Science Curriculum at Roundwood Primary School

Where we are going

You need to:

- Have an interest in and enthusiasm for science. **(respect)**
- Possess knowledge of biology, chemistry and physics and an understanding of the uses and implications of science, today and for the future. **(responsibility, reliability)**
- Display confidence and competence in practical and investigative skills. **(responsibility, resilience)**
- Make detailed observations, draw conclusions and justify explanations. **(resilience, reliability)**

Who we are

We have a number of nearby museums that children can visit including natural history museums in Oxford and Tring, National Space Centre in Leicester, Think Tank Museum in Birmingham and History of Science Museum in Oxford. A number of children will have also visited the National History and Science Museums in London as well as attending relevant exhibitions.

Throughout history, Oxford has made a significant contribution to science from the medieval period onwards and through the university and industry continues to be at the forefront of scientific discoveries. Both schools are located within the countryside, so the children have access to a diversity of plant and animal life for the children to explore and investigate. Within the school grounds, we have large school fields, wooded areas and mini allotments. There is also an extensive variety of zoos and wildlife parks within close proximity to Buckingham and most children will have visited many of these.

Roundwood children attend science fairs in both Year 2 and Year 5 which is organised by the local grammar school giving them a practical and hands on experience. Buckingham is an expanding town and as a result, the children are exposed to a changing environment and the impact that has on living things.

In EYFS, Science opportunities are planned for under the following EYFS Overarching Aims:

- "I can problem solve"
- "I know how to look after the world"
- "I know how to be healthy"
- "I can grow plants and vegetables"

From Year 1 to Year 6, we use the White Rose Science scheme to guide our learning and help us grow as scientists. From September 2026, Roundwood Primary School began following the 2025 edition of the White Rose Science scheme, which carefully builds knowledge and skills through to Year 6. The scheme helps the children at Roundwood become successful scientists, by making sure our learning progresses step by step, revisiting important prior knowledge so we can remember more over time. It also connects our learning to real-world sustainability issues and exciting STEM opportunities across all year groups, helping us see how Science makes a difference in the world around us.

Primary Vocabulary

Please see document titled: Roundwood Science Vocabulary Progression 2025-26

RPS Science Journey

Early Years

Children are naturally inquisitive and as we all know, full of questions! We support our children to connect and think critically, we help them to foster a love and fascination of their outside world, which will last them a lifetime. Children firstly learn about the things that are important to them and relevant in their lives. Their immediate family, community and cultural background. Once they have a secure base in this they can go on to develop knowledge and experience of the wider community and living and non- living things.

Children at the expected level of development will:

- 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
- Understand the effect of the changing seasons on the natural world around them.

In Early Years we learn to understand the world by going outdoors. Outdoor learning encompasses all that children do, see, hear or feel in their outdoor space. This includes the experiences that practitioners create and plan for, the spontaneous activities that children initiate, and the naturally occurring opportunities linked to the seasons, weather and nature. Nature has the ability to calm and soothe our children, to help them to play together successfully, to engage with their activities on a deeper level and offers them a sense of wonderment and joy that manmade resources just can't match. It's about playing exploring, noticing and understanding nature in a tactile way from a child's perspective.

In Year 1

Working Scientifically

Children begin their journey as a practicing Scientist in Key Stage 1. We start the foundation of how to work scientifically through teaching our children how to ask questions, knowing they can be answered in different ways. We encourage them to look closely and use equipment to do this. They begin to start testing and learn the initial elements of a fair test. As well as this, they look at naming, grouping and observing in order to collect and record data. We teach the children that these skills help us to answer scientific questions.

Animals, including humans

- **The human body (autumn) –** In this block, children will find out about the different parts of the human body and what they are for. Children will learn to name, draw and label the basic parts of a human, understanding how the many different functions work in unison to keep a person healthy. They will then go on to attribute different parts of the body to each of the five senses. To make learning a fun and hands-on experience, children will be invited to explore tasting and listening activities.
- **Animals (spring) –** Children will be taught to understand that animals can be identified in a variety of different ways. They will be taught categories such as mammals, reptiles and amphibians, learning how a crow, for example, scientifically differs from a dolphin. After being able to spot and name an assortment of common animals, students will go on to learn the terms carnivore, herbivore and omnivore. They will come to understand the common traits which attribute each animal to one of these categories. Then, with this new knowledge, children can begin to compare different species to each other, noting both similarities and differences in appearance, behaviour and life cycles.

Seasonal changes (across the year)

Seasonal changes builds on from the work children completed during their time in Early Years when exploring the natural world around them. This unit focuses on the differences between each of the four seasons, and how this might typically affect their daily lives and the four lessons are taught at the corresponding time of year so that children can easily link learning to real-life contexts. By the end of the unit, children will understand when each season occurs, how this changes the climate, effects plant and animal life, and how the days get both longer and shorter.

Materials (autumn)

Children's introduction to this vast topic begins with being able to name a variety of everyday materials. Students will use terms such as wood, plastic, glass, metal, water, and rock, and be able to physically hold and manipulate examples of each type. Then, children will be invited to describe each of these everyday materials, being encouraged to explore the different vocabulary which comes out through group discussion. The children's learning will then be moved onto the idea of grouping these different materials. Using the words they have shared and new vocabulary that has been taught, children will agree how to best group their many examples, clearing up any misconceptions along the way. An important learning point for the unit is the ability to tell the difference between an object and the material from which it is made. Through further physical explorations with examples of each, children will be taught to separate objects such as chairs from wood, cars from metal, and books from paper.

Plants (summer)

In this unit, the focus is on learning new vocabulary and applying it correctly to a variety of plant life. Children will be taught the correct names for many common wild and garden plants, then go on to find examples of each type in the surrounding outdoor area. Building on this, students will be taught the terms deciduous and evergreen, using sorting and categorising activities to correctly group examples of each. Children will then learn to name and describe the basic structure of a variety of flowering plants, including trees commonly found in their part of the world. They will be taught words such as petal, root and stem, and be able to correctly identify them both on diagrams and on actual examples collected from the surrounding area. As well as the main unit, there are 3 "planting" blocks spread across the Spring and Summer Term to allow time for things to grow.

Sustainability

- **Caring for the planet (spring) –** This block is the first time children look at the concept of sustainability. Children should understand that if an action can be done forever or long term then it is sustainable or helpful for the planet. If it cannot, then it can be harmful for the planet or unsustainable. They will think about our planet and why it is important to care for it and they should understand that everyone has a responsibility to care for the planet. Children should think of simple ways to care for their local area and may want to start actions within their school to improve their area over time.
- **Growing and cooking (summer) –** Children will look at how some plants can be grown and eaten for food. They will be introduced to farming and how fruit and vegetables can be grown on a large scale and that much of the food on their plate comes from crops grown by farmers. They will have an opportunity to revisit learning from previous planting steps by looking at how these plants could be used for food. Children will create ideas for meals using a variety of commonly grown fruit and vegetables.

In Year 2

Working Scientifically

In Year 2, children continue to develop their skills as practicing Scientists. They progress their skills of how to work scientifically through understanding how questions influence tests, knowing they can be answered in different ways. We develop their skills in looking closely and using different types of equipment. They continue applying their skills in testing and demonstrate the elements of a fair test. In different topics, they look at naming, grouping and observing in order to collect and record data.

Animals, including humans

- **Animals' needs for survival (autumn) –** Building on from the Animals including Humans unit in Year 1, here children will learn the basic needs of all animals and humans, understanding what is required for survival and the dangers of not looking after one's self.
- **Humans (autumn) –** Children will begin to learn more about their own bodies and, more specifically, the importance of exercise, eating healthily and also keeping clean. Through the enquiry question 'Do the oldest children have the most teeth?' children will be taught how to maintain good oral hygiene.
- **Growing up (summer) –** Children will come to understand the basic life cycles of living creatures, and, through the enquiry question 'Are there patterns between the life cycles of different animals?,' they will be taught that animals and humans have offspring which eventually grow into adults.

Materials (autumn)

Building on from the Year 1 unit on identifying different everyday materials, Year 2's unit focuses on the enquiry question: 'Which material would be the best for an umbrella?' Children will explore materials and will identify objects made from natural, human-made and recyclable materials and think sustainably about different materials. Children will be given the chance to experiment with a wide variety of materials, classifying their different properties, and then testing them out in an array of practical scenarios. They will then move on to carrying out simple tests to discover whether they can change the shape of a solid material through bending, squashing, twisting and stretching. Finally, they will plan a comparative test to identify which material would be the most suitable for an umbrella and make predictions as to which material they think would be best. Children will carry out the investigation and will be able to explain what they are changing and what they are keeping the same.

Plants

- **Plants: light and dark (spring)** – Children will explore a wide range of plants, closely observing them, sorting and grouping these plants using different criteria. They will then name and identify the parts of common plants and trees and will recap the terms 'deciduous' and 'evergreen'. They will then explore the conditions plants need in order to grow. Within this unit, children focus on how plants need water and light to grow, by answering the enquiry question 'Do plants grow healthier in the light or dark?' They will plan and carry out a comparative test to explore this and determine what they will change and keep the same. Children will make careful observations and measurements, noting down any changes they observe over time, before making conclusions.
- **Plants: bulbs and seeds (summer)** – Children will be taught how seeds and bulbs eventually grow into plants, through the enquiry question 'How do bulbs and seeds change over time?' In the previous Plants block, children explored the parts of plants and conditions for their growth. First, they build on this knowledge as they look at the differences between bulbs and seeds. They then look at the best conditions for plant growth, focusing on temperature. Children conduct an observation over time enquiry and explore how the bulbs and seeds they plant change over time under different temperature conditions.

Living things and their habitats

- **Living things and their habitats (spring) –** This unit will work on answering the enquiry question 'What different habitats are there on planet Earth and what lives in each habitat?' In this block, they build on

understanding from autumn term to learn that all animals are dependent on their habitats for survival. The children will investigate a habitat in their local area and collect data about the different plants and animals that live there. They will then look in depth at different habitats around the world: Polar habitats, Desert habitats, Ocean habitats, Woodland habitats and microhabitats. In Year 1 children were introduced to the terms 'carnivore', 'herbivore', and 'omnivore'. They will develop this further by exploring habitats and diet, and creating simple food chains to show how energy is passed from one plant/animal to another animal. Finally, they will explore and compare the differences between things that are living, things that are dead and things that have never been alive.

- **Growing up (summer) –** In this unit, children are introduced to the processes of growth in animals. This small step introduces the term "offspring" for the first time. Children should identify that "offspring" refers to an animal's young. Children look at a life cycle for the first time and explore the stages in the life cycle of a human including baby, child, teenager and adult. Building on this knowledge, they will explore simple life cycles of a range of mammals, comparing with humans, noticing patterns, similarities and differences. Finally, they will look at the life cycles of amphibians (frogs) and the life cycles of butterflies, to eventually answer the enquiry question 'Are there patterns between the life cycles of different animals?'

Sustainability

- **Plastic (autumn) -** In the previous materials unit, children learnt that plastic is a human-made material and some plastics can be recycled. In this small unit, they look at how plastic is both helpful and harmful. Children learn that the overuse of single-use plastic has had negative impacts on humans and other animals all over the world. They then build on their understanding of plastic and look at how they can reduce plastic waste in school. Children will have the opportunity to work scientifically and practically to think of ways to reuse and recycle plastic items, rather than send them to landfill.
- **Sustainability (summer) -** In this small unit, children explore how wildlife is beneficial for humans. In previous blocks, they explored different animals and plants and their needs for survival. They will explore the ways in which they can support wildlife within the school environment. Wildlife projects that support the local ecosystem could include creating hedgehog houses, bug hotels, seed bombs or growing a mini wildlife garden.

In Year 3

Working Scientifically

Moving into Year 3, children begin to extend their skills in simple, practical enquiries. They concentrate on setting-up comparative and fair tests. Using observations, they take measurements using standard units and a range of equipment (including thermometers and data-loggers). Becoming more accurate scientists, our children gather, record, classify and present data in a variety of ways to help in answering questions. Once our children have carried out experiments, they now have the knowledge to record their findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. Extending on their knowledge from Key Stage 1, Year 3 can report on findings from enquiries using both spoken and written explanations. As well as this, they are beginning to draw simple conclusions and make predictions for new values, suggesting improvements and raising further questions. They can add to this by forming simple hypotheses which relate scientific ideas and evidence.

Animals, including humans

- **Skeletons (autumn) –** Through the enquiry question 'How can animals be sorted and grouped based on their skeletons?' children will learn all about skeletons and muscles. They will identify, name and locate bones in the human body. Children learn that humans have a skeleton for movement, support and protection. They learn the function of the skeleton and also the jobs of specific bones. They will then look at a wide range of animal skeletons including mammals, birds, fish, amphibians and reptiles, and they will label the bones of the skeleton and spot any similarities or differences between them. Children look at animals that have a spine

and animals that do not, and are introduced to the term 'exoskeleton' to describe an animal with a skeleton on the outside of its body.

- **Movement (autumn) –** By the end of this unit, children will understand that joints allow the skeleton to move and that major bones in the human body are connected by joints. They will identify two different joint types: hinge and ball-and-socket joints. Next, they will learn how the skeleton, joints and muscles work together to allow movement. Children learn the terms contract and relax to describe the process. They will use labelled diagrams, simple practical models and relevant scientific language to show their understanding.
- **Nutrition and diet (autumn) –** During this unit, children will explore the concepts of nutrition and a healthy diet through the enquiry question 'What is a balanced diet and is it important?' They will identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food. Children will consolidate that they get nutrition from what they eat, and will even be lucky enough to sample some food in their lessons – some tasty, some healthy, and some not so much!

Rocks

- **Rocks (autumn) –** During this unit, children will use the enquiry question 'How can rocks be identified and grouped based on their properties?' as a starting point to group various types of rocks on the basis of their appearance and simple physical properties.
- **Fossils (spring) –** Tying in with the Year 3 History topic on The Stone Age, students will look into the formation of fossils through the enquiry question 'How are fossils formed?' Here, through the inspection of various real-life examples, children will come to understand how living creatures throughout history are trapped in rock and can still be discovered and studied to this day.
- **Soils (spring) –** In this unit, children will be able to put their knowledge of different types of rocks into practice by addressing the enquiry question 'Which soils absorb the most water?' Here, children will learn that different soils are made from rocks and organic matter, having the opportunity to collect water through a variety of examples. Through practical enquiry, children will find out which types of soil are effective and which, like sand, are not.

Light (spring)

In this unit, children will be introduced to the core concept that darkness is the absence of light. Students will learn that light is needed in order to see anything, and have the opportunity to experiment with torches on different reflective surfaces. The class will learn the terms translucent, transparent and opaque, experimenting with how each type of material affects the subsequent shadows it creates. Moving on from this, students will have the opportunity to experiment with shadows, understanding that they are created when a light source is blocked by a solid object. Finally, children will address the enquiry question 'How does the distance between the light source and the object affect the size of a shadow?' where they will manipulate the size and shape of shadows through different variables.

Plants (summer)

Building on from the children's previous work, this Year 3 unit delves into more detail regarding the different parts of a flower. Using the enquiry question 'Does the number of seeds within one plants pot affect the growth of the plants?' children will explore pollination, seed formation and seed dispersal. Here, students will learn to understand and appreciate the complicated role that the environment and other wildlife plays in the continuing life cycle of plants and flowers.

Forces and magnets

- **Forces (summer) –** In the study of Forces, children will compare how things move differently on different surfaces. Through the enquiry question 'How the material on the ramp affect the distance a car does travel?' students will explore friction and its constant effect on the busy world around us.
- **Magnets (summer) –** Moving on to magnets, children will see that although forces like friction require contact between two objects, magnetic forces actually act at a distance. Through practical tests, children will compare and group materials on the basis of whether they are attracted to a magnet, and identify a variety of magnetic materials. With their new knowledge on the behaviour of magnetic poles, children will approach the enquiry question 'Are all metals magnetic?'

Sustainability

- **Food waste (autumn) –** Children look at food waste and the impacts of food waste on the planet. Previously, children learnt that food can be sorted into different food groups and that different foods provide nutrients for the body. Children look at how food waste has a negative impact on people and the planet and children look at how they can reduce food waste in school so that less is sent to landfill.
- **Biodiversity (summer) –** In Key Stage 1, children learnt about different plants, animals and how their habitats provide everything they need to survive. This sustainability unit builds on children's understanding by introducing the term "biodiversity". Children explore how biodiversity can be increased or decreased and investigate how humans can affect the biodiversity of an area.

In Year 4

Working Scientifically

By Year 4, our children can now ask relevant questions and use different types of scientific enquires to answer them. They are now confident in setting-up simple practical enquires, they can make systematic and careful observations and take accurate measurements using standard units and a wider range of equipment. They are beginning to independently gather, record, classify and present data in variety of ways. Year 4 continue to report their findings in the form of presentations and displays. They can now use their results to raise further scientific questions, identifying differences, similarities or changes related to scientific ideas. They are now beginning to support their findings using scientific evidence.

Living things and their habitats

- **Group and classify living things (autumn) –** Building on Year 2's learning, children will then go on to learn different classification keys to help them group, identify and name a variety of living things. Children will understand and demonstrate that life on Earth can be grouped together in a variety of different ways, including vertebrates or non-vertebrates, seed-producing or non-seed producing plants, or, determined by which habitat they populate.
- **Habitats (summer) –** Children will then go on to learn how these habitats can change over time, discussing the many factors which can lead to these massive shifts in climate and terrain. Building on this awareness, children will then look into how these changes in environments can have detrimental effects on the many living things which live there, even causing certain species to eventually become extinct.

States of matter (autumn)

Here, children will gain a basic understanding of how everything in the known universe is made up of matter and that these are grouped into solids, liquids and gases. They will look at the properties of solids, liquids and gases and relate these to common materials. Advancing this, children will then go to on discuss trickier examples to categorise, such as toothpaste, shaving foam and ooblek (a mixture of corn starch and water) and explore examples of materials that challenge their definitions such as solid materials that can be poured and liquids that flow slower than water, such as treacle. They will explore how materials can change state and the terms 'evaporation' and 'condensation' are introduced. They will see that temperature changes can cause a change in state and will explore melting and freezing

through hands-on activities. They will then go on to answer the enquiry question 'How does the temperature of the water affect the time it takes for ice to melt?' by planning and carrying out a fair test. Building on their understanding of evaporation and condensation, they will then look at the water cycle. They will then plan an experiment to investigate whether the temperature of air affects the time it takes for water to evaporate.

Sound (spring)

During this unit, children will learn all about the relationship between sound and vibration. Progressing on their work on the human body, children will also learn how sound reached the ear and how different parts of the ear all us to hear sounds. Children will use their technical drawing skills to accurately label and understand this particularly delicate and complex piece of human anatomy, then linking this new knowledge to their interaction with the world around them. Building on this, children will learn that the intensity, or loudness of sound is measured in decibels (dB). Within this step, children will record and measure sound levels over the day to see how the decibel levels increase and decrease, using a decibel meter to record an accurate measure of sound. They will explore the concept of volume using musical instruments. In this small step, children explore the term 'pitch'. Children will understand that pitch refers to how high or low a sound is, and will explore how the pitch of the sound made by different objects can be changed. Finally they will plan an experiment to answer the enquiry question 'How does the distance from the sound source affect the volume of the sound?'

Electricity (spring)

In Year 4, children are introduced to the concept of electricity for the first time. They will learn that electricity is a way of moving the energy needed to power appliances and they will identify common appliances that use electricity. They will be introduced to the concept of circuits and focus on series circuits – where all parts are connected in a singles loop. After building and drawing circuits, they will then identify problems in circuits that do not work correctly. Following on from this, they will be introduced to the terms 'conductors' and 'insulators' and once secure with the definitions, will begin to investigate materials which are conductors and insulators. They will complete a pattern seeking enquiry question 'What materials are conductors or insulators of electricity and is there a pattern?' Children will use their skills of predicting and make educated guesses before accurately recording results and analysing their results to think about generalisations.

Animals, including humans

- **The digestive system (summer) –** Children will begin this unit by exploring how an animal's diet influences the structure of its teeth. Building on learning from Year 2, children will learn why humans have more than one type of tooth and they will learn the four main types: incisor, canine, premolar and molar teeth. They will then describe the layers of the teeth and look at how plaque build-up which can lead to decay is teeth are not brushed regularly. They will build on this by exploring the digestive system and the route food takes through the body, starting with the teeth when food is bitten to when it reaches the rectum, to answer the enquiry question 'What is the digestive system and how does it work?'
- **Food chains (summer) –** Armed with this new understanding of how food is consumed and metabolised from previous unit, children will then explore the relationship between different types of predators, producers, prey and consumers in the animal kingdom. Children will look into a variety of food chains, understanding which attributes assign each animal their place in the different groups. Furthermore, they will explore the potential impact of human activity on food chains, such as the impact of habitat destruction, hunting, farming and overfishing on the population of different living things.

Sustainability

- **Energy (spring) –** In this unit, **c**hildren will consider their energy usage and how it impacts the planet. They will explore how they can reduce their energy usage at home and in school and discuss the positive impacts this has on planet Earth.
- **Deforestation (summer) –** In this unit, children build on their understanding of human impacts on habitats and look at the effects of deforestation both locally and globally. They will then focus on the damage to orang-utan habitats as a result of the production of palm oil, and look at their local area to identify any areas of possible historic deforestation. They will also investigate changes they could make to their lifestyle to help prevent deforestation around the world.

In Year 5

Working Scientifically

As the children enter upper Key Stage 2, their skills as scientists move into more advanced areas of Working Scientifically. The children can now plan a variety of different types of Scientific enquiry, and moreover, they can now recognise controlling variables where necessary. When taking measurements, they can now do this with increasing accuracy and precision, taking repeat readings when appropriate. By now, pupils can record data and results of increasing complexity. Children do this by using a range of scientific diagrams, including scatter graphs, line graphs and classification keys. The children use their results to make predictions in order to set-up further tests. When discussing their findings, they now include causal relationships and explanations of how reliable their information is. Finally, pupils are now able to independently identify scientific evidence that has been used to support or refute ideas.

Forces (autumn)

During the study of Forces, students will further their general understanding of friction through practical exploration using different objects on ramps and simple brake mechanisms of push bikes. Building on their knowledge of friction, children will look at air resistance, a type of frictional force on an object moving through air. Children will have the opportunity to create and experiment with parachutes, to answer the fair test enquiry question 'Does the size of a parachute affect the time it takes for it to fall to the ground?' Moving on from this, children will then investigate water resistance by planning a comparative test to observe whether the shape of an object affects the time it takes for it to fall to the bottom of a measuring cylinder filled with water. Children will then explore gravity using a Newton meter. Finally, children will have the chance to experiment with levers, pullies and gears. Through hands-on investigations, students will realise that with the right mechanism, a smaller force can have a greater effect.

Earth and space (autumn)

In this unit, children will be taught about Earth's place in our Solar System. Through a variety of sources, students will look into the complicated relationship between the Sun, the Earth and the Moon, and then compare their movements through space to the other planets which share our portion of the universe. Children will then go on to understand how these great movements in space affect conditions back on our planet. They will learn how the rotation of the Earth control the cycles of night of day, and how this relates to behaviour of the Sun seemingly moving across the sky. During this exciting topic, Children will be lucky enough to have a day visit to the National Space Centre. Here they will be able to see all of their studies in action, being treated to live demonstrations from experts, as well as having the opportunity to have hands-on experience with the fascinating equipment of space travel.

Materials

- **Properties of materials (spring) –** In this unit children build on previous learning of materials, by testing everyday materials and grouping them based on their transparency, hardness and magnetism. Next they will test some everyday materials and group them based on their electrical conductivity. By planning a comparative test, they will answer enquiry question 'Which material is the best insulator of heat?' by

exploring which material is the best at keeping hot water warm. After that, they will look at three common materials, plastic wood and metal, and link the uses of these materials to their properties.

- **Reversible and irreversible changes (spring) –** Building on the children's work on solids, liquids and gases in Year 4, this Year 5 unit explores the changing states of different materials in greater depth. Throughout the unit, students will learn the difference between reversible and irreversible changes, having the opportunity to experiment on mixtures with different separating techniques, such as filtering, sieving and evaporation. Children will be invited to dissolve solids in carefully planned fair tests, going on to create solutions, and then hypothesising about how to separate these materials back into their original form. Finally, the children will learn that some changes result in the formation of new materials, and that this kind of change is not usually reversible, for example, burning and chemical changes such as the reaction between an acid and bicarbonate of soda.

Living things and their habitats

- **Life cycles (spring) –** During their study of life cycles, children will build on their ability to classify living things in different ways by learning about the life cycles of mammals, amphibians (frogs), insects and birds. Then, children will compare the life cycles of each group respectively, celebrating the vast and complicated beauty of how so many different types of life can all coexist harmoniously across the many different habitats of our planet.
- **Reproduction (summer) –** Here, the children will take all of their previous knowledge on Living things and their habitats, and move it into more advanced studies of the reproduction process of some plants and animals. From seed dispersal to frog spawn, students will have the opportunity to witness and record the processes which keep the many, many diverse species of life on planet Earth alive and prospering.

Animals, including humans (summer)

In this unit, children will describe the changes as humans develop into old age. The students will have the opportunity to compare different stages in a human's life, noting the key differences through milestone moments such as being a baby and child, moving through adolescence and puberty as a teenager, and finally slowing down in active movement as the bones and joints grow tired in later life as adults and the elderly. This unit will tie-in with the Year 5 PSHCE topic during the same term, as the students look into the changes happening in their own bodies. Children will also learn about the gestation periods of other mammals and different lifespans.

Sustainability

- **Global warming (autumn) –** Children will gain a simple understanding of global warming and learn what it is and why it is happening. They will have opportunities to explore how global warming occurs, with reference to human action. Children could research the different ways that humans can reduce global warming and climate change. They find out what they can do in their local community and school to help promote activities that can reduce global warming.
- **Plastic pollution (spring) –** Children will explore the causes of plastic pollution. Building on their knowledge from the materials block, children should understand that the properties of plastic make it a useful material. However, plastic can take hundreds of years to break down which can be harmful to the environment, animals and humans. They will then suggest ways to reduce negative impacts, such as using reusable bags, using recyclable plastic water bottles instead of buying bottled water and recycling and buying items made from more environmentally friendly materials.

In Year 6

Working Scientifically

As the children finalise their time as Scientists as Roundwood Primary School, they are now competent in planning all types of Scientific enquiry. Their measurements are accurate, and children understand the need to take repeat readings when appropriate. They continue to use and record complex data, using a range of methods. From this, they can report and findings, including causal relationships, both in oral and written forms. Alongside this, children are able to use scientific evidence to support their findings. By now, children can evaluate their own and other people's scientific ideas, using a range of evidence from a variety of sources. In order to be Secondary ready, the children are able to use scientific language and ideas to explain, evaluate and communicate their methods and findings.

Living things and their habitats (autumn)

Building on pupils' knowledge, this unit begins by exploring requirements for life and the differences between living and non-living things. Children will then group animals and plants based on their features, and they will recap different organisms including flowering and non-flowering plants, vertebrates and invertebrates. Building on this, children will look at classification systems in more detail but classifying a range of animals based on their features. Then they will classify both flowering and non-flowering plants. They will then explore microorganisms, including bacteria, viruses and fungi, before moving on to classifying microorganisms. All of this information will be used to answer the enquiry question 'How can animals, plants and microorganisms be identified, grouped and classified?' Finally, they will learn about the work of Carl Linnaeus and his system of classifying organisms.

Electricity (autumn)

In Year 4, children explored the basic concepts of electricity. In this unit, children build on their understanding of circuits to construct and draw series circuits using circuit symbols and draw circuits accurately. They will be introduced to the terms 'current' and 'voltage' and will look at complete and incomplete circuits – they should understand that the current cannot flow when the circuit is incomplete. Children will move on to explore variations within circuits and the effects of having fewer or more components and will construct a range of series circuits with varying numbers of components. They will then work on a voltage experiment to answer a comparative and fair test enquiry question 'How does the voltage in a circuit affect the loudness of a buzzer?'

Light (spring)

In Year 3, children were introduced to the concept of light. Throughout this unit, Year 6 will discover how to record and manipulate light in a variety of different ways. They will begin by exploring how humans are able to see objects and they will name and identify parts of the human eye and discuss their functions in relation to being able to see objects. They will identify that light travels in straight lines but can change direction if it is reflected from an object such as a mirror. Children will use opaque objects to produce shadows and draw scientific diagrams to explain why a shadow has the same shape as the object that cast it. They will investigate an answer to the enquiry question 'How does the distance from a light source affect the size of the shadow?' This knowledge will be developed by looking at refraction, exploring how refraction occurs and explaining that light passes through different materials at different speeds. Moving on from this, they will explore the concept of 'white light' and children will use prisms to separate white light into different colours.

Animals, including humans

- **The circulatory system (spring) –** During this unit, children will be introduced to the circulatory system, which is made up of the heart, blood vessels and blood, that work together to pump blood around the body. They will look closely at the composition of blood, and explore the functions carried out by blood. Then, children will learn that the heart is a muscle – it works as a pump which contracts to pump blood around the circulatory system, through the blood vessels. Children will carry out or observe a heart dissection to learn more about the physical structures of the heart and how they help with its function.
- **Diet, drugs and lifestyle (spring) –** In this block, children explore the impacts of diet, drugs and lifestyle on overall body health. They should make links to learning in the previous circulatory system block as much as

possible to identify how diet can have positive or negative effects on the heart. They learn that fats can be classified as saturated, unsaturated and trans fats; that the body needs vitamins (such as, A, C and D) and minerals (such as, iron and calcium). Children will encounter energy measured in calories and research the impact of too many or too little calories on the body. Children will learn about drugs such as painkillers, cigarettes, vaping, and their effects on the body. They will then investigate lifestyle by answering the enquiry question 'How does the duration of exercise affect heart rate?'

Evolution and inheritance

- **Variation (summer) –** Through this short unit, children will be introduced to the term 'variation' and will extend learning about organisms to explore the term 'species' as a group of similar organisms where two parents can reproduce to create offspring. Children then explore inheritance and characteristics – they will learn that human offspring inherit characteristics from their parents, such as eye colour. Other animals inherit characteristics from their parents, such as breeding in dogs.
- **Adaptations (summer) –** Children will learn about animal and plant adaptations and understand that adaptations are characteristics which improve the chances of survival in a habitat. They build on this, by learning about evolution – the process where descendants develop different characteristics from their ancestors to create a new species. In this unit, children will complete a pattern seeking enquiry to answer the question 'Is the type of food a bird eats related to the shape of its beak?' Building on their knowledge of evolution, children learn about Charles Darwin and his contributions towards the understanding of the process of evolution. They specifically learn about Darwin's observations on the Galapagos Islands and his work in finches. Children learn about natural selection and how that can lead to variation in characteristics within a species.
- **Fossils (summer) –** Through the study of fossils, pupils will address the enquiry question 'How have fossils changed over time and does this provide evidence for evolution?' In this unit, children revisit learning from Year 3 and deepen their understanding of fossilisation. They will confidently recall that fossils are imprints in a rock of a living thing from a long time ago. Children will link learning about evolution to fossils, as fossils provide valuable evidence to show how organisms have evolved over time. Finally, children learn about Mary Anning and her Jurassic fossil discoveries in south-west England.

Sustainability

- **Renewable energy (autumn) –** In Year 5 children explored global warming. In this unit, children learn about renewable energy, such as solar and wind power, and how it can be used to generate electricity. Children use their knowledge of non-renewable energy sources to look at the impact on the environment. They will learn that sources such as coal, oil and natural gas are contributing to global warming.
- **Light pollution (spring) –** In this block, children learn about three types of light pollution: glare, light trespass and sky glow, and the impact on living things on Earth. They look at ways that they can reduce light pollution in their local area and link light pollution to other areas of sustainable living.

Links with other subjects

Geography – sustainability blocks; local area studies; deforestation; earthquakes and volcanoes.
Mathematics – units of measurement; results tables; interpreting data.
History – Stone Age fossils; Roman sun dials; space exploration.
Music – seasons; electronic music; human body.
Art – observational drawings; collages made from natural materials; textiles.

As a scientist leaving RPS

Working Scientifically

- Ask relevant scientific questions and choose which each enquiry type would be best suited to answer them.
- Make predictions based on scientific knowledge.
- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables when necessary.
- Use a range of scientific equipment to make systematic and careful observations with increased complexity.
- Take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, scatter graphs, bar and line graphs.
- Report and present 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.
- Make conclusions based on scientific evidence and from their own testing and findings.
- Identify scientific evidence that has been used to support or refute ideas or arguments.
- Use test results to make predictions to set up further comparative and fair tests. Provide some simple examples of how to extend the investigation.

Science subject knowledge

Animals, including humans

- name and describe the functions of the main parts of the digestive, musculoskeletal and circulatory systems
- describe and compare different reproductive processes and life cycles in animals
- describe the effects of diet, exercise, drugs and lifestyle on how the body functions

Living things and their habitats

- use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods, including those in our local environment and the wider world
- understand food chains and how plants and animals are interdependent in our local environment and the wider world
- explain how environmental changes may have an impact on living things, e.g. endangered species such as the great crested newt, flooding in Buckingham
- use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved and provide evidence for evolution

Plants

- name, locate and describe the functions of the main parts of plants, including those involved in reproduction and transporting water and nutrients
- describe the requirements of plants for life and growth

Materials

- group and identify materials in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties
- identify, with reasons, whether changes in materials are reversible or not

Rocks

- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- describe how fossils are formed and recognise that soils are made from rocks and organic matter

Forces and magnets

- describe the effects of simple forces: air and water resistance, friction, magnetic forces and gravity
- identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force

Light

- use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects and the formation, shape and size of shadows

States of matter

- describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle
- identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components

Sound

- use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard
- describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source

Electricity

- use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams

Earth and space

- describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night

Evolution and inheritance

- 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

Memory Makers

I will have experienced

- **A wide range of practical scientific experiments, like growing my own plants in Key Stage 1 and recreating the human digestive system in Key Stage 2**
- **The opportunity to test out my predictions, and then create new and improved experiments based upon my findings**
- **A rich variety of Science themed school trips, including a visit to the farm in Key Stage 1 and the National Space Centre in Key Stage 2**
- **Meeting interesting visitors in school from a wide range of scientific background, including a local farmer in Key Stage 1 and a reptile & arachnid expert in Key Stage 2 (armed with a bird eating tarantula and ten-foot-long python!)**
- **An action-packed Science Week, where every day includes science themed activities and demonstrations**
- **Having my worked displayed in the classroom and on whole school displays**
- **Sharing and celebrating my work in front of the whole school in Science themed assemblies**
- **Using a wide range of exciting scientific equipment for a host of different purposes**
- **Witnessing Science in action in my local community, having completed, for example, pond dipping and bird watching activities**
- **Meeting real life scientists, having had the opportunity to witness and ask questions on the nature of their work**
- **Visiting a Secondary School and joined in with Key Stage 3 Science, all ran and taught by Young Leaders**

Because I went to RPS

- I have developed a genuine love and appreciation for Science
- I understand how the Science Curriculum applies to the world around me, knowing the purpose and value of Scientific concepts
- I am confident in correctly using a wide range of scientific vocabulary
- I have developed a natural interest in the pursuit of Science as a potential profession in later life
- I have an appreciation and knowledge of a diverse range of scientists, understanding the impact they have had on the world around me