their own shadow</li> <li>• shadows result from objects giving off darkness.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>• Explore how different objects are more or less visible in different levels of lighting. <b>(Pattern Seeking)</b></li> <li>• Explore how objects with different surfaces, e.g. shiny vs matt, are more or less visible. <b>(Pattern Seeking)</b></li> <li>• Explore how shadows vary as the distance between a light source and an object or surface is changed. <b>(Pattern Seeking)</b></li> <li>• Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground.</li> <li>• Choose suitable materials to make shadow puppets.</li> <li>• Create artwork using shadows.</li> </ul>	<ul style="list-style-type: none"> <li>• Can describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change</li> <li>• Can clearly explain, giving examples, that objects are not visible in complete darkness</li> <li>• Can describe and demonstrate how shadows are formed by blocking light</li> <li>• Can describe, demonstrate and make predictions about patterns in how shadows vary</li> </ul>
<b>Key Scientists</b>	Iba al-Haytham "Alhazen", Lewis Latimer
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Outdoor learning space – Exploring shadows throughout the day.</li> <li>• Diversity – Scientists from different cultural backgrounds (Iba al-Haytham) - Scientists from different races (Lewis Latimer)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	3	<b>Topic</b>	Forces and magnets
	<ul style="list-style-type: none"> <li>• Compare how things move on different surfaces.</li> <li>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li> <li>• Observe how magnets attract or repel each other and attract some materials and not others.</li> <li>• 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.</li> <li>• Describe magnets as having two poles.</li> <li>• Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</li> </ul>	<ul style="list-style-type: none"> <li>• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (Y5 - Forces)</li> <li>• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. (Y5 - Forces)</li> <li>• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (Y5 - Forces)</li> <li>• Magnetic fields by plotting with compass, representation by field lines. (KS3)</li> <li>• Earth's magnetism, compass and navigation. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes.</p> <p>A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.</p>	<ul style="list-style-type: none"> <li>• Can give examples of forces in everyday life</li> <li>• Can give examples of objects moving differently on different surfaces</li> <li>• Can name a range of types of magnets and show how the poles attract and repel</li> <li>• Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets</li> </ul>


# St Anselm's Science Curriculum Map 2022-23

For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.	
<b>Key vocabulary</b>	
Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	
<b>Common misconceptions</b>	
Some children may think: <ul style="list-style-type: none"> <li>the bigger the magnet the stronger it is</li> <li>all metals are magnetic.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. <b>(Pattern Seeking)</b></li> <li>Explore what materials are attracted to a magnet. <b>(Comparative &amp; Fair Test)</b></li> <li>Classify materials according to whether they are magnetic. <b>(Grouping &amp; Classifying)</b></li> <li>Explore the way that magnets behave in relation to each other.</li> <li>Use a marked magnet to find the unmarked poles on other types of magnets.</li> <li>Explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table. <b>(Pattern Seeking)</b></li> <li>Devise an investigation to test the strength of magnets. <b>(Comparative &amp; Fair Test)</b></li> </ul>	<ul style="list-style-type: none"> <li>Can use their results to describe how objects move on different surfaces</li> <li>Can use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface</li> <li>Can use classification evidence to identify that some metals, but not all, are magnetic</li> <li>Through their exploration, they can show how like poles repel and unlike poles attract, and name unmarked poles</li> <li>Can use test data to rank magnets</li> </ul>
<b>Key Scientists</b>	John McAdam, Isaac Newton
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>Maths links – units of measure</li> </ul>

Year

4

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	4	<b>Topic</b>	Living things and their habitats
	<ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways.</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)</li> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)</li> <li>Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)</li> </ul>	<ul style="list-style-type: none"> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats)</li> <li>Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)</li> <li>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. (Y6 - Living things and their habitats)</li> <li>Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.</p> <p>Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year.</p>	<ul style="list-style-type: none"> <li>Can name living things living in a range of habitats, giving the key features that helped them to identify them</li> <li>Can give examples of how an environment may change both naturally and due to human impact</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>		
Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate		
<b>Common misconceptions</b>		
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain</li> <li>there is always plenty of food for wild animals</li> <li>animals are only land-living creatures</li> <li>animals and plants can adapt to their habitats, however they change</li> <li>all changes to habitats are negative.</li> </ul>		
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>		
<b>Activities</b>		<b>Impact</b>
<ul style="list-style-type: none"> <li>Observe plants and animals in different habitats throughout the year. <b>(Observing over Time)</b></li> <li>Compare and contrast the living things observed.</li> <li>Use classification keys to name unknown living things.</li> <li>Classify living things found in different habitats based on their features. <b>(Grouping &amp; Classifying)</b></li> <li>Create a simple identification key based on observable features.</li> <li>Use fieldwork to explore human impact on the local environment e.g. litter, tree planting.</li> <li>Use secondary sources to find out about how environments may naturally change. <b>(Researching)</b></li> <li>Use secondary sources to find out about human impact, both positive and negative, on environments. <b>(Researching)</b></li> </ul>		<ul style="list-style-type: none"> <li>Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.)</li> <li>Can use classification keys to identify unknown plants and animals</li> <li>Can present their learning about changes to the environment in different ways e.g. campaign video, persuasive letter</li> </ul>
<b>Key Scientists</b>	Rachel Carson, Jacques Cousteau	
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>Local walk to investigate cleanliness of the local environment (litter survey).</li> <li>Diversity – Women in science (Rachel Carson)</li> </ul>	

# St Anselm's Science Curriculum Map 2022-23

	Year	4	Topic	Animals, including humans
	<ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>Identify the different types of teeth in humans and their simple functions.</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)</li> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)</li> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)</li> <li>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 - Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Y6 - Animals, including humans)</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans)</li> </ul>


WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added.</p> <p>The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.</p> <p>Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).</p>	<ul style="list-style-type: none"> <li>Can sequence the main parts of the digestive system</li> <li>Can draw the main parts of the digestive system onto a human outline</li> <li>Can describe what happens in each part of the digestive system</li> <li>Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for</li> <li>Can name producers, predators and prey within a habitat</li> </ul>



# St Anselm's Science Curriculum Map 2022-23

Living things can be classified as producers, predators and prey according to their place in the food chain.	<ul style="list-style-type: none"> <li>• Can construct food chains</li> </ul>
<b>Key vocabulary</b>	
Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	
<b>Common misconceptions</b>	
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• arrows in a food chains mean 'eats'</li> <li>• the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain</li> <li>• there is always plenty of food for wild animals</li> <li>• your stomach is where your belly button is</li> <li>• food is digested only in the stomach</li> <li>• when you have a meal, your food goes down one tube and your drink down another</li> <li>• the food you eat becomes "poo" and the drink becomes "wee".</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>• Research the function of the parts of the digestive system. <b>(Researching)</b></li> <li>• Create a model of the digestive system using household objects.</li> <li>• Explore eating different types of food to identify which teeth are being used for cutting, tearing and grinding (chewing).</li> <li>• Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls. <b>(Grouping &amp; Classifying)</b></li> <li>• Use food chains to identify producers, predators and prey within a habitat.</li> <li>• Use secondary sources to identify animals in a habitat and find out what they eat.</li> <li>• Research the different teeth of animals. <b>(Researching)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Can use diagrams or a model to describe the journey of food through the body explaining what happens in each part</li> <li>• Can record the teeth in their mouth (make a dental record)</li> <li>• Can explain the role of the different types of teeth</li> <li>• Can explain how the teeth in animal skulls show they are carnivores, herbivores or omnivores</li> <li>• Can create food chains based on research</li> </ul>
<b>Key Scientists</b>	Marie M. Daly, Pierrie Fauchard
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Visit to Harrow School farm.</li> <li>• In-school digestive system workshop.</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	Year	4	Topic	States of matter
	<ul style="list-style-type: none"> <li>• Compare and group materials together, according to whether they are solids, liquids or gases.</li> <li>• 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).</li> <li>• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)</li> <li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)</li> <li>• Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)</li> <li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)</li> <li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</li> <li>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials)</li> <li>• Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. (Y5 - Properties and changes of materials)</li> <li>• Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (Y5 - Properties and changes of materials)</li> <li>• Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)</li> <li>• Demonstrate that dissolving, mixing and changes of state are reversible changes. (Y5 - Properties and changes of materials)</li> <li>• Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. (Y5 - Properties and changes of materials)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

## WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

### Show understanding of a concept using scientific vocabulary correctly

#### Key learning

A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.

Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0°C. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100°C. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.

Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.

#### Key vocabulary

Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle

#### Impact

- Can create a concept map, including arrows linking the key vocabulary
- Can name properties of solids, liquids and gases
- Can give everyday examples of melting and freezing
- Can give everyday examples of evaporation and condensation
- Can describe the water cycle

#### Common misconceptions

Some children may think:

- 'solid' is another word for hard or opaque
- solids are hard and cannot break or change shape easily and are often in one piece
- substances made of very small particles like sugar or sand cannot be solids
- particles in liquids are further apart than in solids and they take up more space
- when air is pumped into balloons, they become lighter
- water in different forms – steam, water, ice – are all different substances
- all liquids boil at the same temperature as water (100 degrees)
- melting, as a change of state, is the same as dissolving
- steam is visible water vapour (only the condensing water droplets can be seen)

# St Anselm's Science Curriculum Map 2022-23

- clouds are made of water vapour or steam
- the substance on windows etc. is condensation rather than water
- the changing states of water (illustrated by the water cycle) are irreversible
- evaporating or boiling water makes it vanish
- evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material.

Apply knowledge in familiar related contexts, including a range of enquiries

## Activities

- Observe closely and classify a range of solids. Observe closely and classify a range of liquids.
- Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind.
- Classify materials according to whether they are solids, liquids and gases. **(Grouping & Classifying)**
- Observe a range of materials melting e.g. ice, chocolate, butter.
- Investigate how to melt ice more quickly. **(Comparative & Fair Test)**
- Observe the changes when making rocky road cakes or ice-cream.
- Investigate the melting point of different materials e.g. ice, margarine, butter and chocolate. **(Comparative & Fair Test)**
- Explore freezing different liquids e.g. tomato ketchup, oil, shampoo.
- Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration).
- Observe water evaporating and condensing e.g. on cups of icy water and hot water. **(Observing over time)**
- Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on paper towels, liquids in containers. **(Pattern Seeking)**
- Use secondary sources to find out about the water cycle. **(Researching)**

## Impact

- Can give reasons to justify why something is a solid liquid or gas
- Can give examples of things that melt/freeze and how their melting points vary
- From their observations, can give the melting points of some materials
- Using their data, can explain what affects how quickly a solid melts
- Can measure temperatures using a thermometer
- Can explain why there is condensation on the inside the hot water cup but on the outside of the icy water cup
- From their data, can explain how to speed up or slow down evaporation
- Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet


## Key Scientists

Daniel Gabriel Fahrenheit, Antoine Lavoisier

## Enrichment/ Curriculum Links/ Diversity/ BTK

- Maths links – Measurement
- Geography links – Climate change and how humans are having an impact on the water cycle

# St Anselm's Science Curriculum Map 2022-23

	Year	4	Topic	Sound
	<ul style="list-style-type: none"> <li>• Identify how sounds are made, associating some of them with something vibrating.</li> <li>• Recognise that vibrations from sounds travel through a medium to the ear.</li> <li>• Find patterns between the pitch of a sound and features of the object that produced it.</li> <li>• Find patterns between the volume of a sound and the strength of the vibrations that produced it.</li> <li>• Recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>• Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. (KS3)</li> <li>• Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3)</li> <li>• Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3)</li> <li>• Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3)</li> <li>• Auditory range of humans and animals. (KS3)</li> <li>• Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3)</li> <li>• Waves transferring information for conversion to electrical signals by microphone. (KS3)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

## WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

### Show understanding of a concept using scientific vocabulary correctly

#### Key learning

A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.

The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively.

Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.

#### Key vocabulary

Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation

#### Impact

- Can name sound sources and state that sounds are produced by the vibration of the object
- Can state that sounds travel through different mediums such as air, water, metal
- Can give examples to demonstrate how the pitch of a sound are linked to the features of the object that produced it
- Can give examples of how to change the volume of a sound e.g. increase the size of vibrations by hitting or blowing harder
- Can give examples to demonstrate that sounds get fainter as the distance from the sound source increases

#### Common misconceptions

Pitch and volume are frequently confused, as both can be described as high or low.

Some children may think:

- sound is only heard by the listener
- sound only travels in one direction from the source
- sound can't travel through solids and liquids
- high sounds are loud and low sounds are quiet.

### Apply knowledge in familiar related contexts, including a range of enquiries

#### Activities

- Classify sound sources.
- Explore making sounds with a range of objects, such as musical instruments and other household objects.
- Explore how string telephones or ear gongs work.
- Explore altering the pitch or volume of objects, such as the length of a guitar string, amount of water in bottles, size of tuning forks. **(Pattern Seeking)**
- Measure sounds over different distances.
- Measure sounds through different insulation materials.


#### Possible evidence

- Can explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear
- Can demonstrate how to increase or decrease pitch and volume using musical instruments or other objects
- Can use data to identify patterns in pitch and volume

# St Anselm's Science Curriculum Map 2022-23

	<ul style="list-style-type: none"><li>• Can explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium</li></ul>
<b>Key Scientists</b>	James West, Alexander Graham Bell
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"><li>• Music links – exploring sounds in a range of contexts - exploring pitch, volume etc and how these can be changed</li></ul>

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	4	<b>Topic</b>	Electricity
	<ul style="list-style-type: none"> <li>• Identify common appliances that run on electricity.</li> <li>• Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li> <li>• 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.</li> <li>• Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</li> <li>• Recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. (Early Learning Goal)</li> </ul>	<ul style="list-style-type: none"> <li>• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. (Y6 - Electricity)</li> <li>• Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. (Y6 - Electricity)</li> <li>• Use recognised symbols when representing a simple circuit in a diagram. (Y6 - Electricity)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off.</p> <p>Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity.</p>	<ul style="list-style-type: none"> <li>• Can name the components in a circuit</li> <li>• Can make electric circuits</li> <li>• Can control a circuit using a switch</li> <li>• Can name some metals that are conductors</li> <li>• Can name materials that are insulators</li> </ul>




# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	
<b>N.B.</b> Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.	
<b>Common misconceptions</b>	
Some children may think: <ul style="list-style-type: none"> <li>• electricity flows to bulbs, not through them</li> <li>• electricity flows out of both ends of a battery</li> <li>• electricity works by simply coming out of one end of a battery into the component.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>• Construct a range of circuits.</li> <li>• Explore which materials can be used instead of wires to make a circuit.</li> <li>• Classify the materials that were suitable/not suitable for wires. <b>(Grouping &amp; Classifying)</b></li> <li>• Explore how to connect a range of different switches and investigate how they function in different ways. <b>(Comparative &amp; Fair Test)</b></li> <li>• Choose switches to add to circuits to solve particular problems, such as a pressure switch for a burglar alarm.</li> <li>• Apply their knowledge of conductors and insulators to design and make different types of switch.</li> <li>• Make circuits that can be controlled as part of a DT project.</li> </ul> <b>N.B.</b> Children should be given one component at a time to add to circuits.	<ul style="list-style-type: none"> <li>• Can communicate structures of circuits using drawings which show how the components are connected</li> <li>• Use classification evidence to identify that metals are good conductors and non-metals are insulators</li> <li>• Can incorporate a switch into a circuit to turn it on and off</li> <li>• Can connect a range of different switches identifying the parts that are insulators and conductors</li> <li>• Can add a circuit with a switch to a DT project and can demonstrate how it works</li> <li>• Can give reasons for choice of materials for making different parts of a switch</li> <li>• Can describe how their switch works</li> </ul>
<b>Key Scientists</b>	Hertha Ayrton, Joseph Swam
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• History links – How did electricity look different to today in the time of Oliver Twist?</li> </ul>

# Year 5

# St Anselm's Science Curriculum Map 2022-23

	Year	5	Topic	Living things and their habitats
	<ul style="list-style-type: none"> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>Describe the life process of reproduction in some plants and animals.</li> </ul>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)</li> </ul>	<ul style="list-style-type: none"> <li>Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. (KS3)</li> <li>Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.</p> <p>Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects.</p>	<ul style="list-style-type: none"> <li>Can draw the life cycle of a range of animals identifying similarities and differences between the life cycles</li> <li>Can explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	
<b>Common misconceptions</b>	
Some children may think: <ul style="list-style-type: none"> <li>• all plants start out as seeds</li> <li>• all plants have flowers</li> <li>• plants that grow from bulbs do not have seeds</li> <li>• only birds lay eggs.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>• Use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals.</li> <li>• Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth. <b>(Pattern Seeking)</b></li> <li>• Look for patterns between the size of an animal and its expected life span. <b>(Pattern Seeking)</b></li> <li>• Grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes.</li> <li>• Take cuttings from a range of plants e.g. African violet, mint.</li> <li>• Plant bulbs and then harvest to see how they multiply. <b>(Observing over time)</b></li> <li>• Use secondary sources to find out about pollination. <b>(Research)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Can present their understanding of the life cycle of a range of animals in different ways e.g. drama, pictorially, chronological reports, creating a game</li> <li>• Can identify patterns in life cycles</li> <li>• Can compare two or more animal life cycles they have studied</li> <li>• Can explain how a range of plants reproduce asexually</li> </ul>
<b>Key Scientists</b>	Mary Agnes Chase, David Attenborough
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• BTK – God's purpose for us on earth (reproduction)</li> <li>• Links to RHE curriculum</li> <li>• Trip - London Zoo</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	5	<b>Topic</b>	Animals, including humans
	<ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age.</li> </ul>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce.</p> <p>This needs to be taught alongside PSHE. The use of TenTen resources should be used to develop children's understanding of elements of this topic.</p>	<ul style="list-style-type: none"> <li>Can explain the changes that takes place in boys and girls during puberty</li> <li>Can explain how a baby changes physically as it grows, and also what it is able to do</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
Puberty – the vocabulary to describe sexual characteristics	
<b>Common misconceptions</b>	
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• a baby grows in a mother's tummy</li> <li>• a baby is "made".</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
This unit is likely to be taught through direct instruction due to its sensitive nature, although children can carry out a research enquiry by asking an expert e.g. school nurse to provide answers to questions that have been filtered by the teacher.	<ul style="list-style-type: none"> <li>• Can present information about the changes occurring during puberty as an information leaflet for other Y5 children or answers to 'problem page questions'</li> </ul>
<b>Key Scientists</b>	Elizabeth Blackwell, Patrick Steptoe, Robert Edwards & Jean Purdy
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Links to RHE curriculum</li> <li>• Diversity - Women in science (Elizabeth Blackwell, Jean Purdy)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	Year	5	Topic	Properties and changes of materials
	<ul style="list-style-type: none"> <li>• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</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> <li>• Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</li> <li>• Demonstrate that dissolving, mixing and changes of state are reversible changes.</li> <li>• Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 – Uses of everyday materials)</li> <li>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 – Uses of everyday materials)</li> <li>• Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 – States of matter)</li> <li>• 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). (Y4 – States of matter)</li> <li>• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Y4 – States of matter)</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical reactions as the rearrangement of atoms. (KS3)</li> <li>• Representing chemical reactions using formulae and using equations. (KS3)</li> <li>• Combustion, thermal decomposition, oxidation and displacement reactions. (KS3)</li> <li>• Defining acids and alkalis in terms of neutralization reactions. (KS3)</li> <li>• The pH scale for measuring acidity/alkalinity; and indicators. (KS3)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

## WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

### Show understanding of a concept using scientific vocabulary correctly

Key learning	Impact
<p>Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.</p> <p>Mixtures can be separated by filtering, sieving and evaporation.</p> <p>Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.</p>	<ul style="list-style-type: none"> <li>• Can use understanding of properties to explain everyday uses of materials, for example, how bricks, wood, glass and metals are used in buildings</li> <li>• Can explain what dissolving means, giving examples</li> <li>• Can name equipment used for filtering and sieving</li> <li>• Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving</li> <li>• Can describe some simple reversible and non-reversible changes to materials, giving examples</li> </ul>
<p><b>Key vocabulary</b></p>	
<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p>	

### Common misconceptions

Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed.

Some children may think:

- thermal insulators keep cold in or out
- thermal insulators warm things up
- solids dissolved in liquids have vanished and so you cannot get them back
- lit candles only melt, which is a reversible change.

### Apply knowledge in familiar related contexts, including a range of enquiries


Activities	Impact
<ul style="list-style-type: none"> <li>• Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat. <b>(Comparative &amp; Fair Test)</b></li> <li>• Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate. <b>(Comparative &amp; Fair Test)</b></li> <li>• Investigate rates of dissolving by carrying out comparative and fair test. <b>(Comparative &amp; Fair Test)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Can create a chart or table grouping/comparing everyday materials by different properties</li> <li>• Can use test evidence gathered about different properties to suggest an appropriate material for a particular purpose</li> </ul>



# St Anselm's Science Curriculum Map 2022-23

<ul style="list-style-type: none"> <li>Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture.</li> <li>Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning.</li> <li>Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced? <b>(Comparative &amp; Fair Test)</b></li> <li>Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).</li> </ul>		<ul style="list-style-type: none"> <li>Can group solids based on their observations when mixing them with water</li> <li>Can give reasons for choice of equipment and methods to separate a given solution or mixture such as salt or sand in water</li> <li>Can explain the results from their investigations</li> </ul>
<b>Key Scientists</b>	Spencer Silver & Arthur Fry, Stephanie Kwolek	
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>Diversity – Women in science (Stephanie Kwolek)</li> </ul>	

# St Anselm's Science Curriculum Map 2022-23

	Year	5	Topic	Earth and space
	<ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</li> <li>Describe the movement of the Moon relative to the Earth.</li> <li>Describe the Sun, Earth and Moon as approximately spherical bodies.</li> <li>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Observe changes across the four seasons. (Y1 - Seasonal changes)</li> <li>Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)</li> </ul>	<ul style="list-style-type: none"> <li>Gravity force, weight = mass x gravitational field strength (g), on Earth <math>g=10 \text{ N/kg}</math>, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). (KS3)</li> <li>Our Sun as a star, other stars in our galaxy, other galaxies. (KS3)</li> <li>The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3)</li> <li>The light year as a unit of astronomical distance. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes <math>365\frac{1}{4}</math> days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical.</p>	<ul style="list-style-type: none"> <li>Can create a voice over for a video clip or animation</li> <li>Can show, using diagrams, the movement of the Earth and Moon</li> <li>Can explain the movement of the Earth and Moon</li> <li>Can show using diagrams the rotation of the Earth and how this causes day and night</li> <li>Can explain what causes day and night</li> </ul>
<p><b>Key vocabulary</b></p>	
<p>Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets</p>	

# St Anselm's Science Curriculum Map 2022-23

## Common misconceptions

Some children may think:

- the Earth is flat
- the Sun is a planet
- the Sun rotates around the Earth
- the Sun moves across the sky during the day
- the Sun rises in the morning and sets in the evening
- the Moon appears only at night
- night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.

## Apply knowledge in familiar related contexts, including a range of enquiries

### Activities

- Use secondary sources to help create a model e.g. role play or using balls to show the movement of the Earth around the Sun and the Moon around the Earth. **(Research)**
- Use secondary sources to help make a model to show why day and night occur. **(Research)**
- Make first-hand observations of how shadows caused by the Sun change through the day. **(Observing over time)**
- Make a sundial.
- Research time zones.
- Consider the views of scientists in the past and evidence used to deduce shapes and movements of the Earth, Moon and planets before space travel.

### Impact

- Can use the model to explain how the Earth moves in relation to the Sun and the Moon moves in relation to the Earth
- Can demonstrate and explain verbally how day and night occur
- Can explain evidence gathered about the position of shadows in term of the movement of the Earth and show this using a model
- Can explain how a sundial works
- Can explain verbally, using a model, why we have time zones
- Can describe the arguments and evidence used by scientists in the past


### Key Scientists

Galleo Gallei, Mae Jerrison, Maggie Aderin-Pocock, Sanjeev Gupta

### Enrichment/ Curriculum Links/ Diversity/ BTK

- Trip - Science Museum / Planetarium visit into school.
- BTK and links to RE – Creation
- Cross-curricular links to English – 'Hidden Figures' and the work of Kathryn Johnson, Mary Jackson & Dorothy Vaughan

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	5	<b>Topic</b>	Forces
	<ul style="list-style-type: none"> <li>• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</li> <li>• Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</li> <li>• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>• Compare how things move on different surfaces. (Y3 – Forces and magnets)</li> <li>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 – Forces and magnets)</li> <li>• Observe how magnets attract or repel each other and attract some materials and not others. (Y3 – Forces and magnets)</li> <li>• 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. (Y3 – Forces and magnets)</li> <li>• Describe magnets as having two poles. (Y3 – Forces and magnets)</li> <li>• Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 – Forces and magnets)</li> </ul>	<ul style="list-style-type: none"> <li>• Forces as pushes or pulls, arising from the interaction between two objects. (KS3)</li> <li>• Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. (KS3)</li> <li>• Moment as the turning effect of a force. (KS3)</li> <li>• Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. (KS3)</li> <li>• Forces measured in Newtons, measurements of stretch or compression as force is changed. (KS3)</li> </ul>


WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.</p> <p>Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.</p> <p>A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long</p>	<ul style="list-style-type: none"> <li>• Can demonstrate the effect of gravity acting on an unsupported object</li> <li>• Can give examples of friction, water resistance and air resistance</li> <li>• Can give examples of when it is beneficial to have high or low friction, water resistance and air resistance</li> <li>• Can demonstrate how pulleys, levers and gears work</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<p>distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.</p>	
<p><b>Key vocabulary</b></p>	
<p>Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p>	
<p><b>Common misconceptions</b></p>	
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• the heavier the object the faster it falls, because it has more gravity acting on it</li> <li>• forces always act in pairs which are equal and opposite</li> <li>• smooth surfaces have no friction</li> <li>• objects always travel better on smooth surfaces</li> <li>• a moving object has a force which is pushing it forwards and it stops when the pushing force wears out</li> <li>• a non-moving object has no forces acting on it</li> <li>• heavy objects sink and light objects float.</li> </ul>	
<p><b>Apply knowledge in familiar related contexts, including a range of enquiries</b></p>	
<p><b>Activities</b></p>	<p><b>Impact</b></p>
<ul style="list-style-type: none"> <li>• Investigate the effect of friction in a range of contexts e.g. trainers, bathmats, mats for a helter-skelter. <b>(Comparative &amp; Fair Test)</b></li> <li>• Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water and pulling shapes, such as boats, along the surface of water. <b>(Comparative &amp; Fair Test)</b></li> <li>• Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats. <b>(Comparative &amp; Fair Test)</b></li> <li>• Explore how levers, pulleys and gears work.</li> <li>• Make a product that involves a lever, pulley or gear.</li> <li>• Create a timer that uses gravity to move a ball.</li> <li>• Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. <b>(Research)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Can explain the results of their investigations in terms of the force, showing a good understanding that as the object tries to move through the water or air or across the surface the particles in the water, air or on the surface slow it down</li> <li>• Can demonstrate clearly the effects of using levers, pulleys and gears</li> </ul>
<p><b>Key Scientists</b></p>	<p>Albert Einstein, Archimedes</p>
<p><b>Enrichment/ Curriculum Links/ Diversity/ BTK</b></p>	<ul style="list-style-type: none"> <li>• Trip – Science Museum</li> </ul>

# Year 6

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	6	<b>Topic</b>	Living things and their habitats
	<ul style="list-style-type: none"> <li>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</li> <li>Give reasons for classifying plants and animals based on specific characteristics.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats)</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats)</li> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats)</li> <li>Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)</li> </ul>	<ul style="list-style-type: none"> <li>Differences between species. (KS3)</li> </ul>


WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot.</p> <p>Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms.</p> <p>Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.</p>	<ul style="list-style-type: none"> <li>Can give examples of animals in the five vertebrate groups and some of the invertebrate groups</li> <li>Can give the key characteristics of the five vertebrate groups and some invertebrate groups</li> <li>Can compare the characteristics of animals in different groups</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>		<ul style="list-style-type: none"> <li>• Can give examples of flowering and non-flowering plants</li> </ul>
Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering		
<b>Common misconceptions</b>		
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• all micro-organisms are harmful</li> <li>• mushrooms are plants.</li> </ul>		
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>		
<b>Activities</b>		<b>Impact</b>
<ul style="list-style-type: none"> <li>• Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important. <b>(Research)</b></li> <li>• Use first-hand observation to identify characteristics shared by the animals in a group. <b>(Grouping &amp; Classifying)</b></li> <li>• Use secondary sources to research the characteristics of animals that belong to a group.</li> <li>• Use information about the characteristics of an unknown animal or plant to assign it to a group. <b>(Grouping &amp; Classifying)</b></li> <li>• Classify plants and animals, presenting this in a range of ways e.g. Venn diagrams, Carroll diagrams and keys. <b>(Grouping &amp; Classifying)</b></li> <li>• Create an imaginary animal which has features from one or more groups.</li> </ul>		<ul style="list-style-type: none"> <li>• Can use classification materials to identify unknown plants and animals</li> <li>• Can create classification keys for plants and animals</li> <li>• Can give a number of characteristics that explain why an animal belongs to a particular group</li> </ul>
<b>Key Scientists</b>	Carl Linnaeus, Marjory Stoneman Douglas	
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Outdoor learning space – Using classification keys to group plants</li> </ul>	



# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	6	<b>Topic</b>	Animals, including humans
	<ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)</li> <li>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 - Animals, including humans)</li> <li>Describe the simple functions of the basic parts of the digestive system in humans. (Y4 - Animals, including humans)</li> <li>Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans)</li> </ul>	<ul style="list-style-type: none"> <li>The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. (KS3)</li> <li>The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. (KS3)</li> <li>The structure and functions of the gas exchange system in humans, including adaptations to function. (KS3)</li> <li>The mechanism of breathing to move air in and out of the lungs. (KS3)</li> <li>The impact of exercise, asthma and smoking on the human gas exchange system. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system.</p> <p>Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins.</p>	<ul style="list-style-type: none"> <li>Can draw a diagram of the circulatory system and label the parts and annotate it to show what the parts do</li> <li>Produces a piece of writing that demonstrates the key knowledge e.g. explanation text, job description of the heart</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

## Key vocabulary

Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle

## Common misconceptions

Some children may think:

- your heart is on the left side of your chest
- the heart makes blood
- the blood travels in one loop from the heart to the lungs and around the body
- when we exercise, our heart beats faster to work the muscles more
- some blood in our bodies is blue and some blood is red
- we just eat food for energy
- all fat is bad for you
- all dairy is good for you
- protein is good for you, so you can eat as much as you want
- foods only contain fat if you can see it
- all drugs are bad for you.

## Apply knowledge in familiar related contexts, including a range of enquiries

### Activities

- Create a role play model for the circulatory system.
- Carry out a range of pulse rate investigations:
  - fair test – effect of different activities on my pulse rate
  - pattern seeking – exploring which groups of people may have higher or lower resting pulse rates
  - observation over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate)
  - pattern seeking – exploring recovery rate for different groups of people.
- Research the negative effects of drugs (e.g. tobacco) and the benefits of a healthy diet and regular exercise by asking an expert or using carefully selected secondary sources.

### Impact

- Use the role play model to explain the main parts of the circulatory system and their role
- Can use subject knowledge about the heart whilst writing conclusions for investigations
- Can explain both the positive and negative effects of diet, exercise, drugs and lifestyle on the body
- Present information e.g. in a health leaflet describing impact of drugs and lifestyle on the body


### Key Scientists

Marie Curie, Alexander Fleming

### Enrichment/ Curriculum Links/ Diversity/ BTK

- In-school heart workshop
- Links to RHE – Effects of drugs on the body

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	6	<b>Topic</b>	Evolution and inheritance
	<ul style="list-style-type: none"> <li>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</li> <li>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not 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>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>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. (Y2 – Living things and their habitats)</li> <li>Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 – Rocks)</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 – Living things and their habitats)</li> </ul>	<ul style="list-style-type: none"> <li>Heredity as the process by which genetic information is transmitted from one generation to the next. (KS3)</li> <li>A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. (KS3)</li> <li>The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. (KS3)</li> <li>Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other.</p> <p>Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution.</p>	<ul style="list-style-type: none"> <li>Can explain the process of evolution</li> <li>Can give examples of how plants and animals are suited to an environment</li> <li>Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth</li> <li>Give examples of living things that lived millions of years ago and the fossil evidence we have to support this</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<p>Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.</p>	<ul style="list-style-type: none"> <li>• Can give examples of fossil evidence that can be used to support the theory of evolution</li> </ul>
<p><b>Key vocabulary</b></p>	
<p>Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils, breed, changes, identical, non-identical, parents, reproduction, survive, survival of the fittest</p>	
<p><b>Common misconceptions</b></p>	
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life</li> <li>• offspring most resemble their parents of the same sex, so that sons look like fathers</li> <li>• all characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills, can be inherited</li> <li>• cavemen and dinosaurs were alive at the same time.</li> </ul>	
<p><b>Apply knowledge in familiar related contexts, including a range of enquiries</b></p>	
<p><b>Activities</b></p>	<p><b>Impact</b></p>
<ul style="list-style-type: none"> <li>• Design a new plant or animal to live in a particular habitat.</li> <li>• Use models to demonstrate evolution e.g. 'Darwin's finches' bird beak activity.</li> <li>• Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution.</li> <li>• Make observations of fossils to identify living things that lived on Earth millions of years ago.</li> <li>• Identify features in animals and plants that are passed on to offspring and explore this process by considering the artificial breeding of animals or plants e.g. dogs.</li> <li>• Compare the ideas of Charles Darwin and Alfred Wallace on evolution.</li> <li>• Research the work of Mary Anning and how this provided evidence of evolution.</li> </ul>	<ul style="list-style-type: none"> <li>• Can identify characteristics that will make a plant or animal suited or not suited to a particular habitat</li> <li>• Can link the patterns seen in the model to real examples</li> <li>• Can explain why the dominant colour of the peppered moth changed over a very short period of time</li> </ul>
<p><b>Key Scientists</b></p>	<p>Charles Darwin, Gregor Mendel</p>
<p><b>Enrichment/ Curriculum Links/ Diversity/ BTK</b></p>	<ul style="list-style-type: none"> <li>• BTK – Uniqueness of our world</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	<b>Year</b>	6	<b>Topic</b>	Light
	<ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines.</li> <li>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</li> <li>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</li> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>			


Prior learning	Future learning
<ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light. (Y3 - Light)</li> <li>Notice that light is reflected from surfaces. (Y3 - Light)</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)</li> <li>Recognise that shadows are formed when the light from a light source is blocked by an opaque object. (Y3 - Light)</li> <li>Find patterns in the way that the size of shadows change. (Y3 - Light)</li> </ul>	<ul style="list-style-type: none"> <li>The similarities and differences between light waves and waves in matter. (KS3)</li> <li>Light waves travelling through a vacuum; speed of light. (KS3)</li> <li>The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. (KS3)</li> <li>Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. (KS3)</li> <li>Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. (KS3)</li> <li>Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. (KS3)</li> </ul>

WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE	
Show understanding of a concept using scientific vocabulary correctly	
Key learning	Impact
<p>Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen.</p> <p>Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.</p>	<ul style="list-style-type: none"> <li>Can describe, with diagrams or models as appropriate, how light travels in straight lines either from sources or reflected from other objects into our eyes</li> <li>Can describe, with diagrams or models as appropriate, how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
As for Year 3 - Light, plus straight lines, light rays, emit, periscope	
<b>Common misconceptions</b>	
Some children may think:	
<ul style="list-style-type: none"> <li>we see objects because light travels from our eyes to the object.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>Explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card.</li> <li>Explore the uses of the behaviour of light, reflection and shadows, such as in periscope design, rear view mirrors and shadow puppets.</li> </ul>	<ul style="list-style-type: none"> <li>Can explain how evidence from enquiries shows that light travels in straight lines</li> <li>Can predict and explain, with diagrams or models as appropriate, how the path of light rays can be directed by reflection to be seen, e.g. the reflection in car rear view mirrors or in a periscope</li> <li>Can predict and explain, with diagrams or models as appropriate, how the shape of shadows can be varied</li> </ul>
<b>Key Scientists</b>	Thomas Edison, Edith Clarke
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>Diversity – Women in science (Edith Clarke)</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

	Year	6	Topic	Electricity
	<ul style="list-style-type: none"> <li>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</li> <li>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</li> <li>Use recognised symbols when representing a simple circuit in a diagram.</li> </ul>			

Prior learning	Future learning
<ul style="list-style-type: none"> <li>Identify common appliances that run on electricity. (Y4 - Electricity)</li> <li>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. (Y4 - Electricity)</li> <li>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. (Y4 - Electricity)</li> <li>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. (Y4 - Electricity)</li> <li>Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)</li> </ul>	<ul style="list-style-type: none"> <li>Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. (KS3)</li> <li>Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. (KS3)</li> <li>Differences in resistance between conducting and insulating components (quantitative). (KS3)</li> <li>Static electricity. (KS3)</li> </ul>

## WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE

### Show understanding of a concept using scientific vocabulary correctly

Key learning	Impact
<p>Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.</p> <p>You can use recognised circuit symbols to draw simple circuit diagrams.</p>	<ul style="list-style-type: none"> <li>Can make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs, can be changed by increasing or decreasing the number of cells or using cells of different voltages</li> <li>Can draw circuit diagrams of a range of simple series circuits using recognised symbols</li> </ul>

# St Anselm's Science Curriculum Map 2022-23

<b>Key vocabulary</b>	
Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage, components, function, volume	
<p><b>N.B.</b> Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words “cells” and “batteries” are now used interchangeably.</p>	
<b>Common misconceptions</b>	
<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• larger-sized batteries make bulbs brighter</li> <li>• a complete circuit uses up electricity</li> <li>• components in a circuit that are closer to the battery get more electricity.</li> </ul>	
<b>Apply knowledge in familiar related contexts, including a range of enquiries</b>	
<b>Activities</b>	<b>Impact</b>
<ul style="list-style-type: none"> <li>• Explain how a circuit operates to achieve particular operations, such as to control the light from a torch with different brightnesses or make a motor go faster or slower.</li> <li>• Make circuits to solve particular problems, such as a quiet and a loud burglar alarm.</li> <li>• Carry out fair tests exploring changes in circuits.</li> <li>• Make circuits that can be controlled as part of a DT project.</li> </ul>	<ul style="list-style-type: none"> <li>• Can incorporate a switch into a circuit to turn it on and off</li> <li>• Can change cells and components in a circuit to achieve a specific effect</li> <li>• Can communicate structures of circuits using circuit diagrams with recognised symbols</li> <li>• Can devise ways to measure brightness of bulbs, speed of motors, volume of a buzzer during a fair test</li> <li>• Can predict results and answer questions by drawing on evidence gathered</li> </ul>
<b>Key Scientists</b>	Michael Faraday, William Kamkwamba
<b>Enrichment/ Curriculum Links/ Diversity/ BTK</b>	<ul style="list-style-type: none"> <li>• Diversity – Scientists from different backgrounds (William Kamkwamba)</li> </ul>