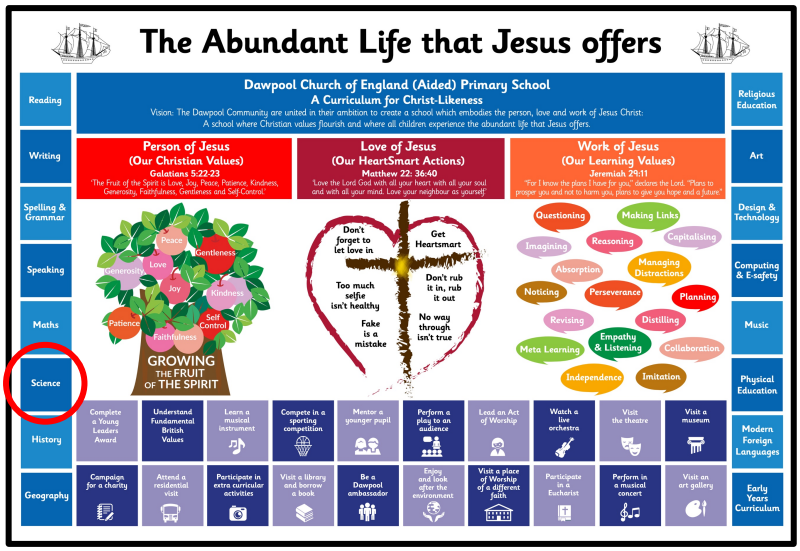
Dawpool C.E. (Aided) Primary School

DAWPOOL

A Dawpool Scientist

Science



Vision Statement

'The Dawpool community are united in their ambition to create a school which embodies the **person, love and work** of **Jesus Christ**: a school which enables **Christian values to flourish** and where all children may experience the **abundant life that Jesus offers**.'

'The Fruit of the Spirit is Love, Joy, Peace, Patience, Kindness, Generosity, Faithfulness, Gentleness and Self-Control' (Galatians 5: 22-23).

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Why is Science Important?

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. Because science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving quality of life. Pupils recognise the cultural significance of science and trace its worldwide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.

Dawpool's Vision for Science

On completion of the Science curriculum at Dawpool, pupils will have developed:

- *Curiosity and the ability to ask scientific questions.*
- *Confidence and competence in a range of practical skills: observing, questioning, planning, collecting, recording, concluding, communicating, reflecting and responding.*
- *The ability to plan and carry out scientific investigations and report findings.*
- *Good scientific knowledge and understanding across a range of topics which is demonstrated in written and verbal explanations.*
- *An interest in science and its application in past, present and future technologies.*

National Curriculum for Science

The National Curriculum for Science at Key Stages 1 and 2 can be downloaded from the 'Curriculum' tab of the Dawpool school website.

Early Years Understanding the World

The frequency and range of children's personal experiences increases their knowledge of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will

foster their understanding of our culturally, socially and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. And enriching and widening their vocabulary will support later reading comprehension.

Early Learning Goal (ELG): Understanding the World

ELG The Natural World

Children at the expected level of development in the Early Years 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 in class;
- Understand the effect of the changing seasons on the natural world around them.

A Year 1 Scientist at Dawpool

Year 1 Working Scientifically

- I can ask simple scientific questions.
- I can use simple equipment to make observations.
- I can carry out simple tests.
- I can identify and classify things.
- I can suggest what I have found out.
- I can use simple data to answer questions

Year 1 Biology

Plants

- I can name a variety of common wild and garden plants.
- I can name the petals, stem, leaf and root of a plant.
- I can name the roots, trunk, branches and leaves of a tree.

Animals, including humans

- I can name a variety of animals including fish, amphibians, reptiles birds and mammals.
- I can classify and name animals by what they eat (carnivore, herbivore and omnivore).
- I can sort animals into categories (including fish, amphibians, reptiles, birds and mammals).
- I can sort living and non-living things.
- I can name the parts of the human body that I can see.
- I can link the correct part of the human body to each sense.

Year 1 Chemistry

Everyday materials

- I can distinguish between an object and the material it is made from.
- I can explain the materials that an object is made from.
- I can name wood, plastic, glass, metal, water and rock.
- I can describe the properties of everyday materials.
- I can group objects based on the materials they are made from.

Year 1 Physics

Seasonal changes

- I can observe and comment on changes in the seasons.
- I can name the seasons and suggest the type of weather in each season.

Year 1 Greater Depth in Science

- I can find out by watching, listening, tasting, smelling and touching.
- I can talk about similarities and differences.

- I can explain what I have found out using scientific vocabulary.
- I can make accurate measurements.
- I can classify animals according to a number of given criteria.
- I can point out differences between living things and non-living things.
- I can say why certain animals have particular characteristics
- I can sort some plants by those that can be eaten and those that cannot.
- I can sort some animals on a simple branching diagram with features such as meat eaters and non meat eaters; can swim and cannot swim.
- I can explain what happens to certain materials when they are heated or cooled, for example, bread, ice, chocolate, jelly, etc.

A Year 2 Scientist at Dawpool

Year 2 Working Scientifically

- I can ask simple scientific questions.
- I can use simple equipment to make observations.
- I can carry out simple tests.
- I can identify and classify things.
- I can suggest what I have found out.
- I can use simple data to answer questions

Year 2 Biology

Living things and their habitats

- I can identify things that are living, dead and never lived.
- I can describe how a specific habitat provides for the basic needs of things living there (plants and animals).
- I can identify and name plants and animals in a range of habitats.
- I can match living things to their habitat.
- I can describe how animals find their food.
- I can name some different sources of food for animals.
- I can explain a simple food chain.

Plants

- I can describe how seeds and bulbs grow into plants.
- I can describe what plants need in order to grow and stay healthy (water, light & suitable temperature).

Animals, including humans

- I can explain the basic stages in a life cycle for animals, including humans.
- I can describe what animals and humans need to survive.
- I can describe why exercise, a balanced diet and good hygiene are important for humans.

Year 2 Chemistry

Uses of everyday materials

- I can identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.
- I can suggest why a material might or might not be used for a specific job.
- I can explore how shapes can be changed by squashing, bending, twisting and stretching.

Year 2 Greater Depth in Science

- I can say whether things happened as I expected and if not why not.
- I can suggest more than one way of grouping animals and plants and explain my reasons.
- I can use information from books and online sources to find things out.
- I can name some characteristics of an animal that helps it to live in a particular habitat.
- I can describe what animals need to survive and link this to their habitats.
- I can describe what plants need to survive and link it to where they are found.
- I can classify living things into groups according to a range of criteria I have been given.
- I can describe the properties of different materials using words like transparent or opaque, flexible, etc.
- I can say which materials are natural and which are man made.

- I can tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted.

A Year 3 Scientist at Dawpool

Year 3 Working Scientifically

- I can ask relevant scientific questions.
- I can use observations and knowledge to answer scientific questions.
- I can set up a simple enquiry to explore a scientific question.
- I can set up a test to compare two things.
- I can set up a fair test and explain why it is fair.
- I can make careful and accurate observations, including the use of standard units.
- I can gather, record, classify and present data in different ways to answer scientific questions.
- I can use diagrams, keys, bar charts and tables; using scientific language.
- I can use findings to report in different ways, including oral and written explanations, presentation.
- I can draw conclusions and suggest improvements.
- I an make a prediction with a reason.
- I can identify differences, similarities and changes related to an enquiry.

Year 3 Biology

Plants

- I can describe the function of different parts of flowing plants and trees.
- I can explore and describe the needs of different plants for survival.
- I can explore and describe how water is transported within plants.
- I can describe the plant life cycle, especially the importance of flowers.

Animals, including humans

- I can explain the importance of a nutritious, balanced diet.
- I can explain how nutrients, water and oxygen are transported within animals and humans.
- I can describe and explain the skeletal system of a human.
- I can describe and explain the muscular system of a human.
- I can describe the purpose of the skeleton in humans and animals.

Year 3 Chemistry

Rocks

- I can compare and group rocks based on their appearance and physical properties, giving a reason.
- I can describe how fossils are formed.
- I can describe how soil is made.
- I can describe and explain the difference between sedimentary and igneous rock.

Year 3 Physics

Light

- I can describe what dark is (the absence of light).
- I can explain that light is needed in order to see.
- I can explain that light is reflected from a surface.
- I can explain and demonstrate how a shadow is formed.
- I can explore shadow size and explain.
- I can explain the danger of direct sunlight and describe how to keep protected.

Forces and magnets

- I can explore and describe how objects move on different surfaces.
- I can explain how some forces require contact and some do not, giving examples.
- I can explore and explain how objects attract and repel in relation to objects and other magnets.
- I can predict whether objects will be magnetic and carry out an enquiry to test this out.
- I can describe how magnets work.
- I can predict whether magnets will attract or repel and give a reason.

Year 3 Greater Depth in Science

- I can record and present what I have found using scientific language, drawings, labelled diagrams, bar charts and tables.

- I can use my findings to draw a simple conclusion.
- I can explain how the muscular and skeletal systems work together to create movement.
- I classify living things and non-living things by a number of characteristics that I have thought of.
- I can explain how some living things depend on one another to survive.
- I can explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and speed dispersal
- I am beginning to relate the properties of rocks with their uses
- I can investigate the strengths of different magnets and find fair ways to compare them.
- I can explain why lights need to be brighter or dimmer according to need.
- I can explain why a shadow changes when the light source is moved closer or further from the object.

A Year 4 Scientist at Dawpool

Year 4 Working Scientifically

- I can ask relevant scientific questions.
- I can use observations and knowledge to answer scientific questions.
- I can set up a simple enquiry to explore a scientific question.
- I can set up a test to compare two things.
- I can set up a fair test and explain why it is fair.
- I can make careful and accurate observations, including the use of standard units.
- I can use equipment, including thermometers and data loggers to make measurements.
- I can gather, record, classify and present data in different ways to answer scientific questions.
- I can use diagrams, keys, bar charts and tables; using scientific language.
- I can use findings to report in different ways, including oral and written explanations, presentation.
- I can draw conclusions and suggest improvements.
- I an make a prediction with a reason.
- I can identify differences, similarities and changes related to an enquiry.

Year 4 Biology

Living things and their habitats

- I can group living things in different ways.
- I can use classification keys to group, identify and name living things.
- I can create classification keys to group, identify and name living things (for others to use).
- I can describe how changes to an environment could endanger living things.

Animals, including humans

- I can identify and name the parts of the human digestive system.
- I can describe the functions of the organs in the human digestive system.
- I can identify and describe the different types of teeth in humans.
- I can describe the functions of different human teeth.
- I can use food chains to identify producers, predators and prey.
- I can construct food chains to identify producers, predators and prey.

Year 4 Chemistry

States of matter

- I can group materials based on their state of matter (solid, liquid, gas).
- I can describe how some materials can change state.
- I can explore how materials change state.
- I can measure the temperature at which materials change state.
- I can describe the water cycle.
- I can explain the part played by evaporation and condensation in the water cycle.

Year 4 Physics

Electricity

- I can identify and name appliances that require electricity to function.
- I can construct a series circuit.
- I can identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers).
- I can draw a circuit diagram.

- I can predict and test whether a lamp will light within a circuit.
- I can describe the function of a switch in a circuit.
- I can describe the difference between a conductor and insulators; giving examples of each.

Sound

- I can describe how sound is made.
- I can explain how sound travels from a source to our ears.
- I can explain the place of vibration in hearing.
- I can explore the correlation between pitch and the object producing a sound.
- I can explore the correlation between the volume of a sound and the strength of the vibrations that produced it.
- I can describe what happens to a sound as it travels away from its source.

Year 4 Greater Depth in Science

- I can plan and carry out a scientific enquiry by controlling variables fairly and accurately.
- I can use test results to make further predictions and set up further comparative tests.
- I can record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models.
- I can report findings from scientific enquiries through written explanations and conclusions.
- I can explain how people, weather and the environment can affect living things.
- I can group and classify a variety of materials according to the impact of temperature upon them.
- I can relate temperature to the change of state of materials.
- I can work out which metals can be used to connect across a gap in a circuit.

A Year 5 Scientist at Dawpool

Year 5 Working Scientifically

- I can plan different types of scientific enquiry.
- I can control variables in an enquiry.
- I can measure accurately and precisely using a range of equipment.
- I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- I can use the outcome of test results to make predictions and set up a further comparative fair test.
- I can report findings from enquiries in a range of ways.
- I can explain a conclusion from an enquiry.
- I can explain causal relationships in an enquiry.
- I can relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.
- I can read, spell and pronounce scientific vocabulary accurately.

Year 5 Biology

Living things and their habitats

- I can describe the life cycle of different living things, e.g. mammal, amphibian, insect bird.
- I can describe the differences between different life cycles.
- I can describe the process of reproduction in plants.
- I can describe the process of reproduction in animals.

Animals, including humans

- I can create a timeline to indicate stages of growth in humans.

Year 5 Chemistry

Properties and changes of materials

- I can compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets).
- I can describe how a material dissolves to form a solution; explaining the process of dissolving.
- I can describe and show how to recover a substance from a solution.
- I can describe how some materials can be separated.
- I can demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating).

- I know and can demonstrate that some changes are reversible and some are not.
- I can explain how some changes result in the formation of a new material and that this is usually irreversible.
- I can discuss reversible and irreversible changes.
- I can give evidenced reasons why materials should be used for specific purposes.

Year 5 Physics

Earth and space

- I can describe and explain the movement of the Earth and other planets relative to the Sun.
- I can describe and explain the movement of the Moon relative to the Earth.
- I can explain and demonstrate how night and day are created.
- I can describe the Sun, Earth and Moon (using the term spherical).

Forces

- I can explain what gravity is and its impact on our lives.
- I can identify and explain the effect of air resistance.
- I can identify and explain the effect of water resistance.
- I can identify and explain the effect of friction.
- I can explain how levers, pulleys and gears allow a smaller force to have a greater effect.

Year 5 Greater Depth in Science

- I can explore different ways to test an idea, choose the best way and give reasons.
- I can vary one factor whilst keeping the others the same in an experiment.
- I can use information to help make a prediction.
- I can explain (in simple terms) a scientific idea and what evidence supports it.
- I can create a timeline to indicate the stages of growth in certain animals, such as frogs and butterflies.
- I can observe my local environment and draw conclusions about life-cycles, for example, the vegetable garden or plants in a shrubbery.

- I can describe methods for separating mixtures, for example, filtration, distillation.
- I can compare the time of day at different places on Earth.
- I can describe and explain how motion is affected by forces, for example, gravitational attractions, magnetic attraction and friction.
- I can work out how water can cause resistance to floating objects.

A Year 6 Scientist at Dawpool

Year 6 Working Scientifically

- I can plan different types of scientific enquiry.
- I can control variables in an enquiry.
- I can measure accurately and precisely using a range of equipment.
- I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- I can use the outcome of test results to make predictions and set up a further comparative fair test.
- I can report findings from enquiries in a range of ways.
- I can explain a conclusion from an enquiry.
- I can explain causal relationships in an enquiry.
- I can relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.
- I can read, spell and pronounce scientific vocabulary accurately.

Year 6 Biology

Living things and their habitats

- I can classify living things into broad groups according to observable characteristics and based on similarities & differences.
- I can describe how living things have been classified.
- I can give reasons for classifying plants and animals in a specific way.

Animals, including humans

- I can identify and name the main parts of the human circulatory system.
- I can describe the function of the heart, blood vessels and blood.
- I can discuss the impact of diet, exercise, drugs and life style on health.

- I can describe the ways in which nutrients and water are transported in animals, including humans.

Evolution and inheritance

- I can describe how the earth and living things have changed over time.
- I understand that some people will explain adaptation over time to evolution.
- I can explain what people mean by evolution.
- I can explain how fossils can be used to find out about the past.
- I can explain about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).
- I can explain how animals and plants are adapted to suit their environment.

Year 6 Physics

Light

- I can explain how light travels.
- I can explain and demonstrate how we see objects.
- I can explain why shadows have the same shape as the object that casts them.
- I can explain how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Electricity

- I can explain how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.
- I can compare and give reasons for why components work and do not work in a circuit.
- I can draw circuit diagrams using the correct symbols.

Year 6 Greater Depth in Science

- I can use information from different sources to answer a question and plan a scientific enquiry.

- I can make a prediction that links with other scientific knowledge.
- I can plan in advance which equipment I will need and use it appropriately.
- I can link my conclusions to other scientific knowledge.
- I can explain how some living things adapt to survive in extreme conditions.
- I can analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet.
- I am beginning to understand about the nature of DNA.
- I can readily group animals into reptiles, fish, amphibians, birds and mammals.
- I can make a diagram of the human body and explain how different parts work and depend on one another.
- I can compare the organ systems of humans to those of other animals.
- I can use the ray model to explain the size of shadows.
- I can explain the danger of short circuits and what a fuse is.