The Holy Spirit Catholic Primary School
Long Term Science Planning

Science Intent

In Science, we inspire pupils with a curiosity and fascination about the world around them. We will develop their scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. We will develop their scientific language, enabling children to talk about their methods and explain their findings and conclusions. The curriculum will motivate them to become effective communicators of scientific ideas, facts and data whilst enhancing their practical skills of scientific enquiry.

Work Scientifically by:

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

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

National Curriculum Year 5 Subject Content Pupils should be taught

Living Things and their Habitats

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals.

Animals, including Humans

- describe the changes as humans develop to old age

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
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- 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

National Curriculum Year 6 Pupils should be taught to:

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 microorganisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics.

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

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 produce 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 adaptation may lead to evolution.

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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

• use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Forces

• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object

• identify the effects of air resistance, water resistance and friction, that act between moving surfaces

• recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect

Light

• recognise that light appears to travel in straight lines

• 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

• 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

• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Electricity

• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

• 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

• use recognised symbols when representing a simple circuit in a diagram.

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Year 5 /6 Cycle A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Electricity (Y6) • Identifying scientific evidence that has been used to support or refute ideas or arguments • Use recognised symbols when representing a simple circuit in a diagram • Associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in the circuit • 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 • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Recording data and results of increasing complexity • Reporting and presenting findings from enquiries • Using test results to make predictions to set	**Living things and their habitats (Y5)** • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals. • I can give examples of the differences in life cycles of mammals, insects, birds and amphibians • I can label and explain the reproduction process of plants • I can describe the reproductive process of animals •I can make observations and compare the life cycles of plants and animals in their local environment with other plants and animals around the world	**Light (Y6)** • To recognise that light appears to travel in straight lines • To 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 • 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 • To identify scientific evidence that has been used to support or refute ideas or arguments • I can explain that light travels in straight lines from light sources to our eyes, and from light sources to objects and then to our eyes • I can understand how mirrors reflect light, and how they can help us see objects. • I can investigate how refraction changes the direction in which light travels	**Living things and their habitats (Y6)** •To give reasons for classifying plants and animals based on specific characteristics • To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals • I can give reasons for classifying animals based on their similarities and differences. • I can describe how living things are classified into groups. • I can identify the characteristics of different types of animals. • I can classify a creature based on its characteristics. • I can describe and investigate helpful and harmful microorganisms.	**Evolution and inheritance (Y6)** • Recognise that living things produce 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 • Identifying scientific evidence that has been used to support or refute ideas or arguments; Identify how adaptation may lead to evolution • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • Identify how adaptation may lead to evolution • I can explain the scientific concept of inheritance. • I can demonstrate understanding of the scientific meaning of adaptation.	**Animals including humans (Y6)** • To identify and name the main parts of the human circulatory system • To describe the functions of the heart, blood vessels and blood • To describe the ways in which nutrients and water are transported within animals, including humans • To recognise the impact of diet and exercise on the way their bodies function • To plan different types of scientific enquiries to answer questions • To record data and results of increasing complexity • To recognise the impact of drugs on the way their bodies function • To identify scientific evidence that has been used to support or refute ideas or arguments • I can identify and name the parts of the human circulatory system. • I can describe the functions of the main

	up further comparative and fair tests • I can explain the importance of the major discoveries in electricity • I can observe and explain the effects of differing volts in a circuit. • I can observe and explain the effects of differing volts in a circuit. • I can plan an investigation. • I can understand variations in how components function. • I can conduct an investigation. • I can record my data and report my findings. • I can investigate my results further.		• I can investigate how a prism changes a ray of light. • I can investigate how light enables us to see colours. • I can explain why shadows have the same shape as the object that casts them.	• I can identify the characteristics of different	• I can identify the key ideas of the theory of evolution. • I can identify evidence for evolution from fossil records. • I can understand how human beings have evolved. • I can explain how adaptations can result in both advantages and disadvantages. • I can explain how human intervention affects evolution.	parts of the circulatory system • I can explain how water and nutrients are transported within the body. • I can describe how diet and exercise impact on human bodies. • I can plan a scientific enquiry. • I can record, report and present results appropriately. • I can explain the impact of drugs and alcohol on the body. •I can describe how scientific evidence highlighted the dangers of smoking. **Living things and their habitats (Y4) recap**

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Year 5 /6 Cycle B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key Knowledge & Skills	**Properties and changes in materials** • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. • I can describe how the weather changes across the seasons • I can describe day length in autumn. • I can identify signs of autumn. • I can describe how day length varies from autumn to winter. • I can identify changes in the trees and in clothes that we wear from autumn to winter. • I can observe and describe the weather in winter. • I can collect and record data about the weather in winter. • I can explain how some animals adapt in winter.	**Forces** • identify how things move • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Observe and describe how forces can be effected dependant on the surface it is moving along • compare different surfaces and what effect it has on a force • notice that some forces need contact between two objects, but magnetic forces can act at a distance • I can explain how things move • I can describe the force that is acting on an object • I can explore the effect gravity has on objects and how gravity was discovered. • I can explain why different materials can change how something moves • I can give reason for some objects needing contact to move • I can explain how magnetic forces can work with non contact	**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 • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. • I can explain how and why the earth spins • I can identify how planets move in relation to the sun • I can recognise that the sun, earth and moon are not quite spherical • I can draw a diagram to explain the contrast between day and night • I can explain why the sun appears to move across the sky	**Animals including human's lifestyle** • recognise the impact of diet, exercise on the human body • explain how drugs and lifestyle choices can have an impact on the way their bodies function • describe the ways in which nutrients and water are used within the human body. • explain how water and nutrients are transported within animals • I can identify the positive and negative effects of diet choices, on a human body • I can describe the effect of drugs and lifestyle choice taken on the human body • I can explain and draw how nutrients are used within the human body • I can observe the process of water transportation through an human and an animal's body	**Animals including humans to old age** • describe the changes as humans develop to old age • Sequence events of the changes of a human from a baby to old age • draw a timeline to indicate stages in the growth and development of humans • I can identify and describe the main changes a human body progresses to an old age • I can order a time span of a human • I can I can place on a timeline stages of growth and development.	**Forces (recap and develop understanding)** • identify how things move • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Observe and describe how forces can be effected dependant on the surface it is moving along • compare different surfaces and what effect it has on a force • notice that some forces need contact between two objects, but magnetic forces can act at a distance • To identify the effects of air resistance, water resistance and friction • To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect • I can identify forces acting on objects • I can explore the effect gravity has on objects and how gravity was discovered. • I can investigate the effects of water resistance • I can investigate the effects of air resistance • I can investigate the effects of friction. • I can explore and design mechanisms.