Gosfield Primary School Science Curriculum

Intent

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. Science at Gosfield focusses upon developing student's thinking and scientific practices that enable them to make sense of the world in which they live. We achieve this by ensuring that students are exposed to quality first teaching, investigating scientific phenomena and by applying scientific skills. Students are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, as well as analyse the causes they observe or record. Students at Gosfield are constantly exposed and immersed in key scientific vocabulary, increasing student's knowledge and understanding of not only the specific matter they are currently studying, but of the world they live in. Fundamentally, science in our school is about developing our student's ideas and scientific thinking by allowing them to investigate and study the environment and world around them, regardless of their gender, ethnicity or ability which we achieve with a balanced and broad science programme of study

Implementation

In ensuring high standards of teaching and learning in science, we implement a curriculum that is progressive throughout our school. Science teaching at Gosfield involves adapting and extending the curriculum to match all pupils' needs. Science is taught in two main ways at Gosfield. Science may be blocked across a term or taught each week depending on the topic and teacher preference. At the end of each science unit, an assessment lesson will occur to help guide teacher assessment. This can be done in the form of a test, quiz, activities etc. knowledge organises are being developed to aid all science topics, highlighting key vocabulary and significant events in the period of study. Assessment at Gosfield is used by teacher judgement over a unit of work; children who are working at 80% understanding in a topic are working at ARE, children working above 80% are above ARE and children working under 80% are working towards ARE. At Gosfield, we aim to:

- Prepare our students for life in an increasingly scientific and technological world.
- Build on our student's natural curiosity and develop a scientific approach to solving problems.
- Help our students acquire a growing understanding of the nature, processes and methods of scientific ideas.
- Develop the use of scientific language and vocabulary, recording and techniques.
- Develop in pupils a general sense of enquiry, which encourages them to question and make suggestions.
- Encourages open-mindedness, self-assessment, resilience and developing the key scientific skills including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.

Impact

By the time our students leave Gosfield Primary School, we want them to be forward thinkers in the world of science, to question and understand the world they live in and have a good level of understanding in the scientific field. The impact of the quality of teaching and learning, and the three-year rolling programme in Ks1/2, (one year programme in year 6), gives the children a solid foundation ready for their next educational journey.

Ks1 Cycle A	**Animals Including Humans** **Materials** **Seasonal Change**
Ks1 Cycle B	**Plants** **Living things and their Habitats**
Ks1 Cycle C	**My Body** **Life Cycles**
Ks2 Cycle A	**Animals Including Humans** **Light/Sound** **States of Matter**
Ks2 Cycle B	**Plants** **Forces and Magnets** **Materials**
Ks2 Cycle C	**Rocks** **Electricity** **Living things and their Habitats**
Y6	**Earth and Space** **Animals Including Humans** **Evolution and Inheritance**

Science Progression of knowledge and skills Key Stage 1 CYCLE A

KS1 Working Scientifically.	Knowledge objectives.
✓ Asking simple questions (R). Asking simple questions and recognising that they can be answered in different ways (Y1/2). ✓ Observing closely, using simple equipment and measurement. ✓ Performing simple tests (R/1). Performing simple comparative tests (Y2). ✓ Identify and classifying. ✓ Using their observations and ideas to suggest simple answers to questions (R/1). To observe changes over time (Y2). ✓ Gathering, recording and communicating simple data (R/1). Record and communicate findings in a range of ways with support (Y2). ✓ Use basic scientific language (R). Use scientific language, read and spell age-appropriate scientific vocabulary with support (Y1/2). ✓ To start to notice links between cause and effect with support (R/1). Notice patterns and relationships, identifying difference between results. ✓ To label diagrams/pictures.	**<u>Animals Including Humans</u>** ○ Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. ○ Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals). ○ Identify, group and name common animals that are carnivores, herbivores and omnivores) ○ Describe the importance of exercise, eating healthy and hygiene. ○ Describe the basic needs of animals including humans for survival (water, food, air). **<u>Materials</u>** ○ Distinguish between an object and the material from which it is made. ○ Identify, name and compare a variety of everyday materials, including wood, plastic, glass, metal, water and rock. ○ Describe how the shapes of solid objects made from some materials can be changed by squashing, bending twisting and stretching. ○ To know why some materials are used for specific purposes (transparency, waterproof, absorbency). **<u>Seasonal Change</u>** ✓ Observe changes across the four sessions ✓ Observe and describe weather associated with the seasons ✓ Observe have the length of day varies.

Science Progression of knowledge and skills Key Stage 1 CYCLE B

KS1 Working Scientifically.	Knowledge objectives.
✓ Asking simple questions (R). Asking simple questions and recognising that they can be answered in different ways (Y1/2). ✓ Observing closely, using simple equipment and measurement. ✓ Performing simple tests (R/1). Performing simple comparative tests (Y2). ✓ Identify and classifying. ✓ Using their observations and ideas to suggest simple answers to questions (R/1). To observe changes over time (Y2). ✓ Gathering, recording and communicating simple data (R/1). Record and communicate findings in a range of ways with support (Y2). ✓ Use basic scientific language (R). Use scientific language, read and spell age-appropriate scientific vocabulary with support (Y1/2) ✓ To start to notice links between cause and effect with support (R/1). Notice patterns and relationships, identifying difference between results (Y2). ✓ To label diagrams/pictures.	**<u>Plants</u>** ○ Identify and name a variety of common wild and garden plants including deciduous and evergreen trees ○ Identify and describe the basic structure of a variety of common flowering plants including trees ○ Observe and describe how seeds and bulbs grow into mature plants ○ Describe how plants need water, light and a suitable temperature to grow and stay healthy ○ describing the impact of changing these (fair tests **<u>Living things and their Habitats</u>**. ○ Identify and name a variety of plants and animals in their habitats ○ Identify and name a variety of animals in their microhabitats (mini bests). ○ Describe how living things are suited to their habitats (simple adaptation). ○ To understand that animals and plants depend on each other. ○ describe a simple food chain.

Science Progression of knowledge and skills Key Stage 1 CYCLE C

KS1 Working Scientifically.	Knowledge objectives.
✓ Asking simple questions (R). Asking simple questions and recognising that they can be answered in different ways (Y1/2). ✓ Observing closely, using simple equipment and measurement. ✓ Performing simple tests (R/1). Performing simple comparative tests (Y2). ✓ Using their observations and ideas to suggest simple answers to questions (R/1). To observe changes over time (Y2). ✓ Use basic scientific language (R). Use scientific language, read and spell age-appropriate scientific vocabulary with support (Y1/2). ✓ To start to notice links between cause and effect with support (R/1). Notice patterns and relationships, identifying difference between results (Y2). ✓ To draw and label diagrams/pictures.	**My Body.** ○ To label and identify key body parts. ○ To name, draw and label basic human body parts and say which are associated with the senses. ○ To describe parts of the body used for different activities. ○ To name key internal organs and their functions. ○ To know how to look after my body – oral hygiene, keeping fit etc. ○ To know the importance of skin. **Life Cycles.** ○ To understand that animals, including humans have offspring which grow into adults. ○ To compare animal and plant life cycles. ○ To know the names of physical appearance of off-spring and adult animals. ○ To describe the life cycle of a frog and a butterfly. ○ To draw and describe life cycles of mini-beasts and compare each stage of its life.

Science Progression of knowledge and skills Key Stage 2 CYCLE A

KS2 Working Scientifically.	Knowledge objectives.
✓ Ask relevant questions and use different types of scientific enquires to answer them (Y3/4). To plan different scientific enquires to answer questions and recognising controls and variables where necessary (Y5). ✓ To be able to gather, record and classify data in a variety of ways to help answer questions (3/4/5). ✓ Make predictions using own ideas of the world to answer and question similarities, differences and patterns (Y3/4). Make predictions using scientific knowledge to answer and question similarities, differences and patterns (Y5). ✓ To start to organise their data in a constructed table format (Y3/4). To be able to organise their findings (using scientific language) in a variety of ways fit for purpose (Y5). ✓ Identify, group and classify objects. ✓ To communicate simple results and make predictions using some scientific language (Y3/4). To be able to communicate their results using relevant and scientific language, using data to predict future outcomes (Y5). ✓ Report on findings from enquiries, including oral and written explanations (Y3/4). Identify results and scientific evidence that has been used to support or refute ideas (Y5). ✓ To draw and label diagrams/pictures. ✓ To know when it is appropriate to set up investigations to find answers to questions. ✓ Pupils should read, spell and pronounce age-appropriate scientific vocabulary. ✓ Recognise that scientific ideas change over time.	**Animals Including Humans** ○ Identity that animals/humans need the right types of nutrition from food as humans cannot generate their own. ○ Identify that humans and some animals have skeletons and muscles for support, protection and movement. ○ Describe the simple functions of the human digestive system. ○ Identify the different types of teeth and their functions. ○ Construct and interpret a variety of food chains (producers, predators and prey). **States of Matter** ○ Compare and group materials together, according to weather they are solids, liquids or gases. ○ Identity the part played by evaporation and condensation in the water cycle, associating the rate of evaporation with temperature. ○ Observe that some materials change state when they are heated or cooled. Research which temperature this happens at in degrees Celsius. **Light and Sound** ○ To know how light travels and how shadows are formed. ○ To find patterns in the way that size and position of shadows change ○ To explain how we see things (from light sources to our eyes or from light sources to objects then to our eyes). ○ Identify how sounds are made associating them with vibrations. ○ Recognised that vibrations from sound travels through a medium to the ear. ○ Find patterns between the pitch, volume and strength of a sound.

Science Progression of knowledge and skills Key Stage 2 CYCLE B

KS2 Working Scientifically.	Knowledge objectives.
✓ Ask relevant questions and use different types of scientific enquires to answer them (Y3/4). To plan different scientific enquires to answer questions and recognising controls and variables where necessary (Y5). ✓ To be able to gather, record and classify data in a variety of ways to help answer questions (3/4/5). ✓ Make predictions using own ideas of the world to answer and question similarities, differences and patterns (Y3/4). Make predictions using scientific knowledge to answer and question similarities, differences and patterns (Y5). ✓ To start to organise their data in a constructed table format (Y3/4). To be able to organise their findings (using scientific language) in a variety of ways fit for purpose (Y5). ✓ To communicate simple results and make predictions using some scientific language (Y3/4). To be able to communicate their results using relevant and scientific language, using data to predict future outcomes (Y5). ✓ Report on findings from enquiries, including oral and written explanations (Y3/4). Identify results and scientific evidence that has been used to support or refute ideas (Y5). ✓ To draw and label diagrams/pictures. ✓ To know when it is appropriate to set up investigations to find answers to questions. ✓ Pupils should read, spell and pronounce scientific vocabulary correctly. ✓ Recognise that scientific ideas change over time.	**<u>Plants</u>** ○ Identify and describe the functions of different parts of flowering plants. ○ Investigate the ways in which water transported within plants. ○ Explore and describe the requirements of plant life for growth (air, water, light, nutrients from soil and room to grow) and how they vary from plant to plant ○ Describe the life cycle of a flowering plant (pollination, seed formation and seed dispersal). **<u>Forces and Magnets</u>** ○ Investigate whether two magnets will attract or repel each other. ○ Group everyday materials based on whether they are magnetic or not. ○ Understand that magnetic forces can act from a distance. ○ Compare how objects move on different surfaces due to friction. ○ To explore the force of gravity acting between the earth and a falling object. ○ Investigate resistance (water, air). **<u>Properties and changes of materials</u>** ○ Recognise that some materials will dissolve in a liquid. ○ Describe how to recover a substance from a solution. ○ To decided how mixtures can be separated including through filtering, sieving and evaporating. ○ To investigate reversable and irreversible change by dissolving and mixing. ○ To investigate chemical reactions to form a new material.

Science Progression of knowledge and skills Key Stage 2 CYCLE C

KS2 Working Scientifically.	Knowledge objectives.
✓ Ask relevant questions and use different types of scientific enquires to answer them (Y3/4). To plan different scientific enquires to answer questions and recognising controls and variables where necessary (Y5). ✓ To be able to gather, record and classify data in a variety of ways to help answer questions (3/4/5). ✓ Make predictions using own ideas of the world to answer and question similarities, differences and patterns (Y3/4). Make predictions using scientific knowledge to answer and question similarities, differences and patterns (Y5). ✓ To start to organise their data in a constructed table format (Y3/4). To be able to organise their findings (using scientific language) in a variety of ways fit for purpose (Y5). ✓ To communicate simple results and make predictions using some scientific language (Y3/4). To be able to communicate their results using relevant and scientific language, using data to predict future outcomes (Y5). ✓ Report on findings from enquiries, including oral and written explanations (Y3/4). Identify results and scientific evidence that has been used to support or refute ideas (Y5). ✓ To know when it is appropriate to set up investigations to find answers to questions. ✓ To draw and label diagrams/pictures. ✓ Pupils should read, spell and pronounce scientific vocabulary correctly. ✓ Recognise that scientific ideas change over time.	**Rocks** o To observe and group rocks in different ways, according to their observable features and qualities. o To be able to name 6 common rocks. o To understand that rocks are formed in 3 different ways. o To understand and describe the process of fossil formation in simple terms. **Electricity.** o Identify common appliances that run on mains electricity. o Construct a simple electrical circuit. o Use recognised symbols when representing a simple circuit in a diagram. o Identify what makes a bulb light up in a simple circuit. o Recognise that a switch opens and closes a circuit. o Compare and give reasons for variations in how components function in a circuit. o Recognise some common conductors and insulators. **Living things and their habitats.** o Recognise that living things can be grouped in a variety of ways. o To use classification keys to help group, identify and name a variety of living things in their local and wider community. o Recognise that environments can change, sometimes posing dangers and impacting living things and their habitats. o Describe the difference in the life cycle of a mammal, amphibian, insect and bird.

Science Progression of knowledge and skills YEAR 6

Y6 Working Scientifically.	Knowledge objectives.
✓ taking measurements, using a range of scientific equipment, with increasing accuracy, taking repeat readings when appropriate ✓ recording data and results of increasing complexity using scientific diagrams and labels and graphs. ✓ using test results to make predictions to set up further comparative and fair tests. ✓ reporting and presenting findings from enquiries, including conclusions in a variety of ways. ✓ identifying scientific evidence that has been used to support or refute ideas or arguments. ✓ explore and talk about their ideas; asking their own questions about their understanding of science. ✓ recognise that scientific ideas change and develop over time. ✓ draw conclusions based on their data and observations, use evidence to justify their ideas, and explain their findings. ü Pupils should read, spell and pronounce scientific vocabulary correctly	**Earth and Space** ○ Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. ○ Describe the movement of the Moon relative to the Earth. ○ Describe the Sun, Earth and Moon as approximately spherical bodies. **Animals Including Humans** ○ Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood ○ Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. ○ To investigate our brilliant brain and label key features. ○ Identity and compare the key organs in the human and animal body **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. ○ Recognise that living things reduce offspring of the same kind, but normally offspring vary and are not identical to their parents. ○ Identify how animals and plants are adapted to suit their environment in different ways and that adaption may lead to evolution.