**National Curriculum:**

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

**EYFS**

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| **Vocabulary**  **By the end of EYFS they will be able touse the words:** | **Outcomes for the end of EYFS. Children will be able to:** |
| **Plants**  Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud  **Animals inc. Humans**  Head, body, eyes, ears, mouth, teeth, leg,  Parts of the body including those linked to Managing Self teaching  Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue  **Seasonal Changes**  Weather (sunny, rainy, windy, snowy etc.)  Seasons (winter, summer, spring, autumn)  Sun, sunrise, sunset, day length | **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  **Managing Self**  Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices |

**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.

**Key Stage 1 - Working Scientifically**

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

**Programme of Study**

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| KS1 | **Plants** | **Animals inc. Humans** | **Materials** | **Living Things & Their Habitats** | **Seasonal Changes** |
| Y1 | **🗸** | **🗸** | **🗸** |  | **🗸** |
| Y2 | **🗸** | **🗸** | **🗸** | **🗸** |  |

**LOWER KEY STAGE 2**

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.

**Lower Key Stage 2 - Working Scientifically**

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

* 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.

**Programme of Study**

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| LKS2 | **Plants** | **Animals inc. Humans** | **Materials** | **Living Things & Their Habitats** | **Light** | **Forces & Magnets** | **Sound** | **Electricity** |
| Y3 | **🗸** | **🗸** | **🗸 (Rocks)** |  | **🗸** | **🗸** |  |  |
| Y4 |  | **🗸** | **🗸 (States of Matter)** | **🗸** |  |  | **🗸** | **🗸** |

**UPPER KEY STAGE 2**

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.

**Upper Key Stage 2 - Working Scientifically**

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

* 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

**Programme of Study**

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| UKS2 | **Animals inc. Humans** | **Materials** | **Living Things & Their Habitats** | **Light** | **Forces** | **Earth & Space** | **Electricity** | **Evolution & Inheritance** |
| Y5 | 🗸 | 🗸 (Properties & Changes) | 🗸 |  | 🗸 | 🗸 |  |  |
| Y6 | 🗸 |  | 🗸 | 🗸 |  |  | 🗸 | 🗸 |

**Cycle A, Spring 2 2024**

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| **EYFS, Year 1** | **Lesson 1** | **Lesson 2** | **Lesson 3** | **Lesson 4** |
| Animals | Flash back:  What does the word absorb mean?  Do you think this material will absorb water? | Flash back:  What does “transparent” mean?  What does “opaque” mean? | Flash back:  How many seasons are there in one year?  What are the names of the seasons? | Flashback:  How is the season winter different from Summer? |
| Animals – Reptiles  I will be able to explore reptiles and their features.  I will know that a reptile is an animal that has dry scales on its body. | Animals – Carnivores  I will be able to explore different carnivores and their key characteristics.  I will know that in the wild, carnivores hunt and kill other animals for food. | Animals – Herbivores  I will know that herbivores are animals that eat plants | Animals – Omnivores  I will know that an omnivore is an animal that eats both animals and plants. |
| Key Questions:  Are all animals the same?  What features do reptiles have?  What reptile is this?  Is a a reptile?  What is similar about these two reptiles?  What is different about these reptiles?  Are there similarities between reptiles/mammals/birds/fish and amphibians?  What are the differences between reptiles/mammals/birds/ fish and amphibians? | Key Questions:  What is a carnivore?  Is a a carnivore? How do you know?  What do carnivores eat?  What animals does a eat?  Do all carnivores live in the wild? How do you know?  Are there any pets that are carnivores?  What animal group does this carnivore belong to?  Are there any reptiles/birds/amphibians/fish that are carnivores? | Key Questions:  What is a herbivore?  Is a a herbivore? How do you know?  What do herbivores eat?  Do herbivores live in the wild? How do you know?  Are there any pets that are herbivores?  What animal group does this herbivore belong to?  Are there any reptiles that are herbivores?  Are there any birds that are herbivores? | Key Questions:  What is an omnivore?  Is a an omnivore? How do you know?  What do omnivores eat?  Do omnivores live in the wild? How do you know?  Are there any pets that are omnivores? What animal group does this omnivore belong to?  Are there any reptiles/birds that are omnivores?  Are there any amphibians/fish that are omnivores? |
| Key Vocabulary:  Reptile  Scales  Lizard  Crocodile  turtle | Key Vocabulary:  Animal  Carnivore  Sharp teeth  Wild animal  Pet | Key Vocabulary:  Animal  Herbivore  Plants  Vegetable  Fruit | Key Vocabulary:  Animals  Carnivore  Herbivore  Plants |

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| **Year 2, Year 3** | **Lesson 1** | **Lesson 2** | **Lesson 3** | **Lesson 4** |
| Skeletons | Flash back:  See Power point | Flash back:  See Power point ? | Flash back:  See Power point | Flashback:  See Power point |
| Skeletons:  Functions of the Skeleton  I will know that humans have skeletons for movement, support and protection  I will not only be aware of the function of the skeleton but also the jobs of specific bones. | Skeletons:  Name and identify bones  I will know that some animals have skeletons.  I will use my knowledge of bones in the human skeleton to identify, locate and name bones in a variety of animals. | Skeletons:  Animals without a spine    I will know that the term “exoskeleton“ describes an animal with a skeleton on the outside of its body.  I will be able to group animals by using the terms with and without a spine | Skeletons:  Are all skeletons the same?  I will be able to identify, sort and group animals in different ways based on their skeletal systems. |
| Key Questions:  What are the functions of the skeleton?  Why is the skeleton important?  What is the function of the skull, or femur, or ribcage?  What would happen if humans did not have a spine?  What is similar about the skull and ribcage? What is different? | Key Questions:  What bones can you identify in these amphibian, or reptile, or fish, or bird skeletons?  What are the similarities between mammal and bird skeletons? What are the differences?  How are human skeletons similar to other mammals? Are there any differences?  Do each of these animals have a spine/femur/pelvis/ribcage? Where is it on the skeleton? | Key Questions:  How can we sort and group animals based on their skeletons?  Name 3 animals that have a spine.  Name 3 animals that do not have a spine.  What is an exoskeleton? What is its function?  Name 2 animals with an exoskeleton. How can we sort these spineless animals into groups? How many ways can you group them? | Key Questions:  Name 3 animals with a spine.  Name 3 animals without a spine.  What is an exoskeleton?  What are the differences between the skeletons of a bird and a snail?  How can you sort and group these animals?  How many ways can you think of? |
| Key Vocabulary:  Skull  Ribcage  Spine  Pelvis  Femur | Key Vocabulary:  Mammal  Bird  Fish  Amphibian  Reptile | Key Vocabulary:  Spine  Antennas  Insect  Exoskeleton | Key Vocabulary:  Skeleton  Exoskeleton |

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| **Year 4, 5 and 6 will complete the same baseline of work.**  **There will be additional challenges tied into the objectives for year 5 and 6, planned by class teachers.**  **There will be significant differences in the expectations of the way that the different year groups record their work.** | | | | | | | |
| **Year 4, Year 5 & Year 6** | **Lesson 1 – Sound** | | **Lesson 2 – Sound** | | **Lesson 3 – Sound** | **Lesson 4 – Data collection B** | |
|  | Flash back:  See PowerPoint | | Flash back:  See PowerPoint | | Flash back:  See PowerPoint | Flash back:  See PowerPoint | |
| Explore Volume  I will explore how the strength of the vibrations affects the volume of a sound  I will know that, in general, louder sounds have bigger vibrations and quieter sounds have smaller vibrations. | Explore pitch  I will know that pitch refers to how high or low a sound is  I will explore how the pitch of the sound made by different objects can be changed. | Plan – Volume experiment  I will be able to plan a fair test to explore whether distance has an effect on the volume of a sound. | Investigate – volume experiment  I will be able to carry out a fair test to explore how the distance from a sound source affects the volume. | Evaluate – Volume experiment  I will be able to evaluate the volume experiment.  I will be able to work scientifically to analyse data, make conclusions and evaluate their experiment | Data collection B  I will be able to continue the observation over time enquiry from the Autumn term to name and identify living things in their local area  I will collect data to gain a deeper understanding of how seasonal changes influence plant and animal life | Analyse data  I will be able to continue my enquiry to identify living things in their local area.  I will gain a deeper understanding of how seasonal changes influence plant and animal life |
| Key Questions:  What are vibrations? What is volume?  How can you increase the volume of a sound?  How can you decrease the volume of a sound?  How do wooden blocks produce a louder sound than ice cubes?  Do bigger or smaller vibrations produce louder sounds?  How do different materials insulate sound? Which material would be the best insulator of sound? Why?  How will you measure the volume of a sound? | Key Questions:  What is “pitch”?  When you hit different pans, why do they make different sounds?  When you pluck the strings on a guitar, which strings have a high pitch and which strings have a low pitch?  What happens to the pitch of the string when it is tightened and loosened?  When an elastic band is plucked, how can the pitch be changed?  How can the pitch of a musical instrument with no strings, such as a trumpet, be changed? | Key Questions:  What does “volume” mean when thinking about sound? What measurement is used to record the loudness of a sound?  What measurements are used to record distance?  What will you change in this experiment?  What will you measure in this experiment?  What will you keep the same?  How will you record your results? | Key Questions:  What is your experiment plan?  What are you changing?  What are you measuring?  What are you keeping the same?  Is there any background noise? What does the background noise measure on the decibel meter? | Key Questions:  Was there any background noise?  What did the background noise measure on the decibel meter?  Does the sound get louder or fainter as the distance from the sound source increases?  What conclusions can you make from your data?  If you were to repeat this experiment, how could you improve your results?  What questions do you have for further investigation? | Key Questions:  How will you record the data? What plants and animals are there in our local area?  How many vertebrates and invertebrates did you identify?  How many flowering plants did you identify?  How many non-flowering plants did you identify? | Key Questions:  What vertebrates/invertebrates did you identify?  What flowering/non-flowering plants did you identify?  What was the most/least common animal/plant?  What patterns can you spot in your data?  How are your findings similar to or different from autumn? Why?  Do you predict your data will be similar or different in summer? Why? |
| Key Vocabulary:  Vibration  Volume  Insulate  Decibel (dB)  Decibel meter | Key Vocabulary:  Pitch  High-pitched  Low-pitched  Sound | Key Vocabulary:  Independent variables  Dependent variables  Controlled variables | Key Vocabulary:  Volume  Decibel (dB)  Decibel meter  Ear  Background noise | Key Vocabulary:  Conclusion  Volume  Decibel (dB)  evaluate | `Key vocabulary:  Vertebrate  Invertebrate  Flowing plant  Non-flowering plant | Key Vocabulary:  Bar chart  Pictogram  Data  Vertebrate  invertebrate |