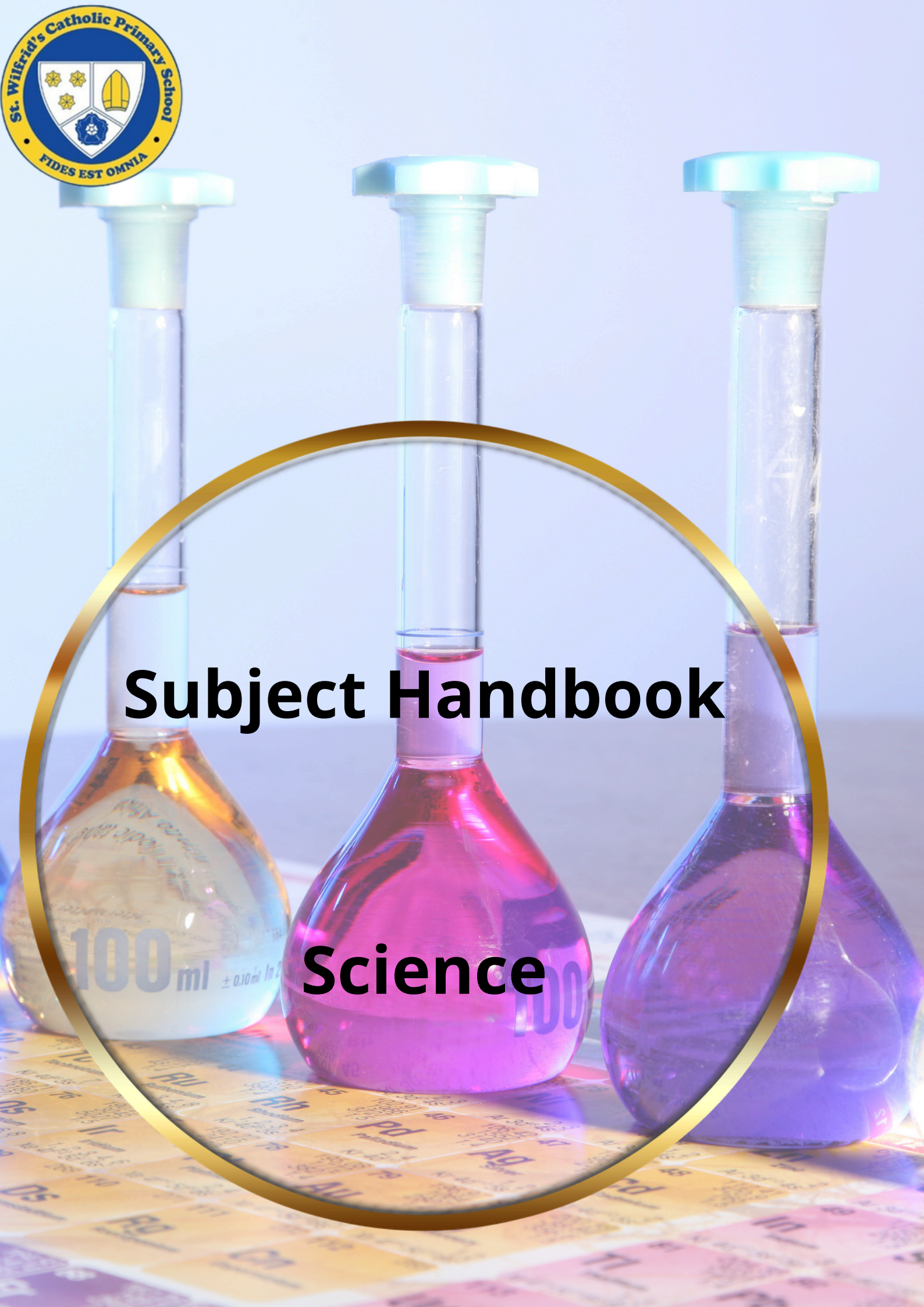
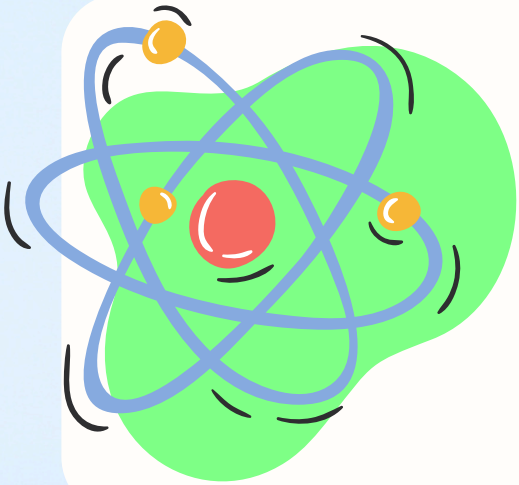



# Subject Handbook

# Science



# Science Handbook



## Vision for Science

Our science curriculum aims to give all children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and also an understanding of the uses and implications of science, today and for the future. .

## Our Science Curriculum

Our curriculum is knowledge rich and has been developed using the curriculum map from Primary Knowledge Curriculum combined with subject leader expertise to ensure the best possible curriculum to meet the needs of all of our pupils. Through our science curriculum we offer a range of opportunities to explore and understand the world around us, gaining a secure knowledge of scientific concepts. Our curriculum is designed to engage all pupils and prepare them for future learning, encourage curiosity and questioning attitudes. In science we take pride in our pupils developing independence, confidence and resilience. We focus on building up extended specialist vocabulary, enabling pupils to articulate scientific concepts.



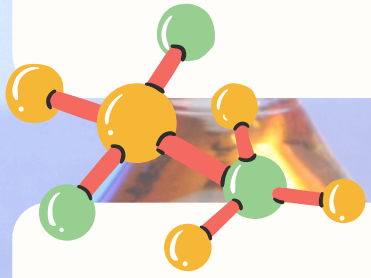
## Our Science Curriculum Will Enable Pupils to:

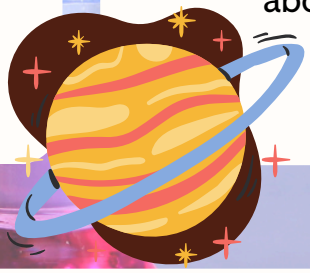
- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world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

# Intent

It is our vision to distil a lifelong love of science within our pupils. Science has changed our lives and is vital to the world's future prosperity. We work hard to provide a rich and varied curriculum to challenge and meet the needs of our children. We believe all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.

From EYFS up to KS2 our pupils will build up a body of key foundational knowledge and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.





# Implementation

Science , as a subject, is taught using the Primary Knowledge Curriculum map subsidised with subject leader knowledge to ensure the best possible curriculum to meet the needs of all of our children. This is then enhanced with subject specific and contextual reading materials. Staff subject knowledge is continuously being strengthened so that a well-sequenced and planned curriculum can be designed: a curriculum that builds on prior knowledge, focuses on key scientific vocabulary and concepts, makes links to other subjects within the curriculum whilst pre-empting and addressing misconceptions.

Prior learning is built upon. As the children's knowledge and understanding increases, and they become more proficient in selecting and using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

Pupils at learn about natural phenomena through a range of teaching strategies, including practical investigations, which are at the heart of the teaching and learning of Science. In order to encourage a 'hands on, minds on' approach to learning, teachers plan lessons which ensure pupils are exposed to all 5 types of enquiry and are equipped with the scientific knowledge required to understand the uses and implications of science today and for the future. Stimulating experiments not only allow for the pupils to practice working scientifically skills, but also act as hooks for our pupils, However, we are committed to ensuring that our children can articulate the Scientific explanations behind all the excitement and can retain that knowledge rather than just have the memory of a 'fun' task



# Impact

Our Science Curriculum is high quality, well thought out and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress.

In addition, we measure the impact of our curriculum through the following methods:

- A reflection on standards achieved against the planned outcomes (Key Objective linked to National Curriculum objectives assessment on Fisher Family Trust);
- Tracking of knowledge in post learning quizzes and flashback questions;
- Pupil / Teacher discussions about their learning;



**FLASHBACK 4**

= DIALOGUE

Children will review learning from previous lessons, days, units and years to consolidate learning and ensure children know more and remember more.

**LET'S LEARN**

= INTRODUCE RECALL & SCAFFOLDED SUPPORT

Children are taught the key concepts they need to succeed in the lesson. The direct teaching will looking at primary and secondary sources and is designed to impart key vocabulary and knowledge the children need to succeed.

**TALK TASK**

= COLLABORATIVE CONVERSATION

Kagan strategies will be used at this point to support understanding and mastery.

**INDEPENDENT TASK**

= RECORD RESPONSES

Children are provided with a variety of independent, paired and group tasks to apply their knowledge and use new vocabulary in context.

**PLENARY**

= EVALUATE UNDERSTANDING & NEXT STEPS

Children's understanding of the knowledge taught in the lesson is assessed and progress reviewed. Assessment for learning takes place throughout the Art lesson and this is used to adapt future teaching and flash back questions.

# Curriculum Overviews

Curriculum overviews are available to inform planning. They identify which unit the object is covered within the curriculum with clearly defined end points.



| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 1 | The Human Body | Animals and their Needs | Seasons and Weather | | Plants | Materials and Magnets |
| Year 2 | The Human Body | Living things and their Environment | Plants | | Materials | |
| Year 3 | The Human Body | Rocks | Light | Plants | Forces and Magnets | |
| Year 4 | The Human Body | | Classification | Sound | THe Water Cycle | |
| Year 5 | The Human Body | Materials | Living Things | Forces | Astrology | |
| Year 6 | The Human Body | Classification | Electricity | | Light | |

## Science in the Early Years Foundation Stage

| EYFS | Development Matters 3&4 Years will learn to: | Development Matters Children in Reception will learn to: | Statutory Framework Early Learning Goals |
|---|---|---|---|
| Understanding the world | Use all their senses in hands-on exploration of natural materials.<br>Explore collections of materials with similar and/or different properties.<br>Begin to make sense of their own life-story and family's history.<br>Explore how things work.<br>Plant seeds and care for growing plants.<br>Understand the key features of the life cycle of a plant and an animal.<br>Begin to understand the need to respect and care for the natural environment and all living things.<br>Explore and talk about different forces they can feel.<br>Talk about the differences between materials and changes they notice. | Explore the natural world around them.<br>Describe what they see, hear and feel whilst outside.<br>Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. | The Natural World<br>Explore the natural world around them, making observations and drawing pictures of animals and plants.<br>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.<br>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. |
| | Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" | Learn new vocabulary.<br>Ask questions to find out more and to check what has been said to them.<br>Use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen.<br>Use new vocabulary in different contexts. | Make comments about what they have heard and ask questions to clarify their understanding. |

| Working Scientifically KS1 | Year 1 | | | | | | | | Year 2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Human Body | Animals and their Needs | Seasons and Weather | Taking Care of the Earth | Plants | Materials and Magnets | The Human Body | Living Things and their Environment | Electricity | Plants | Materials and Matter | Astronomy |
| Statutory | | | | | | | | | | | | |
| asking simple questions and recognising that they can be answered in different ways | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| observing closely, using simple equipment | ✓ | | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ |
| performing simple tests | ✓ | | | | ✓ | | | | | ✓ | ✓ | ✓ |
| identifying and classifying | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | | ✓ |
| using their observations and ideas to suggest answers to questions | | ✓ | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ |
| gathering and recording data to help in answering questions | | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | ✓ |
| Notes and guidance | | | | | | | | | | | | |
| use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships | | ✓ | | | ✓ | ✓ | | | | | | |
| ask people questions and use simple secondary sources to find answers | ✓ | | | ✓ | | | ✓ | | | | | |
| use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out | | | ✓ | | ✓ | | | | | | | |
| record and communicate their findings in a range of ways and begin to use simple scientific language (with help) | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |

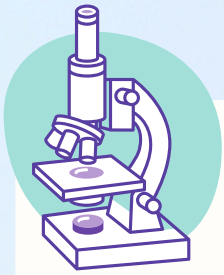
## Key Stage 2 Science and the National Curriculum

| Year Group | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 4 National Curriculum Coverage | • Describe the simple functions of the basic parts of the digestive system in humans (NC Yr4)<br>• Identify the different types of teeth in humans and their simple functions (NC Yr4) | | • Recognise that living things can be grouped in a variety of ways (NC Yr4)<br>• Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (NC Yr4) | Pupils should be taught to:<br>• identify how sounds are made, associating some of them with something vibrating<br>• recognise that vibrations from sounds travel through a medium to the ear<br>• find patterns between the pitch of a sound and features of the object that produced it<br>• find patterns between the volume of a sound and the strength of the vibrations that produced it | • compare and group materials together, according to whether they are solids, liquids or gases<br>• observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)<br>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature | • identify common appliances that run on electricity<br>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers<br>• identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery<br>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit<br>• recognise some common conductors and insulators, and associate metallicity with being good conductors |
| Year 4 Topic and lesson sequence | The Human Body | | Classification<br>1. Introduction to classification<br>2. Classes of vertebrates: Fish and Amphibians<br>3. Classes of vertebrates: Reptiles, Birds, and Mammals<br>4. Classes of invertebrates: Insects, Arachnids and Molluscs<br>5. Classification of plants | Sound<br>1. What is sound?<br>2. Speed of sound<br>3. Qualities of sound—Pitch and Volume<br>4. Human Voice<br>5. Ears—How we Hear | States of Matter<br>1. States of Matter<br>2. Evaporation<br>3. Condensation<br>4. Precipitation<br>5. The Water Cycle | Electricity<br>1. Electrical Safety<br>2. Parts of a circuit<br>3. Switches<br>4. Thomas Edison and Lewis Latimer<br>5. Investigating conductive and non-conductive materials |

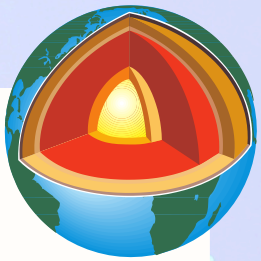


# Progression

The progression maps carefully maps the development of key ideas within a strand from Y1 to Y6 ensuring that the learning journey is cohesive and that each new element builds on the appropriate conceptual components.



# Assessment



Assessment  allows teachers to make live judgements about children's learning. Based on comprehensive knowledge and skills framework, teachers assess, monitor, track, and report Science.

# Inclusion

All children access the Science Curriculum. We teach to the top and scaffold down using resources, adaptations and adult support to ensure all learners make progress.

Within the representation stage there is a systematic approach to the introduction of new content which builds on prior learning and explicit links are made with the content that the children have previously acquired.

The use of practical resources to represent the concept or method is vital within the representation stage to ensure all children have conceptual understanding.

The use of resources also support pupils who are less confident but a reliance on the use of physical resources is to be avoided.

