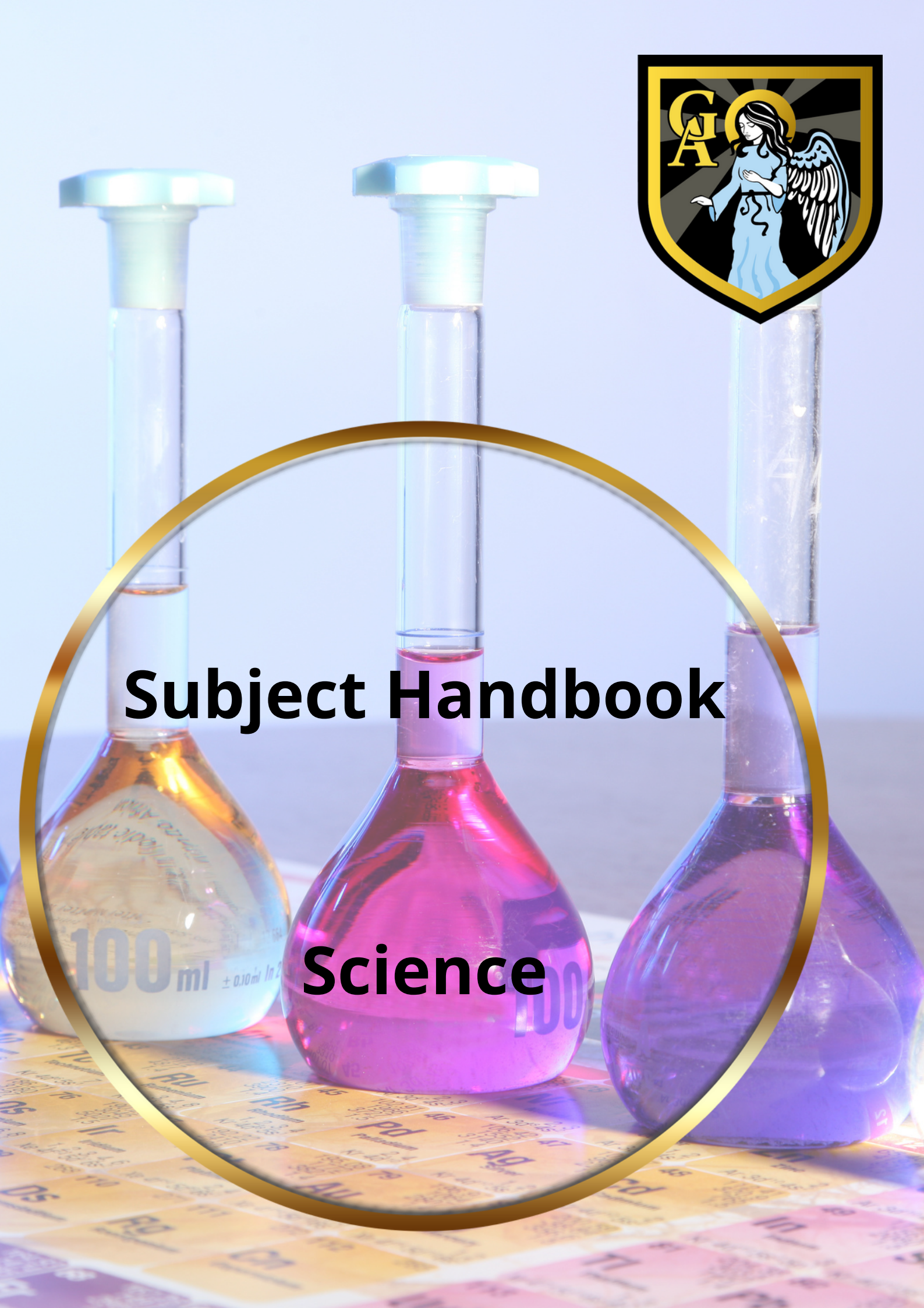
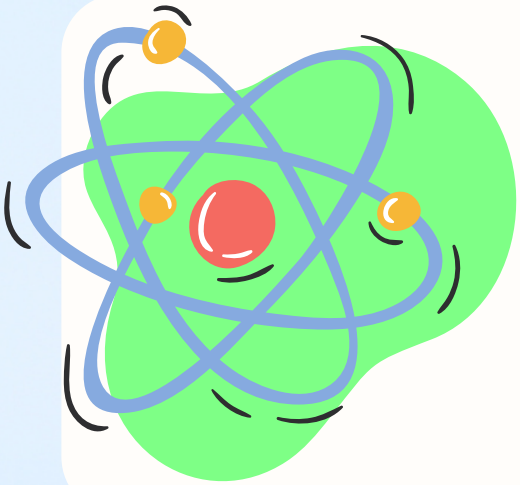


Subject Handbook

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.

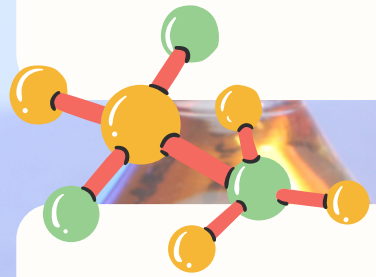
Our Science Curriculum Will Enable Pupils to:

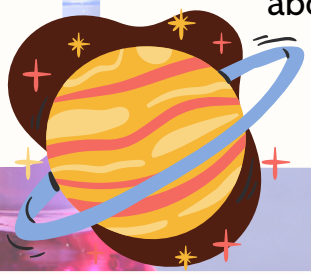
- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world 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 Guardian Angels 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;

Prior Learning (Flashback 4)

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

Direct Teaching (Let's Learn)

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 and Independent Task

Children are provided with a variety of independent, paired and group tasks and practical activities and investigations to apply their knowledge and use new vocabulary in context. Kagan strategies will be used at this point to support understanding and mastery.

Plenary

Children's understanding of the knowledge taught in the lesson is assessed and progress reviewed. Assessment for learning takes place throughout the 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	Taking Care of the Earth	Plants	Materials and Magnets
Year 2	The Human Body	Living things and their Environment	Electricity	Plants	Materials	Astronomy
Year 3	The Human Body	Cycles in Nature	Light	Plants	Rocks	Forces and
Year 4	The Human Body	Classification	Ecology	Sound	THe Water Cycle	
Year 5	The Human Body	Materials	Living Things	Forces	Astrology	
Year 6	The Human Body	Classification	Electricity	Light	Reproductio	

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. Explore collections of materials with similar and/or different properties. Begin to make sense of their own life-story and family's history. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.	Explore the natural world around them. Describe what they see, hear and feel whilst outside. 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 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 some important processes and changes in the natural world around them, including the seasons and changing states of matter.
		Learn new vocabulary. Ask questions to find out more and to check what has been said to them	

Working Scientifically KS1

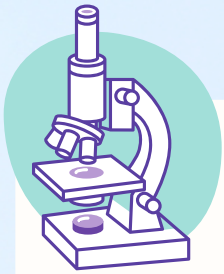
	Year 1								Year 2			
	Human Body	Animals and their Needs	Seasons and Weather	Taking Care of the Earth	Plants	Materials and Magnets	The Human Body	Living Things and their Environments	Electricity	Plants	Materials and Matter	Astronomy
Statutory												
asking simple questions and recognising that 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 1 Science and the National Curriculum

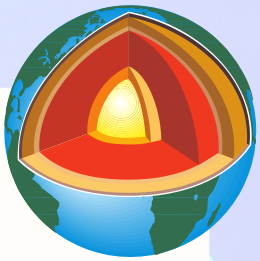
Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2 National Curriculum Coverage	• notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	• differences between living, dead and never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats (NC 9c2)	• This unit is beyond the requirements of the National Curriculum for Year 2. It has been written to teach some important background knowledge that will help children in Year 3, when electricity features again, to access curriculum content in greater depth.	Children should be taught to: Observe and describe how seeds and bulbs grow to mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	This unit has been written in addition to the National Curriculum content in Science for Year 2. It has been included to give pupils some prior knowledge which will be useful when they study astronomy again in Year 5.
Year 2 Topic and lesson sequence	The Human Body 1. Animals, including humans, survival and offspring 2. The Skeletal System, The Muscular System, and Exercise 3. The Digestive system and Healthy Eating 4. The Circulatory system 5. Germs, Diseases and preventing illness	Living Things and their Environments 1. Dead or Alive 2. What is a habitat? 3. Rainforest and Desert habitats 4. Meadow habitats 5. Underground habitats	Electricity 1. Introduction to Electricity 2. Safety 3. Exploring Circuits (A) 4. Exploring Circuits (B) 5. Investigating Conductive and non-conductive materials	Plants 1. Plants around us 2. Seeds and bulbs 3. Comparative test 1 4. Comparative test 2 5. Food and farming	Materials 1. Materials and their uses 2. George de Mestral and Velcro 3. Matter under the microscope 4. Changing Solids, Gases & Liquids and their properties	Astronomy 1. Introduction to Astronomy 2. Model the Solar System 3. Orbit and Rotation 4. The Moon and its Phases 5. Constellations

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.