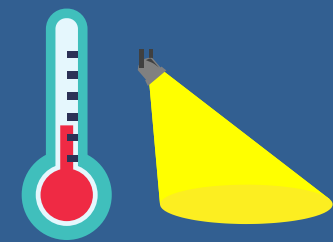


# Science Curriculum Map

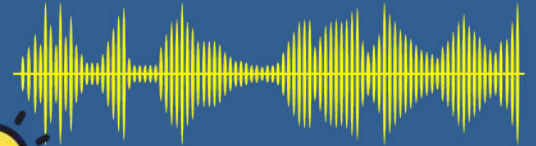
In Y5, we learn about electricity and build a variety of circuits. We are introduced to chemistry in which we explore irreversible changes. We build on our understanding of changing state.



Y5

Y6

In Y6, we explore soundwaves including pitch and amplitude. We look at living organisms and are introduced to cells structures in plants and animals. We apply our knowledge of states of matter and enjoy the topic of evolution and inheritance by evaluating different theories.



In Y4, we look at how particles are arranged in solids, liquids and gases. We learn about the properties of liquids such as density and viscosity. We learn about different forces and magnetism as well as learning about the human body.

Y4



Y3

In Y3, we learn about our solar system and how light travels. We discover more about the different parts of a plant and how these enable them to produce their own food and grow. We sort, compare and classify rocks as we learn how they are formed and are introduced to forces.



Y2

In Y2, we compare animal life cycles and learn how to classify different animals. We continue to learn about materials and plants in more depth. .



Y1

In Y1, we learn about the properties of everyday materials such as absorbency. We begin to understand what helps plants to grow. We discover more about the seasons and our senses. We are introduced to states of matter to help explain the world around us.



EYFS

We develop our scientific skills through the Understanding the World strand of our curriculum. We learn about the human body and how to keep it healthy. We begin to learn about some important processes and changes in the natural world, including the seasons and changing states of matter. We take part in a range of experiments and investigations.





## Autumn Term – Marvellous Me!

National Curriculum Coverage	What I learn	Progression Pathway
<ul style="list-style-type: none"> <li>• Know and talk about the different factors that support their overall health and wellbeing:               <ul style="list-style-type: none"> <li>- regular physical activity</li> <li>- healthy eating</li> <li>- toothbrushing</li> <li>- sensible amounts of 'screen time'</li> <li>- having a good sleep routine</li> <li>- being a safe pedestrian</li> </ul> </li> </ul>	<p>In this term, pupils learn all about themselves in the 'Marvellous Me' topic. They explore their bones and different body parts, finding out about the important role that their skeletons plays. They are also introduced to the digestive system and find out its role in the body. Pupils develop an understanding of what their body needs to keep healthy. Pupils have the opportunity to talk about healthy food options and bake nutritious cakes and make fruit salads and smoothies. They also learn about the importance of hygiene, keeping clean and why they need to look after their teeth</p>	<p>Pupils will be introduced to the human body and the basic function of some body parts. In Year 1, pupils will build upon their knowledge of their different body parts by naming and labelling their functions.</p> <p>In year 2, pupils explore food in more detail, looking at not only vegetables and fruit but processed food and the effects on the body.</p>



## Autumn Term 2 – Marvellous Me! (continued)

National Curriculum Coverage	What I learn	Progression Pathway
<ul style="list-style-type: none"> <li>• Understand the effect of changing seasons on the natural world around them.</li> <li>• Describe what they see, hear and feel whilst outside.</li> </ul>	<p>In this half term, pupils learn about Autumn and explore how their environment changes depending on the weather. Pupils use all their senses to build an understanding of what nature is, how it appears in Autumn; exploring the natural world through nature walks in their environments. They explore seasonal vegetables and plants and begin sorting foods into groups, looking at how different food groups help to keep us healthy. Pupils use their observational skills to examine different vegetables. The pupils then prepare and cook a delicious vegetable soup.</p>	<p>Pupils will be introduced to the environmental changes caused by the weather. In year 1 pupils will build upon their knowledge of the seasons and the natural changes they experience throughout the year as they look closely at the days and change in length and sunlight.</p>



## Spring Term 1 – Traditional Tales

### National Curriculum Coverage

- Explore the natural world around them
- Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.
- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

### What I learn

In this term, pupils explore the characteristics of different materials. They investigate the best material for building a house for 'The Three Little Pigs' and experiment with making a waterproof jacket for 'The Gingerbread Man'. This introduces the pupils to the similarities and differences between materials and their suitability for certain jobs.

Pupils plant their own beans, just like 'Jack and the Beanstalk' and explore what plants need to grow. They develop an understanding of what plants need in order to grow by watching their beans begin to shoot, recording and discussing their observations as they start to understand the life cycle of plants.

### Progression Pathway

The pupils are introduced to the idea of different materials with different characteristics. In Year 1, pupils will build upon their knowledge of this by sorting and classifying materials depending on their characteristics. They will discuss and compare the suitability of different materials for a range of purposes. Pupils expand on their knowledge of a bean plant life cycle and start to look at different plants, their features and structures thinking about what it is to not just make a plant grow but how to keep it healthy.

## Spring Term 2 – Amazing Adventures

### National Curriculum Coverage

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

### What I learn

In this term, pupils journey across the seas as pirates and investigate objects that float and sink. They go into space as astronauts and look at the Earth in the solar system, developing understanding about our life on earth. They begin to understand that life in space is very different to Earth.

They explore reflective materials in a dark tent using torches and are introduced to reflective and non-reflective materials

### Progression Pathway

Pupils are introduced to planet earth and the solar system. In year 1, pupils they use their knowledge of the solar system, the sun and moon to build on their knowledge of space. They will be able to build on their understanding of the differences between Earth and the moon to investigate day and night.



## Summer Term 1 – Mini-beast Adventures

### National Curriculum Coverage

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

### What I learn

In this term, pupils learn about the different minibeasts that inhabit our environment and the different habitats that mini beasts live in. They look at the features and life cycles of some mini beasts. Pupils study the different stages of the butterfly lifecycle and begin to understand the process of metamorphosis. They learn to identify which minibeasts are insects.

### Progression Pathway

Pupils will be introduced to features of various minibeasts and their lifecycles. In Year 2, pupils expand their knowledge on animal life cycles as they compare life cycles of different animals. They classify animals according to what they eat.



## Summer Term 2 – Animals around the World

### National Curriculum Coverage

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

### What I learn

In this term, pupils learn about caring for the animals and the natural environment. Making comparisons between animals that live on land and those that live in the water. Pupils learn how humans can affect animals and the environment through the way they live. This is then linked to materials and recycling. Pupils look at different materials, name them and sort them into recyclable groups based on their characteristics. They explore the process of ice melting so they can understand one of the impacts of global warming.

### Progression Pathway

The pupils are introduced to the basic principles of materials. In Year 1, pupils will build on their observations around solids and liquids to then go on to explore and investigate gasses around us.



## Autumn Term 1 – Materials

### National Curriculum Coverage

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties

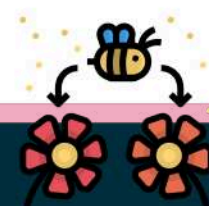
### What I learn

In this unit, pupils will be introduced to different materials that they encounter in their daily life. They will explore how materials can be sorted by looking at various properties, e.g. hard, soft, flexible, waterproof and so on. They will use this understanding to describe and compare materials. This knowledge is then applied to their topic in Literacy - Little Bear- and they will be required to use their knowledge to suggest materials to build his house whilst considering the suitability of each type of material. Pupils investigate the absorbency of given materials and identify waterproof materials through investigation

### Progression Pathway

In this unit, pupils build on their knowledge about everyday materials explored in EYFS.

In Year 2, pupils will continue with this topic with a greater focus on the purpose of materials and their features make them suitable for those.



## Autumn Term 2 – Plants

### National Curriculum Coverage

- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- identify and describe the basic structure of a variety of common flowering plants, including trees

### What I learn

Pupils learn to identify various types of plants in their environment and learn to recognise the difference between basic plants, e.g. flowering plants and trees. Observing their differences. They will explore how to look after plants and what they need in order to survive. Pupils will also be introduced to structures of flowers and trees, find out what pollen is and why it is important for plant to have pollen.

### Progression Pathway

Pupils will have been learning about plants and planting seeds in EYFS and will have an opportunity to revisit and build on prior knowledge.

In Year 2, pupils will learn to classify trees in deciduous and evergreen trees. They will build on their knowledge from this year to learn about what plants need to grow well.

### Working Scientifically

Pupils will be expected to do the following:

- ask simple questions and recognise that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classify
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions



## Spring Term 1 – Lighthouses and seasons

### National Curriculum Coverage

- observe changes across the 4 seasons
- observe and describe weather associated with the seasons and how day length varies

### What I learn

In this unit, pupils will explore the changes that happen in nature as the seasons change, including the understanding linked to changes to the length of a day during different seasons and the reason that the sky is blue. They are introduced to the concepts of light and electricity and will apply this knowledge as part of their Lighthouse topic; understanding that electricity is needed for power, how electricity travels through conductors and how to make a light bulb shine more brightly. They will look at what happens to light when shone on different materials and observe and explain static electricity.

### Progression Pathway

The pupils are introduced to electricity and light. The topic, Light, will be explored thoroughly in Year 3 with a greater focus on physics.

Electricity will be fully explained and embedded in Year 5 whereas in Year 1, pupils are only expected to understand that energy is needed to create light.



## Spring Term 2 – Animals including humans

### National Curriculum Coverage

- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

### What I learn

In this unit, pupils look at the human body and learn the names of the body parts. They explore how they have changed since they were babies, naming parts of the human body. They investigate how we use our five senses and how we have to rely on them; exploring how humans hear and how we use our tongues to classify food. They will carry out investigations to explore what would happen if we did not have the ability to smell, taste, touch, see or hear, looking at the way our senses work together to allow us to explore the world

### Progression Pathway

In this unit pupils are introduced to our senses and aspects of how we grow. In year 2, pupils will continue to learn about how humans change as they get older and compare the human life cycle to that of animals'. They will further explore how humans stay healthy by looking at their diet and exercise. There will be a greater focus classifying animals in various ways and their habitats.



## Summer Term 1 – Space

### National Curriculum Coverage

- describe the movement of the Earth and other planets relative to the sun in the solar system
- describe the movement of the moon relative to the Earth
- describe the sun, Earth and moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

### What I learn

Pupils are introduced to the topic of Space with a particular focus on the sun. They learn how to staff safe in the sun and test different sun creams, investigating chemical reactions. They discover how the earth moves around the sun as well as other bodies in our solar system. Pupils will also have the opportunity to find out about day and night as the earth rotates on its own axis and they will explore star constellations

### Progression Pathway

This unit develops further understanding of the solar system that was first introduced in reception. They will find out about night and day however this will be explored in Year 3 with a closer look at the solar system and the planets' movements around the sun.

## Summer Term 2 – States of matter

### National Curriculum Coverage

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

### What I learn

In this unit, pupils are introduced to different states of matter, explaining how things are either solid, liquid or gas and how gases are all around us. They learn to recognise the difference between solids liquids and gases and observe how liquids turn to gas when heated. They will also observe and investigate what happens to a gas when it is cooled. They are also introduced to the water cycle and begin to recognise how rain is formed.

### Progression Pathway

This unit is only a brief introduction to solids, liquids and gases in which pupils learn the scientific vocabulary associated with this topic. Pupils will learn more in Year 4 when they understand how particles are arranged in each state of matter and how they can be separated and changed through different processes – heating, filtering and dissolving



## Autumn Term 1 – Animals including humans

### National Curriculum Coverage

- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense notice that animals, including humans, have offspring which grow into adults find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene
- 

### What I learn

In this unit, pupils learn about different ways in which animals can be classified, e.g. amphibians, reptiles, mammals, birds and fish. They will classify them in more subcategories e.g. herbivore, carnivore, nocturnal, diurnal, cold-blooded and warm-blooded as well as distinguishing nocturnal and diurnal animals – through fun practical activities and experiments. They will study the lifecycles of certain animals and learn that different animals require different habitats to survive, exploring habitats, food sources and how the availability of food can impact the animal population.

In Autumn 2, the topic continues but with a focus on humans, their life cycle and how to keep their bodies healthy, with investigations regarding the importance of exercise and the affect it has on our body. Pupils will understand the basic needs for survival and will explore healthy foods. They will also look at the effects of foods considered unhealthy and explore the impact these have on our body.

### Progression Pathway

This unit is a continuation of the same unit in Year 1; however, the focus will firstly be on animals, which is a topic to which pupils were introduced in EYFS, including life cycles, names of animals and habitats. This unit will further explored in Year 4; where pupils will learn about human skeletal systems, muscle systems, the function of teeth and food chains. In year 6 this is developed further through micro-biology with the study of cells and cell structures and the purpose of some specialised cells

### Working Scientifically

Pupils will be expected to do the following:

- ask simple questions and recognise that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classify
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions





## Spring Term – Materials

### National Curriculum Coverage

- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

### What I learn

In this unit pupils will learn about more properties of materials. They explore and sort different materials according to their properties, investigating elasticity, flexibility and transparency exploring materials that make the best thermal insulators. They will then have the opportunity to apply their knowledge to decide on the suitability of everyday materials for particular uses. As part of that objective, pupils will learn about materials used in greenhouses, about choosing recyclable materials where possible and think about safety of materials by discovering which burn and which melt. They will explore aspects of recycling and investigate how objects can be made waterproof. Pupils will also investigate rigidity of materials and apply this knowledge to creating a strong paper bridge.

### Progression Pathway

This unit links to the unit completed in Year 1 about materials but with a greater focus on the suitability of different materials for different purposes. In year 4 they develop their understanding by exploring the properties of materials and classify them into solids, liquids and gases. They investigate the characteristics of each of these and the affect that heat has on them.



## Summer Term 1 – Plants

### National Curriculum Coverage

- observe and describe how seeds and bulbs grow into mature plants
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

### What I learn

In this unit, pupils are introduced to the basics knowledge of photosynthesis; exploring why plants are so important to the planet. They will learn what a plant requires to germinate, what is needed to make its own food and what happens when those conditions are not met. Investigating the affect of light and water. Pupils continue to learn about different features of plants, particularly in relation to trees, and classify according to those features; making observations about deciduous and evergreen trees. In addition they will identify simple and compound leaves and their features

### Progression Pathway

This unit builds on knowledge gained in Year 1 but with a greater focus on what plants need to survive, photosynthesis and classification regarding trees.

In Year 3, pupils will build on this knowledge with a closer look what role roots and other parts of the plant play in allowing plants to grow well.

## Summer Term 2 – Forces



### National Curriculum Coverage

- compare how things move on different surfaces
- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others

### What I learn

In this unit, pupils are introduced to forces and learn to recognise forces evident in everyday life. They will learn the terms associated with real life experiences, e.g. friction or buoyancy and carry out fair tests and experiments to see how these forces can change. They will explore aspects of elasticity as well as gravity, air resistance (defying gravity) and magnetism.

### Progression Pathway

This unit introduces the topic, Forces and pupils will be introduced to different forces found in the world around them. This topic will be explored in more detail in Year 4 where children will be investigating how objects create different amounts of friction, how some mechanisms allow a small force to have a greater effect (levers)



## Autumn Term 1 – Light and Space

### National Curriculum Coverage

- recognise that light appears to travel in straight lines
- 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
- 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
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
- describe the movement of the Earth and other planets relative to the sun in the solar system
- describe the movement of the moon relative to the Earth
- describe the sun, Earth and moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

### What I learn

The Light, Earth and Space unit allows pupils to understand exactly what light is, to explore that light is energy which travels in waves. They explore different ways in which light reacts to the surrounding environment, including how light is reflected, and how the angle of a light source or distance from it can affect shadows. Light and darkness will be explored through comparative tests. There is a natural progression to the Space element of the unit as most of what is known about space is because of our knowledge of light. They learn about how the earth moves, they explore the orbits of different planets and investigate the movement of the moon relative to the earth. They explore the sun's light in our atmosphere and further develop understanding of its importance. They also learn about the lunar space missions and the moon landing.

### Progression Pathway

The topic, Space, is introduced in Year 1 and in this unit, pupils revisit some of the concepts covered and are introduced to new ones. By the end of the unit, they should possess a greater understanding of the earth's orbit around the sun, as well as the orbits of other planets. They will also take a closer look at the role light plays in our understanding of the solar system.

This unit explores light, what it is and how it travels. This is revisited in greater depth in Year 6.

### Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.



## Spring Term 1 – Plants

### National Curriculum Coverage

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

### What I learn

In this unit, pupils will have an opportunity to look closely at the parts of different kinds of plants, including flowering plants, by using powerful handheld microscopes and dissecting flowering plants. They will explore the functions of the different parts and look in depth at how each part plays a role helping the plants grow and spread. They will explore the requirements for growth, identifying the way in which water is transported through the plant, they will investigate the affect that temperature has on capillary action, as well as investigations into the process of photosynthesis. As part of a fair test, they will also look at the conditions necessary for a healthy plant. Pupils will explore the process of pollination, how seeds are dispersed and they will study how plants have adapted to different environments

### Progression pathway

This unit links to the units covered in Year 1 and Year 2. They continue to learn about what plants need to survive but with an in-depth look at the different parts of the plant that aid this and photosynthesis. They also explore habitats of various plants and how temperature affects growth. They build on their knowledge of plant reproduction from Year 1 by learning about the process of pollination and seed dispersal. In year 6 pupils study the structure of plant cells and look closely at the function of each cell part



## Summer Term 1 – Rocks

### National Curriculum Coverage

- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- describe in simple terms how fossils are formed when things that have lived are trapped within rock
- recognise that soils are made from rocks and organic matter
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### What I learn

The pupils will have the opportunity to explore and investigate different types of rocks with a series of fair tests and investigations. The results of these tests will enable pupils classify rocks according to their properties - to identify if they are igneous, sedimentary or metamorphic. Pupils will not only be able to name different types of rocks but they will also be able to explain how each type is formed. Their knowledge will then be applied to fossil formation. The pupils will explore the affect of phsical weathering and chemical weathering on rocks, linking to the processes of erosion.

### Progression pathway

This unit appears in Year 3 as an independent unit; however, the knowledge is applied in Geography units in Year 5. It equips pupils with knowledge needed in KS 3 for the Earth and Atmosphere unit of work.



## Autumn Term – Solids, liquids and gasses

National Curriculum Coverage	What I learn	Progression pathway
<ul style="list-style-type: none"><li>• compare and group materials together, according to whether they are solids, liquids or gases</li><li>• observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</li><li>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</li><li>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li><li>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li><li>• demonstrate that dissolving, mixing and changes of state are reversible changes</li></ul>	<p>This unit looks at solids, liquids and gases and how the particles in each are arranged in each. Pupils explore how energy is transferred through particles and use this knowledge to explain thermal conductors and insulators. They also have an in-depth look at properties of liquids, explaining carefully how the particle arrangement allows for viscosity and density; exploring the properties of non-Newtonian fluids.</p> <p>Pupils explore the solubility of materials, what factors affect the rate of dissolving. They explore methods that separate mixtures and solutions. Pupils investigate changes in state from liquid to gas and vice versa and how this science applies to the water cycle and what happens inside clouds</p>	<p>This unit builds on the knowledge gained in Year 1 and enables pupils to discover how particles are arranged in each state of matter. They have the opportunity to explore how states of matter can be changed using temperature. This year, there is also a big focus on properties of liquids. In Year 5, this topic will be continued with a greater focus on the properties of gases.</p>

### Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.



## Spring Term – Forces and magnets

### National Curriculum Coverage

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect
- compare how things move on different surfaces
- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having 2 poles
- predict whether 2 magnets will attract or repel each other, depending on which poles are facing

### What I learn

This unit is all about different forces: gravity, friction, air resistance, buoyancy, magnetism and air pressure. By carrying out a series of observations, fair tests and experiments, pupils will observe these forces first hand and will begin to explain exactly how they work – demonstrating their understanding using diagrams

They will be experience the laws of Newton:

Law 1. A body continues in its state of rest, or in uniform motion in a straight line, unless acted upon by a force.

Law 2. A body acted upon by a force moves in such a manner that the time rate of change of momentum equals the force.

Law 3. If two bodies exert forces on each other, these forces are equal in magnitude and opposite in direction.

Through their investigations pupils will explore air resistance, friction (and the affects of lubrication on friction), magnetism and buoyancy. They will investigate levers and demonstrate how they reduce the force required to move objects

### Progression pathway

This unit is linked to the topic of Forces covered in Year 2 but pupils look in greater detail at what a force is, and explore different types of forces in greater depth. They will use their knowledge about particles, learnt in the Solids Liquids and Gases topic to explain how forces impact materials In year 5 they are look at the links between electricity and magnets, exploring aspects of electro-magnetism



## Summer Term – Animals including humans

National Curriculum Coverage	What I learn	Progression pathway
<ul style="list-style-type: none"> <li>• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</li> <li>• identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>• describe the simple functions of the basic parts of the digestive system in humans</li> <li>• identify the different types of teeth in humans and their simple functions</li> <li>• construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul>	<p>This unit allows pupils to take and in depth look at the human body and its various systems: respiratory, digestive, muscular, skeletal and circulatory. With a variety of fun hands-on activities and experiments, pupils will be given knowledge of each and will be able to explain processes involved. They will look at the way exercise affects our body in terms of our heart rate and our breathing, as well as exploring the journey of blood through our body and the function it has. They will also look at how to keep the body healthy with reference to these systems. Pupils will look at the functions of different teeth and how teeth can be damaged. Pupils will explore food chains and classify mammals as vertebrates and invertebrates, as well as other animals – carnivores, herbivores and omnivores</p>	<p>This unit will build on the knowledge about the human body from Year 1 and Year 2 but with greater knowledge of the different systems of the human body. They will also continue to build on their knowledge about life cycles and classification of animals with a more thorough coverage of some of the topics.</p> <p>In Year 6, this topic is revisited within the Evolution and Inheritance topic as well as a unit about micro-biology in which animal cells and specialised cells in the human body is explored.</p>





## Autumn 1 Term – States of Matter

### National Curriculum Coverage

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius ( $^{\circ}\text{C}$ )
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

### What I learn

In this unit, pupils will explore the different properties of solids, liquids and gases. Through a variety of activities, including drama, they will learn how particles move in each state and what happens to these movements when a material changes from a solid to a liquid to a gas and vice versa. They will further build on their knowledge about gases and find out about diffusion, density and pressure and how adding or removing heat energy can affect these properties. They will carry out experiments to find out how to change state of matter, which changes are reversible and which are not. This will be carried out through heating and cooling, observing the changes to materials and classifying them according to their properties.

### Progression pathway

This unit is a continuation of the work completed in Year 4 unit 'Solids, Liquids and Gases' where pupils looked at properties of liquids, explaining carefully how the particle arrangement allows for viscosity and density. In this unit these concepts are developed and pupils focus on the properties of gases and the changing state of matter. This is further developed in year 6 in the 'States of Matter' unit where pupils explore chemical reactions, the process of dissolving and investigate how to separate materials



## Autumn 2 Term – Changes of Materials

### National Curriculum Coverage

- compare and group together everyday materials on the basis of their properties
- know that some materials will dissolve in liquid to form a solution
- use knowledge of solids, liquids and gases to decide how mixtures will be separated
- give reasons based on evidence of comparative or fair tests for particular uses of every day materials
- demonstrate that dissolving, mixing and changing state are reversible changes

### What I learn

In this unit, pupils will explore the different properties of solids, liquids and gases. Through a variety of activities, including drama, they will learn how particles move in each state and what happens to these movements when a materials changes from a solid to a liquid to a gas and vice versa. They will further build on their knowledge about gases and find out about diffusion, density and pressure and how adding or removing heat energy can affect these properties. They will carry out experiments to find out how to change state of matter, which changes are reversible and which are not. This will be carried out through heating and cooling, observing the changes to materials and classifying them according to their properties.

### Progression pathway

This unit is a continuation of the work completed in Year 1 and Year 2 but with a greater focus on using their knowledge of the properties of materials in order to determine how they can be separated. This is further developed in year 6 in where pupils will learn the difference between melting and dissolving by exploring what happens to sugar and salt molecules.



## Spring Term – Irreversible changes

### National Curriculum Coverage

- demonstrate that dissolving, mixing and changes of state are reversible changes
- 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
- exothermic and endothermic chemical reactions (qualitative)

### What I learn

In this unit, pupils will have the opportunity to carry out various experiments with chemicals to observe irreversible reactions. They will be able to describe the difference between exothermic and endothermic reactions, explore different types of chemical reactions, e.g. temperature changes, mine explosions and luminescence. With their knowledge, they will be able to plan and follow a line of enquiry and carry out fair tests to answer a hypothesis, reporting and presenting findings as well as using their results to set up further tests. They will focus on rate and mass of a reaction as well as considering the affect of electricity on a chemical reaction. They will not only focus on irreversible change but will also consider changes that are reversible

### Progression pathway

In this unit, pupils are introduced to basic chemistry and irreversible changes through a series of investigations. In the year 6 unit, 'States of Matter' they futher explore chemical changes and continue to carry out fair testing principals during their investigations into dissolving materials and separating materials. This process is developed further through sdtudy of the periodic table and exploration into which elements are more reactive than others by looking at how the electrons are arranged.



## Summer Term – Electricity

National Curriculum Coverage	What I learn	Progression pathway
<p>identify common appliances</p> <ul style="list-style-type: none"> <li>• that run on electricity.</li> </ul> <p>Construct a simple series electrical circuit and name the basic parts: cell, wires, bulbs, switches and buzzer</p> <ul style="list-style-type: none"> <li>• Identify whether or not a lamp will light in a simple series circuit, based on whether or not a lamp is part of a complete loop with a battery</li> <li>•</li> </ul> <p>Recognise that switch opens and closes in a circuit and associate this with whether or</p> <ul style="list-style-type: none"> <li>• not a lamp lights in a simple series circuit.</li> </ul> <p>Recognise some common</p> <ul style="list-style-type: none"> <li>• conductors and insulators, and associate metals with being good conductors.</li> </ul>	<p>Pupils will be introduced to the concept of static electricity as well as current electricity. They will have the opportunity to observe static electricity in a wide variety of contexts and use their scientific knowledge to explain what is happening. They will build simple electrical circuits in which they will explore the purpose of each component and explore how changing the flow electrons affect the components, e.g. a bulb will be brighter with more cells or switch can stop the flow of electrons if opened. They will investigate electrical conductors and insulators and explore which metals are not conductors of electricity</p>	<p>Electricity is introduced in Y1 in the Lighthouses and Seasons where pupils are introduced to electric circuits and given an overview of static electricity</p> <p>In this unit pupils look very closely at the behaviour of electrons and explore the effects of changing components or the amounts of components in circuits and as well the physics electro-magnetism.</p> <p>Elements from this unit will continue into KS3 where they will continue to develop understanding of circuits and explore resistance</p>

### Working Scientifically

In Year 5 and 6, pupils will encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They will also encounter lessons which deals changes in scientific ideas over times. Similarly to Year 4, pupils will follow their own line of enquiry but will look more closely at patterns in data.

### Working scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, 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



## Summer Term – Living things

National Curriculum Coverage	What I learn	Progression pathway
<ul style="list-style-type: none"> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> </ul> <p>Describe the life process of reproduction in some plants and animals</p> <ul style="list-style-type: none"> <li></li> <li></li> <li></li> </ul>	<p>In this unit, pupils will find out about different types of reproduction, including sexual and asexual reproduction in plants and sexual reproduction in animals. They will work scientifically by observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world. Children will learn about the different asexual ways in which plants reproduce. They will research different life cycles and compare the life cycles of amphibians, reptiles, mammals and birds.</p>	<p>Pupils learn about life cycles and plants in year 1 and 2. The year 5 unit explores the reproduction stage in more depth. This unit is supported by Relationship and Sex Education where reproductive organs are discussed, in particular in year 6.</p>

### Working Scientifically

In Year 5 and 6, pupils will encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They will also encounter lessons which deals changes in scientific ideas over times. Similarly to Year 4, pupils will follow their own line of enquiry but will look more closely at patterns in data.

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- identifying scientific evidence that has been used to support or refute ideas or arguments



## Autumn Term – Sound

### National Curriculum Coverage

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases

### What I learn

In this unit pupils take an in-depth look at the topic, sound. Through various observations, they find out what it is, how it travels and how it can be changed. They plan and carry out many fair tests to identify what might affect the pitch or the amplitude of sound and they apply their knowledge of how particles in solids, liquids and gases are arranged, to predict how well sound will travel through each medium. With this in mind, pupils will learn how the speed of sound as well as the distance from a sound source can be calculated. At the end of the unit, children will use all their knowledge gained in this topic to explain how humans and other animals hear and they will explore the Doppler Effect.

### Progression pathway

As sound is energy and travels in longitudinal waves, it links very well to the Year 3 topic, Light in which pupils explore how light travels. Pupils in Year 6 can apply their knowledge to help them visualise what sound might look like if visible. As well as covering the KS2 statutory requirements, this unit also look at some knowledge which will be taught in greater depth in KS3.

### Working Scientifically

In Year 5 and 6, pupils will encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They will also encounter lessons which deals changes in scientific ideas over times. Similarly to Year 4, pupils will follow their own line of enquiry but will look more closely at patterns in data.

### Working scientifically

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- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, 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



## Spring Term 1 – Structures of living organisms

### National Curriculum Coverage

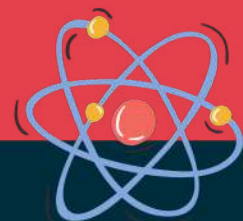
- cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts the
- similarities and differences between plant and animal cells
- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the
- impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in
- which nutrients and water are transported within animals, including humans

### What I learn

Pupils are introduced to KS3 unit of work in which they will begin to identify the different parts in animals and plant cells, developing understanding of life processes. They will have the opportunity to look closely at an onion cell under the microscope to identify the cell wall, vacuole, cytoplasm, chloroplasts and the nucleus. They will also look at animal cells under the microscope to compare and contrast with plant cells and explore single cell micro organisms. As part of this unit, pupils will learn about specialised cells in the human body and their functions, e.g. white blood cells. They will further their knowledge to understand the difference between a virus and disease and explore how breakthroughs in microbiology help to cure certain illnesses. Pupils will have the opportunity to witness fungus grow in a fair test.

### Progression pathway

In reception pupils are first instructed to the study of the human body in the 'Marvellous Me' unit. The 'Plants' unit in year 2 introduces the pupils to plant structures and both animals and plants are revisited in years 3 and 4. The Year 4 unit 'Animals including Humans' looks at some of the structures within the human body and this is the introduction that is required for this KS3 unit on microbiology. This unit provides the scientific knowledge that can be further developed in KS3 and KS4



## Spring Term 2 – States of matter

### National Curriculum Coverage

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- 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

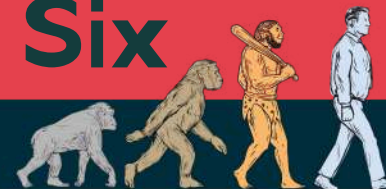
### What I learn

In this unit, pupils use their knowledge about solids, liquids and gases to plan and carry out range of fair tests. They will be expected to explain changes in state by referring to particles and how particles behave in different temperatures. Through carrying out experiments, pupils will explore the difference between melting and dissolving. Pupils will draw on their knowledge of reversible and irreversible changes to separate mixtures and solutions. To further their knowledge, pupils will explore the periodic table and carry out various experiments to explain chemical reactions. They will explore which elements are more reactive than others by looking at how the electrons are arranged.

### Progression pathway

In year 1 pupils were introduced to solids, liquids and gases. They explored the differences between how particles moved in each state of matter. In year 4 pupils investigated the affect that heat had on each state and explored viscosity and density. In year 5 the focus was on reversible and irreversible changes as well as an indepth study of gas. In this unit, pupils are able to apply their knowledge gained in Year 4 and 5 to a variety of investigations. They will also build on their knowledge of chemistry taught in Year 5 which will support them in KS3.





## Summer Term – Evolution and inheritance

### National Curriculum Coverage

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

### What I learn

In this unit, pupils distinguish between living on non-living things that inhabit the earth. They will explore the difference between inheritance and evolution and discover how adaptation led to evolution. By carrying out various case studies, pupils will learn how animals' and plants' adaptations have lead to the survival of the species and understand how animals are suited to their environment. Pupil will have the opportunity to critically think about the theories and discoveries various naturalists and understand how conclusions about inheritance and evolution were drawn from their findings. They will understand what a cladogram is and how it shows evolutionary relationships

### Progression pathway

In reception the children were introduced to 'Animals Around the World' They were already considering that some animals are found in water and some on land. This concept of habitats and adaptation was further developed in the unit 'Plants' in year 3.

This unit continues to build on pupils' knowledge about habitats. Pupils will look at how adaptations and evolution enable animals to survive in variety of habitats. This unit will introduce pupils to the KS3 unit: Inheritance, chromosomes, DNA and genes; enabling them to have an overview prior to embarking in KS3