



*To inspire confident learners who will thrive in a changing world.*

## **Science**

### **Intent of study at Swinford School**

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.

### **Implementation**

The Science lead, in conjunction with class teachers for each year group, checks the long-term plans to ensure coverage of the National Curriculum content. Science is taught as a discrete subject, weekly. Every year group teaches Science every half term. The sequence of the lessons has been carefully chosen so that children can create links to other subjects and build on relevant prior learning. To create the interesting and engaging lessons, we use a variety of resources. The planning template identifies the series of lessons with each lesson having a clear learning objective and a key takeaway to be achieved. Throughout the year, investigations are undertaken so that children can independently discover an answer to a given challenge or as they progress through the school create their own investigations to answer questions. Within each teaching cycle a review has been carried

out to ensure that the children have an opportunity to cover each of the following enquiry types: - Comparative and fair testing - Research - Observations over time - Pattern seeking - Identifying, grouping and classifying.

The following information shows the focus of learning for each phase of learning.

## **Early Years Foundation Stage**

The main focus within EYFS is to harness children's natural curiosity with the world and everything around them. More specifically, as part of the EYFS framework and specified within the 'Understanding the world' educational programme there is an Early Learning Goal (ELG) for the natural world. Within this it states children at the expected level of attainment will:

- 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 to them in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

## **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 are encouraged to be curious and ask questions about what they notice and 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 begin to use simple scientific language to talk about what they have found out and communicate their ideas in a variety of ways, both within the class and to a wider audience via visual displays.

## **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 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 start to 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.

## **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 encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They 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. In order to help children retain key information, we use retrieval questions at the start of most lessons. These questions revisit key facts and important information from within that year group and previous year groups. Regular recall of such facts helps children commit them to their long term memory, ensuring they will retain the 'key knowledge' for the end of Key Stage 2.

In addition, at the end of each new Science unit a Knowledge Organiser is sent home which contains the key points of learning and vocabulary so that the children have an opportunity to discuss this with the parents or guardians.

Knowledge Organisers can be used alongside an assessment task at the end of each unit to provide an opportunity for teachers to identify misconceptions or where some learning may need to be revisited and for children to self assess their progress.

## **Impact**

The children in all the classes love the science lessons and as a result it has a high profile in the school. Each child's everything book shows that Science is taught regularly, and learning is recorded in a variety of ways. Outcomes of work are monitored to ensure that they reflect a sound understanding of the key identified knowledge. Teachers can then intervene in a timely manner to clarify misconceptions and revisit areas of learning if necessary. Through our science teaching we aim that all children will:

- Evidence progression of what is taught.
- Question ideas and reflect on their knowledge.
- Draw conclusions following investigations.

- Develop scientific skills and knowledge, ready for life beyond primary school.
- Suggest ways to investigate a hypothesis, ensuring the test is fair.
- Articulate their understanding of scientific concepts using scientific language.

By fostering a love of science, the children are encouraged to work collaboratively and independently to increase their vocabulary and their science skills. By equipping our children with these skills, they leave Swinford with a greater understanding of their world around them and a desire to learn science in their next phase of education. The outcomes of children will be monitored by the class teacher, subject champion and SLT through formative assessment, tracking, book looks and pupil interviews.

## Coverage of National Curriculum

We follow the National Curriculum and this is mapped carefully in our curriculum planner.

|         |      |                        |                                                                                                       | Total | Seals Yr A | Seals Yr B | Turtles Yr A | Turtles Yr B | Dolphins Yr A | Dolphins Yr B |
|---------|------|------------------------|-------------------------------------------------------------------------------------------------------|-------|------------|------------|--------------|--------------|---------------|---------------|
| Science | Y1&2 | Working Scientifically | asking simple questions and recognising that they can be answered in different ways                   | 3     | 1          | 2          |              |              |               |               |
| Science | Y1&2 | Working Scientifically | observing closely, using simple equipment                                                             | 4     | 2          | 2          |              |              |               |               |
| Science | Y1&2 | Working Scientifically | performing simple tests                                                                               | 4     | 2          | 2          |              |              |               |               |
| Science | Y1&2 | Working Scientifically | identifying and classifying                                                                           | 4     | 2          | 2          |              |              |               |               |
| Science | Y1&2 | Working Scientifically | using their observations and ideas to suggest answers to questions                                    | 3     | 2          | 1          |              |              |               |               |
| Science | Y1&2 | Working Scientifically | gathering and recording data to help in answering questions                                           | 3     | 2          | 1          |              |              |               |               |
| Science | Y1   | Plants                 | identify and name a variety of common wild and garden plants, including deciduous and evergreen trees | 1     |            | 1          |              |              |               |               |
| Science | Y1   | Plants                 | identify and describe the basic structure of a variety of common flowering plants, including trees    | 1     |            | 1          |              |              |               |               |
| Science | Y2   | Plants                 | observe and describe how seeds and bulbs grow into mature plants                                      | 1     |            | 1          |              |              |               |               |
| Science | Y2   | Plants                 | find out and describe how plants need water, light                                                    | 2     | 1          | 1          |              |              |               |               |

|         |    |                  |                                                                                                                                   |   |   |   |  |  |  |  |
|---------|----|------------------|-----------------------------------------------------------------------------------------------------------------------------------|---|---|---|--|--|--|--|
|         |    |                  | and a suitable temperature to grow and stay healthy                                                                               |   |   |   |  |  |  |  |
| Science | Y1 | Animals          | identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals                             | 1 | 1 |   |  |  |  |  |
| Science | Y1 | Animals          | identify and name a variety of common animals that are carnivores, herbivores and omnivores                                       | 1 | 1 |   |  |  |  |  |
| Science | Y1 | Animals          | describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) | 1 | 1 |   |  |  |  |  |
| Science | Y1 | Animals          | identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense     | 1 | 1 |   |  |  |  |  |
| Science | Y2 | Animals          | notice that animals, including humans, have offspring which grow into adults                                                      | 1 | 1 |   |  |  |  |  |
| Science | Y2 | Animals          | find out about and describe the basic needs of animals, including humans, for survival (water, food and air)                      | 1 |   | 1 |  |  |  |  |
| Science | Y2 | Animals          | describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene                  | 1 | 1 |   |  |  |  |  |
| Science | Y1 | Everyday objects | distinguish between an object and the material from which it is made                                                              | 2 | 1 | 1 |  |  |  |  |
| Science | Y1 | Everyday objects | identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock                         | 2 | 1 | 1 |  |  |  |  |
| Science | Y1 | Everyday objects | describe the simple physical properties of a variety of everyday materials                                                        | 1 |   | 1 |  |  |  |  |
| Science | Y1 | Everyday objects | compare and group together a variety of everyday materials on the                                                                 | 1 |   | 1 |  |  |  |  |

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|---------|------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|--|--|
|         |      |                                  | basis of their simple physical properties                                                                                                                                                                              |   |   |   |   |   |  |  |
| Science | Y1   | Seasonal changes                 | observe changes across the four seasons                                                                                                                                                                                | 6 | 3 | 3 |   |   |  |  |
| Science | Y1   | Seasonal changes                 | observe and describe weather associated with the seasons and how day length varies                                                                                                                                     | 6 | 3 | 3 |   |   |  |  |
| Science | Y2   | Living things and their habitats | explore and compare the differences between things that are living, dead, and things that have never been alive                                                                                                        | 1 | 1 | 0 |   |   |  |  |
| Science | Y2   | Living things and their habitats | 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 | 1 | 1 | 0 |   |   |  |  |
| Science | Y2   | Living things and their habitats | identify and name a variety of plants and animals in their habitats, including micro-habitats                                                                                                                          | 1 | 1 | 0 |   |   |  |  |
| Science | Y2   | Living things and their habitats | describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food                                                           | 1 | 1 | 0 |   |   |  |  |
| Science | Y2   | Uses of everyday materials       | identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses                                                   | 1 |   | 1 |   |   |  |  |
| Science | Y2   | Uses of everyday materials       | find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching                                                                                        | 1 |   | 1 |   |   |  |  |
| Science | Y3&4 | Working Scientifically           | asking relevant questions and using different types of scientific enquiries to answer them                                                                                                                             | 4 |   |   | 2 | 2 |  |  |

|         |      |                        |                                                                                                                                                                                           |   |  |  |   |   |  |  |
|---------|------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|---|---|--|--|
| Science | Y3&4 | Working Scientifically | setting up simple practical enquiries, comparative and fair tests                                                                                                                         | 3 |  |  | 1 | 2 |  |  |
| Science | Y3&4 | Working Scientifically | making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers | 3 |  |  | 1 | 2 |  |  |
| Science | Y3&4 | Working Scientifically | gathering, recording, classifying and presenting data in a variety of ways to help in answering questions                                                                                 | 4 |  |  | 2 | 2 |  |  |
| Science | Y3&4 | Working Scientifically | recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables                                                                            | 2 |  |  | 1 | 1 |  |  |
| Science | Y3&4 | Working Scientifically | reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions                                                       | 4 |  |  | 2 | 2 |  |  |
| Science | Y3&4 | Working Scientifically | using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions                                                               | 3 |  |  | 1 | 2 |  |  |
| Science | Y3&4 | Working Scientifically | identifying differences, similarities or changes related to simple scientific ideas and processes                                                                                         | 2 |  |  | 1 | 1 |  |  |
| Science | Y3&4 | Working Scientifically | using straightforward scientific evidence to answer questions or to support their findings                                                                                                | 1 |  |  | 1 |   |  |  |
| Science | Y3   | Plants                 | identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers                                                                         | 1 |  |  | 1 |   |  |  |
| Science | Y3   | Plants                 | explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant                                   | 1 |  |  | 1 |   |  |  |

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| Science | Y3 | Plants  | investigate the way in which water is transported within plants                                                                                                        | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Plants  | explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal                                     | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Animals | identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat | 1 |  |  |   | 1 |  |  |
| Science | Y3 | Animals | identify that humans and some other animals have skeletons and muscles for support, protection and movement                                                            | 1 |  |  |   | 1 |  |  |
| Science | Y4 | Animals | describe the simple functions of the basic parts of the digestive system in humans                                                                                     | 1 |  |  |   | 1 |  |  |
| Science | Y4 | Animals | identify the different types of teeth in humans and their simple functions                                                                                             | 1 |  |  |   | 1 |  |  |
| Science | Y4 | Animals | construct and interpret a variety of food chains, identifying producers, predators and prey                                                                            | 1 |  |  |   | 1 |  |  |
| Science | Y3 | Rocks   | compare and group together different kinds of rocks on the basis of their appearance and simple physical properties                                                    | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Rocks   | describe in simple terms how fossils are formed when things that have lived are trapped within rock                                                                    | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Rocks   | recognise that soils are made from rocks and organic matter                                                                                                            | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Light   | recognise that they need light in order to see things and that dark is the absence of light                                                                            | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Light   | notice that light is reflected from surfaces                                                                                                                           | 1 |  |  | 1 |   |  |  |

|         |    |                                  |                                                                                                                                                         |   |  |  |   |   |  |  |
|---------|----|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|---|---|--|--|
| Science | Y3 | Light                            | recognise that light from the sun can be dangerous and that there are ways to protect their eyes                                                        | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Light                            | recognise that shadows are formed when the light from a light source is blocked by a solid object                                                       | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Light                            | find patterns in the way that the size of shadows change                                                                                                | 1 |  |  | 1 |   |  |  |
| Science | Y3 | Forces and magnets               | compare how things move on different surfaces                                                                                                           | 1 |  |  |   | 1 |  |  |
| Science | Y3 | Forces and magnets               | notice that some forces need contact between two objects, but magnetic forces can act at a distance                                                     | 1 |  |  |   | 1 |  |  |
| Science | Y3 | Forces and magnets               | observe how magnets attract or repel each other and attract some materials and not others                                                               | 1 |  |  |   | 1 |  |  |
| Science | Y3 | Forces and magnets               | compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials | 1 |  |  |   | 1 |  |  |
| Science | Y3 | Forces and magnets               | describe magnets as having two poles                                                                                                                    | 1 |  |  |   | 1 |  |  |
| Science | Y3 | Forces and magnets               | predict whether two magnets will attract or repel each other, depending on which poles are facing                                                       | 1 |  |  |   | 1 |  |  |
| Science | Y4 | Living things and their habitats | recognise that living things can be grouped in a variety of ways                                                                                        | 1 |  |  | 1 |   |  |  |
| Science | Y4 | Living things and their habitats | explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment                    | 1 |  |  | 1 |   |  |  |
| Science | Y4 | Living things and their habitats | recognise that environments can change and that this can sometimes pose dangers to living things                                                        | 1 |  |  | 1 |   |  |  |
| Science | Y4 | States of matter                 | compare and group materials together,                                                                                                                   | 1 |  |  |   | 1 |  |  |

|         |    |  |                  |                                                                                                                                                                |   |  |  |   |   |  |  |
|---------|----|--|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|---|---|--|--|
|         |    |  |                  | according to whether they are solids, liquids or gases                                                                                                         |   |  |  |   |   |  |  |
| Science | Y4 |  | States of matter | 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) | 1 |  |  |   | 1 |  |  |
| Science | Y4 |  | States of matter | identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature                             | 1 |  |  |   | 1 |  |  |
| Science | Y4 |  | Sound            | identify how sounds are made, associating some of them with something vibrating                                                                                | 1 |  |  |   | 1 |  |  |
| Science | Y4 |  | Sound            | recognise that vibrations from sounds travel through a medium to the ear                                                                                       | 1 |  |  |   | 1 |  |  |
| Science | Y4 |  | Sound            | find patterns between the pitch of a sound and features of the object that produced it                                                                         | 1 |  |  |   | 1 |  |  |
| Science | Y4 |  | Sound            | find patterns between the volume of a sound and the strength of the vibrations that produced it                                                                | 1 |  |  |   | 1 |  |  |
| Science | Y4 |  | Sound            | recognise that sounds get fainter as the distance from the sound source increases                                                                              | 1 |  |  |   | 1 |  |  |
| Science | Y4 |  | Electricity      | identify common appliances that run on electricity                                                                                                             | 1 |  |  | 1 |   |  |  |
| Science | Y4 |  | Electricity      | construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers                      | 1 |  |  | 1 |   |  |  |
| Science | Y4 |  | Electricity      | 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               | 1 |  |  | 1 |   |  |  |

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| Science | Y4   |  | Electricity                      | recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit                                                                                   | 1 |  |  | 1 |  |   |   |
| Science | Y4   |  | Electricity                      | recognise some common conductors and insulators, and associate metals with being good conductors                                                                                                                     | 1 |  |  | 1 |  |   |   |
| Science | Y5&6 |  | Working Scientifically           | planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary                                                                                | 5 |  |  |   |  | 2 | 3 |
| Science | Y5&6 |  | Working Scientifically           | taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate                                                                          | 4 |  |  |   |  | 1 | 3 |
| Science | Y5&6 |  | Working Scientifically           | recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs                                                           | 3 |  |  |   |  | 3 |   |
| Science | Y5&6 |  | Working Scientifically           | using test results to make predictions to set up further comparative and fair tests                                                                                                                                  | 3 |  |  |   |  | 3 |   |
| Science | Y5&6 |  | Working Scientifically           | reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations | 5 |  |  |   |  | 3 | 2 |
| Science | Y5&6 |  | Working Scientifically           | identifying scientific evidence that has been used to support or refute ideas or arguments                                                                                                                           | 3 |  |  |   |  | 2 | 1 |
| Science | Y5   |  | Living things and their habitats | describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird                                                                                                                          | 1 |  |  |   |  |   | 1 |

|         |    |                                     |                                                                                                                                                                                                     |   |  |  |  |  |   |   |
|---------|----|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|--|--|---|---|
| Science | Y5 | Living things and their habitats    | describe the life process of reproduction in some plants and animals                                                                                                                                | 1 |  |  |  |  |   | 1 |
| Science | Y6 | Living things and their habitats    | describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals | 1 |  |  |  |  |   | 1 |
| Science | Y6 | Living things and their habitats    | give reasons for classifying plants and animals based on specific characteristics                                                                                                                   | 1 |  |  |  |  |   | 1 |
| Science | Y5 | Animals                             | describe the changes as humans develop to old age                                                                                                                                                   | 1 |  |  |  |  | 1 |   |
| Science | Y6 | Animals                             | identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood                                                                  | 1 |  |  |  |  | 1 |   |
| Science | Y6 | Animals                             | recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function                                                                                                        | 1 |  |  |  |  | 1 |   |
| Science | Y6 | Animals                             | describe the ways in which nutrients and water are transported within animals, including humans                                                                                                     | 1 |  |  |  |  | 1 |   |
| Science | Y5 | Properties and changes of materials | compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets  | 1 |  |  |  |  |   | 1 |
| Science | Y5 | Properties and changes of materials | know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution                                                                        | 1 |  |  |  |  |   | 1 |
| Science | Y5 | Properties and changes of materials | use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating                                                          | 1 |  |  |  |  |   | 1 |

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|---------|----|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|--|--|--|---|
| Science | Y5 | Properties and changes of materials | give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic                                                                  | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Properties and changes of materials | demonstrate that dissolving, mixing and changes of state are reversible changes                                                                                                                                     | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Properties and changes of materials | explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Earth and Space                     | describe the movement of the Earth, and other planets, relative to the Sun in the solar system                                                                                                                      | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Earth and Space                     | describe the movement of the Moon relative to the Earth                                                                                                                                                             | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Earth and Space                     | describe the Sun, Earth and Moon as approximately spherical bodies                                                                                                                                                  | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Earth and Space                     | use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky                                                                                                   | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Forces                              | explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object                                                                             | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Forces                              | identify the effects of air resistance, water resistance and friction, that act between moving surfaces                                                                                                             | 1 |  |  |  |  |  | 1 |
| Science | Y5 | Forces                              | recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect                                                                                                 | 1 |  |  |  |  |  | 1 |

|         |    |                           |                                                                                                                                                                    |   |  |  |  |  |   |  |
|---------|----|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|--|--|---|--|
| Science | Y6 | Evolution and inheritance | recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago        | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Evolution and inheritance | recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents                                | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Evolution and inheritance | identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution                                  | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Light                     | recognise that light appears to travel in straight lines                                                                                                           | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Light                     | use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye                             | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Light                     | 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                              | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Light                     | use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them                                         | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Electricity               | associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit                                              | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Electricity               | 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 | 1 |  |  |  |  | 1 |  |
| Science | Y6 | Electricity               | use recognised symbols when representing a simple circuit in a diagram                                                                                             | 1 |  |  |  |  | 1 |  |



## Long Term Coverage

|                |                |                  |
|----------------|----------------|------------------|
| <b>Biology</b> | <b>Physics</b> | <b>Chemistry</b> |
|----------------|----------------|------------------|

| <b>Year A</b>   |                                        |                                               |                                                              |                                                                                                         |
|-----------------|----------------------------------------|-----------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                 | <b>Autumn 1</b>                        | <b>Autumn 2</b>                               | <b>Spring 3</b>                                              | <b>Summer 4</b>                                                                                         |
| <b>Year 1/2</b> | 1 – Animals<br>(Common animals, needs) | 2 – Animals<br>(Parts of the body and senses) | 1 Materials and its properties                               | 2-Living Things and their habitats                                                                      |
|                 | 1- Seasonal changes                    |                                               |                                                              |                                                                                                         |
| <b>Year 3/4</b> | 3 - Rocks                              | 4 – Electricity & 3- Light                    | 4 - Animals and Living Things<br>(Habitats and environments) | 3- Plants                                                                                               |
| <b>Year 5/6</b> | 6 – Evolution & Inheritance            | 6 – Light                                     | 5- electricity                                               | 5 - Animals including humans<br>(Lifecycles, reproduction in plants and animals)<br>Healthy Eating - Y6 |

| <b>Year B</b>   |                                                                                     |                                          |                                        |                                                       |
|-----------------|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------|-------------------------------------------------------|
|                 | <b>Autumn 1</b>                                                                     | <b>Autumn 2</b>                          | <b>Spring 3</b>                        | <b>Summer 4</b>                                       |
| <b>Year 1/2</b> | 2 – Living Things and their Habitats & food chains                                  | 2-Animals including Humans/living things | 2 Materials and their properties       | 1 and 2 - Plants                                      |
|                 | 1- Seasonal Changes                                                                 |                                          |                                        |                                                       |
| <b>Year 3/4</b> | 3 & 4 - Animals Inc. Humans<br>(Nutrition, food chains, skeleton, digestion, teeth) | 4 - States of Matter                     | 3 - Forces & Magnets                   | 4 - Sound                                             |
| <b>Year 5/6</b> | 5 - Forces                                                                          | 5 - Earth and Space                      | 5 – Properties and Change of Materials | 6 - Living Things and Their Habitats<br>(Classifying) |

## Assessment

Assessment is ongoing throughout each science topic. Children start new topics by discussing or mind-mapping what they already know. AfL is used regularly in lessons through verbal discussions, questioning, observations and retrieval questions. These are then used to identify misconceptions which are quickly clarified at the start of the next lesson. Knowledge organisers are used at the end of a unit to self assess learning.

## Progression in Skills in Science

### EYFS

|  | A1                                                                                                                                                                | A2                                                                                                                                                                                                                                                                                                                                                                                               | A4                                                                                                                                | A5                                                                                                                                                                                                            | A6                                                                                                                                                                                                                                         |
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|  | <b>Topic: All About Me</b><br>Know the lifecycle of a human.<br><b>Topic: Super Senses</b><br>Know the five senses and explore these using a range of activities. | <b>Topic: Dinosaurs</b><br>Understand the term extinct.<br>Investigate the features of different dinosaurs and compare these to animals today.<br><b>Topic: Things that Go</b><br>Explore the forces of pushing and pulling when moving toy cars.<br><b>Topic: Winter Wonderland</b><br>Investigate the weather in the North Pole.<br>Explore the features of Arctic animals e.g. thick fur etc. | <b>Topic: On Safari</b><br>Know that animals are suited to their environment.<br>Compare animals in Swinford to animals in Kenya. | <b>Topic: Growing</b><br>Know that plants grow like humans.<br>Name one thing that plants need to grow.<br>Describe plants that grow in our school grounds.<br>Name 2 plants that grow in the school grounds. | <b>Topic: Pirates</b><br>Explore floating and sinking.<br>Understand the terms floating and sinking.<br>Sort materials into those that float and those that do not.<br>Make a floating model boat using knowledge of floating and sinking. |

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|  | Seals A1 | Seals A2 | Seals B2 | Turtles B1 | Dolphins A4 |
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| Animals Including Humans | <p><b>Pupils should be taught to:</b></p> <p>identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals;</p> <p>identify and name a variety of common animals that are carnivores, herbivores and omnivores;</p> <p>describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets);</p> <p>find out about and describe the basic needs of animals, including humans, for survival (water, food and air);</p> | <p><b>Pupils should be taught to:</b></p> <p>notice that animals, including humans, have offspring which grow into adults;</p> <p>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>                                                           | <p><b>Pupils should be taught to:</b></p> <p>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>                                                                                                                   | <p><b>Pupils should be taught to:</b></p> <p>Find that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat;</p> <p>identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p> | <p><b>Pupils should be taught to:</b></p> <p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood;</p> <p>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function;</p> <p>describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>describe the changes as humans develop to old age.</p> |
|                          | <p><b>Vocabulary Progression</b></p> <p><u>Names of animal groups:</u> <b>fish, amphibians, reptiles, birds, mammals.</b></p> <p><u>Animal diets:</u> <b>carnivore, herbivore, omnivore.</b></p> <p><u>Other:</u> human, animal, pet.</p>                                                                                                                                                                                                                                                                                 | <p><u>Being born and growing:</u> <b>Young, offspring, live young, grow, develop, change, hatch, lay, fly, crawl, talk.</b></p> <p><u>Young and adult names:</u> e.g. lamb and sheep, kitten and cat, duckling and duck.</p> <p><u>Life cycle stages:</u> e.g. baby, toddler, child, teenager, <b>adult</b>; frogspawn, tadpole, froglet, frog.</p> <p><u>Survival and staying healthy:</u> basic needs, survive, food, air, <b>exercise, diet,</b></p> | <p><u>Survival and staying healthy:</u> basic needs, survive, food, air, <b>exercise, diet, nutrition, healthy, balanced diet, hygiene, germs.</b></p> <p>Food groups: fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar.</p> | <p><u>Digestive system:</u> <b>digest</b>, digestion, tongue, teeth, saliva, salivary glands, <b>oesophagus, stomach, liver, pancreas, gall bladder, small intestine, duodenum, large intestine, rectum, anus, faeces, organ.</b></p> <p><u>Types of teeth and dental care:</u> <b>molar, premolar, incisor, canine</b>, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth.</p> <p><u>Food chains and animal diets:</u> decomposer, food web.</p>                                                                                                                                                            | <p><u>Circulatory system:</u> circulation, <b>heart</b>, pulse, heartbeat, heart rate, lungs, breathing, <b>blood vessels</b>, blood, pump, transported, <b>oxygenated blood, deoxygenated blood</b>, oxygen, arteries, veins, capillaries, chambers, plasma, platelets, white blood cells, red blood cells.</p> <p><u>Lifestyle:</u> <b>drug, alcohol</b>, smoking, disease, calorie, energy input, energy output.</p>                                     |

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|  |  | <p><b>nutrition</b>, healthy, balanced diet, <b>hygiene, germs.</b></p> <p>Food groups: fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar.</p> <p><u>Human and animal body parts:</u> e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet, tail, wings, feathers, fur, beak, fins, gills.</p> <p><u>Human senses:</u> <b>sight, hearing, touch, smell, taste.</b></p> <p><u>Exploring senses:</u> loud, quiet, soft, rough.</p> <p>Previously introduced vocabulary: <b>water.</b></p> |  | <p><u>Food groups and nutrients:</u> fibre, fats (<b>saturated and unsaturated</b>), vitamins, minerals.</p> <p><u>Skeletons and muscles:</u> skeleton, <b>muscles, tendons, joints</b>, protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, shell, <b>vertebrate, invertebrate</b>, endoskeleton, exoskeleton, hydrostatic skeleton.</p> <p><u>Names of human bones:</u> e.g. skull, spine, backbone, vertebral column, ribcage, pelvis, clavicle, scapula, humerus, ulna, pelvis, radius, femur, tibia, fibula.</p> <p>Other: <b>energy.</b> Previously introduced vocabulary: <b>producer, consumer, prey, predator</b>, excretion, habitat. movement.</p> | <p>Other: water transportation, nutrient</p> <p>transportation, waste products.</p> <p><u>Process of reproduction:</u> <b>gestation</b>, sperm, egg, cells, clone.</p> <p><u>Changes and life cycle:</u> embryo, foetus, uterus, <b>prenatal, adolescence, puberty, menstruation, adulthood, menopause, life expectancy</b>, old age, hormones, sweat.</p> <p><u>Changing body parts:</u> e.g. breasts, penis, larynx, ovaries, genitalia, pubic hair.</p> <p>Previously introduced vocabulary: <b>reproduction, reproduce</b>, types of animals and animal groups, <b>fertilisation.</b></p> <p>Previously introduced vocabulary: <b>carbon dioxide.</b></p> |
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|  | <b>Seals B4</b> | <b>Turtles A4</b> | <b>Dolphins</b> |
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| Plants                 | <p><b>Pupils should be taught to:</b><br/>identify and name a variety of common wild and garden plants, including deciduous and evergreen trees;</p> <p>identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>observe and describe how seeds and bulbs grow into mature plants;</p> <p>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p><b>Pupils should be taught to:</b><br/>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers;</p> <p>explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant;</p> <p>investigate the way in which water is transported within plants;</p> <p>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> |  |
| Vocabulary Progression | <p>Names of common plants: <b>wild plant, garden plant, evergreen tree, deciduous tree</b>, common flowering plant, <b>weed</b>, grass.</p> <p><u>Name some features of plants:</u> e.g. <b>flower</b>, vegetable, <b>fruit</b>, berry, <b>leaf/leaves</b>, blossom, <b>petal</b>, <b>stem</b>, trunk, branch, <b>root</b>, <b>seed</b>, <b>bulb</b>, soil.</p> <p><u>Name some common types of plant:</u> e.g. sunflower, daffodil.</p> <p><u>Growth of plants:</u> <b>germination</b>, <b>shoot</b>, <b>seed dispersal</b>, grow, food store, life cycle, die, wilt, seedling, sapling.</p> <p><u>Needs of plants:</u> <b>sunlight</b>, <b>nutrition</b>, light, healthy, space, air.</p> <p><u>Name different types of plant:</u> e.g. bean plant, cactus.</p> <p><u>Names of different habitats:</u> e.g. rainforest, desert.</p> <p><b>Previously introduced vocabulary: water, temperature, warm, hot, cold, habitat.</b></p> | <p>Water transportation: transport, <b>evaporation, evaporate, nutrients</b>, absorb, anchor.</p> <p><u>Life cycle of flowering plants:</u> <b>pollination</b> (insect/wind), pollen, nectar, pollinator, seed formation, <b>seed dispersal</b> (animal/wind/water), reproduce, <b>fertilisation</b>, fertilise, <b>stamen</b>, anther, filament, <b>carpel (pistil)</b>, stigma, style, ovary, ovule, <b>sepal</b>, carbon dioxide.</p> <p><b>Previously introduced vocabulary: life cycle.</b></p>                                                |  |

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| Seals A4 | Seals B1 & B2 | Turtles A3 | Dolphins B4 |
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| <p><b>Living Things and Their Habitats</b></p> | <p><b>Pupils should be taught to:</b><br/>explore and compare the differences between things that are living, dead, and things that have never been alive;<br/><br/>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;<br/><br/>identify and name a variety of plants and animals in their habitats, including microhabitats;<br/><br/>describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>                                                                                                                                                                                                                          | <p><b>Pupils should be taught to:</b><br/>recognise that living things can be grouped in a variety of ways;<br/><br/>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment;<br/><br/>recognise that environments can change and that this can sometimes pose dangers to living things.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p><b>Pupils should be taught to:</b><br/>describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals;<br/><br/>give reasons for classifying plants and animals based on specific characteristics.<br/><br/>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird;<br/><br/>describe the life process of reproduction in some plants and animals</p>                                                                                                                                                                                                                                                         |
| <p><b>Vocabulary Progression</b></p>           | <p><b>Spiders-indoor habitats</b><br/><b>Beach habitat</b></p> <p><b>Woodland habitats</b><br/><b>Microhabitat- log</b><br/><b>Ocean habitat</b><br/><b>Nocturnal creatures</b></p> <p><u>Living or dead:</u> <b>living, dead, never living</b>, not living, alive, never been alive, healthy.</p> <p><u>Habitats including microhabitats:</u> <b>depend</b>, shelter, safety, <b>survive</b>, suited, space, minibeast, air.</p> <p><u>Life processes:</u> movement, sensitivity, growth, reproduction, nutrition, excretion, respiration.</p> <p><u>Food chains:</u> <b>food sources</b>, food, producer, consumer, predator, prey.</p> <p><u>Names of habitats and microhabitats:</u> e.g. under leaves, woodland, rainforest, sea shore, ocean, urban, local habitat.</p> <p>Previously introduced vocabulary: <b>senses, carnivore, herbivore, omnivore, seed, water</b>, names of materials.</p> | <p><u>Living things:</u> <b>organisms, specimen</b>, species.</p> <p><u>Grouping living things:</u> <b>classification</b>, classification keys, classify, <b>characteristics</b>.</p> <p><u>Names of invertebrate animals:</u> snails and slugs, worms, spiders, insects.</p> <p><u>Invertebrate body parts:</u> e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs.</p> <p><u>Environmental changes:</u> <b>environment</b>, environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, <b>endangered species, extinct</b>.</p> <p>Previously introduced vocabulary: carbon dioxide, <b>fish, bird, mammal, amphibian, reptile, skeleton, bone, vertebrate, invertebrate, backbone</b>, names for animal body parts, names of common plants, <b>photosynthesis</b>.</p> | <p><u>Classifying:</u> Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation.</p> <p><u>Microorganisms:</u> <b>bacteria</b>, single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, <b>microscope</b>, decompose.</p> <p><u>Reproduction:</u> <b>asexual reproduction, sexual reproduction, gestation, metamorphosis</b>, gametes, tuber, runners/side branches, plantlet, cuttings, embryo, adolescent, penis, vagina, egg, pregnancy, gestation.</p> <p>Previously introduced vocabulary: <b>life cycle, pollination, offspring, fertilise, fertilisation, sepal, filament, anther, stamen, pollen, petal, stigma, style, ovary, carpel, ovule, stem, bulb, roots, mammal, adult, baby, sperm, cells, live young</b></p> |
|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p><b>Dolphins A1</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| Evolution and Inheritance |  |  |  |  | <p><b>Pupils should be taught to:</b></p> <p>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago;</p> <p>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents;</p> <p>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>                                                                                                                                                                                              |
| Vocabulary Progression    |  |  |  |  | <p><b>Evolution and inheritance:</b> evolve, adaptation, inherit, natural selection, adaptive traits, inherited traits, mutations, theory of evolution, ancestors, biological parent, chromosomes, genes, Charles Darwin.</p> <p><b>Other:</b> selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA.</p> <p><b>Previously introduced vocabulary:</b> classification, offspring, characteristics, habitat, environment, adapt, variations, human, fossil, suited, cells, names of different habitats, names of animals and their body parts, species, sedimentary rock, lava, igneous rock, metamorphic rock, magma, heat, fossilisation.</p> |

|                  | Seals each term A                                                                                                                                                          | Seals each term B3 |  |  |  |  |
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| Seasonal Changes | <p>Pupils should be taught to:</p> <p>observe changes across the 4 seasons;</p> <p>observe and describe weather associated with the seasons and how day length varies.</p> |                    |  |  |  |  |

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| Vocabulary Progression | <b>Seasons:</b> spring, summer, autumn, winter, seasonal change.                                                                           |  |  |  |  |
|                        | <b>Weather:</b> e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast.               |  |  |  |  |
|                        | <u>Measuring weather:</u> temperature, rainfall, wind direction, thermometer, rain gauge. <u>Day length:</u> night, day, <b>daylight</b> . |  |  |  |  |
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|                        |  |  | Turtles B3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Dolphins B1                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Forces                 |  |  | <p>Forces and Magnets</p> <p><b>Pupils should be taught to:</b></p> <p>compare how things move on different surfaces;</p> <p>notice that some forces need contact between 2 objects, but magnetic forces can act at a distance;</p> <p>observe how magnets attract or repel each other and attract some materials and not others;</p> <p>compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials;</p> <p>describe magnets as having 2 poles;</p> <p>predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p> | <p>Forces</p> <p><b>Pupils should be taught to:</b></p> <p>explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object;</p> <p>identify the effects of air resistance, water resistance and friction, that act between moving surfaces;</p> <p>recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>                             |
| Vocabulary Progression |  |  | <p><u>How things move:</u> move, movement, <b>surface</b>, distance, strength.</p> <p><u>Types of forces:</u> push, pull, contact force, non-contact force, <b>friction</b>.</p> <p><b>Magnets:</b> magnetic, magnetic field, magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic poles (north pole, south pole), <b>attract</b>, <b>repel</b>, compass.</p> <p><u>Magnetic and non-magnetic materials:</u> e.g. iron, nickel, cobalt.</p> <p>Previously introduced vocabulary: metal, names of materials.</p>                                                                                                                           | <p><u>Types of forces:</u> <b>air resistance</b>, <b>water resistance</b>, <b>buoyancy</b>, <b>upthrust</b>, <b>Earth's gravitational pull</b>, <b>gravity</b>, opposing forces, driving force.</p> <p><b>Mechanisms:</b> levers, pulleys, gears/cogs.</p> <p><u>Measurements:</u> <b>weight</b>, mass, kilograms (kg), Newtons (N), scales, speed, fast, slow.</p> <p><u>Other:</u> <b>streamlined</b>, Earth.</p> <p>Previously introduced vocabulary: air, heat, moon.</p> |

|                        | Seals |  | Turtles A2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Dolphins A2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Light                  |       |  | <p><b>Pupils should be taught to:</b><br/> recognise that they need light in order to see things and that dark is the absence of light;<br/> notice that light is reflected from surfaces;<br/> recognise that light from the sun can be dangerous and that there are ways to protect their eyes;<br/> recognise that shadows are formed when the light from a light source is blocked by an opaque object;<br/> find patterns in the way that the size of shadows change.</p>                                                                                                       | <p><b>Pupils should be taught to:</b><br/> recognise that light appears to travel in straight lines;<br/> use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye;<br/> 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;<br/> use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> |
| Vocabulary Progression |       |  | <p><u>Light and seeing:</u> <b>dark</b>, absence of light, <b>light source</b>, illuminate, visible, <b>shadow</b>, <b>translucent</b>, energy, block.<br/> <u>Light sources:</u> e.g. candle, torch, fire, lantern, lightning.<br/> <u>Reflective light:</u> <b>reflect</b>, <b>reflection</b>, surface, <b>ray</b>, scatter, reverse, beam, angle, mirror, moon.<br/> <u>Sun safety:</u> dangerous, glare, damage, UV light, UV rating, sunglasses, direct.<br/> <b>Previously introduced vocabulary:</b><br/> <b>opaque</b>, <b>transparent</b>, <b>sunlight</b>, <b>sun</b>.</p> | <p><u>Reflection:</u> periscope.<br/> <u>Seeing light:</u> <b>visible spectrum</b>, <b>prism</b>.<br/> <u>How light travels:</u> light waves, wavelength, straight line, <b>refraction</b>.<br/> <b>Previously introduced vocabulary:</b><br/> <b>names and properties of materials</b>, <b>absorb</b>.</p>                                                                                                                                                                                                                        |

|                        | Seals |  | Turtles B4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Dolphins |  |
|------------------------|-------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--|
| Sound                  |       |  | <p><b>Pupils should be taught to:</b><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;<br/> recognise that sounds get fainter as the distance from the sound source increases.</p> |          |  |
| Vocabulary Progression |       |  | <p>Parts of the <b>ear:</b> <b>eardrum</b>.<br/> <u>Making sound:</u> <b>vibration</b>, vocal cords, <b>particles</b>.<br/> <u>Measuring sound:</u> <b>pitch</b>, <b>volume</b>, <b>amplitude</b>, <b>sound wave</b>, quiet, loud, high, low, travel, <b>distance</b>.<br/> <u>Other:</u> <b>soundproof</b>, <b>absorb sound</b>.</p>                                                                                                                                                                     |          |  |

|                        | Seals |  | Turtles |  | Dolphins B2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Earth and Space        |       |  |         |  | <p><b>Pupils should be taught to:</b></p> <p>describe the movement of the Earth and other planets relative to the Sun in the solar system;</p> <p>describe the movement of the Moon relative to the Earth;</p> <p>describe the Sun, Earth and Moon as approximately spherical bodies;</p> <p>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>                                                                                                           |
| Vocabulary Progression |       |  |         |  | <p><u>Solar system:</u> <b>star, planet.</b></p> <p><u>Names of planets:</u> Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus.</p> <p><u>Shape:</u> <b>spherical bodies, sphere.</b></p> <p><u>Movement:</u> rotate, axis, orbit, satellite.</p> <p><u>Theories:</u> <b>geocentric model, heliocentric model, astronomer.</b></p> <p><u>Day length:</u> sunrise, sunset, midday, time zone.</p> <p><b>Previously introduced vocabulary:</b><br/> <b>Sun, moon, shadow, day, night, heat, light, reflect.</b></p> |

|             | Seals |  | Turtles A2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Dolphins A3                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| Electricity |       |  | <p><b>Pupils should be taught to:</b></p> <p>identify common appliances that run on electricity;</p> <p>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers;</p> <p>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;</p> <p>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit;</p> <p>recognise some common conductors and insulators, and associate metals.</p> | <p><b>Pupils should be taught to:</b></p> <p>associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit;</p> <p>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;</p> <p>use recognised symbols when representing a simple circuit in a diagram.</p> |

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| Vocabulary Progression |  |  | <b>Electricity:</b> mains-powered, battery-powered, <b>mains electricity</b> , plug, <b>appliances</b> , devices.<br><b>Circuits:</b> <b>circuit</b> , simple series circuit, complete circuit, incomplete circuit.<br><b>Circuit parts:</b> bulb, cell, wire, buzzer, switch, motor, <b>battery</b> .<br><b>Materials:</b> <b>electrical conductor</b> , <b>electrical insulator</b> .<br><b>Other:</b> safety.<br><b>Previously introduced vocabulary:</b> names of materials. | <b>Flow and measure of electricity:</b> <b>voltage</b> , <b>amps</b> , <b>resistance</b> , <b>electrons</b> , volts (V), <b>current</b> .<br><b>Circuits:</b> <b>symbol</b> , circuit diagram, component, function, filament.<br><b>Variations:</b> dimmer, brighter, louder, quieter.<br><b>Types of electricity:</b> natural electricity, human-made electricity, solar panels, power station.<br><b>Other:</b> positive, negative. |
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|           | Seals A3                                                                                                                                                                                                                                                                                                                                                                                                                                       | Seals B3                                                                                                                                                                                                                                                                                                                                                                     | Turtles A1                                                                                                                                                                                                                                                                                                                                  | Turtles B2                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Dolphins B3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Materials | Everyday Materials<br><b>Pupils should be taught to:</b><br>distinguish between an object and the material from which it is made;<br>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock;<br>describe the simple physical properties of a variety of everyday materials;<br>compare and group together a variety of everyday materials on the basis of their simple physical properties. | Use of Everyday Materials<br><b>Pupils should be taught to:</b><br>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses;<br>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | Rocks<br><b>Pupils should be taught to:</b><br>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties;<br>describe in simple terms how fossils are formed when things that have lived are trapped within rock;<br>recognise that soils are made from rocks and organic matter. | States of Matter<br><b>Pupils should be taught to:</b><br>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. | Properties and Changes of Materials<br><b>Pupils should be taught to:</b><br>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets;<br>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution;<br>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating;<br>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic;<br>demonstrate that dissolving, mixing and changes of state are reversible changes; |

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|                        |                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.                                                                                                                                                                                                                                                                                                            |
| Vocabulary Progression | <p><u>Names of materials:</u> wood, plastic, glass, metal, water, rock, paper, cardboard, rubber, fabric.</p> <p><u>Properties of materials:</u> <b>hard, soft, shiny, dull, stretchy, rough, smooth, bendy, not bendy, transparent, opaque, waterproof, not waterproof, absorbent, not absorbent, sharp, stiff.</b></p> <p><u>Other:</u> <b>object.</b></p> | <p><u>Changing shape:</u> squash, bend, twist, stretch.</p> <p><u>Properties of materials:</u> e.g. strong, flexible, light, hard-wearing, elastic.</p> <p><u>Other:</u> <b>suitability, recycle, pollution.</b></p> | <p><u>Types of rock:</u> <b>sedimentary rock, igneous rock, metamorphic rock.</b></p> <p><u>Properties of rocks:</u> <b>permeable, semi-permeable, impermeable, durable.</b></p> <p><u>Names of rocks:</u> e.g. marble, chalk, granite, sandstone, slate.</p> <p><u>Formation of rocks and fossils:</u> natural, human-made, <b>magma, lava, molten rock, sediment, erosion, fossilisation, layers, bone, fossil.</b></p> <p><u>Soil:</u> sandy, chalky, clay, peaty, loamy, topsoil, subsoil, bedrock, mineral, organic matter, compost.</p> <p><u>Other:</u> <b>palaeontology.</b></p> <p>Previously introduced vocabulary: <b>soil, water, air.</b></p> | <p><u>States of matter:</u> <b>solids, liquids, gases, particles.</b></p> <p><u>State change:</u> <b>evaporate, condense, melt, freeze, heat, cool, melting point, freezing point, boiling point, water vapour.</b></p> <p><u>Water cycle:</u> <b>precipitation, evaporation, condensation, ground run-off, collection, underground water, bodies of water (sea, river, stream), water droplets, hail.</b></p> <p><u>Other:</u> <b>atmosphere.</b></p> <p>Previously introduced vocabulary: <b>temperature, rain, cloud, snow, wind, sun, hot, cold, absorb, carbon dioxide.</b></p> | <p><u>Properties of materials:</u> <b>thermal conductor/insulator, magnetism, electrical resistance, transparency.</b></p> <p><u>Mixtures and solutions:</u> dissolving, substance, soluble, insoluble.</p> <p><u>Changes of materials:</u> reversible change, physical change, irreversible change, chemical change, burning, new material, product.</p> <p><u>Separating:</u> sieving, filtering, magnetic attraction.</p> <p>Previously introduced vocabulary: <b>electrical conductor/insulator, bulb, translucent.</b></p> |

## Progression in vocabulary for working scientifically

| KS1                                                                                                                                                                                                                                                                                                                                                                             | LKS2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | UKS2                                                                                                                                                                                                                                                                                             |
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| aim<br>answers<br>block diagrams<br>changes<br>compare<br>comparative test<br>data<br>describe<br>difference<br>different<br>do<br>equipment<br>explore<br>findings<br>gather<br>group<br>identify (name)<br>identifying, grouping and<br>classifying<br>investigate<br>measure<br>notice<br>observe<br>observing over time<br>patterns<br>pattern seeking<br>pictogram<br>plan | accurate<br>bar chart<br>chart<br>classify<br>conclusion (What have we found out?)<br>criteria<br>data<br>develop<br>diagram<br>evaluate<br>evidence<br>explanation<br>key<br>making a test fair<br>method<br>observations<br>practical enquiry<br>prediction (What do you think will happen?)<br>primary sources<br>questioning<br>reasoning<br>relationships<br>results (What happened?)<br>secondary sources<br>standard units<br>What do we change, what do we keep the same, what are we measuring? | accuracy<br>causal relationship<br>justify<br>line graph<br>precision<br>readings<br>refute<br>repeat readings<br>scatter graph<br>support<br>variables<br>control variable (What do we keep the same?)<br>independent variable (What do we change?)<br>dependent variable (What do we measure?) |

## Key Takeaways

### EYFS

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| <b>A1</b> | <p>Topic: All about me</p> <p>Topic: Super senses</p>                                | <p>Know the lifecycle of a human.</p> <p>Know that we change as we grow.</p> <p>Discuss the changes we have been through throughout our lives so far.</p> <p>Know the five senses.</p> <p>Explore our senses using a range of activities like food tasting, listening bingo, feely bags etc.</p>                                                                                                                                                                                                                                                                                               |
| <b>A2</b> | <p>Topic: Dinosaurs</p> <p>Topic: Things that go</p> <p>Topic: Winter Wonderland</p> | <p>Know what extinct means.</p> <p>Compare and sort dinosaurs e.g. into carnivores and herbivores</p> <p>Compare dinosaurs with animals today.</p> <p>Be able to discuss similarities and differences.</p> <p>Know how to push objects to make them move.</p> <p>Know how to pull objects to make them move.</p> <p>Compare the North Pole to Swinford.</p> <p>Compare the weather of the North Pole to Swinford.</p> <p>Compare animals you find in the North Pole to animals you find in Swinford.</p> <p>Know how some animals are suited to the North Pole e.g. thick fur, large feet.</p> |
| <b>A4</b> | Topic: On Safari                                                                     | <p>Know that animals are suited to the environment they live in e.g. zebras have stripes to camouflage them on the Africa Savannah.</p> <p>Compare animals you find in Kenya to animals you find in Swinford.</p> <p>Draw an African animal and label it.</p>                                                                                                                                                                                                                                                                                                                                  |
| <b>A5</b> | Topic: Growing                                                                       | <p>Be able to plant a seed and observe it as it grows.</p> <p>Know that plants grow.</p> <p>Name at least one thing a plant needs to grow e.g water, sunlight, soil etc.</p> <p>Draw a picture of a plant that grows in our school grounds.</p> <p>Describe verbally a plant that grows in our school grounds.</p> <p>Name 2 common plants that grow in our school grounds e.g. daisy, grass.</p>                                                                                                                                                                                              |
| <b>A6</b> | Topic: Pirates                                                                       | <p>Know what floating and sinking mean.</p> <p>Identify materials which float.</p> <p>Identify materials which sink.</p> <p>Group materials according to whether they sink or float.</p> <p>Use this knowledge to make a floating boat.</p> <p>Test whether our boats float or sink.</p> <p>Evaluate the boats we made. E.g. My boat floated because...</p>                                                                                                                                                                                                                                    |

### Year 1 and 2

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| <b>A<br/>B</b> | <b>Seasonal Changes</b>             | <p>Know that there are 4 seasons – autumn, winter, spring and summer. Know that the current season is autumn. Know that leaves fall off deciduous trees in autumn. Know that the leaves change colour and the number of hours of daylight gets shorter. There are 4 seasons in the year and at the moment it is winter. In winter the days are getting shorter and the nights longer. The weather is colder and wetter in the winter months. Deciduous trees lose their leaves in winter. There are 4 seasons in the year and at the moment it is spring. In spring the days are getting longer and the nights shorter. The weather is beginning to warm up and wetter in the spring months. The leaves begin to grow in deciduous trees, and bulbs grow. There are 4 seasons in the year and at the moment it is summer. In summer, the days are longer and weather is warmer. Leaves, fruits and flowers grow on trees and plants.</p>                                                                                                                   |
| <b>A1</b>      | <b>Animals</b>                      | <p>Know the names of common animals including pets. Know that animals have special features such as wings, claws and beaks etc.</p> <p>Know that humans and all animals need water, air, food and shelter to survive. Know and name the features of a dog, cat, fish, bird.</p> <p>Know which animals are grouped into fish, birds, reptiles, amphibians and mammals.</p> <p>Know that herbivores eat plants, and a carnivore eats meat and an omnivore eats plants and meat.</p> <p>Know that birds have feathers, lay eggs and most can fly. Know that mammals give birth to live young, they are warm blooded, most live on the land.</p> <p>Know that amphibians live in water and on the land, they lay eggs and are cold blooded.</p> <p>Know that reptiles are cold blooded, lay eggs and have scaly skin.</p>                                                                                                                                                                                                                                      |
| <b>A2</b>      | <b>Humans</b>                       | <p>Know that animals have offspring (babies) which grow into adults. The young of some adults do not look like their parents, and they undergo a change called metamorphosis.</p> <p>Humans have key common parts of the body which have different functions. They have a skeleton which is made up of the bones which support your body.</p> <p>Humans find out about their world from using their senses. Our eyes help us to see things in the natural world. When we touch things with our skin, it sends messages to our brain.</p> <p>Humans find out about their world from using their senses. Our ears help us to hear different sounds. Things can affect how well we hear sounds.</p> <p>Humans find out about their world from using their senses. Our mouths and our tongues help us to taste different things. Our noses help us to smell different things.</p> <p>Know that to grow into healthy humans, they need the right amounts and types of food and exercise. Good hygiene is important for preventing infections and illnesses.</p> |
| <b>A3</b>      | <b>Materials</b>                    | <p>All objects are made from one or more materials. All objects have a purpose. A prediction is a well thought out guess.</p> <p>A kite needs light materials to fly well. We can use our sense of sight to make observations.</p> <p>Some materials are good insulators. Scientists make accurate observations.</p> <p>That the properties of a material determine its suitability for different purposes.</p> <p>Name -wood, plastic, metal, glass, brick, rock, paper and cardboard. That materials can come in different forms such as plastic.</p> <p>Some materials have waterproofing properties.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>A4</b>      | <b>Living things &amp; habitats</b> | <p>Objects are either living, dead or have never been alive. Living things are plants and animals. Dead things include dead animals and plants that are no longer attached.</p> <p>A habitat / microhabitat is where an animal or plant can find the things it needs to survive.</p> <p>Know that local habitats are physically different and have different trees, plants and animals that live there and adapt to that environment.</p> <p>Arrows in a food chain show the transfer of energy. The animal at the top of the chain is the predator.</p> <p>Animals live in the habitat that provides food and shelter for them.</p> <p>Animals and plants in the same habitat depend on each other for survival.</p>                                                                                                                                                                                                                                                                                                                                      |

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| <b>B1</b> | <b>Living things and habitats</b> | <p>That living things are identified as they show movement, respiration, sensing, nutrition, excretion, reproduction and growth (MRS NERG).</p> <p>Worms, owls, badgers, squirrels and birds live in the school woodland.</p> <p>That there are lots of microhabitats (a small place within a larger habitat) that has everything needed for a creature to survive. Leaf litter and under a log are examples of microhabitats.</p> <p>That whales, angelfish and turtles live in an ocean habitat. Carnivores eat meat, herbivores are plant eaters and omnivores eat meat and plants.</p> <p>Sharks are omnivores, Turtles are herbivores and whales are carnivores.</p> <p>That badgers are omnivores and live in a set. Worms are omnivores and live underground, and owls are carnivores and live in trees. Owls are nocturnal.</p> |
| <b>B2</b> | <b>Humans</b>                     | <p>Animals can be sorted into groups according to what they eat. A carnivore eats meat. A herbivore eats plants and a omnivore eats meat and plants. They all eat to get energy.</p> <p>That owls are carnivores and eat small rodents which are mice, shrews, moles and small rats. They are nocturnal creatures.</p> <p>That owls, bats, badgers and foxes are nocturnal animals.</p> <p>Know that to grow into healthy humans, they need the right amounts and types of food and exercise. Good hygiene is important for preventing infections and illnesses.</p>                                                                                                                                                                                                                                                                    |
| <b>B3</b> | <b>Uses of everyday materials</b> | <p>That objects are made of materials. That all things are made of materials. Wood, plastic, glass, paper, metal, wool and fabric are types of materials.</p> <p>Wood, plastic, glass, paper, metal, wool, fabric, diamond, rubber and stone are types of materials. The materials have different properties. Transparent objects can be seen through. Opaque objects can't be seen through. Translucent materials allow light through but a shape can't be clearly seen through it.</p> <p>That absorbent materials soak up water while waterproof materials don't.</p>                                                                                                                                                                                                                                                                |
| <b>B4</b> | <b>Plants</b>                     | <p>Know the basic structure &amp; parts of a flowering plant and that the parts of a flower have specific functions</p> <p>Know that seeds &amp; bulbs grow into mature plants</p> <p>Know that a plant needs water, light, warmth to grow and stay healthy</p> <p>Know how to set up a simple test</p> <p>Know the names of common wild &amp; common flowers/plants</p> <p>Know how a plant changes overtime and follows a lifecycle</p> <p>Know how to make and record simple observations about changes to how plants have grown</p> <p>Know the names of common deciduous and evergreen trees</p> <p>Know the key parts of trees and that each part has a specific function</p>                                                                                                                                                     |

## Year 3 and 4

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| <b>A1</b> | <b>Rocks</b> | <p>I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>I will know the names of some types of rocks and what they are used for in everyday life.</p> <p>I can describe, in simple terms, how fossils are formed when things that have lived are trapped within rock.</p> <p>I know that soils are made from rocks and organic matter.</p> <p>I will explore different kinds of rocks and soils, including those in the local environment.</p> |
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| <b>A2</b> | <b>Light</b>                     | <p>Know that electricity is an energy which is used to power electrical items such as toasters, kettles and computers. Electricity can be converted into heat, sound, light and movement.</p> <p>Know that a circuit is a path that allows electricity to pass through it. For electricity to pass through, the circuit must be a complete loop.</p> <p>Know that a switch can be used to turn a circuit on and off. A switch 'breaks' a complete circuit on purpose to stop the flow of electrical charge when it is off. There are several types of switches including toggle, paddle, pull and dimmer.</p> <p>Know that in a series circuit, the current is the same which means that a bulb will be the same brightness wherever it is placed in the circuit. If one bulb doesn't work in a series circuit, the other components will not work as the circuit will be broken.</p> <p>Know that materials that allow electricity to pass through them are called conductors (e.g copper, iron, steel, silver). Insulators are materials that don't allow electricity to pass through (e.g paper, wood, rubber and plastic).</p> <p>Know how the intervention of electricity has impacted our lives (such as light and appliances).</p> |
|           | <b>Electricity</b>               | <p>Know that anything that provides light is a light source. Some sources are natural (sun, stars, firefly) and some are man-made (torch, fireworks, light bulb).</p> <p>Know that light travels in a straight line and reflects off objects.</p> <p>Know that a shiny surface reflects most light that reaches it. Matt surfaces are not very reflective and scatter light equally in all directions.</p> <p>Know that a shadow is created when light is blocked by an opaque object. The size of a shadow varies depending on the position of the light source.</p> <p>Know that opaque objects block out the light, transparent objects allow all light to pass through them and translucent objects allow some light to pass through, but the light is scattered so you can't see clearly through it.</p> <p>Know that the light from the sun can be very dangerous to our eyes and that we can protect them by wearing a sun cap and sunglasses with a high UV rating.</p>                                                                                                                                                                                                                                                           |
| <b>A3</b> | <b>Animals and Living things</b> | <p>Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.</p> <p>Living things live in a habitat which provides an environment to which they are suited. These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering).</p> <p>These environments also change with the seasons;</p> <p>Different living things can be found in a habitat at different times of the year.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>A4</b> | <b>Plants</b>                    | <p>Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom.</p> <p>The roots absorb water and nutrients from the soil and anchor the plant in place.</p> <p>The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal.</p> <p>The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce.</p> <p>Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination).</p> <p>This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways.</p> <p>Different plants require different conditions for germination and growth.</p>                                                                                                                                                                                                                                                                                                                                                                                               |

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| <b>B1</b> | <b>Humans<br/>Digestion<br/>Teeth</b> | <p>Recognise that animals including humans need nutrients to survive. Understand that animals including humans cannot create their own nutrients and get it from what they eat.</p> <p>Understand that humans, and other animals, have skeletons for support, protection and movement.</p> <p>Understand that humans, including other animals, have muscles for support, protection and movement.</p> <p>Know the process of how food passes through a human's body and identify the key body parts that are needed for this to happen.</p> <p>Identify which teeth humans have and what their functions are. Compare the teeth functions those of other animals.</p> <p>Identify what producers, consumers, predators and prey are. Understand how food chains work.</p> |
| <b>B2</b> | <b>States of Matter</b>               | <p>Understand the terms: solid, liquid and gas.</p> <p>Understand that states of matter changed depending on the movement of the particles in different materials.</p> <p>When liquids are cooled, they become solids.</p> <p>When liquids are heated, they become gases.</p> <p>Evaporation means a liquid turning into a gas when is heated.</p> <p>Condensation means a gas turning into a liquid when it is cooled.</p> <p>The boiling point of water is 100 degrees Celsius.</p> <p>The freezing point of water is 0 degrees Celsius.</p> <p>The water cycle is a continuous cycle.</p>                                                                                                                                                                              |
| <b>B3</b> | <b>Forces and Magnets</b>             | <p>A push and a pull are both types of forces .</p> <p>Different surfaces create different amounts of friction. The friction depends on the roughness of the surface and the amount of force between them.</p> <p>Friction slows down the motion of an object.</p> <p>Some objects are magnetic and others are not. Not all metal are magnetic.</p> <p>Magnets have different strengths.</p> <p>A magnetic field is invisible.</p>                                                                                                                                                                                                                                                                                                                                        |
| <b>B4</b> | <b>Sound</b>                          | <p>Sound is created by vibrations.</p> <p>Sound travels as vibrations that pass from particle to particle.</p> <p>The loudness of the sound changes the size of the vibration changes.</p> <p>Pitch is a measure of how high or low a sound is.</p> <p>If an object vibrates quickly, we hear a high-pitched sound and if an object vibrates slowly, we hear a low-pitched sound.</p> <p>As the distance from the sound source increases, the area covered by the sound waves increases too.</p> <p>The same amount of energy is spread over a greater are, so the intensity and loudness of the sound is less.</p> <p>Generally, soft, pliable materials that have air pockets in, like a sponge or bubble wrap, will be the best at absorbing sound.</p>                |

## Year 5 and 6

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| <b>A1</b> | <b>Evolution and Inheritance</b> | <p>Recognise that living things have changed over time.</p> <p>Know that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> |
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|           |                                                                           | <p>Identify how animals and plants are adapted to suit their environment in different ways and know that adaptation may lead to evolution.</p> <p>Know about Charles Darwin's theory of evolution and apply this to some other known adaptations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>A2</b> | Light                                                                     | <p>Know that anything that provides light is a light source and that the moon is not one as it reflects light.</p> <p>Know that light appears to travel in straight lines.</p> <p>Be able to explain that objects are seen because they give out or reflect light into the eye.</p> <p>Be able to 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.</p> <p>Know why shadows have the same shape as the objects that cast them.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>A3</b> | Electricity                                                               | <p>Know how to identify why a circuit doesn't work and how to make corrections to make the circuit work. Use recognised symbols to when drawing a circuit diagram.</p> <p>Know that increasing the voltage in a circuit will make a light brighter, a buzzer louder and a motor more powerful. Know that the voltage is measured using a voltmeter which is placed outside the circuit.</p> <p>Know that resistance measures how well a material or object conducts electricity. The lower the resistance the more an object will conduct electricity.</p> <p>Know that a practical enquiry involves observing what happens whereas a fair and comparative test involves recording observations, comparing results and finding patterns.</p> <p>Know how to use previous results to make new predications and plan further investigations.</p>                                                                                                                                                           |
| <b>A4</b> | <p>Animals including humans</p> <p>The Heart &amp; Circulatory system</p> | <p>The heart pumps blood in the blood vessels around to the lungs.</p> <p>Oxygen goes into the blood and carbon dioxide is removed.</p> <p>The blood goes back to the heart and is then pumped around the body.</p> <p>Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed.</p> <p>As they are used, they produce carbon dioxide and other waste products.</p> <p>Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system.</p> <p>Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet such as lack of vitamins.</p> |

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| <b>B1</b> | Forces | <p>Forces are pushes and pulls. Gravity is the pull force exerted by the Earth (or anything else which has mass). It is the Earth's gravitational pull which keeps us on the ground.</p> <p>A type of friction caused by air pushing against any moving object.</p> <p>A type of friction caused by water pushing against any moving object. An object is buoyant if it floats. This is because the weight of the object is equal to the upthrust. When an object is shaped to minimise the effects of air or water resistance.</p> <p>A force that acts between two surfaces or objects that are moving, or trying to move, across each other.</p> <p>Mechanisms are simple machines with moving parts that change input forces and movement into a set of useful output forces. Examples of mechanisms are pulleys, gears and levers. Pulleys can be used to make a small force lift a heavier load. Gears can be</p> |
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|           |                 | used to change the direction, force and speed of a motion. Levers can be used to make a small force lift a heavier load.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>B2</b> | Earth and Space | <p>The order of the planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.</p> <p>Planets in the Solar System are spherical.</p> <p>Astronomers have evidence that the Earth is spherical.</p> <p>The Earth and planets in the Solar System orbit the sun.</p> <p>The Earth's rotation causes night and day.</p> <p>The sun moves across the sky as the Earth rotates.</p> <p>Different countries on Earth have night and day at different times.</p> <p>The Moon orbits the Earth not the Sun.</p>                                             |
| <b>B3</b> | Materials       | <p>Materials can be sorted according to their properties.</p> <p>A conductor is a material that heat easily travels through. An insulator is a material that heat does not easily travel through.</p> <p>An electrical conductor allows electricity to flow through it. Electrical current will not pass through an insulator.</p> <p>Dissolving materials occur when certain solids mix with the particles of certain liquids to make a transparent solution.</p> <p>Materials can be separated in different ways using sieving, filtering and evaporating.</p> |
| <b>B4</b> | Living Things   | <p>Sexual reproduction means that the new life will come from two parents.</p> <p>Asexual reproduction means that plants will be a copy of just one parent plant.</p> <p>Mammals use sexual reproduction to produce their offspring.</p> <p>Metamorphosis is a process by which animals undergo an abrupt and obvious change in the structure of their body and their behaviour.</p> <p>Different plants and animals all have different life cycles.</p>                                                                                                         |

## SEND

Planning inclusive learning in science involves children and young people building their knowledge of important concepts and procedures. When learning new content, learners must connect this to what they already know. This means that it is important that learners develop secure understanding of previously taught concepts and procedures.

When planning lessons, we carefully consider learners with SEND and the objective of each individual lesson.

We encourage learners to ask questions about their learning and build in opportunities for small group and whole-class discussions. Oracy-led sessions, with visuals to support the access of all learners, enable learners to build on and extend their scientific thinking. An additional adult in the lesson is used to support the learning where possible.

## Strategies to Scaffold Learning

### How to support learners who struggle to access lessons because of literacy difficulties.

- Provide topical word banks and picture cards that the learner can point or refer to when explaining scientific processes.

- Collate word/picture banks on a mini whiteboard/paper with the learner to support their independent learning activity.
- Scaffold learning to make it accessible for all, e.g., if writing up the method for their experiment, a learner with writing difficulties could verbally explain for you or a teaching assistant to scribe, note-take or film explaining their answers.

### **How to support learners who struggle to access lessons because of numeracy difficulties.**

- Scaffold learning to make it accessible for all, e.g., when creating data tables for an experiment, learners with numeracy difficulties could create a pictogram.
- Employ manipulatives and resources used in maths lessons to support learning in science.
- Bring abstract concepts to life through concrete resources and comparisons.

### **How to support learners who struggle to retain vocabulary.**

- Begin each lesson with a review of the vocabulary learnt in the previous lesson.
- Provide word banks that are accessible throughout the science topic. Encourage learners to tick the words they feel confident with to help target language that still needs support, e.g., when learners can independently use a word in a sentence. This could also encourage and motivate the learner to use language they have yet to use.
- Refer to language regularly during lessons and, where applicable, throughout the school day, as this will embed the vocabulary and build stronger links and associations.

### **How to support learners who need additional time to develop conceptual understanding.**

- Provide pre-teaching opportunities for learners to hear vocabulary prior to the lesson, to support their access and engagement in whole-class teaching.
- Plan small group teaching opportunities, for example whilst learners who have already met an objective are doing enrichment activities independently, dedicate time to conference with and/or provide additional learning opportunities for learners working towards the learning objective.
- Provide learners with worked examples to use as a model whilst completing independent work.

### **How to support learners who struggle with attention.**

- Create a working classroom environment that is calming and simple, e.g., clear routines, organised workspaces.
- Use preferential seating and proximity to engage all learners – have learners who struggle to concentrate at the front of the class, or plan for a teaching assistant to encourage the learner to participate and maintain focus.
- Pre-expose learners to the equipment and nature of the lesson (especially for experiments and practical lessons) to spark engagement and interest in the upcoming lesson.
- Plan movement breaks and classroom jobs (e.g., handing out materials) for individual learners.

### **How to support learners who struggle with change and transition.**

- Science doesn't always follow the same lesson format and structure, so prepare learners in advance by explaining how the lesson will run.
- Use visuals (e.g., now, next, then boards or visual timetables) to segment the lesson into manageable chunks that are achievable for the learner.
- Think about the individual learner – some learners may be highly motivated if they know something in advance of a lesson. Show them an object, or picture about the lesson

## **Resources**

A wealth of resources for teachers on how to plan and teach science. It includes resources for EYFS Play Observe Ask (EYFS) | Primary Science Teaching Trust ([pstt.org.uk](http://pstt.org.uk))

And PLAN primary science resources ([planassessment.com](http://planassessment.com)) Plan Knowledge Matrices show progression of knowledge as progress from EYFS to Y6. Includes misconceptions to be addressed by year group and topic.

Explorify Create your own log in and use the pictorial resources to help promote deeper thinking. Ranges of useful activities include 'odd one out', 'zoom in/out' and 'What's going on?'

Twinkl Resources for teaching lessons as required. Teachers often amend or use other appropriate resources as required