 **Science Curriculum**

At Church Lane, we have designed our curriculum in a progressive way from Nursery through to Year 6. Based on the Government’s curriculum it has been adapted and takes in to account the aims and schemes of work set out within that document alongside the needs of our own children to ensure that we deliver a tailored curriculum that supports our children to achieve the best they can.

The curriculum aims are:

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

Our curriculum is laid out in the following way:

1. Science knowledge is split in to five main areas: Our world, Life around us, Our bodies, Materials and Forces. This knowledge is accompanied by working scientifically procedural knowledge and questions that the children look at within each main area of science.   
These main areas are set out progressively throughout the school to ensure that the children’s knowledge is chronological and builds on what they already know (This information is in the **Progression document**).

2. Each year group has a set area of Science per half term – this is shared with the children in a child friendly question, which encourages our children to engage with being scientists whilst introducing them to high quality vocabulary. (This information is in the **Yearly map**)

3. Each question is then explored by the children through a number of lessons, which assist the children in gaining and building the knowledge and experience they need to achieve. (The in depth knowledge we will be teaching is contained in **unit plans** - these further breakdowns include the knowledge taught in the unit and working scientifically questions to ensure that our children gain both knowledge and experience of being scientists.)

# **Progression document**

**Knowledge**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Area/Year | Nursery | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Our world | **What do I notice during each season?**  Discuss environmental and clothing changes linked to weather. | **What are some of the key changes during the seasons?**  Identify and notice environmental and clothing changes linked to the weather  Learn about how plants change during seasons.  Learn about how seasons affect animal behaviour. | **What are the features of the seasons?**  Observe changes across the four seasons (including day length) Describe weather associated with the seasons | **Why do animals choose to live where they do?**  Identify and discuss features of different habitats and microhabitats  Identify and name a variety of plants and animals in their habitats (and microhabitats)  Describe how different habitats provide the basic needs for animals that live there and how they depend on each other. | **What do the oceans do for us?**  Identify and discuss features of different underwater habitats and microhabitats  Identify and name a variety of underwater plants and animals in their habitats (and Microhabitats)  Describe how different habitats provide the basic needs for animals that live there and how they depend on each other. | **How do habitats and ecosystems help animals who live there survive?**  Identify and discuss food chains and food webs in different habitats including producers, predators and prey  Discuss the effects of changing habitats on the animals and food chains that live there | **How does our solar system work?**  Describe the movement of the Earth and other planets relative to the sun  Describe the movement of the moon relative to the Earth  Describe the sun, Earth and moon as approximately spherical bodies  Use the idea of Earth’s rotation to explain day, night and the sun and stars apparent movement across the sky | **How do habitats and ecosystems affect the plants and animals that live there over time?**  Recognise that living things have changed over time  Understand what the Fossil record is  Explain how the Fossil record provides information about things that lived on Earth millions of years ago.  Recognise that living things produce offspring of the same kind with some variation  Identify that animals and plants are adapted to suit their environments and that this leads to evolution |
| Life around us | **What do I need to grow a plant from seed?**  Discover the tools/resources needed to grow a plant  Plant fast growing plants and compare to s slower growing plant  Learn about decay over time  Talk about the daily/weekly changes  **What minibeasts can we find in the garden?**  Identify some common minibeasts  Explore why they are found in certain habitats  **What is the Lifecycle of a Butterfly?**  Discover the lifecycle of a butterfly first- hand  Learn how to keep them alive | **What does a seed need to germinate?**  Plant a variety of seeds and compare sizes  Recap what a seed needs to germinate and how  Discover what plant seeds need to grow strong and healthy  **What is an insect?**  Identify a variety of minibeasts found in the garden and record findings  Discover what an insect is and identify some in the garden  Learn facts about different insects e.g. beetles, butterflies and bees  **Why do we need to look after bees?**  Learn facts about bees  Find out why Bees are important  Discover how to encourage Bees into gardens at home  Learn how honey is made and use senses to taste, smell and feel  **Why do Butterflies lay eggs?**  Learn facts about caterpillars and butterflies  Discover/recap the lifecycle of a butterfly first- hand  Describe each stage of the life cycle and the changes that occur  **What plants and flowers can we now see?**  Identify some common plants and flowers now in garden/local area  Talk about the changes over time | **What can we find out about the plants and animals around us?**  Identify a variety of common plants and trees  Describe the basic structure of flowering plants and trees  Identify a variety of common animals  Understand the concepts carnivore, herbivore and omnivore  Describe and compare the structure of a variety of common animals | **What do plants and animals require for survival?**  Observe and describe how seeds and bulbs grow in to mature plants  Discover and describe how plants need water, light and a suitable temperature to grow and stay healthy  Notice that animals have offspring which grow in to adults  Find out about the basic needs of animals for survival  Understand the concepts living, dead and never alive | **How do the features of plants and animals help them to stay healthy and grow?**  Describe the functions of different parts of flowering plants – including the way water is transported and how flowers play a part in the life cycle of plants.  Explore the requirements of plants for life and growth and how they vary from plant to plant  Identify that animals need the right types and amount of nutrition and that they cannot make their own food; they get nutrition from what they eat  Identify that some animals have skeletons and muscles for support, protection and movement. | **How could we group plants and animals?**  Recognise that living things can be grouped in a variety of ways  Explore and use classification keys to help group, identify and name a variety of living things | **How do plants and animals reproduce?**  Describe the differences in the life cycles of mammals, amphibians, insects and birds  Describe the life process of reproduction in some plants and animals | **How do we group plants and animals within groups?**  Describe how living things are classified in to broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals  Give reasons for classifying plants and animals based on specific characteristics |
| Our bodies |  |  | **What are the different parts of our body?**  Identify, name, draw and label the basic parts of the human body  Describe which part of the body is associated with each of the senses | **What do humans need to grow and stay healthy?**  Notice that humans have offspring which grow in to adults  Find out about the basic needs of humans for survival  Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene | **How do features of humans help them to stay healthy and grow?**  Identify that humans need the right types and amount of nutrition and that they cannot make their own food; they get nutrition from what they eat  Identify that humans and some other animals have skeletons and muscles for support, protection and movement. | **How do humans get energy from their food?**  Describe the simple functions of the basic parts of the digestive system in humans  Identify different types of teeth and their simple functions | **How do we change over time?**  Describe the changes as humans develop to old age | **How do our bodies stay healthy?**  Identify and name the main parts of the human circulatory system  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 in humans |
| Materials | **What objects sink? What objects float?**  Explore sinking and floating  Visit River Slea and explore sinking and floating | **Why can I see ice outside?**  Learn about the change in state- ice melting and water freezing  Discover how we can speed up ice melting  **Is it only large items that sink?**  Investigate large/small items made from different items  Sort into groups  Discuss materials and properties  Link to Plastic pollution | **What can we find out about everyday materials?**  Distinguish between and object and the material it is made from  Identify a variety of everyday materials  Describe the properties of everyday materials | **Which materials are best for the job?**  Compare and group a variety of everyday materials  Compare the suitability of a variety of everyday materials for particular uses  Find out how materials can be changed or manipulated by squashing, bending, twisting and stretching | **What are different rocks and how were they made?**  Compare and group different types of rocks based on appearance and simple physical properties  Describe how fossils are formed  Recognise that soils are made from rocks and organic matter | **Are all materials solid?**  Compare and group materials according to whether they are solids, liquids or gases  Observe that some materials change state when they are heated or cooled and investigate these temperatures  Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature | **How could we manipulate and change materials?**  Compare the group materials on the basis of their properties (hardness, solubility, transparency, conductivity and magnetism)  Know that some materials will dissolve 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 (Filtering, sieving and evaporating)  Give reasons based on evidence from comparative and fair tests, for the particular uses of everyday materials  Demonstrate that dissolving, mixing and changes of state are reversible changes  Explain that some changes result in the formation of a new material and that this change is not usually reversible (Acid and bicarb) |  |
| Forces | **What is a shadow?**  Explore making shadows outside and talk about how shadows occur | **Can shadows only be seen outside?**  Explore making shadows inside and outside using different light sources  Re-cap what a shadow is and how they are made |  |  | **How does light help us see?**  Recognise they need light in order to see things and that dark is the absence of light  Notice that light is reflected from surfaces  Recognise that light from the sun can be dangerous and there are ways to protect your eyes  Recognise that shadows are formed when the light from a light sources is blocked by an opaque object  Find patterns in the way that the size of shadows change  **How do forces affect movement?**  Compare how things move on different surfaces  Notice that some forces need contact between two 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 materials according to if they are magnetic  Describe magnets as having 2 poles  Predict whether magnets will attract or repel based on the poles | **How is sound made?**  Identify how sounds are made  Recognise that vibrations from sounds travel through a medium to the ear  Find patterns between pitch and the features of objects that produce that sound  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 source increases  **How does electricity travel?**  Identify common appliances that run on electricity  Construct a simple series circuit (cells, wires, bulbs, switches and buzzers)  Identify whether a lamp will light in a simple circuit  Recognise that a switch opens and closes a circuit  Recognise some common conductors and insulators – associate metal with being a good conductor | **How could we combat the effect forces have?**  Explain that unsupported objects fall towards the Earth because of the force of gravity  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 | **How can we manipulate light and shadow?**  Recognise that light travels 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 in to 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  **How can we manipulate how electricity travels?**  Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit  Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches  Use recognised symbols when representing a simple circuit in a diagram |

**procedural knowledge**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Working Scientifically – This overarching procedural knowledge supports children in being investigative scientists. In Church Lane, we have linked them to question stems that we use during lessons across all areas of Science. This is knowledge and skills that the children gain whilst investigating other areas of Science.** | | | | | | | |
| **N** | **R** | **1** | **2** | **3** | **4** | **5** | **6** |
| **What do we want to know?**  **What do we see?** | **What do we want to know?**  **What do we notice?** | **What do we want to discover?**  Ask simple supported questions  **How can I find the answer to my question?**  Think of how to answer a question  **What can I observe?**  Observe closely  **What is \_\_\_\_\_\_?**  Identifying and grouping  **What do you think?**  Using observations to suggest answers to questions  **What answers did we discover?**  Gathering and recording data to help in answering questions | **What do we want to discover?**  Ask simple questions  **How many ways could we try to answer my question?**  Recognise that questions can be answered in different ways  **How can I observe accurately?**  Observe closely, using simple equipment  **What is \_\_\_\_\_ and how do I link it to other things?**  Identifying and classifying  **What do you think and why?**  Using observations and ideas to suggest answers to questions  **What answers did we discover?**  Gathering and recording data to help in answering questions | **What do we want to discover?**  Ask supported relevant questions  **How could we set up an enquiry to find the answer?**  Set up simple practical enquiries to answer questions  **How could we observe systematically and carefully?**  Make systematic and careful observations  **How can we gather and present our data?**  Gather, record, classify and present data in a variety of ways  **How can we share our answers with others?**  Record findings using: *scientific language, drawings, labelled diagrams*  **How can we give a simple answer when we have so much data?**  Report on findings from enquiries including oral and written reports  Use results to draw simple conclusions | **What do we want to discover?**  Ask relevant questions  **How could we set up an enquiry that was fair to find the answer?**  Set up simple practical enquiries which are fair to answer questions  **What equipment could we use to help us make accurate measurements and observations?**  Make systematic and careful observations taking accurate measurements  **How can we gather and present our data so that we have answered our question?**  Gather, record, classify and present data in a variety of ways to help in answering the question  **How can we help others access our answers?**  Record findings using: *scientific language, drawings, labelled diagrams, keys, bar charts and tables)*  **How can we use our conclusion to make new predictions?**  Use results to draw simple conclusions and make predictions for new values  Suggest improvements and raise further questions  Use straightforward scientific evidence to support findings and answer questions | **How do I answer a question I have been asked fairly?**  Plan different types of scientific enquiries to answer questions  **How can I ensure my measurements are accurate?**  Take measurements using a range of specific equipment  **How can we gather and present our data so that we have answered our question?**  Record data using: *Scientific diagrams and labels, bar and line graphs*  **How can we help others access our answers?**  Report and present findings including conclusions in oral and written forms  **How can we use our conclusion to make predictions about different questions?**  Use conclusions to explain what may happen in another experiment | **How do I answer a question I have been asked fairly?**  **What variables will I need to control and change?**  Plan different types of scientific enquiries to answer questions controlling variables where necessary  **How can I ensure my measurements are accurate?**  Take measurements using a range of specific equipment and repeat measurements when deemed appropriate  **How can we gather and present our data so that we have answered our question?**  Record data using: *Scientific diagrams and labels, bar graphs, line graphs, classification keys and scatter graphs*  **How can we help others access our answers?**  Report and present findings including conclusions and causal relationships in oral and written forms  **How can we use our conclusion to make predictions about different questions?**  Use conclusions to explain what may happen in another experiment  **What evidence has been used to support ideas and arguments?**  Identify scientific evidence that has been used to support or refute ideas and arguments |
| **Vocabulary progression:** | | | | | | | |
|  |  | Question  Answer  Observe  Identify  Group | Equipment  Classify  Diagram  Data | Relevant questions  Careful observation  Systematic  Conclusion | Accurate measurements  Explanation  Prediction  Evidence  Keys | Precision  Bar and line graphs  Classification keys  Labels | Variables  Scatter graphs  Support  Refute |

# **Yearly map**

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| --- | --- | --- | --- | --- | --- | --- |
|  | Year 1 | | | | | |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|  | Our bodies | Our World | Materials | Our World | Life around us | Life around us |
| question | [What are the different parts of our body?](#_Our_bodies_-) | [What are the features of autumn and winter?](#_Our_World_-) | [What can we find out about every day materials?](#_Materials_-_What) | [What are the features of spring and summer?](#_Our_World_–) | [What can we find out about the animals around us?](#_Life_around_us_1) | [What can we find out about the plants around us?](#_Life_Around_Us_2) |

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| --- | --- | --- | --- | --- | --- | --- |
|  | Year 2 | | | | | |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|  | Life around us | Our World | Life around us | Our bodies | Materials | Life around us |
| question | [What do living creatures need to survive?](#_Life_Around_Us_3) | [Why do animals choose to live where they do?](#_Our_World_–_1) | [What do plants need to grow and stay healthy?](#_Life_Around_Us_4) | [What do humans need to grow and stay healthy?](#_Our_bodies_-_1) | [Which materials are best for the job?](#_Materials_–_Which) | [What observations have we made about how plants grow?](#_Life_Around_Us) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Year 3 | | | | | |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|  | Our bodies | Materials | Life around us | | Our world | Forces |
| question | [How do features of humans help them to stay healthy and grow?](#_Our_bodies_-_2) | [What are different rocks and how were they made?](#_Materials_–_What) | [How do the features of plants and animals help them to stay healthy and grow?](#_Life_Around_Us_5) | | [What do the oceans do for us?](#_Our_World_–_2) | [How does light help us see?](#_Forces_-_How)  [How do forces affect movement?](#_Forces_-_How) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Year 4 | | | | | |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|  | Life around us | Our bodies | Our World | Materials | Forces | Forces |
| question | [How could we group plants and animals?](#_Life_Around_Us_6) | [How do humans get energy from their food?](#_Our_bodies_-_3) | [How do habitats and ecosystems help animals who choose to live there survive?](#_Our_World_–_3) | [Are all materials solid?](#_Materials_–_Are) | [How is sound made?](#_Forces_–_How) | [How does electricity travel?](#_Forces_–_How_1) |

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| --- | --- | --- | --- | --- | --- | --- |
|  | Year 5 | | | | | |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|  | Life around us | Our bodies | Our World | Forces | Materials | |
| question | [How do plants and animals reproduce?](#_Life_Around_Us_7) | [How do we change over time?](#_Our_bodies_-_4) | [How does our solar system work?](#_Our_World_–_4) | [How could we combat the effect forces have?](#_Forces_–_How_2) | [How could we manipulate and change materials?](#_Materials_–_How) | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Year 6 | | | | | |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|  | Life around us | Our World | |  | Our bodies | Forces |
| question | [How do we group plants and animals within groups?](#_Life_Around_Us_8) | [How do habitats and ecosystems affect the plants and animals that live there over time? (evolution and inheritance)](#_Our_World_–_5) | |  | [How do our bodies stay healthy?](#_Our_bodies_-_5) | [How can we manipulate light and shadow?](#_How_can_we)  [How can we manipulate how electricity travels?](#_How_can_we) |