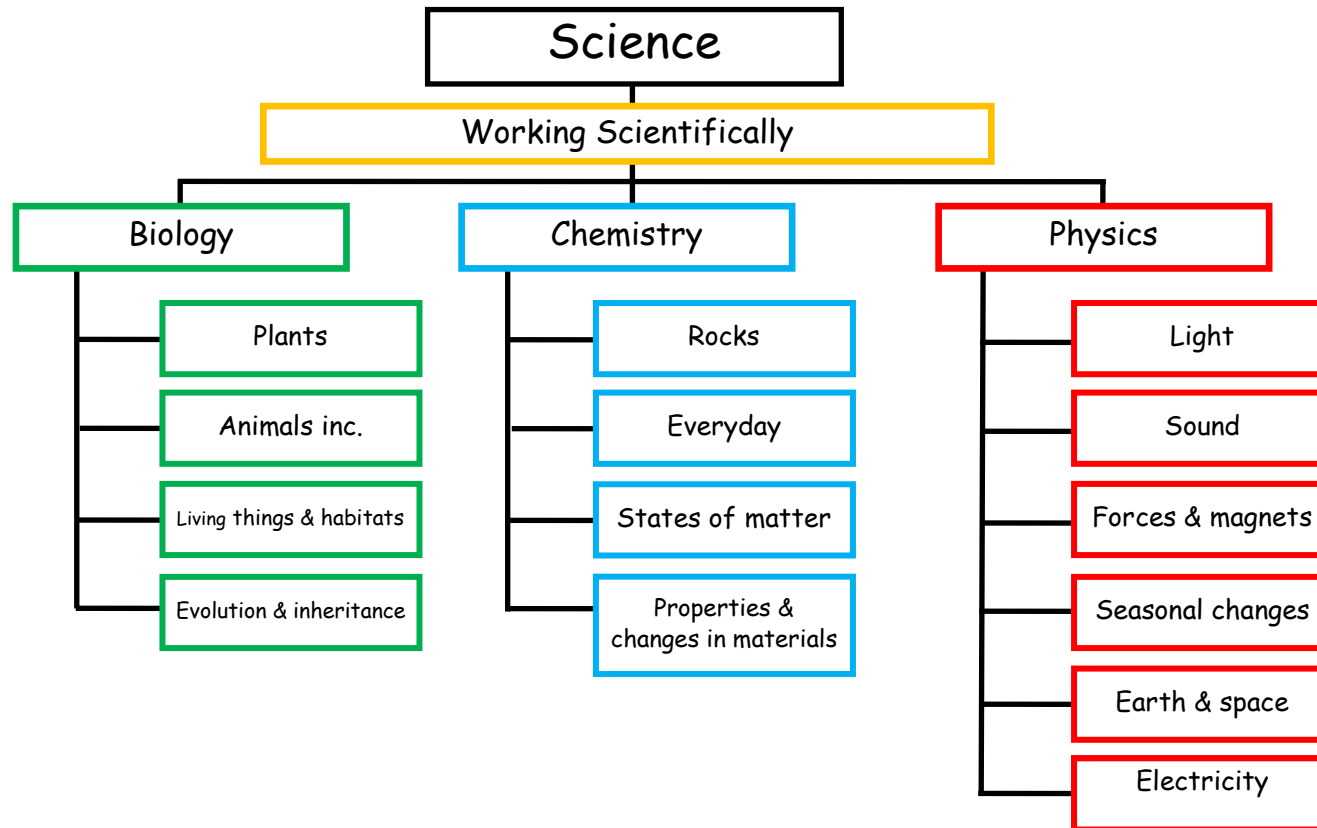


Angram Bank's Big Bus Curriculum



Science

The **intention** of our Science curriculum is to provide the foundations for understanding the world through biology, chemistry and physics. Our Science curriculum is **implemented** through White Rose's carefully sequenced units. This enables us to develop essential aspects of the knowledge, methods, processes and uses of science to ensure children construct a secure foundation of knowledge and concepts, which will be built upon in subsequent learning. The **impact** of this approach will ensure children have the skills and knowledge to apply when working scientifically; this is how children will develop a sense of excitement and curiosity around science and how the world works.

Design and Planning Non-Negotiables

- We follow White Rose Science which covers all National Curriculum statements
- The National Curriculum map shows where all National Curriculum objectives and working scientifically objectives are covered
- Key concepts and vocabulary are identified and taught throughout the teaching sequence
- The sequence small steps are highlighted to show coverage.

At the session planning stage:

- Previous learning is revisited throughout the sequence
- We annotate the planning to adapt to the needs of our children

Angram Bank's Scientific Key Concepts

Every child will become confident with the key concepts in Science.

Each concept will be further developed in each year group at the appropriate depth.

Green = new to that year group

FS	similarities differences observe changes (growth and decay)				
Year 1	asking simple questions observe test identify classify gather and record data describe compare	Year 3 / 4	identify describe compare explore investigate recognise ask simple and relevant questions make systematic and careful observations conduct comparative and fair tests gather, record, classify, present data record findings report findings draw simple conclusions predict use scientific evidence	Year 5/6	identify describe compare explore investigate recognise ask simple and relevant questions answer questions make systematic and careful observations conduct comparative and fair tests gather, record, classify, present data record and report findings present findings draw simple conclusions predict use scientific evidence control variables
Year 2	ask simple questions observe test identify classify gather and record data describe compare explore				

Foundation Stage

Understanding the world: The Natural World

Intent: By the end of Foundation Stage our children will know about some **similarities and differences** in relation to animals, plants and the world around them. They will be able to ask questions, make **observations**, explain why some things occur and talk about changing states of matter. They will be able to talk about and record their findings through stories, personal experiences and drawings.

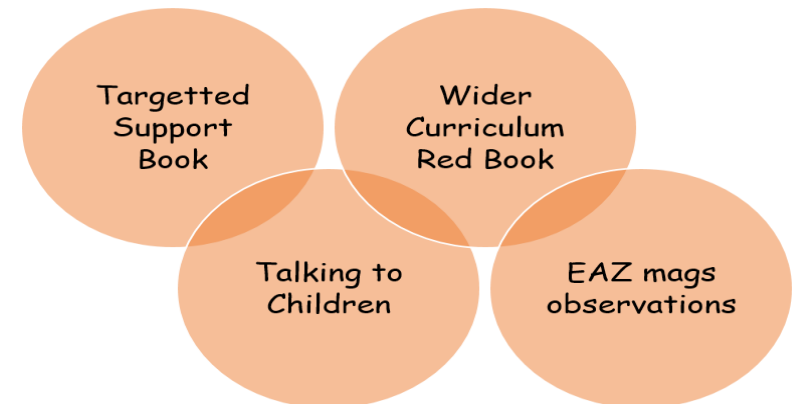
Sequence of implementation

Foundation Stage Scientific skills		
Observing	Questioning	Grouping and classifying
Asks questions and show they are curious.	Talk about and draw pictures of what they have observed . Use senses and simple equipment to make observations. Observe changes.	Finds things that are similar or different . Use senses to group things (objects/living things)

Sequence of implementation

	Autumn	Spring	Summer	Key Vocabulary
FS1	- All about me - our senses and body part. - Children asks questions about their own lives/bodies. - Light and Dark - changing materials.	- Planting - life cycles (plants and animals)	Changing states of matter — floating and sinking.	Body parts, light, dark, Plant, cycle, change , grow, seeds, sun, water, soil Float, sink,

Where will we see the impact?



Yearly overview

The yearly overview provides an at-a-glance progression through the science blocks and the direct links to the Reception maths blocks. The same amount of content is given for each block so teachers have more than what they need for the time to adapt this to their own children's needs and interests.

Autumn	Me and my small world Maths link: Match, sort and compare	What's in my basket? Maths link: Talk about measure and pattern	Senses Maths link: It's me 1, 2, 3	Let's go outside Maths link: Circles and triangles	What's changed? Maths link: 1, 2, 3, 4, 5	Night and day Maths link: Shapes with 4 sides
Spring	Changes in Winter Maths link: Alive in 5	Let it flow Maths link: Mass and capacity	From desert to jungle Maths link: Growing 6, 7, 8	Watch it grow Maths link: Length, height and time	Animal detectives Maths link: Building 9 and 10	Pushes and pulls Maths link: Explore 3-D shapes
Summer	Maths link: To 20 and beyond	Maths link: How many now?	Maths link: Manipulate, compose and decompose	Maths link: Sharing and grouping	Maths link: Visualise, build and map	Maths link: Make connections

Science—The National Curriculum

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of **biology, chemistry and physics**. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of **key foundational knowledge and concepts**, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to **explain what is occurring, predict how things will behave, and analyse causes**.

Aims

The national curriculum for science aims to ensure that all pupils:

- 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. Scientific knowledge and conceptual understanding.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum - cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions. School curriculum The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage if appropriate. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online.

Key stage 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

	Working Scientifically
Y1/2	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • 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.

Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	The human body					Seasonal changes (autumn)	Materials					Seasonal changes (winter)	
Spring term	Planting A	Animals						Caring for the planet		Seasonal changes (spring)	Planting B	Consolidation	
Summer term	Plants					Planting C	Growing and cooking		Seasonal changes (summer)	Consolidation			

Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	Animal needs for survival				Humans		Materials					Plastic	
Spring term	Plants (light and dark)			Living things and their habitats							Light and dark		Consolidation
Summer term	Plants (bulbs and seeds)		Growing up			Bulbs and seeds		Growing up		Wildlife		Consolidation	

Lower Key Stage 2 – Years 3 and 4

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

	Working Scientifically
Y3/4	• asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.

Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Skeletons			Movement	Nutrition and diet			Food waste	Rocks			Consolidation
Spring term	Fossils		Soils		Light							
Summer term	Plants A						Forces		Magnets		Plants B	Biodiversity

Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Group and classify living things			Data collection A	States of matter							Consolidation
Spring term	Sound					Data collection B	Electricity				Energy	Consolidation
Summer term	Data collection C	Habitats		Deforestation	The digestive system					Food chains		

Upper Key Stage 2 - Years 5 and 6

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. 'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

	Working Scientifically
Y5/6	• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments

Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Forces					Space					Global warming	Consolidation
Spring term	Properties of materials				Animals including humans				Life cycles			
Summer term	Reproduction A		Reversible and irreversible changes				Plastic pollution	Reproduction B		Consolidation		

Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Living things and their habitats						Electricity					Renewable energy 
Spring term	Light					Light pollution 	The circulatory system		Diet, drugs and lifestyle			
Summer term	Variation	Adaptations					Fossils	Consolidation	Themed projects (Year 7 ready)			