Holy Family Catholic Primary School

Science Curriculum 2025-2026

What do we want for our pupils?

Intent

Our high-quality, knowledge-based science education at Holy Family Catholic Primary School aims to provide all learners with the foundations for understanding the world through the specific disciplines of biology, physics and chemistry, as well as develop a sense of excitement and curiosity about natural phenomena within every pupil.

Our curriculum aims to give purposeful learning opportunities that build on children's prior learning. Children should be taught through enquiry based learning, where they are given time to investigate, prove and justify theories and reasons.

Science links in with other school intents; working independently and collaboratively and trying new experiences.

Implementation

The teaching of Science at Holy Family Catholic Primary School focuses on expanding children's knowledge, encouraging them to ask questions, use and understand new vocabulary and acquire the scientific skills they need to carry out investigations safely by using the correct equipment.

We provide our learners with a knowledge rich curriculum, focusing on developing the vocabulary and skills to understand and explore the world around them. Our children are 'Scientists' and enjoy exploring and discovering what is around them, hence providing them with a deeper understanding of the world they live in.

All teachers are responsible for planning their own science lessons which cover the programs of study for the National Curriculum 2014 and Understanding the World in the Early Years. Science at Holy Family is delivered using the 'ARK Mastery Curriculum' once per week. A progression grid is in place to ensure that science is taught in a systematic and progressive way, as well as long term planning.

All classes have an interactive learning wall where science vocabulary, children's work and questions to further children's knowledge can be found. Information is also displayed and shared with children in the form of a knowledge organiser. These are to support children in learning current themes and objectives, whilst also reminding them of prior knowledge.

What is our goal?

Impact

Children will achieve age related expectation in science for the end of their cohort year.

This will be moderated and examples of WT, EXP and GDS shared.

Gain a wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills.

Have a richer vocabulary which will enable children to articulate their understanding of taught concepts.

Have high aspirations, which will see them through to further study, work and a successful adult life.

Have a general knowledge of biology, chemistry and physics which will allow them to make sense of the world around them.

Hence enabling them to take on further learning and acquire new skills.

Become 'scientists' with a love and understanding of science.

Assessment in Science

Assessment Questions

Attainment of Science is reported on O'track; staff are also supported by the ARK/Oxford Owl Assessment database– end of topic/block quizzes and assessment. This assessment allows us to assess if children are WTS, EXS or GDS in Science. Monitoring– Book looks, monitoring with other School's will also take place. The assessment tool is kept up to date on a regular basis. The Science team check the data at the end of Autumn, Spring and Summer.

Year Groups	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Everyday Materials	Autumn and Winter	Amazing Animals		The Seasons: Spring and Summer	Common Plants
Year 2	Animals and Survival	Uses of Materials	Living Things and Their Habitats		Plants: Bulbs and growth	Protecting our Environment.
Year 3	Skeletons and Muscles	Rocks and Fossils	Light and Shadows		Plants: Needs for Survival	Forces and Magnets
Year 4	Teeth and Digestion	States of Matter	Classification and Environments		Electricity	Sound
Year 5	Earth and Space	Forces	Properties and Changes of Materials		Life Cycles	Growing Older
Year 6	Light and Perception	Classification	Evolution and Inheritance		Electricity and Circuits	Circulation and Lifestyle

Year 1	Autumn 1—Everyday Materials	Autumn 2—Autumn and Winter	Spring—Amazing Animals	Summer 1—The Seasons: Spring and Summer	Summer 2—Common Plants

Everyday Materials—Chemistry

Pupils should be taught to:

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what materials are and the names of different materials
- what different materials look like
- which materials different objects are made from
- what some the properties of different materials are and if materials can have other properties
- some properties are easy to see but others need to be investigated
- how the properties of materials mean they are used to make certain objects

how to group, sort, and compare objects and materials

Vocabulary

Glass, material, wood ,plastic, paper, fabric, rock, metal, water, hard, soft, umbrella, good idea, bad idea, water, dry, wet. object, dull, shiny, stretchy, stiff, rough, smooth, bendy, not bendy, investigate, waterproof, not waterproof, transparent, opaque, absorbent, not absorbent, Venn diagram, sort, group , compare

Autumn and Winter—Physics

Pupils should be taught to:

- observe changes across the 4 seasons
- observe and describe weather associated with the seasons and how day length varies

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- names of the four seasons
- which months are in each of the four seasons
- what we mean by the word 'weather'
- weather patterns, weather symbols and what the weather is like in both autumn and winter
- how we, as humans, might dress differently according to the weather outside
- how daylight hours change across autumn and winter
- the impact of changing weather and seasons on different plants and animals

Vocabulary

Season, Autumn, Winter, Spring, Summer, Month, Year, Weather, Colder , Warmer, Leaves, Fruit, Fall, Nuts, Animals. Forecasts, Fungi, Migration, Temperature, Colder, Daylight, Longer Forecast, Sleet, Snow , Hibernate, Adapt, Active

Year 1	Autumn 1—Everyday Materials	Autumn 2—Autumn and Winter	Spring—Amazing Animals	Summer 1—The Seasons: Spring and Summer	Summer 2—Common Plants
<u>Amazing Animals—Biology</u>		<u>The Seasons: Spring and Summer</u>		Common Plants—Biology	
Pupils should be taught to: • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Pupils will acquire the following **scientific knowledge** throughout this unit of work: • recognise and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals • recognise and name a variety of common animals that are carnivores, herbivores, and omnivores • know similarities and differences across a variety of common animals (fish, amphibians, reptiles, birds, and mammals, including pets) • recognise and name the basic parts of the human body and say which part of the body is associated with each sense		Pupils should be taught to: • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies Pupils will acquire the following **scientific knowledge** throughout this unit of work: • how the weather changes from winter to spring • what happens to plants and animals in spring and summer • what changes can be seen in the weather from spring to summer • understand how the changing seasons can affect humans		Pupils should be taught to: • 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 Pupils will acquire the following **scientific knowledge** throughout this unit of work: • what a plant is and the basic parts of a plant • recognise and name common garden plants • recognise and name common wild plants • recognise and name different types of trees • know why plants are important	
<u>Vocabulary:</u> Animals, Fish, Birds, Warm blooded, Cold blooded, Saltwater · Freshwater Skeleton, Hearing, Touch, Taste, Smell, Pet, Wild animal, Shelter, Similarities, Differences, Describe, Reproduce Amphibians, Reptile, Mammals, Characteristics, Backbone, Vertebrate, Medicine · Exercise		<u>Vocabulary</u> Blossom, Bud, Crops Daylight, Insect, Weather. Celebration, Degrees Celsius, Festival, Harvest, Seasonal, Temperature, Thermometer.		<u>Vocabulary</u> Fern, flower, fruit, grass, grow, living thing, bulbs, flower, leaf, petal, trunk, food, air, cotton, farmer, deciduous, evergreen, medicine, pod, raw.	

Year 2	Autumn 1- Animals and Survival	Autumn 2- Uses of Materials	Spring- Living Things and Their Habitats	Summer 1– Plants: Bulbs and growth	Summer 2– Protecting our environment.

Animals and Survival– Biology

National Curriculum objectives

Pupils should be taught to:

- notice that animals, including humans, have offspring which grow into adults
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Pupils will acquire the following **scientific** knowledge throughout this unit of work:

- the things that animals need to survive.
- know how animals change as they grow
- know why exercise is important to health
- what a balanced diet is and apply this knowledge to understanding their own diet
- understand what hygiene is and why it is important

Vocabulary

Balanced diet, basic needs, BPM, calcium, carbohydrates, dehydration, energy, exercise, germs, heart, hygiene, life cycle, nutrients, offspring, protein, pulse, shelter, survival, vitamins and minerals.

Uses of materials– Chemistry

National Curriculum objectives

Pupils should be taught to:

- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Pupils will acquire the following **scientific** knowledge throughout this unit of work:

- the materials different objects are made from
- how materials are used in their local area
- gather and use data to compare the suitability of different materials
- perform simple tests to explore how the shapes of objects made from some materials can be changed
- suggest ways to stop plastic pollution
- understand how new materials have been/are discovered

Vocabulary

Absorbent, dull, inventor, pollution, recycling, transparent, biodegradable, flexible, opaque, properties, rigid, waterproof.

Year 2	Autumn 1- Animals and Survival	Autumn 2- Uses of Materials	Spring- Living Things and Their Habitats	Summer 1– Plants: bulbs and growth	Summer 2- Protecting our environment.
<u>Living things and their Habitats– Biology</u>		<u>Plants and growth—Biology</u>		<u>Protecting our environment</u>	
<u>National Curriculum objectives</u> Pupils should be taught to: • explore and compare the differences between things that are living, dead, and things that have never been alive • 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 • identify and name a variety of plants and animals in their habitats, including microhabitats • 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. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • recognise and classify objects and organisms as: alive, dead, or never alive • explore how we know if an object or organism is alive – using the life processes • know some of the different habitats plants are found in • investigate and name the minibeasts found in a range of different microhabitats • which animals are found in different world habitats with a focus on the Arctic and the Sahara • understand simple food chains using the vocabulary carnivore, herbivore, omnivore, predator and prey • understand that habitats can change over time		National Curriculum objectives Pupils should be taught to: • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Pupils will acquire the following scientific knowledge throughout this unit of work: • What seeds are and the different types of seeds • That plants can grow from seeds but can also grow from bulbs • What is meant by ‘seed dispersal’ • What is meant by ‘germination’ and that seeds need certain conditions to germinate • The needs of a plant for survival after the initial germination stage		Pupils will acquire the following scientific knowledge throughout this unit of work: • why we need to protect our planet • what we mean by the word ‘environment’ • why trees are so important for the environment • how habitats can be negatively impacted • how their local environment is being impacted • the different ways in which we can save or conserve water and electricity • how their actions at home could support the protection of the environment The National Curriculum does not require pupils to explore the human impact on the environment until Year 4 but within AC+ Science, pupils will first be introduced to this concept here in Year 2. This ensures that pupils have the necessary foundational knowledge but also that pupils are considering the environment and their role in protecting it.	
<u>Vocabulary</u> Living, dead, never lived, attached, movement, respiration, habitat, needs, urban, woodland, microhabitat, minibeasts, wormery, arctic, polar, herbivore, carnivore, omnivore, season, United Kingdom, life processes.		<u>Vocabulary</u> Dissect, baby plant (embryo), anchor, dormant, germinate, germination, conditions, variables, grow, survive, seedling, life cycle, reproduction, dispersal, expedition.		<u>Vocabulary</u> Danger, environment, rural, urban, wildlife, incineration, conserve, eco-house, efficient, energy, fossil fuels, renewable, sources, carbon dioxide, deciduous, oxygen, pledge.	

Year 3	Autumn 1- Skeletons and Muscles	Autumn 2- Rocks and Fossils	Spring- Light and Shadows	Summer 1- Plants: Needs for Survival	Summer 2- Forces and Magnets
<u>Skeletons and Muscles—Biology</u>		<u>Rocks and Fossils—Chemistry</u>		<u>Light and Shadows– Physics</u>	
National Curriculum Pupils should be taught to: • 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 • identify that humans and some other animals have skeletons and muscles for support, protection and movement Pupils will acquire the following **scientific knowledge** throughout this unit of work: • what a human skeleton looks like • what the function of the human skeleton is in terms of movement, support and protection • how bones and muscles work together • the different types of muscle found within our bodies • how skeletons vary between different animals – endoskeletons, exoskeletons and hydrostatic skeletons • what nutrition is and how it is obtained through eating different food groups • how different animals get the nutrition they need		National Curriculum objectives Pupils should be taught to: • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • what rocks are and how they can be classified as either sedimentary, igneous or metamorphic • the properties of different types of rocks – in particular, durability and permeability • how different rocks can be used and how those uses are based upon their properties • what fossils are and what they can tell us about the past • who Mary Anning was • the process of fossilisation and the different types of fossil • what soil is, what soil is made from and whether all soils are the same		National Curriculum objectives Pupils should be taught to: • recognise that they need light in order to see things and that dark is the absence of light • notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by an opaque object • find patterns in the way that the size of shadows change. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • there are different sources of light and those sources can be natural or man-made • who Thomas Edison was and why he is considered significant • darkness is the absence of light and light allows us to see things • light is reflected from surfaces • some objects are opaque, some are transparent, and some are translucent • shadows are formed when light is blocked by an opaque object • position, shape and size of a shadow can be varied • light is dangerous and we can take steps to protecting our ourselves from the Sun • the different uses of mirrors	

Year 3	Autumn 1- Skeletons and Muscles	Autumn 2- Rocks and Fossils	Spring- Light and Shadows	Summer 1- Plants: Needs for Survival	Summer 2- Forces and Magnets
Skeletons and Muscles—Biology		Rocks and Fossils—Chemistry		Light and Shadows– Physics	
Vocabulary Bone, carnivore, cartilage, endoskeleton , exoskeleton, food chain, herbivore, invertebrate, joint, ligament, movement, muscle, nutrition, support, tendon, vertebrate, omnivore		Vocabulary Earth, rock, molten, mineral, crystal, anthropic rock, igneous rock, sediment, sedimentary rock, metamorphic rock, durable, permeable, impermeable, fossil, fossilisation, palaeontologist		Vocabulary Emit, reflect, rotate, UV, SPF, Pupil, reflective, non-reflective, transparent, translucent, opaque, concave, convex, plane, periscope, sundial, shadow, darkness.	

Year 3	Autumn 1- Skeletons and Muscles	Autumn 2- Rocks and Fossils	Spring- Light and Shadows	Summer 1- Plants: Needs for Survival	Summer 2- Forces and Magnets

Plants: Needs for Survival—Biology

National Curriculum objectives

Pupils should be taught to:

- identify and describe the functions of different parts of flowering plants: roots, stem/ trunk, leaves and flowers
- 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
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what a plant needs to grow
- the impact of fertiliser on a growing plant
- plants have roots to absorb water and nutrients but also to anchor the plant in the ground
- plants have a stem as it is needed to support the plant and transport water from the roots
- plants have leaves because they play an important part in how a plant produces its own food
- that flowering plants produce flowers as an important part of their lifecycle the stages in the lifecycle of a flowering plant

Vocabulary

Consumer, carnivore, fertilisation, function, herbivore, leaf, life cycle, nutrients, omnivore, photosynthesis, pollination, producer, seed dispersal, water transportation, shoot, stem.

Forces and Magnets—Physics

National Curriculum objectives

Pupils should be taught to:

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- 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
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what forces are in terms of pushes and pulls
- that gravity and friction are forces
- how objects move on different surfaces
- what a magnet is and what different magnets look like
- that a magnet has two poles
- how magnets react to each other
- materials can be magnetic or non-magnetic
- how to investigate whether a material is magnetic
- how magnets are used in real-life scenarios to make some tasks much easier

Vocabulary

Force, push, pull, gravity, friction, distance, magnet, lodestone, south pole, north pole, attract, repel, magnetic, magnetic field, magnetised, compass, investigate.

Year 4	Autumn 1- Teeth and Digestion	Autumn 2- States of Matter	Spring- Classification and Environments	Summer 1– Electricity	Summer 2– Sound
Teeth and Digestion—Biology		States of Matter—Chemistry		Classification and Environments—Biology	
National Curriculum objectives Pupils should be taught to: • describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • the names of the different types of human teeth and the function of each type • the importance of looking after teeth and what can happen if we do not look after our teeth • how eating and drinking can damage teeth over time • that not all animals have the same teeth • the teeth that animals have greatly depend on whether that animal is a carnivore, an omnivore or an herbivore • the different organs that make up the digestive system • how the digestive system functions as a whole system		National Curriculum objectives Pupils should be taught to: • compare and group materials together, according to whether they are solids, liquids or gases • 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) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • what the three states of matter are and the properties of each one. • the processes of melting and freezing and how these processes affect the properties and state of a substance • some of the conditions that can affect melting and freezing for example temperature • what the processes of evaporation and condensation are • what the water cycle is • where the processes of evaporation and condensation fit into the water cycle • the importance of the water cycle for plants and animals		National Curriculum objectives Pupils should be taught to: • recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • a habitat is the natural home of an organism • all living organisms display the seven characteristics of life organisms within a habitat or ecosystem are interdependent • the relationships between organisms can be represented by food chains and food webs • the difference between a vertebrate and an invertebrate vertebrates can be classified into five different groups • invertebrates can be classified into seven different groups characteristics of animals supports us with classification • we can use a key to identify and classify animals • plants can be classified as flowering or non-flowering • non-flowering plants can be classified into three groups who Libbie Hyman was and why she is considered significant • that environments can change due to natural causes and through the actions of humans and that these changes can be both positive and negative • the organisms and habitats found within their own local environment and how these are changing	

Year 4	Autumn 1- Teeth and Digestion	Autumn 2- States of Matter	Spring- Classification and Environments	Summer 1– Electricity	Summer 2– Sound
Teeth and Digestion—Biology		States of Matter—Chemistry		Classification and Environments—Biology	
Vocabulary Canine, anus, decay, dentine, digestive system, enamel, gall bladder, incisor, intestine, oesophagus, plaque, premolar, pulp, rectum, stomach, teeth, pancreas.		Vocabulary Matter, solid, liquid, gas, viscosity, particles, precipitation, freeze, melt, temperature, degree Celsius, Evaporation, condensation, water vapour, rate.		Vocabulary Habitat, ecosystem, organism, food chain, food web, producer, consumer, herbivore, omnivore, vertebrate, invertebrate, species, classification, environment, impact, pollution, deforestation, urbanisation, protect.	

Year 4	Autumn 1- Teeth and Digestion	Autumn 2- States of Matter	Spring- Classification and Environments	Summer 1– Electricity	Summer 2– Sound

Electricity—Physics

National Curriculum objectives

Pupils should be taught to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- 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
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- electricity is a form of energy which powers many things we use everyday
- an electric current is a flowing charge of electricity
- there are renewable and non-renewable methods of producing electricity
- some appliances use electricity and others do not
- it is important to be safe and sensible around electricity
- what a circuit is and which components are needed to construct a circuit
- the difference between a complete and incomplete circuit
- how the brightness of a bulb can change within a circuit
- the function of a simple switch within a circuit
- which materials are conductors and insulators of electricity and how to investigate this property

Vocabulary

Electricity, energy, appliance, electric appliance, non-electric appliance, wires, mains, battery, plug, circuit, components, insulator, conductor, material, motor.

Sound —Physics

National Curriculum objectives

Pupils should be taught to:

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- sound is a form of energy which is produced when something vibrates
- different instruments make sound in different ways
- sound travels in waves
- how sound travels through solids, liquids and gases
- what makes up the inside of our ears
- how we hear and how we can protect our hearing
- volume is the intensity of sound and is determined by the strength of vibrations
- pitch is how high or low a sound is and is controlled by the speed of vibrations

Vocabulary

Amplitude, damage, distance, frequency, gas, hear, inner ear, instrument, middle ear, outer ear, pitch, protect, solid, sound, tuning fork, vibration, volume, wave.

Year 5	Autumn 1- Earth and Space	Autumn 2- Forces	Spring- Properties and Changes of Materials	Summer 1- Life Cycles	Summer 2– Getting Older

Earth and Space—Physics

National Curriculum objectives

Pupils should be taught to:

- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what a sun is, what a solar system is, what a galaxy is and how our own solar system fits in to the wider universe
- which planets make up our own solar system
- knowledge of the inner and outer planets of the solar system including order, size, what the planet consists of, atmosphere, temperature, rotation and orbit
- what the relationship is between the Earth and the sun in relation to night and day
- what a time zone is and how the different time zones are arranged across the world
- what the relationship is between the Earth and the sun in relation to seasons
- how daylight hours change across the year in different places across the world
- what a moon is and what the phases of our own moon are
- the heliocentric and geocentric theories of the solar system
- the flat and spherical Earth theories
- the views of various astronomers over time: Aristotle, Ptolemy, Alhazen, Tusi, Copernicus and Galileo

Vocabulary

Atmosphere, axis, equator, galaxy, geocentric, hello centric, hemisphere, lunar, universe, time zone, spherical, solar system, season, rotate, planet, orbit.

Forces—Physics

National Curriculum objectives

Pupils should be taught to:

- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the names of a range of different forces – gravity, friction, water resistance, air resistance, upthrust and magnetism
- which forces are pushes and which are pulls
- the difference between contact and non-contact forces
- the difference between balanced and unbalanced forces
- who Isaac Newton was and the role he played in helping us to understand forces
- what 'matter' is, the difference between mass and weight and how we measure both
- how friction works in the world around us
- how air resistance works in the world around us
- who Galileo Galilei was and the role he played in helping us to understand air resistance
- how upthrust (or buoyancy) and water resistance act in water
- what 'density' is and the relationship between density and whether an object is able to float
- what levers, pulleys and gears are and what they can do to the strength and size of a force

Vocabulary Force, balanced, unbalanced, contact force, non-contact force, gravity, friction, water resistance, air resistance, magnetism, gears, pulleys, levers, density, streamlined, newtons, Grams and kilograms, mass, upthrust.

Year 5	Autumn 1- Earth and Space	Autumn 2- Forces	Spring- Properties and Changes of Materials	Summer 1- Life Cycles	Summer 2– Getting Older
<u>Properties and Changes of Materials—Chemistry</u>		<u>Life Cycles—Biology</u>		<u>Getting Older—Biology</u>	
Pupils should be taught to: • 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 Pupils will acquire the following **scientific knowledge** throughout this unit of work: • materials can be grouped based on their properties including hardness, solubility, transparency and conductivity • what we mean by 'dissolving' and whether certain substances dissolve in water to form a solution • whether the rate at which a substance dissolves can be altered by heat or stirring • mixtures can be sometimes be separated by sieving, filtering and/or evaporation • the difference between a reversible and an irreversible change • examples of reversible and irreversible changes		<u>National Curriculum objectives</u> <u>Pupils should be taught to:</u> • 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. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • the difference between sexual and asexual reproduction • the process of pollination and the role it plays in the lifecycle of a flowering plant • how plants reproduce both sexually and asexually • how different animals produce offspring • how lifecycles differ between animals • how and why gestation periods differ between animals • what a naturalist is and why both Jane Goodall and David Attenborough are considered significant		National Curriculum objectives Pupils should be taught to: • describe the changes as humans develop to old age. Pupils will acquire the following **scientific knowledge** throughout this unit of work: • humans grow and change throughout the human lifecycle • how to place the stages of the human lifecycle on a timeline • the stages of development in babies and children • an introduction to what puberty is • how humans change from adulthood to old age • the changes experienced in old age

Year 5	Autumn 1- Earth and Space	Autumn 2- Forces	Spring- Properties and Changes of Materials	Summer 1- Life Cycles	Summer 2– Getting Older
Properties and Changes of Materials—Chemistry		Life Cycles—Biology		Getting Older—Biology	
Vocabulary Classify, natural, property, man-made, conductivity, magnetism, solution, dissolving, saturated, mixture, separation, filtration, sieving, distillation, combustion, acid, base, alkali, neutralisation.		Vocabulary Anther, asexual, conception, domains, fertilising, gametes, gestation, vertebrate, invertebrate, life cycles, organisms, ovule, pollination, sexual, species, stamen, stigma, viviparous.		Vocabulary Adolescence, behaviour, development, embryo, emotion, fertilisation, foetus, gestation, life cycle, life expectancy, litter, mammal, offspring, periods/menstrual cycle, puberty, toddler, umbilical cord, uterus/ womb, viviparous.	

Year 6	Autumn 1- Light and Perception	Autumn 2- Classification	Spring- Evolution and Inheritance	Summer 1- Electricity and Circuits	Summer 2– Circulation and Lifestyle

Light and Perception—Physics

National Curriculum objectives

Pupils should be taught to:

- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- that we see when light is reflected from an object into our eyes
- light travels (or appears to travel) in straight lines
- the parts of the human eye and how the eye works
- reflection is when light bounces off a surface and changes the direction of the ray of light
- the angle of incidence is always equal to the angle of reflection
- how light behaves in water (refraction)
- clear white light is made of 7 colours
- the colours we see are known as the visible spectrum
- light waves can be absorbed, transmitted or reflected to create colour, white or black
- how shadows are formed and that they are the same shape as the object that cast them
- what light pollution is and its impact on both humans and animals

Vocabulary

Angle of incidence, angle of reflection, cone cells, optic nerve, prism, reflected ray, glare, refraction, incident ray, rod cells, law of reflection, shielding, light pollution, skyglow, light trespass, vacuum, light wave, visible spectrum, normal ray, wave frequency,

Classification—Biology

National Curriculum objectives

Pupils should be taught 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
- give reasons for classifying plants and animals based on specific characteristics.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- who Carl Linnaeus was and how his work influenced the classification of living thing
- how to use the Linnaean System of classification
- the six kingdoms used in classification are: kingdom archaea, Kingdom Bacteria, Kingdom Protista, Kingdom Fungi, Kingdom Plantae and Kingdome Animalia
- how to classify vertebrates and invertebrates
- how to classify plants – beginning with vascular and non-vascular
- what microorganisms are and how they can be classified
- the positive and negative impacts of microorganisms
- how habitats are important for the conservation of species

Vocabulary

Characteristics, classify, taxonomy, taxonomist, dichotomous key, hierarchy, botany, microorganism, microscope, bacteria, virus, protozoa, fungi, algae, angiosperms, gymnosperms, Latin, biodiversity.

Year 6	Autumn 1- Light and Perception	Autumn 2- Classification	Spring- Evolution and Inheritance	Summer 1- Electricity and Circuits	Summer 2– Circulation and Lifestyle

Evolution and Inheritance—Biology

National Curriculum objectives

Pupils should be taught to:

- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- why the information fossils give us is so important
- who Mary Anning was and why her findings are significant
- living things have adapted or changed over time to be able to survive in their environments
- why animals need to adapt to their environments
- natural selection is when living things are better adapted to their environments and have a greater chance of survival
- evolution takes a very long time and animals do not simply chose to evolve
- who Charles Darwin and Alfred Wallace were and why they are considered significant
- why living things produce offspring of the same kind
- why offspring vary and are not identical to their parents

Electricity and Circuits—Physics

National Curriculum objectives

Pupils should be taught to:

- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- electricity is a type of energy produced when electrons move around very quickly and create a current
- electricity can be produced by generators which can be powered by renewable and non-renewable sources
- electrical components in a circuit can be represented by symbols
- the symbols for a bulb, cell, battery, buzzer, motor and switch (on and off)
- what happens to the components in a circuit if a component is added to the circuit or a component is changed
- the difference between a parallel and a series circuit
- we measure electricity in volts (V)

Circulation and Lifestyle—Biology

Pupils should be taught to:

- 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

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the circulatory system consists of the heat, the lungs and the systemic system
- the role the heart play in the circulatory system
- the names of the different parts of the human heart
- human blood consists of plasma, white blood cells and platelets and red blood cells
- the role the lungs play in the circulatory system
- how heart rate differs before and after exercise
- how nutrients are moved around the body by the circulatory system after they are broken down by the digestive system
- how diet, exercise and lifestyle impact the heat and the body
- what drugs are (legal and illegal) and the impact of different drugs on the human body

Year 6	Autumn 1- Light and Perception	Autumn 2- Classification	Spring- Evolution and Inheritance	Summer 1- Electricity and Circuits	Summer 2– Circulation and Lifestyle
Evolution and Inheritance—Biology		Electricity and Circuits—Physics		Circulation and Lifestyle—Biology	
Vocabulary Fossil, species, variation, extinct, environment, adaptations, offspring, traits, inheritance, hereditary, genes, evolution, natural selection, artificial selection, Charles Darwin, Alfred Wallace.		Vocabulary Battery, buzzer, circuit, components, conductor, electrical current, electricity, electrons, generated, insulator, light bulb, motor, parallel circuit, power source, series circuit, static, switch, voltage, wires.		Vocabulary Addiction, arteries, atrium, blood vessels, capillaries, carbon dioxide, circulatory system, depressant, diastole, erythrocyte, leukocytes, nutrients, oxygen, plasma, platelets, stimulant, systemic system, systole, veins, ventricle,	