# Science at Great Whelnetham C of E Primary School

## Year EYFS/Year 1

## Cycle 1

| Title<br>Autumn | Animals including Humans: Amazing Me! |
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| Overview | The aim of this unit is for children to begin identifying fascinating facts about their bodies and senses. They will identify, name, draw and label the basic body parts of the human body and say which part of the body is associated with each sense. They will notice that animals including humans have offspring, which grow into adults. They will find out about and describe the basic needs of animals, including humans, for survival. They will begin to understand the importance for humans of exercise, eating the right amounts of food, and hygiene. They will identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. They will identify and name a variety of common animals that are carnivores, herbivores and omnivores. |
| Knowledge Acquisition | At the end of this unit, children will be able to name most of their body parts and say which body part is associated with each sense.<br>They will have carried out scientific experiments to test the five senses. They will be able to recognise the different stages of the human life cycle. They will be able to use the correct name for adult and baby animals and be able to describe some common animals. They will be able to match adult animals with their offspring. Children will know what animals and humans need to survive. They will be able to say what foods are healthy and why exercise is important. Children will be able to identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. They will be able to identify and name a variety of common animals that are carnivores, herbivores and omnivores. |
| Key LOs | **To be able to draw, name, label human body parts, and say what part of the body is associated with what sense.**<br>**To be able to identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals.**<br>EYFS<br>• To know about the similarities and differences in relation to living things.<br>Year 1<br>• To be able to name and label basic human body parts<br>• To be able to recognise the different stages of the human life cycle<br>• To be able to say the five senses and know which part of the body is associated with which sense.<br>• To know what foods are considered healthy<br>• To be able to name and identify common animals<br>• To be able to sort and classify animals into groups |

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| | • To be able to name common animals that are carnivores, herbivores and omnivores.<br>• To be able to work scientifically |
| Key vocabulary | Body, label, sense, touch, smell, sight, hear, feel, lifecycle, human, offspring, toddler, teenager, adult, elderly, skeleton, muscle, heart, balanced diet, scientific, experiment, fish, birds, reptiles, amphibians, mammals, carnivore, herbivore, omnivore |
| Key Learning experiences | • Hands on experience with a skeleton<br>• BBC bitesize parts of my body video<br>• Body jigsaw<br>• Senses field walk<br>• Taste, sight, smell experiments<br>• Feely bag for touch experiment<br>• Look at baby photos discuss differences between 'baby me' and 'present me'<br>• Sequence a human life cycle<br>• Youtube 'how we look after a pet'<br>• Sorting and classifying which foods are healthy<br>• Design a 'balanced lunch box'<br>• Make a healthy kebab<br>• Photos/videos of different animals |

| **Title**<br>**Spring** | **Everyday Materials: Let's Build Plants** |
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| Overview | The aim of this unit is for children to be able to distinguish between an object and the material from which it is made. The first half of this unit is linked to the history and DT topic 'The Great Fire of London'. Children will identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock. They will describe the simple physical properties of a variety of everyday materials. They will compare and group a variety of everyday materials based on their properties. The second half term children will identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. They will design and set up a garden centre. They will prepare some small tubs outside and observe some vegetables and plants. They will identify and describe the basic structure of flowering plants. They will perform experiments to find out how plants need water, light and suitable temperature to grow and stay healthy. |
| Knowledge Acquisition | At the end of this unit, children will be able to distinguish between an object and the material from which it is made. They will be able to identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock. They will be able to describe the simple physical properties of a variety of everyday materials. They will be able to compare and group a variety of everyday materials based on their properties. Children will be able to identify and name a variety of common wild and garden plants, including deciduous and evergreen |

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| | trees. They will have the knowledge to design and set up a garden centre. They will be able to prepare some small tubs outside and observe changes over time. They will be able to identify and describe the basic structure of a flowering plant. By conducting various experiments, children will work scientifically to discover why plants need water, light and a suitable temperature to grow and stay healthy. |
| Key LOs | **To be able to identify and name a variety of everyday materials.**<br>**To be able to identify and name a variety of common plants**<br>EYFS<br>• To know about similarities and differences in relation to materials and be able to suggest purposes for which they are used<br>• To make observations of plants<br>Year 1<br>• To be able to identify and name a variety of everyday materials<br>• To be able to say what an object is made from<br>• To be able to describe simple physical properties of a variety of everyday materials<br>• To be able to compare and group a variety of materials<br>• To be able to identify and name a variety of common plants<br>• To be able to label the structure of a flowering plant<br>• To be able to observe changes over time |
| Key vocabulary | Material, wood, plastic, metal, glass, rock, properties, compare, sort, observe, deciduous, evergreen, structure, wild, plant, tree, garden centre |
| Key Learning experiences | • Build a London house using various materials<br>• Re-enact the Fire of London<br>• Use 'hands on' materials<br>• Visit a Garden Centre<br>• Design and set up a role play garden centre<br>• Grow some plants and vegetables<br>• Carry out experiments to find out what plants need to grow and stay healthy<br>• Field walk to observe flowers and trees |

| **Title**<br>**Summer** | **Seasonal Changes: Wonderful Weather**<br>**Animal Life Cycles** |
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| Overview | The aim of this unit is to observe changes across the four seasons. To observe and describe weather associated with the seasons and to understand day length varies. The children will observe temperature and the wind. They will record these observations and discuss the changes. Children will track a shadow by observing and measuring it over time. This unit will link to DT: Children will design rain gauges and record the rainfall over a period of time. They will make windsocks to measure wind |

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| | direction and a wind vane to measure the direction of the wind. In the second half of the term, children will explore and compare the difference between things that are living, dead, and things that have never been alive. They will identify that most living things live in habitats to which they are suited. They will describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. |
| Knowledge Acquisition | At the end of this unit, children will be able to observe changes across the four seasons. They will be able to observe and describe weather associated with the seasons and how day length varies. They will be able to observe temperature and the wind, record these observations, and discuss changes. They will be able to track a shadow by observing and measuring it over time. They will be able to design a rain gauge and use it to record the rainfall over a period of time. They will be able to make a windsock and a wind vane in order to measure the direction of the wind. Children will be able to explore and compare the difference between things that are living, dead, and things that have never been alive. They will identify that most living things live in habitats to which they are suited. They will be able to describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. |
| Key LOs | **To observe and describe weather associated with the seasons and how day length varies**<br>**To identify that most living things live in habitats to which they are suited**<br>EYFS<br>• To make observations and talk about changes<br>• To know about similarities and differences in relation to living things<br>Year 1<br>• To be able to observe changes across the four seasons<br>• To be able to observe and describe weather associated with the seasons<br>• To know how day length varies<br>• To know the difference between things that are living, dead, and things that have never been alive<br>• To be able to identify that most living things live in habitats to which they are suited |
| Key vocabulary | Weather, seasons, winter, spring, summer, autumn, observe, change, shadow, rain gauge, wind vane, measure, habitat, living, non-living, mini beast, micro habitat |
| Key Learning experiences | • To design and make a rain gauge<br>• To make a windsock<br>• Track a shadow<br>• Videos of different kinds of weather<br>• Trip to Lackford Lakes with a focus on habitats<br>• Design a micro habitat<br>• Mini beast hunt |

# Cycle 2

| **Title**<br>**Autumn** | **Animals including Humans: People and their Pets**<br>**Identifying Animals** |
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| Overview | The aim of this unit is for children to begin identifying fascinating facts about their bodies and senses. They will identify, name, draw and label the basic body parts of the human body and say which part of the body is associated with each sense. They will notice that animals including humans have offspring, which grow into adults. They will find out about and describe the basic needs of animals, including humans, for survival. They will begin to understand the importance for humans of exercise, eating the right amounts of food, and hygiene. Children will identify and name animals found around and in the home. They will identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. They will identify and name a variety of common animals that are carnivores, herbivores and omnivores. |
| Knowledge Acquisition | At the end of this unit, children will be able to name most of their body parts and say which body part is associated with each sense.<br>They will have carried out scientific experiments to test the five senses. They will be able to recognise the different stages of the human life cycle. They will be able to use the correct name for adult and baby animals and be able to describe some common animals. They will be able to match adult animals with their offspring. Children will know what animals and humans need to survive. They will be able to say what foods are healthy and why exercise is important. Children will be able to identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. They will be able to identify and name a variety of common animals that are carnivores, herbivores and omnivores. |
| Key LOs | **To be able to draw, name, label human body parts, and say what part of the body is associated with what sense.**<br>**To be able to identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals.**<br>EYFS<br>• To know about the similarities and differences in relation to living things.<br>Year 1<br>• To be able to name and label basic human body parts<br>• To be able to recognise the different stages of the human life cycle<br>• To be able to say the five senses and know which part of the body is associated with which sense.<br>• To know what foods are considered healthy<br>• To be able to name and identify common animals<br>• To be able to sort and classify animals into groups |

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| | • To be able to name common animals that are carnivores, herbivores and omnivores.<br>• To be able to identify and name animals found around and in the home<br>• To be able to work scientifically |
| Key vocabulary | Body, label, sense, touch, smell, sight, hear, feel, lifecycle, human, offspring, toddler, teenager, adult, elderly, skeleton, muscle, heart, balanced diet, scientific, experiment, fish, birds, reptiles, amphibians, mammals, carnivore, herbivore, omnivore |
| Key Learning experiences | Hands on experience with a skeleton<br>BBC bitesize parts of my body video<br>Body jigsaw<br>Senses field walk<br>Taste, sight, smell experiments<br>Feely bag for touch experiment<br>Sequence a human life cycle<br>Youtube 'how we look after a pet'<br>Sorting and classifying which foods are healthy<br>Design a 'balanced lunch box'<br>Make a healthy sandwich<br>Photos/videos of different animals |

| **Title**<br>**Spring Term** | **Use of Everyday Materials**<br>**Habitats** |
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| Overview | The aim of this unit is for the children to explore a range of materials suitable for fixing a broken umbrella and then test them using a pipette to simulate raindrops. Linked to the history topic children will devise an investigation to release figures frozen into ice. They will explore puddles and observe how they change. Children will explore and compare differences between things that are living, dead and things that have never been alive. Children will learn how different habitats provide for the basic needs of different kinds of animals. They will focus on animals that live in cold habitats like the Arctic and Antarctic. They will question how animals have adapted to live in those conditions. Children will carry out various floating and sinking experiments. |
| Knowledge Acquisition | At the end of this unit, children will be confident exploring various materials. They will be able to work out which materials to use in order to make an umbrella waterproof. They will be able to work scientifically devising an investigation to release some figures trapped in ice. They will be able to explore puddles and observe changes over time. They will be able to carry out various sinking and floating experiments. Children will be able to say whether something is living, dead or never been alive. They will explore various habitats and be able to say how an animal has adapted to live in that habitat or environment. |
| Key LOs | **To be able to name and identify a range of everyday materials**<br>**To be able to say how arctic animals have adapted to their habitat** |

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| | EYFS<br>• To know about similarities and differences in relation to objects and materials<br>• To be able to talk about features of their own environment and how environments might vary from one another<br>Year 1<br>• To be able to name a variety of everyday materials<br>• To be able to work scientifically<br>• To be able to observe changes over time<br>• To be able to explore and compare the difference between things that are living, dead and never been alive<br>• To know a variety of different habitats<br>• To be able to say how an animal has adapted to their habitat |
| Key vocabulary | Materials, waterproof, scientific, sink, float, frozen, experiment, similarity, difference, investigation, cold, hot, temperate, compare, contrast, habitat, living, non-living, adapted, |
| Key Learning experiences | • Build an igloo<br>• Various experiments: characters frozen in ice, sinking, floating<br>• BBC bitesize Antarctica https://www.bbc.co.uk/bitesize/topics/zyhp34j/articles/zjg46v4<br>• Antarctic animal moments clip<br>• https://www.youtube.com/watch?v=LBbWVw1kp5Q<br>• How to fix an umbrella<br>• Exploring puddles |

| **Title**<br>**Summer Term** | **Seasonal Changes: Weather Art**<br>**Plants** |
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| Overview | The aim for this unit is for children to observe changes across the four seasons. Children will experience being outside on a windy day. They will make a windsock, a windmill and a bottle wind spinner. Linked to the history topic they will talk about the importance of the sun and design sun catchers to hang in the classroom and a sundial for the playground. They will explore shadows. Children will observe, identify, compare, classify and describe garden and wild plants. They will identify and describe a range of trees. They will know the difference between deciduous and evergreen trees. They will be able to identify the different parts of a plant. They will make observations of growing plants. |
| Knowledge Acquisition | By the end of this unit, children will be able to observe changes across the four seasons. They will be able to make a windsock, windmill and bottle wind spinner and use them to test the wind. They will be able to talk about the importance of the sun. They will be able to design and use a sun catcher and sundial. They will show confidence in exploring shadows. They will be aware that the sun moves during the day. Children will be able to observe, identify, compare, classify and describe garden and wild plants. They will be able to identify and describe a range of trees. They will be able to say the difference between deciduous and evergreen trees. They will be able to identify and label the parts of a |

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| | plant or flower. They will be able to make observations of growing plants. |
| Key LOs | **To observe and describe weather associated with the seasons and how day length varies**<br>**To be able to make observations of growing plants**<br>EYFS<br>• To know about similarities and differences in relation to objects and materials<br>• To be able to make simple observations of growing plants<br>Year 1<br>• To be able to observe and describe weather associated with the seasons<br>• To know how day length varies<br>• To be able to work scientifically<br>• To know the difference between deciduous and evergreen trees<br>• To be able to identify the different parts of a plant<br>• To be able to make observations of growing plants<br>• To be able to compare and describe garden and wild plants |
| Key vocabulary | Weather, seasons, autumn, winter, spring, summer, shadows, sun catcher, sundial, wind, observe, classify, compare, contrast, describe, deciduous, evergreen, identify, scientifically |
| Key Learning experiences | • Trip to the beach/sea life centre (feel the wind)<br>• https://www.bbc.co.uk/teach/school-radio/eyfs-listen-and-play-at-the-seaside/zvyf6v4<br>• Barnaby Bear visits the seaside https://www.youtube.com/watch?v=6qO0mu6YJW8<br>• Design a sun catcher and sundial<br>• Grow various plants<br>• Make a windsock, windmill and wind spinner |

# Science at Great Whelnetham C of E Primary School

## Year 2/3

## Cycle 1

| **Title**<br>**Autumn 1** | **Animals including Humans** |
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| Overview | In this unit, children learn about how humans and other animals are born, grow and change, and what we need to survive and be healthy. The pupils will classify different kinds of animal babies, learn about the basic needs that are shared by humans and animals, and research the differing needs of animals within our care. Focusing on their own experiences, children explore the need for humans to eat a varied diet, to keep themselves clean, and to take regular exercise. |
| Knowledge Acquisition | They will be able to say which animal some babies will grow into.<br>They will know the names of some animal babies.<br>They will know the three things that animals need to stay alive.<br>They will know examples of healthy and less healthy foods.<br>They will be able to name some things that humans do to keep clean.<br>The children will be able to record information about exercise |
| Key LOs | ○ To describe how animals change as they grow<br>○ To be able to ask and answer questions about a pet<br>○ To be able to give reasons as to how humans can stay healthy.<br>○ To identify the main body parts of animals and humans<br>○ To be able to compare the diets of humans and animals |
| Key vocabulary | offspring, grow, adults, nutrition, vitamins, minerals, fat, protein, carbohydrates, fibre, water, reproduce, survival, water, food, air, exercise, hygiene, life cycle, skeletons, support, protection, skull, brain, ribs, heart, lungs, movement |
| Key Learning experiences | Sorting and matching animals and their babies.<br>'How to look after your pet' leaflet<br>Fair test recording how fast children can run<br>Interview people on their diets<br>Create a balanced meal on a plate.<br>Keep a food journal<br>Using magnifying glasses to observe how clean their hands are.<br>Draw and label diagrams of their hands. |

| **Title**<br>**Autumn 2** | **Living Things and their Habitats** |
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| Overview | In this unit children will learn about a variety of habitats and the plants and animals that live there. They learn to tell the difference between things that are living, dead and things that have never been alive, and apply this in a range of contexts. They make observations of a local |

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| | habitat and the creatures that live there, investigating conditions in local microhabitats and how they affect the minibeasts found within them. This unit allows children to research a range of global habitats and how the living things that live there are suited to their environments. |
| Knowledge Acquisition | The children will be able to say what is different about things that are living, dead or have never been alive.<br>The children will know the names of plants animals in a familiar habitat<br>The children will be able to sort objects into categories.<br>They will be able to find microhabitats.<br>They will be able to ask and answer questions about different habitats.<br>They will know the characteristics of some plants and animals.<br>They will now some sources of food. |
| Key LOs | ○ To be able to explain how they know something is living, dead or has never been alive<br>○ To be able to recognise animals in their habitats<br>○ To identify how an animal is suited to its habitat |
| Key vocabulary | living, dead, never alive, habitats, micro-habitats, food, fodd chain, sun, grass, cow, human, alive, healthy, logs, leaf litter, stony path, under bushes, shelter, seashore, woodland, ocean, rainforest, conditions, hot/warm/cold, dry/damp/wet, bright.shade/dark |
| Key Learning experiences | Sorting and grouping objects – living and non-living<br>Local habitats walk – observing, drawing findings<br>Create model habitats – bug hotel<br>BBC Science Learning Resource – video clips<br>Natural History Museum website<br>Create a food chain made up of living things |

| **Title**<br>**Spring Term** | **Everyday Materials**<br>**Materials Matter** |
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| Overview | This unit will teach our children about the uses of everyday materials including wood, plastic, metal, glass, brick, paper and cardboard. Children then go on to compare the suitability of different everyday materials for different purposes. They explore how objects made of some everyday materials can change shape and how the recycling process is able to reuse some everyday materials numerous times. It finishes with children learning about new discoveries which have made over time. A range of learning activities are used in this unit including, discussions, debates, sequencing and a local walk where children work scientifically to identify the uses of everyday materials in the local area. |
| Knowledge Acquisition | The children will be able to identify and name everyday materials.<br>The children will know different uses of everyday materials.<br>They will know how to record their observations accurately.<br>The children will be able to explain how the shapes of some materials can be changed. |

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| | The children will know what recycling means and its processes. |
| Key LOs | ○ To be able to identify and group the uses of everyday materials<br>○ To compare the suitability of everyday materials<br>○ To be able to explain how the shapes of objects can change<br>○ To understand the process of recycling |
| Key vocabulary | Material, wood, metal, plastic, glass, brick, rock, paper, cardboard, rubber, waterproof fabric, squashing, bending, twisting, stretching, recycle, reuse, reduce |
| Key Learning experiences | Materials exploring walk in the local area<br>Sorting and grouping materials<br>Create factfiles of inventors – John Dunlop, Charles Macintosh<br>Creating a paper bridge<br>Testing materials for their different uses<br>Visit to a local recycling centre – Suffolk CC recycling manager |

| **Title**<br>**Summer Term** | **Plants**<br>**Ready, Steady, Grow!** |
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| Overview | In this unit children have the opportunity to closely study plants and trees in the natural environment, taking measurements and making observational drawings. Children plant a seed and a bulb and compare them as they grow. They record changes in their plants in words and pictures, take measurements throughout the unit and finally draw bar charts to show the growth of the two plants. Children set up a comparative experiment to observe what plants need to grow well, and watch the germination process first hand by growing cress. Children begin to learn about plants we eat, and understand that farming involves creating the right conditions for food crops to grow |
| Knowledge Acquisition | The children will know how to make observations of plants and trees.<br>They will know how to follow instructions to plant a seed and a bulb.<br>The children will know how to order a life cycle of a plant.<br>The children will know how to care for a plant in order for it to grow well.<br>The children will know examples of food crops.<br>They will know and explain why plants are living things. |
| Key LOs | ○ To be able to record close observations of plants and trees.<br>○ To set up a test and make predictions of how plants grow.<br>○ To be able to describe what plants need to grow and stay healthy. |
| Key vocabulary | wild plants, garden plants, deciduous, evergreen, leaf, leaves, root, bud, flowers, blossom, petals, root, stem, grow, healthy, tree, trunk, branches, leaf, root, fruit, vegetables, bulb, seed, water, light, suitable, temperature, germination, reproduction |
| Key Learning experiences | Observational drawing of trees and plants<br>Planting seeds and bulbs in a vegetable corner<br>Fair test to find out best conditions needed to plant cress<br>Using websites BBC bitesize, Woodland Trust Nature Detectives<br>Keep a plant journal recording changes |

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| | Grouping common foods by the part of the plant they come from.<br>Visit to a local arable farm |

| **Title**<br>**Summer Term** | **Living Things and Their Habitats**<br>**Gardens and Allotments** |
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| Overview | In this unit we will build upon previous skills. The children will investigate home grown foods and their taste. They will create a class allotment, growing and nurturing their own plants. They will understand how food chains work and learn that energy from the sun passes through each link in a food chain. They will sample foods grown and create a food chain dance to be performed. |
| Knowledge Acquisition | The children will know how to plant edible plants.<br>The children will know allotments are habitats that attract mini-beasts.<br>The children will know the conditions needed for plants to grow.<br>The children will know that different habitats provide the basic needs for plants and minibeasts.<br>The children will know what a food chain is and that livings things need other living things to survive.<br>The children will be able to describe the suns energy travelling through a food chain as a 'transfer of energy.'<br>The children will know how to harvest the foods, eat and review their gardening skills. |
| Key LOs | ○ To describe how different habitats provide the basic needs for animals and plants<br>○ To identify and name a variety of plants and animals in their habitats or micro-habitats<br>○ To describe how animals obtain their food from plants and animals using a food chain |
| Key vocabulary | allotment, vegetable patch, seeds, plants, soil, water, trowel, spade, habitats, micro-habitats, mini-beasts, water, sun, shelter, conditions, growing, food chains, survive, living things, energy. |
| Key Learning experiences | Create a mini allotment in the playground.<br>Observing and recording mini-beasts found in habitats.<br>Carrying out comparative and fair tests.<br>Creating our own micro-habitats to encourage minibeasts.<br>Visit or farm or ask for a farmer to discuss why food chains are important.<br>Create own living food chains.<br>Harvest and try edible foodgrown – create own snacks! |

# Cycle 2

| **Title**<br>**Autumn 1** | **Light and Shadows** |
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| Overview | In this unit we will learn about different sources of light, and that we need light to see. The children will work scientifically and collaboratively to investigate reflective materials. They will work in a hands on way to play a range of mirror games, finding out more about reflective surfaces. They will learn that the sun's light can be dangerous. The children will have chance to test which objects are opaque in an exciting investigation and will find out how shadows change when the distance between the object and light source changes. They will develop their scientific enquiry skills, making observations, predictions and conclusions |
| Knowledge Acquisition | The children will know how to identify light sources.<br>They will know that dark is the absence of light.<br>The children will know that light travels in straight lines.<br>They will know that the sun can damage their eyes and will recognise how to protect their eyes from the sun.<br>The children will know that a shadow is formed when a solid object blocks light. |
| Key Los | ○ To recognise that we need light in order to see things and that dark is the absence of light.<br>○ To investigate which surfaces can reflect light.<br>○ To recognise that shadows are formed when the light from a light source is blocked. |
| Key vocabulary | light, see, dark, reflect, surface, natural, star, sun, moon, shadow, blocked, solid, artificial, torch, candle, lamp, sunlight, dangerous, protect. |
| Key Learning experiences | BBC Bite size Light and Dark video clips<br>Use feely bags activity to investigate items with the absence of light<br>Play mirror games finding reflections<br>Designing pairs of sunglasses<br>Creating sun safety posters<br>Hold Shadow puppet show |

| **Title**<br>**Autumn 2** | **Forces and Magnets** |
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| Overview | This 'Forces and Magnets' unit will teach our pupils about forces, friction and magnetic attraction. They will learn about forces in the context of pushing and pulling, and will identify different actions as pushes or pulls. The children will work scientifically and collaboratively to investigate friction, by exploring the movement of a toy car over different surfaces. They will work in a hands on way to identify magnetic materials. They will conduct an investigation into the strength |

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| | of different types of magnet. They will explore the way magnetic poles can attract and repel in an exciting activity, making their own compass and using it to find hidden items. The children will use their understanding of magnetic attraction to design and create their own magnetic game. |
| Knowledge Acquisition | They will know the difference between pushes and pulls.<br>They will know that friction is a force that slows objects down.<br>They will know how to sort materials according to their magnetism.<br>They will know that a magnet has opposing poles.<br>The children will know how to use a magnetic compass with four points.<br>The children will be able to make predictions.<br>The children will know how to form conclusions based on results. |
| Key LOs | ○ To compare how things move on different surfaces.<br>○ To observe how magnets attract or repel each other.<br>○ To compare and group together a variety of everyday materials that are magnetic.<br>○ To describe magnetics as having poles.<br>○ To make predictions whether magnets will repel or attract. |
| Key vocabulary | force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, magnetic fields, North, South, disk magnet, bar magnet, horseshoe magnet, |
| Key Learning experiences | Explore forces by going on a walk around the school.<br>Forces investigation using toy vehicles and ramps.<br>BBC bitesize on gravity and magnets.<br>Investigate different materials which are magnetic or not.<br>Explore a range of magnets and their poles.<br>Create a magnetic game in teams – enter into the Y3 Science Fair.<br>Create a magnets quiz. |

| **Title**<br>**Spring Term** | **Rocks and Soils** |
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| Overview | In this unit pupils will create an amazing rock and fossil museum to which you can invite members of the school community. Each session pupils will build up their knowledge to become expert museum curators and make exhibits, quizzes and activities for the exciting museum. |
| Knowledge Acquisition | Pupils will be able to recognise rocks from their features.<br>Pupils will be able to draw, label and write descriptions of 6 common rocks.<br>Pupils will be able to identify the purposes of different rocks.<br>Pupils will be able to recognise and order rocks according to their hardness.<br>Pupils will know how to test rocks to discover if they are made of dead creatures' shells.<br>Pupils will know how to use a rock identification key effectively.<br>Pupils will be able to identify rocks found in the local area.<br>Pupils will know what fossils are and the stages of fossil formation. |
| Key LOs | To compare and group together different kinds of rocks.<br>To describe the appearance and simple physical properties of rocks. |

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| | To describe how fossils are formed when things that have lived are trapped within rock<br>To recognise that soils are made from rocks and organic matter |
| Key vocabulary | Rock, soil, appearance, texture, sedimentary, metamorphic, igneous, permeable, impermeable, sand, gravel, clay, chalk, flint, granite, sandstone, volcano, grey, soft, rough, smooth |
| Key Learning experiences | Take part in 'The Hard Rock Challenge' observing and grouping rocks.<br>Create drawings and write descriptions of rocks.<br>Test the hardness and permeability of rocks.<br>Take part in a rock quiz game.<br>Create a performance through role play of the story of Mary Anning.<br>Make their own fossils. |

| **Title**<br>**Spring Term** | **Animals Including Humans** |
|---|---|
| Overview | In this unit pupils will learn about the importance of the right type and amount of nutrition. They will find out about the food groups, sort foods and create healthy balanced meals. During this topic pupils will learn about human and animal skeletons through creating their own skeletons and labelling the common or scientific names of bones. Finally they will learn about the functions of skeletons and muscles. |
| Knowledge Acquisition | Pupils will know why humans need some types of nutrients.<br>The will know the different food groups and the amount of foods needed for a balanced diet.<br>They will know different types of skeletons and identify animals based on the type of skeleton.<br>Pupils will know the main bones in the skeleton and how it protects, supports and helps the body to move.<br>Pupils will know how pairs of muscles work together to enable movement. |
| Key LOs | To compare how plants and animals obtain their food.<br>To recognise the food and nutrient groups.<br>To investigate the different skeleton types and sort animals according to their skeleton.<br>To identify the different uses of the skeleton.<br>To investigate pairs of muscles and how they work. |
| Key vocabulary | nutrition, vitamins, minerals, fat, protein,carbohydrates, fibre, water, skeletons, support, protection, skull, brain, ribs, heart, lungs, movement, joints, muscles, pull, contract, relax, diet. |
| Key Learning experiences | Sort types of food into a food group plate.<br>Create a healthy balanced meal collage.<br>Create a healthy café menu for a day.<br>Keep a food diary for a week.<br>Create a giant model skeleton – naming the bones.<br>Create a body model including the organs.<br>Carry out exercise experiment to identify the use of muscles. |

| **Title**<br>**Summer Term** | **Plants – Roots and Shoots** |
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| Overview | In this unit the pupils will find out everything they need to know about plants. They will learn the names of different parts of plants, and the jobs they do. The children will work scientifically and collaboratively to investigate what plants need to grow well, and will present their findings to others as 'Planet Earth Investigators'. Furthermore, they will have chance to predict what will happen in an exciting investigation into the transportation of water within plants. They will work in a hands-on way to identify the parts of a flower, and will explore the different stages of the life cycle of a flowering plant. |
| Knowledge Acquisition | The children will be able to name and label the different parts of flowering plants.<br>The children will be able to explain the functions of the different parts of plants.<br>They will know the stages of the life cycle of flowering plants and describe it in detail.<br>The children will know how to set up an investigation and make predictions.<br>The children will know how to make accurate observations and make conclusions.<br>The children will be able to ask and answer questions using some scientific language. |
| Key LOs | ○ To be able to name the different parts of flowering plants and explain their jobs.<br>○ To explore the requirements of plants for life and growth.<br>○ To be able to set up an investigation to find out what plants need to grow well.<br>○ To be able to record observations and present results using some scientific language. |
| Key vocabulary | flower, seed, leaf, stem, roots, petal, pollen, life cycle, dispersal, pollination, fertilisation, germination, ovary, ovule, sepal, stamen, anther, filament, stigma, style, trunk, anchor, nutrients, absorb, air, light, water, soil, |
| Key Learning experiences | Make plant observations – drawing, measuring, facts.<br>Create a Plants Did you know? Fact file<br>Make comparisons between plants reinforcing parts of plants and their functions.<br>Classify different plants in our diets.<br>Carry out experiments on water transportation in plants.<br>Design a space farm for plants with labels and notes that will enable them to live. |

| **Title**<br>**Summer Term** | **Plants – Artful Flowers, Fruits and Seeds** |
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| Overview | In this unit the pupils will step into the amazing, secret world of flowers. Discover their relationship with bees and other insects. Learn how flowers transform into fruits and seeds to perpetuate the cycle of life and use the inspiration to create some beautiful works of art. Stage your own stunning art exhibition of paintings, sculpture, collage and dance on the theme of Artful Flowers, Fruits and Seeds to delight your visitors. |
| Knowledge Acquisition | The children will know how to make close observations of different types of flowers.<br>The children will know about the artist Georgia O'Keefe and create watercolour paintings from life.<br>The children will know about the importance of insects to flower pollination.<br>The children will know how to sort fruits based on similarities and differences.<br>The children will know different ways seeds are dispersed. |
| Key LOs | ○ To be able to explore the part that flowers play in the life cycle of flowering plants.<br>○ To be able to gather, record, classify and present data in a variety of ways.<br>○ To record findings using simple scientific language, drawings, labelled diagrams.<br>○ To be able to set up simple practical enquiries, comparative and fair tests. |
| Key vocabulary | flower, seed, leaf, stem, roots, petal, pollen, life cycle, dispersal, pollination, fertilisation, germination, ovary, ovule, sepal, stamen, anther, filament, stigma, style, trunk, anchor, nutrients, absorb, air, light, water, soil, |
| Key Learning experiences | Flower walk – making observations of different flowers.<br>Create watercolours in the style of Georgia O'Keefe.<br>Complete pressed flower designs.<br>Create bee and flower models.<br>Create a bee 'waggle' dance to be performed.<br>Create zigzag books explaining how flowers are pollinated.<br>Sorting a range of fruits in different ways with explanations.<br>Fair test on wind dispersal.<br>Create a fruits and seeds quiz.<br>Prepare an art exhibition – quiz, dance, flower display, competition etc. |

# Science at Great Whelnetham C of E Primary School

## Year 3 and 4

Cycle 1

| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|
| Forces and Magnets | Animals Including Humans | Living Things and their Habitats | Plants | States of Matter | Sound |

| | Forces and Magnets |
|---|---|
| Overview | The aim of this unit is for children to extend their knowledge of forces and be introduced to magnets. They will compare how things move on different surfaces and notice that some forces need contact between two objects, but magnetic forces can act at a distance. The children will observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. The children will be able to describe magnets as having two poles and be able to predict whether two magnets will attract or repel each other, depending on which poles are facing. |
| Knowledge Acquisition | The children will know that some forces need contact between 2 objects, but magnetic forces can act at a distance<br>They will know that objects move differently on different surfaces<br>They will know that magnets have two poles and that magnets attract or repel each other and attract some materials and not others<br>They will be able to 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<br>They be able to predict whether 2 magnets will attract or repel each other, depending on which poles are facing |
| Key LOs | • To identify different types of force acting on an object<br>• To notice that some forces need contact between two objects<br>• To investigate the effect of friction on different surfaces<br>• To compare and group materials according to whether they are magnetic<br>• To Understand that magnetic forces can act at a distance and attract some materials and not others<br>• To predict whether magnets will attract or repel each other depending on the position of the poles<br>• To describe magnets as having two poles<br>• To understand magnetism can create a push and pull force<br>• To explain how magnetism works<br>• To use the properties of a magnet in a design to entertain (game) |
| Key Vocabulary | Still, Acceleration, Deceleration, Force, Friction, Motion, Speed, Velocity, Balanced force, Magnet , Magnetic, Pole, Attract, Repel, Gravity, Air resistance, Water resistance, |

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| Key learning experiences | ➢ Chn create push and pull freeze frames of everyday situations and photograph each other, identifying the force<br>➢ Create a push and pull memory card game<br>➢ Carry out a practical investigation of a toy car on different surfaces and the effect of friction<br>➢ Choose materials to predict whether magnetic and test their prediction<br>➢ Measure the strength of different magnets by creating paper clip chains<br>➢ Investigate the polarisation of magnets<br>➢ Make a compass using a magnetic force on a needle in cork and complete an orienteering task |

| **Title** | **Animals including Humans** |
|---|---|
| Overview | The aim of this unit is for children to continue to learn about the importance of nutrition and be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions |
| Knowledge Acquisition | The children will know how to keep our teeth healthy and consider why our teeth are different shapes and understand that they have different functions<br>They will use evidence from their knowledge of an animal's diet to identify which teeth belong to which animal and compare the teeth of a herbivore and a carnivore and consider why they are different. They will Know the basic parts of the digestive system and begin to understand the simple functions of the basic parts of the digestive system.<br>They will look at the diets of other animals and compare them to that of a human.<br>They will explain the different diets of carnivores, herbivores and omnivores.<br>They will be able to define 'predator', 'prey' and 'producer' and make links between plants and animals in the form of food chains and begin to understand that humans have a responsibility to care about their impact on food chains<br>They will research information using the Internet (and/or information books) |
| Key LOs | To Learn about the first stage of the digestive system<br>To use straightforward evidence to answer questions about the functions of human teeth<br>To use a simple practical enquiry to answer questions about the basic parts of the digestive system<br>To use large physical movements to demonstrate an understanding of the digestive system<br>To compare the diets of different animals, and to use the evidence of the food they eat to answer questions<br>To use my understanding of producers, predators and prey to answer questions about the impact of changes to a food chain<br>To create a PowerPoint presentation and demonstrate their understanding of the importance of healthy teeth |
| Key Vocabulary | teeth, incisors, molars, canines, jaw, evidence, digestion, chew, saliva, question, digestive system, nutrition, mouth, teeth, saliva, oesophagus (gullet), stomach, small intestine, large intestine, rectum, anus, faeces (poo) herbivore, carnivore, omnivore, digestion, diet, food chain, producer, predator, prey, consumer, impact, present, display, explain |
| Key Learning Experiences | ➢ Play an active game sorting information relating different animals' diet and teeth ( maths link –Venn diagram)<br>➢ Use their bodies to represent different parts of the digestive system |

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| | ➢ Use a simple practical enquiry to answer questions about the basic parts of the digestive system.<br>➢ Use everyday objects to demonstrate the human digestive system<br>➢ Look at the diets of other animals and compare them to that of a human<br>➢ Discuss with others the impact a break in the food chain may have using different scenarios<br>➢ Plan and perform a 'Healthy Teeth and our Digestive System' video presentation for the school<br>➢ Explore PowerPoint and try to identify how to change the slide transitions, background design and include images, text boxes and hyperlinks |

| **Title** | **Living Things and their Habitats** |
|---|---|
| Overview | The aim of this unit is for children to learn that living things include humans, plants and animals and that there are subcategories within animals: invertebrates, vertebrates amphibians, fish, birds and reptiles. Within this they must understand what criteria is required to classify a living thing and discover that they can be grouped according to their features. |
| Knowledge Acquisition | The children will learn about the 7 life processes that characterise all living things and relate this to animals, humans and plants. They will learn that living things can be grouped in different ways according to their features. They will use an invertebrate key to identify the group/type of creatures found, e.g. mollusc/slug . They will learn how to make a classification key and use books and the internet to research material to present to others. They will know how to design a fair test, take accurate readings to produce data which will be presented in graphs. |
| Key LOs | Recognise that living things can be grouped in a variety of ways<br>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment<br>Set up simple practical enquiries and comparative and fair tests.<br>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers<br>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment<br>Gather, record, classify and present data in a variety of ways to help answer questions.<br>Identify differences, similarities or changes related to simple scientific ideas and processes.<br>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables |
| Key Vocabulary | Life processes, movement, reproduction, sensitivity, nutrition, excretion, respiration, growth, living things, oxygen, energy, waste products, senses, environment Plants, animals, similarities, differences, kingdom, classify, classification, flowering plants, trees, mosses, ferns, spores, cones, leaves, flowers, seeds, Vertebrates, invertebrates, classify, classification, birds, reptiles, warm/cold blooded, scales, feathers |
| Key Learning Experiences | ➢ Throughout the unit they will create an interactive book of living things to use as a teaching aid to other children their age |

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| | ➢ Match the name of each life process to a description of it (Yr3) or write a description for each life process (Yr4)<br>➢ Research plants using non-fiction books and the internet (Yr3 writing 3 fascinating facts, Yr4 finding 5 facts)<br>➢ Play an active team game called "Alive-Alive-Oh!" to reinforce the scientific concepts and vocabulary (Yr3&4)<br>➢ Hunt for invertebrates in their local environment and bring specimens back to the classroom (Yr3&4)<br>➢ Create a turning wheel that reveals invertebrates drawn from life (Yr3&4) and information about the features of that group (Yr4)<br>➢ Make a classification key for living things using group labels and drinking straws (Yr3&4)<br>➢ Design a fair test to investigate the insulation properties of feathers (Yr3&4)<br>➢ Take accurate temperature readings over time and compare data from a bottle covered in feathers to one without feathers (Yr3&4)<br>➢ Display the data on a graph (Y4 with more detail & independence) |

| **Title** | **Plants** |
|---|---|
| Overview | In this unit the children should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. The children can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers. |
| Knowledge Acquisition | They children will be able to identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers<br>They will know 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 They will know how carry out a fair investigation with one variable<br>They will know the way in which water is transported within plants<br>They will know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. |
| Key LOs | To set up an enquiry to test our theories on what plants need to grow and thrive.<br>To research plant facts using books and the Internet.<br>To continue to take measurements and notes from our seedling investigation and make comparisons of their growth and health.<br>To make labelled, annotated drawings of plants from close first hand observation<br>To continue to take measurements and notes from our seedling investigation.<br>To classify food plants according to the part of the plant that is eaten. |

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| | ↳ To create a detailed Plasticine™ model of a slice of fruit using careful observation<br>↳ To spot differences in the health of seedlings and begin to think about reasons.<br>↳ To investigate the way in which water is transported within plants<br>↳ To look at tables and line graphs from data loggers on temperature and light levels.<br>↳ To explain findings using knowledge of the Earth's rotation.<br>↳ To review the results of our investigations and begin to draw conclusions.<br>↳ To use scientific knowledge to explain findings.<br>↳ To use our knowledge of plants to design a space farm. |
| Key Vocabulary | Plants, growth, light, warmth, air, soil, water, investigate, seedlings, research, investigate, seedlings, research, height, root, stem, leaves, flowers, petals, buds, fruits, seeds, classify Data logger, light level, temperature, wilting, yellowing, requirement, measure, record table, line graph, bar graph, light levels, temperature, transported, results |
| Key Learning Experiences | ➢ Set up a plant growth investigation to test our theories<br>➢ Begin to take measurements of height and make notes on observations<br>➢ Create a display of "Did you know …?" facts<br>➢ Closely observe whole specimen plants and make detailed, labelled and annotated drawings<br>➢ Play a game to reinforce the various parts of a plant and their functions<br>➢ Create detailed models of sections through fruits showing flesh, skin, seeds etc.<br>➢ Set up an experiment to investigate the way in which water is transported within plants<br>➢ Use data loggers to measure light levels and temperature over a 24 hour period<br>➢ Draw graphs or write reports on findings and seek to explain and interpret results in terms of what you know about plants<br>➢ Design a space farm for plants with labels and annotations that meets all their requirements for life<br>➢ |

| **Title** | **States of Matter** |
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| Overview | The aim of this unit is to explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). The children will observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. |
| Knowledge Acquisition | The children will compare and group materials together, according to whether they are solids, liquids or gases. They will 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)<br>They will identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature |
| Key LOs | ↳ To explore a number of different materials and classify them as solids or liquids.<br>↳ To discuss and decide what properties make a solid and a liquid. |

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| | ➢ To actively investigate the nature of gases through a variety of hands on tasks.<br>➢ To draw conclusions about the nature of gases and relate findings to scientific principles<br>➢ To understand the arrangement of particles in different states of matter.<br>➢ To describe the changes in state seen in ice cream and chocolate sauce.<br>➢ To recognise and name *evaporation* and *condensation* as changes of state.<br>➢ To design and set up a fair test to find the factors that affect the rate of evaporation.<br>➢ To report on the findings of their Fair Test and draw scientific conclusions.<br>➢ To understand and explain the water cycle using appropriate scientific vocabulary<br>➢ To design an exciting learning activity for others using scientific knowledge and vocabulary |
| Key Vocabulary | states of matter, material, solid, liquid, gas, natural, manmade, classify, molecule, atom, bonds .air, oxygen, nitrogen, carbon dioxide, argon, molecules change, state, bromine, ice, freeze, melt, heat, energy, solidify, vapour evaporation, condensation, condense, water vapour, invisible, liquid, change state, energy, particles |
| Key Learning Experiences | ➢ Actively explore the properties of a range of materials, discuss them and classify each as either a solid, a liquid or a "hard to classify material" **(Yrs 3&4)**<br>➢ Either create a set of sorting cards that describe the properties of liquids and solids **(Yr 4)** or explain the properties of 5 "hard to classify materials" **(Yr 3)**<br>➢ Do a Solids and Liquids puzzle to consolidate scientific knowledge introduced previously **(Yrs 3&4)**<br>➢ Investigate the nature of gases through a variety of practical activities **(Yrs 3&4)**<br>➢ Discuss the scientific phenomena and what this tells us about gases **(Yrs 3&4)**<br>➢ Either write simple instructions for others to undertake a simple investigative activity **(Yr 3)** or write an explanation of what the activity reveals about the nature of gases **(Yr 4)**<br>➢ Use a data logger to record the temperature of water in a jug before and after the addition of ice **(Yrs 3&4)**<br>➢ Play an active game to simulate the arrangement of particles in solids, liquids and gases **(Yrs 3&4)**<br>➢ Observe and record the changes in state in a dessert of ice cream and chocolate sauce by making an annotated drawing **(Yr3)** or writing an explanation **(Yr4)**<br>➢ Observe water changing state through a practical demonstration and use the correct scientific terms for these changes **(Yrs 3&4)**<br>➢ Set up a fair test in groups to investigate the factors affecting the speed of evaporation **(Yrs 3&4)**<br>➢ Either draw up a table to record the results of their investigation **(Yr 4)** or explain how water changes state using given scientific vocabulary appropriately **(Yr 3)**<br>➢ Make a sealed indoor garden that creates an internal water cycle that mirrors what occurs naturally on planet Earth **(Yrs 3&4)**<br>➢ Design and create an exciting game, puzzle or quiz for others that helps to teach and reinforce the scientific concepts and vocabulary of States of Matter **(Yrs 3&4)** |

| Title | Sound |
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| Overview | The aim of this unit is explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. |
| Knowledge Acquisition | The children will identify how sounds are made, associating some of them with something vibrating<br>They will recognise that vibrations from sounds travel through a medium to the ear and find patterns between the pitch of a sound and features of the object that produced it.<br>They will also find patterns between the volume of a sound and the strength of the vibrations that produced it, and recognise that sounds get fainter as the distance from the sound source increases |
| Key LOs | • To investigate how different sounds are made<br>• To understand that sounds are made when objects vibrate<br>• To investigate the nature of vibrations through touch and sight as well as hearing<br>• To set up fair tests to investigate the transmission of sound through different materials (including water - Yr4)<br>• To design and conduct a fair test to answer a scientific question<br>• To record results in tables and graphs<br>• To draw conclusions and raise further questions<br>• To explore how you can vary the volume of a sound<br>• To explain changes of volume/loudness in terms of energy and strength of vibration<br>• To explore how the pitch of a note can change by varying the length, size and tightness of the vibrating object.<br>• To record findings by making careful drawings and notes. |
| Key Vocabulary | Sound, sound source, noise, vibrate travel solid liquid gas pitch tune high low volume loud quiet fainter muffle vibrations insulation instrument percussion strings brass woodwind tuned instrument |
| Key Learning Experiences | ➢ Create a bank of favourite sounds with explanations of how they are generated **(Yrs3&4)** and consider how each sound can be varied **(Yr4)**<br>➢ Discover first hand that when objects vibrate, sound is created and that vibrations spread out from the source of a sound **(Yrs3&4)**<br>➢ Investigate which materials transmit sound and which do not **(Yrs3&4)** including water **(Yr4)**<br>➢ Take part in an active quiz game to rehearse and extend learning on sound **(Yrs3&4)**<br>➢ Consider different animal ears as sound detectors and design a class investigation to compare hearing with bare ears, a cupped hand around your ear or a cardboard animal ear **(Yrs3&4)**<br>➢ Explore how to play a repeated rhythm and change the volume up and down **(Yrs3&4)**<br>➢ Record decibels using a sound probe and seek to answer a question with a simple exploration **(Yrs3&4)**<br>➢ Play a humming game that explores the concept of pitch **(Yrs3&4)**<br>➢ Explore a range of musical instruments and investigate how they play low and high pitched notes **(Yrs3&4)**<br>➢ Create a tuned musical instrument using everyday materials, recording this with an annotated drawing that labels how the high pitched notes and low pitched notes are played **(Yrs3&4)** |

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| | ➢ Design a learning activity for others on the theme of sound: asking relevant questions, and giving scientific explanations **(working in mixed age groups with higher expectations of Y4 children with regard to subject knowledge, organisation and leadership)** |

# Cycle 2

| **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
|---|---|---|---|---|---|
| Light | Rocks and Fossils | Living Things and their habitats | Plants | Animals including Humans | Electricity |

| Title | **Light** |
|---|---|
| Overview | The aim of this unit is for children explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. |
| Knowledge Acquisition | The children will recognise that they need light in order to see things and that dark is the absence of light. They will notice that light is reflected from surfaces and recognise that light from the sun can be dangerous and that there are ways to protect their eyes.<br>The will recognise that shadows are formed when the light from a light source is blocked by an opaque object, and find patterns in the way that the size of shadows change. |
| Key LOs | ✢ To discover through active investigation that without light you cannot see<br>✢ To learn through investigation that light travels in straight lines<br>✢ To actively investigate the nature of white light through a number of practical activities<br>✢ Know what a light source is and that the sun is a light source which is so powerful that it will damage your eyes if you look at it (even with sunglasses)<br>✢ Predict and then investigate which colours show up best and least in the dark<br>✢ Investigate the effect of shining a torch on various objects including reflective materials<br>✢ To investigate how light is reflected by different surfaces, looking for similarities and differences and noting observations<br>✢ To investigate the nature of reflections in mirrors through a variety of practical tasks including mirror writing, navigating mirror mazes and multiple mirror reflections<br>✢ To investigate how objects made from different materials cast shadows<br>✢ To understand how a shadow changes depending on the object's orientation<br>✢ To actively investigate how shadows change as the light source is moved<br>✢ To take measurements and look for patterns in data to answer scientific questions |
| Key Vocabulary | light, white light, visible light, colour, spectrum, refraction, light source, energy, reflector, reflect, predict, investigate, reflective materials, reflect, mirror, reflection, image, concave, convex, transparent, translucent, opaque, shadow, |
| Key Learning Experiences | ❖ Actively investigate the nature of darkness, light and sight with a torch, a cardboard box and pencil holes<br>❖ Design a stage front for their shadow puppet theatre to use in the coming sessions<br>❖ Recap on prior knowledge by playing an active quiz game |

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| | ❖ Predict and then investigate how well different colours and materials reflect light in a simulated dark cave<br>❖ Paint their shadow puppet theatre to make it attractive and exciting for audiences<br>❖ Test their knowledge of light and learn some new light facts by playing an active team game<br>❖ Investigate the properties of mirrors and reflections by undertaking 4 different tasks<br>❖ Discover the effect of using 2 mirrors and how this can help us see round corners using a periscope<br>❖ Actively investigate how different objects cast shadows by playing a guessing game<br>❖ Investigate how the orientation of an object affects the shadow by making hand shadows<br>❖ Create jointed shadow puppets controlled with a flexible stick connection<br>❖ Take accurate measurements of the length of shadows whilst controlling the distance of the light source<br>❖ Observe a demonstration of light travelling in straight lines to help understand and explain shadow data |

| **Title** | **Rocks and Fossils** |
|---|---|
| Overview | The aim of this unit is to link with work in geography and explore different kinds of rocks and soils, including those in the local environment. The children will work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them |
| Knowledge Acquisition | The children will compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. They will describe in simple terms how fossils are formed when things that have lived are trapped within rock and recognise that soils are made from rocks and organic matter. |
| Key LOs | To observe rocks closely and discover that they have different qualities and features<br>To group rocks in different ways according to their observable features<br>To be able to name 6 common rocks<br>To understand that rocks are formed in 3 different ways<br>To devise comparative tests for rocks, record and evaluate observations and results<br>To collect evidence of the local bedrock and other rocks in the local area by doing a rock survey<br>To use knowledge of the properties of rocks to determine why particular rocks were selected for different tasks<br>To discover the contribution to science of the great 19th century fossil hunter Mary Anning<br>To understand the process of fossil formation and be able to describe it in simple terms<br>To investigate, discover and classify the different components of soil<br>To gather evidence on how different soils can vary and suggest reasons for this |
| Key Vocabulary | rock, sandstone, limestone, chalk, granite, slate, marble, classification, observation, petrologist, man-made rocks, brick, tile, concrete, Igneous, sedimentary, metamorphic, permeable, impermeable, acid, erosion, marble, chalk, limestone, slate, granite, sandstone, identification key, survey, data, database, fossil, |

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| | ichthyosaur, plesiosaur, ammonite, sediment, minerals, mould, cast, soil, micro-organisms, organic matter, particles, sand, silt, fair test, compare, sort, predict |
| Key Learning Experiences | ❖ Undertake **The Hard Rock Challenge** – a game that requires them to begin to observe rocks carefully and group them in different ways according to their features<br>❖ Make detailed labelled drawings of 6 common rocks and write descriptions of their observable features<br>❖ Devise their own fair test for the hardness of rocks and put a group of samples in rank order of hardness<br>❖ Devise a fair test for permeability and record results and observations in tabular form<br>❖ Test rocks with acid (vinegar) to discover if they are made of the shells of dead creatures<br>❖ Use a rock identification key to discover what type of rock each sample is<br>❖ Learn the names of 6 common rocks whilst playing an active game – **Rock Stars!**<br>❖ Undertake a rock survey of the local area to answer questions on the local bedrock and other rocks seen<br>❖ Engage (through roleplay) with the great fossil hunter Mary Anning and ask questions to discover her story<br>❖ Learn how fossils are made and record by writing and illustrating the stages or through sequencing a text<br>❖ Make their own "fossil" of a shell using a plasticine mould and plaster of Paris<br>❖ Handle real fossils and rehearse the stages of fossil formation through oral retelling<br>❖ Play a guessing game to learn some amazing facts about soil and the crucial role it plays in supporting life<br>❖ Closely observe soil with hand lenses and list and classify the constituent parts<br>❖ Actively investigate and compare 3 different soils and their properties, recording findings<br>❖ Play a guessing game to learn some amazing facts about soil and the crucial role it plays in supporting life<br>❖ Closely observe soil with hand lenses and list and classify the constituent parts<br>❖ Actively investigate and compare 3 different soils and their properties, recording findings |

| **Title** | **Living Things in their Habitats** |
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| Overview | The aim of this unit is to use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. Children identify how the habitat changes throughout the year and explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. |
| Knowledge Acquisition | The children will recognise that environments can change and that this can sometimes pose dangers to living things. They will understand the processes that give rise to key physical and human geographical features of the world, how these are interdependent and change over time. |
| Key LOs | ❖ To discuss what they are learning and to develop their wider skills in spoken language.<br>❖ To use language in a greater variety of situations, for a variety of audiences and purposes, including through drama, formal presentations and debate. |

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| | ✢ To use a simple enquiry to demonstrate the effect of a greenhouse and relate this to climate change.<br>✢ To recognise that changes to an environment can be dangerous to living things and to begin to understand what can be done to reverse some of the changes<br>✢ To plan positive changes to a local environment and use evidence to answer questions about why they are making the changes.<br>✢ To discuss what they are learning and to develop their wider skills in spoken language.<br>✢ To use language in a greater variety of situations, for a variety of audiences and purposes, including through drama, formal presentations and debate. |
| Key Vocabulary | Environment, change, living thing, danger, climate, change, danger, greenhouse, thermometer, test, carbon dioxide, results, graph, table, Impact, change, positive, negative, danger, living thing, |
| Key Learning Experiences | ❖ Take a walk around their school environment to consider how it might have changed<br>❖ Take part in a class debate about a proposed change to an area in the school environment<br>❖ Conduct an experiment that highlights what the 'greenhouse effect' is<br>❖ Explore what the impact of some environmental changes are, both positive and negative<br>❖ Learn about bumblebees and what the impact of their declining numbers are<br>❖ Work in a group to plan how to make positive changes to a small local area (school based or wider community if possible)<br>❖ Draw a plan of how they would change a local environment for the better Put their positive plan for a local area into action |

| **Title** | **Plants** |
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| Overview | The aim of this unit is to revise knowledge of the key parts of a flowering plant and to introduce the relationship between structure and function: the idea that every part has a job to do. The children will explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. |
| Knowledge Acquisition | The children will explore the part that flowers play in the life cycle of flowering plants. Over the sessions, they will build up expertise on plant lifecycles, understanding the importance of flowers, bees, fertilisation, and the huge variety of fruits and seeds. They will know how each stage in the lifecycle can provide delicious, nutritious food. |
| Key LOs | ✢ To observe a range of different flowers closely using magnifiers.<br>✢ To record observations using annotated drawings, paintings and notes.<br>✢ To understand that flowers vary in size, colour, shape and form but all play a crucial role in reproduction.<br>✢ To be able to identify and describe the role of the male and female parts in a flower.<br>✢ To speak, rehearse and write a wildlife commentary to accompany a bee hand puppet performance that explains the role of bees in the pollination and fertilization of flowers.<br>✢ To understand the role of bees and other insects in the pollination and fertilization of flowers.<br>✢ To make first-hand observations of the development of fruits from flowers.<br>✢ To use evidence to form theories.<br>✢ To understand the process of how fruits develop from pollinated flowers<br>✢ To classify fruits according to their similarities and ask questions about the variety of fruits.<br>✢ To investigate wind dispersal by setting up a fair test to compare the flight of different paper spinners |

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| Key Vocabulary | botany, botanist, botanical, petals, reproduction, male, female, stigma, style, stamens, reproduction, male, female, stigma, style, seed, nectar, stamens, pollination, fertilisation, bee, pollen, nectar, waggle dance, honey, hive, attract, transfer, ovary, ovules, pollen grains, fruit, pod, seeds, parent plant, dispersal, germination, investigate, fair test, record, results |
| Key Learning Experiences | ❖ Play a guessing game to introduce the new topic and introduce some fascinating flower facts **(Yrs3&4)**<br>❖ Closely observe a variety of flowers with magnifiers and record this in the form of annotated botanical illustrations (**Yr3 3-4 annotations, Yr4 4-6 annotations)**<br>❖ Create a model flower and begin to know and name the male and female parts within it **(Yrs3&4)**<br>❖ Create colourful labelled 3D flower models **(Yr3 using key word prompts, Yr4 without prompts)**<br>❖ Help to prepare all the ingredients to make a saffron, vegetable paella **(Yrs3&4)**<br>❖ Learn to do a Waggle Dance and know this is how bees communicate with other bees **(Yrs3&4)**<br>❖ Create bee puppets in pairs and use them to be wildlife presenters by writing an explanatory commentary **(Yrs3&4 but with higher expectation of Yr4 in terms of leadership and outcome)**<br>❖ Play a Waggle Dance game to communicate the location of a target 'flower' **(Yrs3&4)**<br>❖ Examine plant specimens that show the development of fruits from pollinated flowers and generate questions and theories about the process **(Yrs3&4)**<br>❖ Make detailed pastel drawings of sections through fruits **(Yrs3&4)**<br>❖ Cut up fruits for a shared class fruit salad **(Yrs3&4)**<br>❖ Investigate wind dispersal by setting up fair tests to determine the effect of varying size/weight **(Yr3)** or material/shape **(Yr4)** on the flight of a paper spinner<br>❖ Make chewy no bake granola bars and discuss the origins of the various ingredients **(Yrs3&4)** |

| **Title** | **Animals including Humans** |
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| Overview | In this unit the aim is for the children to continue to learn about the importance of nutrition. They should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Children will work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They will research different food groups and how they keep us healthy and design meals based on what they find out. |
| Knowledge Acquisition | The children will know how to identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food.<br>They will know they get nutrition from what they eat.<br>They will know that humans and some other animals have skeletons and muscles for support, protection and movement. |
| Key LOs | To understand that animals (including humans) can be grouped according to what they eat.<br>To answer questions on diet by extracting data from a food survey and displaying it in tables and bar charts.<br>To look for patterns and trends in the data and use this to ask further questions.<br>To classify different foods according to their group (e.g. carbohydrates, proteins, dairy and fats). |

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| | ✚ Know the nutritional properties of each food group and the importance of limiting fats and sugars<br>✚ Understand that not all animals have an internal skeleton and that the presence of this is an important feature in classifying them.<br>✚ Know that a skeleton is needed for support, protection and movement<br>✚ To understand how muscles work in pairs to allow movement and maintain posture.<br>✚ To investigate whether people who do more sport have stronger muscles.<br>✚ To interpret data using a scattergram.<br>✚ Know the diaphragm is used in breathing and the lungs transfer oxygen to the blood.<br>✚ Know that muscles need more oxygen to work hard and this affects breathing rate.<br>✚ interpret and present data using bar charts, pictograms and tables (Yr3)<br>✚ interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs (Yr4) |
| Key Vocabulary | herbivore, carnivore, omnivore, nutrition, diet, food chain, data, table, bar chart, carbohydrates, proteins, dairy, fats, sugars, vitamins, minerals, fibre, growth, repair, health, energy, vertebrate, invertebrate, bone, skeleton, skull, ribcage, pelvis, femur, muscles, joints, tendons, contract, relax, biceps, triceps, data, scattergram, lungs, diaphragm, heart, investigate, measure, compare, breathing rate |
| Key Learning Experiences | ❖ Play an active game to reinforce vocabulary and understanding of animal feeding categories<br>❖ Review data from a food survey to answer a question on either sugar intake or 5 a day portions<br>❖ Create a model of a balanced meal for a paper plate<br>❖ Use knowledge of nutrition to either make food labels or complete a sheet of health advice<br>❖ Make a skeleton string puppet that has moving joints (Yr3 &4)<br>❖ Reinforce knowledge by naming bones on the puppets (Yr3) or writing an explanatory script (Yr4)<br>❖ Puppeteer a skeleton dance (Yr3 &4)<br>❖ Investigate how muscles work in pairs (biceps & triceps) using a bottle of water as a weight (Yr3&4)<br>❖ Collect data to investigate the link between leg muscle strength and either the type of regular exercise (Yr 3) or the amount of regular exercise (Yr 4)<br>❖ With guidance display data as a scattergram and use it to look for a pattern in the data (Yr3&4)<br>❖ Plan and carry out an investigation in groups that attempts to answer a scientific question - *Do people who exercise a lot get their breath back more quickly after strenuous exercise?* (Yr3) or *Do people who exercise a lot pant less after a burst of strenuous exercise?* (Yr4)<br>❖ Create an illustrated presentation for the team on health and fitness, using resources they have made throughout the block and evidence from their own research (Yr3 &4) |

| **Title** | **Electricity** |
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| Overview | The aim of this unit is to gain the skills and knowledge to construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. The unit will teach children to draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. |
| Knowledge Acquisition | The children will identify common appliances that run on electricity. They will construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. |

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| | The will 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 and recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. They will also be able to recognise some common conductors and insulators, and associate metals with being good conductors. |
| Key LOs | <ul><li>To explore electrical games and resources, identifying what they know and what they need to know about electricity.</li><li>To identify the dangers associated with electricity in the home and begin to recognise that the dangers are often associated with materials that are good conductors.</li><li>To construct a simple circuit, identifying the basic parts and to label a diagram of the circuit.</li><li>To predict if different 'circuit' layouts will light a bulb, and then test their predictions.</li><li>To open and close a circuit with a switch and to predict and test which other materials could be used to conduct electricity</li><li>To record findings and draw conclusions about materials used to make electrical circuits, and materials used to keep us safe from electrical circuits</li><li>To make a circuit with a buzzer and a switch and record the circuit in a labelled diagram</li><li>To answer questions using scientific evidence to support them</li><li>To demonstrate an understanding of electrical circuits, including naming its basic parts and drawing a labelled diagram</li><li>To answer questions about conductors and insulators</li></ul> |
| Key Vocabulary | electricity, circuit, switch, battery, plug, mains, appliance, device, wire, crocodile clip, bulb, buzzer, connection, power, cell, electricity, danger, power, electrocute, plug, socket, safety, circuit, switch, battery, plug, mains, appliance, device, wire, energy, flow, connection, power, cell, energy, current, conductor, insulator |
| Key Learning Experiences | <ul><li>Spend time exploring a range of games that use electricity, and materials needed to make a simple electrical circuit</li><li>Create safety posters to highlight the dangers to others</li><li>Identify electrical materials and components required for a buzzer to sound or a bulb to light</li><li>Set up their own series of enquiries that explore electrical circuits and various effects</li><li>Introduce a switch to their circuit and will understand that a break in the circuit will stop the flow of electricity</li><li>Work together to test a range of materials and record their findings in a simple chart</li><li>Work in a team to design and build a buzz wire game</li></ul> |

# Science at Great Whelnetham C of E Primary School

## Year 5 and 6

## Cycle 1

**Working Scientifically**

Across both the school years, children will experience a range of purposeful, practical opportunities to raise questions and recognise they can be answered in different ways. This will include:

- Planning different types of scientific enquiries to answer questions
- Recognise and control variables within an enquiry
- Taking measurements, using a range of scientific equipment
- Recording data and results using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs
- Using test results to make predictions and set up further comparative and fair tests
- Reporting and presenting findings from enquiries in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments

| Title | Autumn 1: Light |
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| Overview | During this unit, the children will explore the way that light behaves. They will explore light sources, reflections and shadows and will be able to talk about what they notice. They will be able to explain how light travels and why this allows us to see objects. They will draw scientific diagrams to show this. They will also explore how shadows are cast. |
| Knowledge Acquisition | The children will know various sources of light and the difference between primary and secondary sources, understanding how secondary sources are reflecting light from primary sources. They will know that light travels in straight lines and that this is what causes shadows of the same shape as a object. They will understand how light reflects off objects into our eyes and that this is how we see them. They will have a basic knowledge of the angle at which light will reflect off a flat surface. |
| Key LOs | • Recognise that light appears to travel in straight lines<br>• 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<br>• 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<br>• Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them |
| Key Vocabulary | Light, straight lines, shadow, reflection, source, opaque, transparent, mirror, eye, primary source, secondary source |

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| Key learning experiences | ❖ Make predictions about how light travels and how we see objects, linking this to our topic work on WW2 and a Spitfire pilot's view from the cockpit<br>❖ Draw scientific diagrams to show how light travels and casts shadows of different sizes<br>❖ Set up an investigation to explore the relationship between light sources, objects and shadows<br>❖ Make and experiment with, a periscope and role play using this to check for the all clear from an air raid shelter or pillbox |

| Title | Autumn 2: Evolution and Inheritance |
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| Overview | This unit will aim to help children to recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Through study of wildlife in various habitats we will understand that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. This is a cross-curricular unit, combining elements of Geography with the Science through the voyage of Charles Darwin to the Galapagos on the HMS Beagle. Children will identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. |
| Knowledge Acquisition | Children will learn who Charles Darwin was, his early life and how he came to be the naturalist on the HMS Beagle. Through this they will then follow Darwin's voyage of discovery as he realised how animals become adapted to their environment by natural selection, how this happens by accident through natural variations in generations of a species, and that it is driven by the need to survive. They will find out how certain animals are adapted to their specific environments, and consider how some species have actually become over-adapted. They will know about selective breeding and over-breeding by human design in both animals and plants. They will understand how fossils provide us with some of the evidence for evolution as a window to the past. |
| Key LOs | • Identify the adaptations that have taken place in certain familiar animals and how they help those animals to survive<br>• Know key observations made by Darwin and how these led him to form his famous theory<br>• Identify common characteristics in their own family and how there are both shared features and variation across the generations<br>• Understand how adaptation and variation over time can lead to evolution<br>• Recognise the influence of habitat on adaptation |
| Key Vocabulary | Adaptation, evolution, inheritance, characteristics, Charles Darwin, HMS Beagle, habitat, environment, survival of the fittest, offspring, fossils, evidence, observations |
| Key Learning Experiences | ❖ Role play as a crew member on the HMS Beagle and consider what life was like on the voyage<br>❖ Create a new dog breed by considering how cross breeding works<br>❖ Visit the Museum of Zoology in Cambridge for a workshop led by an expert, looking at artefacts from Darwin's voyage and studies<br>❖ Conduct a family survey to identify inherited characteristics and natural variations |

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| | ❖ Look at fossils to understand how they provide evidence of life from millions of years ago |

| Title | Spring Term: Forces |
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| Overview | During this topic, pupils will explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. We will then investigate what can affect the speed that this occurs (air resistance). We will use a bottle rocket to examine and demonstrate the nature and size of forces needed to overcome gravity. We will create concept cartoons to explain the other forces that can work against gravity. Finally, we will be making mechanisms and investigating how their components can allow a smaller force to have a greater effect. |
| Knowledge Acquisition | The children will understand the nature of forces, how they often act in pairs (like a push and pull force) and be able to name some main types of force. Our investigations and discussions will look at motion in particular, sliding objects on different surfaces to learn about friction and how to increase/reduce it, and pushing objects up varying slopes with a force meter to measure and record the effect of the force of gravity. They will learn how air resistance changes the speed that an object falls due to gravity and look at ways that this can be harnessed by making simple paper planes and parachutes. They will also understand how a similar effect is caused in water with water resistance.<br>The children will use simple mechanisms like gear, pulleys and levers to understand how forces required to push, pull or lift an object can be changed. |
| Key LOs | • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object<br>• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces<br>• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. |
| Key Vocabulary | Friction, force meter, gravity, air resistance, water resistance, aerodynamic, push, pull, opposing forces, mass, lever, pulley, gears |
| Key Learning Experiences | ❖ Use a force metre to investigate the relationship between mass and force<br>❖ Investigate ways to increase or reduce friction and the effect on the forces needed to move an object<br>❖ Explore how forces affect different objects. Create concept cartoons<br>❖ Fair test experiment to assess how water can effect weight and force of an object.<br>❖ Create mechanisms that include levers, pulleys and gears and use them to investigate force.<br>❖ Display results using mathematical graphs and tables. |

| Title | Summer Term: Materials and Changes of State |
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| Overview | Children will use a range of practical resources to 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. They will then explore the uses of these materials. Children will use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. We will then aim to prove that we can change some states of matter and then reverse them. Through observations we will investigate how some materials change state when heated or cooled and explain the science behind this, also understanding that in an irreversible change, a new substance is always created. |
| Knowledge Acquisition | The children will understand different materials and how they vary from one another, as well as how this affects their uses and applications. They will revisit the 3 states of matter and how we can change some materials between the states. They will know that some changes are reversible and some are not, using demonstrations and examples of each, and that when they are not, a new substance is often created. They will learn ways to separate materials that have been mixed, using sieves, filters and heat to observe this separation. They will understand how a solid can dissolve in a liquid, that the liquid has a different saturation point for different solids, and that heat can affect the speed at which it dissolves. |
| Key LOs | • 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.<br>• Know that some materials will dissolve in liquid to form a solution, describe how to recover a substance from a solution, and understand that a liquid will reach a point of saturation.<br>• Investigate what factors might affect the speed that substances dissolve in a liquid<br>• 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.<br>• Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.<br>• Demonstrate that dissolving, mixing and changes of state are reversible changes.<br>• Compare and group materials together, according to whether they are solids, liquids or gases.<br>• 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). |
| Key Vocabulary | Materials, change of state, solid, liquid, gas, evaporation, condensation, melting, filter, sieve, reversible, irreversible, mixing, temperature, saturation, hardness, solubility, transparency, conductivity |
| Key Learning Experiences | ❖ Identify characteristics of different objects using the correct scientific vocabulary. |

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| | ❖ Investigate how materials dissolve in water. Suggest ways to recover them from water.<br>❖ Identify the properties of solids, liquids and gases.<br>❖ Investigate reversible and irreversible changes, speed of dissolving and saturation points for different solids in the same liquid |

# Cycle 2

| Title | **Autumn 1: Electricity** |
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| Overview | In this unit, the children will have the opportunity to construct their own simple series circuits. They will use these to answer questions about what happens when they try different components. They will go on to learn how to accurately represent their circuit using recognised symbols. |
| Knowledge Acquisition | The children will know what uses we have for electricity, and consider ways to reduce our usage. By learning about ways that our electricity is generated by either renewable or non-renewable methods, children will then understand the importance of saving electricity where possible. They will know how electrons flow from a positive to negative part of a cell or battery, and that a circuit must be created to allow this flow to take place. They will then build circuits using cells and various components, learning how the size of the cell and the quality of the connections in the circuit affect how well things work. They will also use these simple circuits to investigate the conductivity of different materials. They will know how to represent these circuits in a diagram and understand the importance of clear and accurate drawing using recognised symbols. A Homework project will run alongside the unit, where the children research deeper into either the history of the science of electricity or the use of renewable energies. |
| Key LOs | • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit<br>• 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<br>• Use recognised symbols when representing a simple circuit in a diagram |
| Key Vocabulary | Electrons, electricity, circuit, cell, power, energy, renewable, solar, wind, wave, fossil fuels, non-renewable, switch, diagram, bulb, wire, buzzer |
| Key Learning Experiences | ❖ Build simple circuits, including components such as switches, bulbs, buzzers and motors<br>❖ Create a human model for an electrical circuit<br>❖ Use the correct scientific symbols to represent their circuit<br>❖ Create a presentation as part of a Homework project about famous scientists who worked with electricity or the use of renewable energies<br>❖ Plan and make a moon buggy (cross-curricular link with D&T) to link with next half term topic of Earth and Space |

| Title | Autumn 2: Earth and Space |
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| Overview | During this half term, the children will use a human model to describe and understand the movement of the Earth and other planets, relative to the sun. We will revisit the planets of our solar system, their names, characteristics and order, using various mnemonics to help us. They will use a sun dial and a globe to help them understand and explain the concept of the Earth rotating and how this creates night and day. By looking at the tilt of the Earth we will gain a basic understanding of how we get warmer and cooler seasons in the northern and southern hemispheres. |
| Knowledge Acquisition | The children will know the names and key features of the planets in the solar system, and will choose a favourite mnemonic to remember their order. They will learn about one planet in greater detail through a mini research project on it. They will understand that the sun is the centre of the solar system and that all the planets rotate around it in orbits of varying sizes. They will then learn that each planet also rotates on an axis and it is this motion that gives us day and night, and creates the illusion that the sun moves across the sky. The children will know that the Earth tilts on its axis and realise that this is what gives us our seasons. The previous learning on forces and gravity will be reinforced with understanding of how the moon is 'locked' facing Earth and also how it gives us our ocean tides through its own gravitational pull. |
| Key LOs | • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system<br>• Be able to name and order the planets in our solar system<br>• Describe the movement of the Moon, relative to the Earth<br>• Describe the Sun, Earth and Moon as approximately spherical bodies<br>• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky |
| Key Vocabulary | Planets, solar system, moon, satellite, orbit, rotation, day, night, seasons, hemispheres |
| Key Learning Experiences | ❖ Chn to create a human model of the solar system and show the movement of Earth, Moon and the other planets<br>❖ Use a sun dial to show an understanding that the Earth is rotating<br>❖ Use a globe to identify how our rotation creates night time and day time<br>❖ Possible planetarium visit/visitor |

| Title | Spring Term: Living Things – Habitats, Classification and Life Cycles |
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| Overview | During this half term, the children will ask questions about the animals they may see in their local environment., discussing and deciding how to classify them and what models we can use to do so. They will study the life cycle of these animals and make comparisons between the life cycles of different types of animal. They will also build on prior knowledge about the pollination |

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| | of plants, to explain the process of reproduction in some plants. Finally, they will study the life and work of David Attenborough. |
| Knowledge Acquisition | The children will know that there are key characteristics in plants and animals which help us to sort them into different categories and species. They will use that knowledge and apply it to animals in the local area, becoming more familiar with the classification methods. They will understand how the different types of animal have different life cycles and that some types of animal have extra stages, such as metamorphosis in insects and amphibians. The children will look at live plants to learn about the parts, life process and reproduction in those plants.<br>They will then focus on the famous naturalist David Attenborough and learn through research about his achievements, opinions and work. |
| Key LOs | • Understand classification models and use them to sort different creatures according to their characteristics<br>• Identify wildlife in the local environment and use classification models to decide where they belong<br>• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird<br>• Describe the life process of reproduction in some plants and animals<br>• Research key facts and details about a person and give an overview of their life |
| Key Vocabulary | Life cycle, mammal, amphibian, insect, bird, reproduction, naturalist, environment, metamorphosis, larvae, eggs, live young, vertebrates, invertebrates |
| Key Learning Experiences | ❖ Identify the different stages within a life cycle of a mammal, amphibian, insect and bird. Within this, identify how they reproduce (eggs/live offspring)<br>❖ Compare animals found in our local environment and their life cycle, to the life cycle of an animal found in a different environment.<br>❖ Identify the differences between the different life cycles, but how they all do change over time<br>❖ Explain the process of reproduction in some plants – chn to act out the process<br>❖ Research the work of a naturalist (David Attenborough) and make connections with their learning from this half term |

| **Title** | **Summer Term: Animals including Humans** |
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| Overview | During this topic, we will find out about the life cycle of a humans and the changes that happen between each stage, discussing both physical and behavioural changes. They will compare pictures of humans at each stage in order to identify the changes that have happened. The children will have the opportunity to use their computing skills in order to research the gestation periods of some different animals and compare this to humans. They will also complete a research project about the life expectancy of humans in some different countries and think about the reasons for these differences. This unit will be taught alongside our Sex and Relationships unit in PSHE, where |

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| | the children will discuss changes during puberty (Year 5) and sex, relationships and child birth (Year 6). |
| Knowledge Acquisition | The children will learn that humans are mammals and so our life cycle is similar to that of other mammals, including features such as giving birth to live young and feeding young with mother's milk. They will look in depth at each stage and decide what physical and behavioural changes take place as we humans grow up and age. They will understand how the human gestation period compares to that of other mammals. They will also gain knowledge about life expectancies in different cultures or parts of the world and form hypotheses for the reasons for that.<br>The children will learn/recap the changes that take place during puberty for both boys and girls and how growing up will affect their life from both a physical and emotional point of view. This will then be developed through discussions to include friendships and loving physical relationships, leading towards a sexual relationship between consenting partners. Sexual intercourse, conception, pregnancy and child birth will then be taught to the Year 6s only. |
| Key LOs | • Recognise the stages of a mammal's lifecycle and understand how we follow the same cycle<br>• Describe the physical changes as humans develop to old age<br>• Describe the behavioural changes as humans develop to old age<br>• Recognise differences in gestation periods between species of mammal<br>• Suggest reasons for differences in life expectancy across regions and cultures<br>• Know the changes that take place during puberty and how these are different for girls and boys |
| Key Vocabulary | Life cycle, reproduction, puberty, sex, hormones, physical changes, behavioural changes, gestation, birth, infant, child, teenager, adult, old age |
| Key Learning Experiences | ❖ Identify the different stages within a life cycle of a human<br>❖ Describe the changes between each stage, including learning about the changes that happen during puberty<br>❖ Compare pictures of young children, young adults and elderly people and describe the differences<br>❖ Research the gestation periods of other animals and compare them to humans.<br>❖ Research the life expectancy of some different countries and report on reasons for this<br>❖ Have the opportunity for an all-female or all-male discussion about changes during puberty (years 5 and 6) and sex and relationships (year 6 only) |