The Christ Church, Walshaw Science Curriculum

Our Science Intent
Our Science curriculum is based on the National curriculum and will take our pupils on a journey of discovery about the world around them. We aim to promote curiosity and build knowledge and understanding. The specific disciplines of biology, physics and chemistry underpin our curriculum design and pupils will develop their scientific knowledge and conceptual understanding to make sense of the scientific world we live in. Working scientifically is integral to our science curriculum design and is embedded within each unit. This ensures pupils use a range of skills in their scientific enquiries to become inspired and confident scientists.
Our Science Implementation
We use White Rose Science to support our planning, preparation and resourcing of high quality science lessons. Science is taught discreetly each week for a minimum of one hour in KS1 and KS2. Each year group has a science topic each half term totalling 6 units per year group. This units can be moved around by the class teacher to fit in with the seasonal time of year or to match books or topics in other subject areas. Each unit includes knowledge based objectives and also some working scientifically skills to be included. Each unit must include at least one scientific enquiry, but every opportunity is taken for science to be hands-on, practical or outdoors. Each unit has linked key vocabulary and skills, and a linked scientist where appropriate. Science will be promoted through display, Science Weeks, visiting scientists, science shows and opportunities to share learning e.g. through assemblies.
Christ Church Scientists will ...
Talk of a love of science Know how science can be seen in everyday life and talk about why things behave as they do. Write enthusiastically using the subject knowledge they have acquired Plan, carry out, record results and come to conclusions about scientific enquiries that they have carried out. Ask questions to further their scientific understanding Research answers to their scientific questions Observe accurately and measure efficiently to ensure that the results that they achieve can be relied upon Be eager to go to high school and learn more science to further their knowledge and understanding Have aspirations to follow a career which is underpinned by scientific knowledge and understanding.

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Nursery			
Term	Knowledge	Skills	Vocabulary
Autumn Senses	Use all their senses in hands-on exploration of natural materials	Observing and exploring collections of materials with similar and/or different properties using their senses. Questioning what they observe and talk about what they can see using why vocabulary.	Hear, see, taste, touch, feel, autumn, hedgehog, different, same, wood, mud, grass, plant, tree, leaves, night, day, stars, moon
Spring Plants/minibeasts	Plant seeds and care for growing plants Understand the key features of the life cycle of a plant and an animal Begin to understand the need to respect and care for the natural environment and all living things.	Observing and questioning what plants need to survive. Make observations and draw pictures of animals and plants.	Seed, soil, root, water, light, warmth, life cycle, minibeasts, flower.
Summer Materials	Talk about the differences between materials and changes they notice Explore and talk about different forces they can feel.	Talk about and describe pushes and pulls. Explore how things work.	Material, strength, weak, brick, straw, sticks, break, summer, sunny, sea, names of farm animals.

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Reception			
Term	Knowledge	Skills	Vocabulary
Autumn All about me Light/Space	Use all their senses in hands-on exploration of natural materials. To explore the world around them. Describe what they see, feel, and hear whilst outside	Observing and describe using their senses. Questioning what they observe, discover. Recognise some environments are different to their own.	Hear, see, taste, touch, feel, autumn, hedgehog, hibernate, environment, different, similar, same, compare, wood, mud, grass, plant, tree, leaves, night, day, stars, moon
Spring Water freezing Who can I ask for help?	Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Understand and explore the natural world around them.	Observing and questioning what plants need to survive. Make observations and draw pictures of animals and plants.	Seed, soil, root, water, light, warmth, observe, sapling, life cycle, minibeasts, flower.
Summer Do all stories have a happy ending? Would you like to live by the sea?	Talk about the differences between materials and changes they notice. To recognise that some environments are different to the ones in which they live. To understand some important processes and changes in the natural world around them including the seasons.	Make observations and draw pictures of animals.	Material, strength, weak, brick, straw, sticks, break, summer, sunny, sea, tide, names of zoo animals, habitat, environment.

Year 1 Scientist – Mary Seacole and Florence Nightingale

Year 1 – Autumn 1 – The Human Body

Knowledge	Skills	Vocabulary	Scientific enquiry
• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Observing closely, using simple equipment Performing simple tests Identifying and classifying	Senses – ear, eye, nose, mouth, taste, touch, feel, hear, see, mammals, fish, birds, amphibians, reptiles, fin, wing beak, tail, trunk, babies, eggs.	Classifying animals into groups according to similar characteristics by observing photographs closely and using magnifying glasses.

Year 1 – Interwoven throught the year – Changing Seasons

Knowledge	Skills	Vocabulary	Scientific enquiry
• Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies.	Observing closely, using simple equipment Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions. Asking simple questions and recognising that they can be answered in different ways	Winter, summer, spring, autumn, months of the year, snow, mist, wind, clouds, rain, warm, hot, cold, freeze, snow, hail, sunset, sunrise, dawn, dusk.	Weather monitors set up to record weather and seasons and observe changes over time, including a rain collection. This unit should be revisited each term so pupils can see the seasonal changes over time.

Year 1 – Autumn 2 – Materials			
Knowledge	Skills	Vocabulary	Scientific enquiry
• Distinguish between an object and the material from which it is made • Identify and name a variety of everyday materials, including wood, • 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. plastic, glass, metal, water, and rock	Observing closely, using simple equipment Identifying and classifying Performing simple tests Asking simple questions and recognising that they can be answered in different ways Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions.	Plastic, wood, rubber, glass, metal, rock, material, object, hard, bendy, transparent, waterproof, identify, observe, soft, rigid, flexible, opaque.	How can we sort these materials? Identify the material of objects and sort them according to properties using a venn diagram.

Year 1 – Spring Term – Animals			
Knowledge	Skills	Vocabulary	Scientific enquiry

• 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.	Observing closely, using simple equipment Identifying and classifying Gathering and recording data to help in answering questions.	Fish, amphibians, reptiles, birds, mammals, eggs, babies, cold-bloodied, warm-bloodied, water, habitats, carnivores, herbivores, omnivores, meat, plants	How can we sort these animals? Identify animals and what they eat and classify them into categories. Compare two different animals and record similarities and differences.

Year 1 – Summer Term - Plants			
Knowledge	Skills	Vocabulary	Scientific enquiry
• 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.	Observing closely, using simple equipment Identifying and classifying Gathering and recording data to help in answering questions.	Oak tree, school class tree names, daffodils, dandelions, bluebells, roses, tulips, lillies. Roots, leaves, stem, flower, trunk, branches.	Nature walk – Identifying and recording how many different types of plants and trees can be found in the school environment?

By the end of year 1 pupils will…
Be able to name parts of animals, group and classify animals and what they eat. They will know the seasons and be able to describe the weather for each season. They will be able to identify key materials and some of their properties and understand the basic structure of a plant and name some common plants and trees.

Year 2 Scientist – Chris Packham

Year 2 – Autumn 1 – Animals Including Humans

Knowledge	Skills	Vocabulary	Scientific enquiry
• Explore and compare the differences between things that are living, dead, and things that have never been alive • Notice that animals, including humans, have offspring which grow into adults	Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions. Observing closely, using simple equipment	Living, alive, dead, non-living, movement, respiration, sensitivity, growth, reproduction, excretion, nutrition, animal, human, bay, offspring.	Identifying groups of living and non-living things then classifying them into groups.

Year 2 – Autumn 2 – Materials

Knowledge	Skills	Vocabulary	Scientific enquiry
• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, and cardboard for particular uses	Identifying and classifying Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions.	Wood, metal, plastic, glass, brick, rock, paper, cardboard, hard, soft, rigid, smooth, bumpy, shiny, dull, transparent, opaque, waterproof, absorbent, suitability.	Which materials are waterproof? Testing different materials with water droplets to test whether they are waterproof or not.

Year 2 – Spring 1– Plants

• Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. • Identify parts of plants	Observing closely, using simple equipment Gathering and recording data to help in answering questions. Identifying and classifying	Soil, seedling, sapling, shoot, leaf, root, water, light,	Examine different plants. Label and identify different parts across a range of plants.

Year 2 – Spring 2 – Habitats			
Knowledge	Skills	Vocabulary	Scientific enquiry
• 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 micro-habitats	Identifying and classifying Gathering and recording data to help in answering questions. Observing closely, using simple equipment Asking simple questions and recognising that they can be answered in different ways	Habitat, micro-habitat, shelter, food, water, oxygen, warmth, safety, ocean, woodland, coast line, urban, suited, suitability	Nature walk in local woodland/school forest area. Record minibeasts found in the habitat and create own micro-habitat and then record animals found there over a period of time.

Year 2 – Summer 1– Plants bulb and seeds			
Knowledge	Skills	Vocabulary	Scientific enquiry
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.	Working scientifically Observing closely, using simple equipment Identifying and classifying Asking simple questions and recognising that they can be answered in different ways	Bulb, seed, plants, soil, water, light, conditions, nutrients	Children to look at a variety of plants and seeds. Plant seeds and bulbs and observe the changes as the plants develop and mature

Year 2 – Summer 2 - Growing Up/Life Cycles			
Knowledge	Skills	Vocabulary	Scientific enquiry
• Notice that animals, including humans, have offspring which grow into adults.	Using their observations and ideas to suggest answers to questions Observing closely, using simple equipment Asking simple questions and recognising that they can be answered in different ways Performing simple tests	Life cycle, adult, baby, offspring, toddler, teenager, mature, grow, change, metamorphosis	Obtain frogspawn/caterpillars for children to observe a life cycle.

By the end of year 2 pupils will…
Know the seven life processes and that healthy food, exercise and hygiene are important if life. They will understand what lives where be able to describe several habitats. They will know the properties of lots of materials, the suitability of materials and how materials can be changed shapes. They will also know what plants need to stay alive. **Be able to identify and classify in lots of different ways and begin to think about investigating fairly whilst recording their results and concluding.**

Year 3

Year 3 – Autumn 1 and 2 – Skeletons, Movement and Feeding			
Scientist – Leonardo Di Vinci			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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.	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Using straightforward scientific evidence to answer questions or to support their findings	Nutrition Carbohydrates Proteins Vitamins Minerals Dairy Fruit Vegetables Skeleton Muscle Relax Contract Fats Sugars Exercise Heartbeat Respiration Oxygen pulse	Investigating healthy foods and developing a balanced meal. Enquiry about how exercise affects heart rate and concluding about why this is.

Year 3 – Spring 1 – Rocks and Soils

Scientist – Mary Anning			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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.	Making systematic and careful observations and, where appropriate, taking accurate measurements. Setting up simple practical enquiries, comparative and fair tests	Fossils Soils Chalk Granite Limestone Basalt Quartz Slate Marble Obsidian Pumice Sedimentary Metamorphic Igneous Porous Permeavble Durability Density Humus Topsoil	Testing rocks for permeability, density and durability. Making predictions and careful observations.

Year 3 – Spring 2 – Light and Shadows			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Recognise that they need light in order to see things and that dark is the absence of light	Setting up simple practical enquiries, comparative and fair tests	Light Dark Reflection Shadow	Which material is the most reflective? Using different materials and mirrors.

• Notice that light is reflected from surfaces • Recognise that shadows are formed when the light from a light source is blocked by a solid object • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes • Find patterns in the way that the size of shadows change	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Making systematic and careful observations. Using results to draw simple conclusions, make predictions.	Light sources Solid Sunlight UV rays pattern	How does distance from light source affect shadow length?

Year 3 – Summer 1 – Plants			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • 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. • Explore the requirements of plants for life and growth (air, light, water,	Asking relevant questions and using different types of scientific enquiries to answer them Making systematic and careful observations and, where appropriate, taking accurate measurements. Gathering, recording, classifying and presenting data in a variety of ways. Using straightforward scientific evidence to answer questions or to support their findings.	Roots Stem Trunk Leaves Flower Water Transportation Life cycle Pollen Pollination Seed formation Seed dispersal Air Oxygen Carbon dioxide Light Water	What do plants need to grow and survive?

nutrients from soil, and room to grow) and how they vary from plant to plant		Nutrients Soil Respiration	

Year 3 – Summer 2 – Forces and Magnets **Scientist – Jane Colden**			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • 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	Making systematic and careful observations. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Setting up simple practical enquiries, comparative and fair tests Using results to draw simple conclusions, make predictions. Identifying differences, similarities or changes related to simple scientific ideas and processes Asking relevant questions and using different types of scientific enquiries to answer them	Forces Magnets Magnetic force Poles – north and south Attract Repel Magnetic Metal Friction Surface area Rough smooth	How does the amount of friction affect the distance travelled? What materials are magnetic? Does magnetic force go through different materials.

By the end of year 3 pupils will…
Know the importance of nutrition, skeletons and muscles. They will understand light, how it reflects off surfaces and how shadows are created and varied. They will know different and compare rocks, understand how fossils are formed and how soils are made. They will

understand what a force is, describe magnets and how they work and what materials are attracted to magnets. They will know the key parts of plants, what they need to survive, how this varies and understand the life cycle of a plant.

Year 4

Year 4 – Autumn 1 – Grouping Living Things –			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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.	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Using straightforward scientific evidence to answer questions or to support their findings	Classification key Species Location British Isles Habitat Environment Vertebrate Invertebrate Reptile Mammal Bird Fish Amphibian	Classifying animals using a classification key. Classifying living things found in locations in the school grounds.

Year 4 – Autumn 2 – Dangers to Living Things			
Scientist – David Attenborough			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Recognise that environments can change and that this	Asking relevant questions and using different types of scientific enquiries to answer them	Producer Consumer Predator	Gather information and present it on a particular species and dangers it is facing.

can sometimes pose dangers to living things. • Construct and interpret a variety of food chains, identifying producers, predators and prey.	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Setting up simple practical enquiries, comparative and fair tests Using straightforward scientific evidence to answer questions or to support their findings.	Prey Food change Environmental changes Vegetarian Herbivore Carnivore omnivore	

Year 4 – Spring 1 – Sound			
Scientist – Alexander Graham Bell			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Setting up simple practical enquiries, comparative and fair tests Identifying differences, similarities or changes related to simple scientific ideas and processes	Vibrations Pitch Airwaves Pattern Volume Fainter Distance Sound source Tuning fork Vacuum Ear drum Ear canal Malleus (hammer) Incus (anvil) Stapes (stirrup) Auditory nerve Cochlea	How can we alter the pitch of sound? Using different volumes of water to see how this affects pitch of sound. Which material absorbs sound the best? Make their own ear defenders. How does sound travel over distance?

Year 4 – Spring 2 – Electricity			
Scientist – Thomas Edison			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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 some common conductors and insulators, and associate metals with being good conductors. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Using straightforward scientific evidence. Asking relevant questions and using different types of scientific enquiries to answer them. Identifying differences, similarities or changes related to simple scientific ideas and processes	Electrical circuit Cells Wires Bulbs Switches Buzzer Series circuit Conductors Insulators Metals Switch Appliances Battery Turbines Geothermal	How does the number of wires affect the brightness of a bulb? What materials are conductors and which are insulators?

Year 4 – Summer 1 – Changing State			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Compare and group materials together, according to whether they are solids, liquids or gases • Observe that some materials change state when they are	Identifying differences, similarities or changes related to simple scientific ideas and processes Setting up simple practical enquiries, comparative and fair tests	Solid Liquid Gas Particles States of matter Temperature	Does temperature affect the rate of evaporation? Water left at different temperatures in containers and rate of evaporation is tested.

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.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Heated Cooled Degrees Celsius Melting Freezing Evaporation Condensation Water cycle Thermometer	

Year 4 – Summer 2 – Teeth, digestion and food			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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	Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Nutrition Digestion Decay Function Molar Canine Incisor Oesophagus Bile duct rectum Stomach Small intestine	How do different drinks affect our teeth? Effect of sugar on eggshells as a representation of human teeth.

		Large Intestine Digestive system	

By the end of year 4 pupils will…
Understand what needs electricity and how circuits work. They will also investigate what conducts electricity and how switches work. Pupils will know the function and how the digestive system works and will be able to identify teeth and their function. They will group solids, liquids and gases, understand how matter changes state and evaporation and condensation and how these are affected by temperature. Year 4 pupils will understand sound and how it travels, identify ear parts and investigate pitch and volume of sound. Pupils will be able to group living things and use classifications keys, identify dangers to living things and understand and construct food chains.

Year 5

Year 5 – Autumn 1 – Forces			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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,	Identifying scientific evidence that has been used to support or refute ideas or arguments. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate 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	Gravity Gravitational pull Air resistance Water resistance streamlining Friction Surfaces Mechanisms Levers	How does surface area affect air resistance?

that act between moving surfaces • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Using test results to make predictions to set up further comparative and fair tests Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Pulleys Gears Grip Force meters	

Year 5 – Autumn 2 – Earth and Space			
Scientist – Tim Peake			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Describe the Sun, Earth and Moon as approximately spherical bodies • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. • Describe the movement of the Moon relative to the Earth	Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 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	Spherical bodies Solar system Axis Rotation Orbit Gravity Planet names Sun Moon	

Year 5 – Spring 1 – Materials			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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 • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 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. 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 Using test results to make predictions to set up further comparative and fair tests	Materials Properties Hardness Solubility Transparency Conductivity Electrical Thermal Comparative Conductor Insulator Polystyrene Ceramic	What materials insulate heat the best? What materials conduct electricity the best?

Year 5– Spring 2 and Summer 1 – Life Cycles Scientist – Jane Goodall			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	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	Mammal Amphibian Warm-blooded Cold-blooded Bird Eggs	Investigate different wats in which plants can be pollinated/dispersal of seeds.

• Describe the changes as humans develop to old age. • Describe the life process of reproduction in some plants and animals.	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 Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Identifying scientific evidence that has been used to support or refute ideas or arguments	Reproduction Germination Pollination Seed dispersal Metamorphosis Species Survival Offspring Gestation Gestation period	

Year 5 – Summer 2 – Reversible and Irreversible Changes			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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	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 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. Using test results to make predictions to set up further comparative and fair tests	Dissolving Mixing Change of state Reversible change Irreversible change Solute Solvent Bicarbonate Soda Acid Evaporation	What changes are irreversible? Children investigate reversible and irreversible changes using heat.

and the action of acid on bicarbonate of soda.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary		

By the end of year 5 pupils will…
Understand the sun, moon and planets are spherical bodies, that planets rotate on axis and how this creates night and day and how planets orbit the sun and the moon orbits the Earth. They will know how states of matter can be separated through sieving, filtering and evaporation and how substances can be dissolved and then recovered from a solution. Pupils will also know about forces and in particular gravity, air resistance and water resistance and also different things which affect them e.g. surface area. They will also understand life cycles of animals and plants and the process of reproduction. **They will extend their knowledge of materials to include properties such as transparency and solubility, whilst testing materials and giving reasons for why they are selected for particular reasons. Finally, they will extend their knowledge of dissolving, mixing and reversible and irreversible changes of state and how new materials can be formed.**

Year 6

Year 6 – Autumn 1 – Classifying Living Things			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Identifying scientific evidence that has been used to support or refute ideas or arguments. 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 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	Classification Characteristics Similarities Differences Micro-organisms Mould Moisture Observable Species Decomposition	Is yeast a living micro-organism?

• Give reasons for classifying plants and animals based on specific characteristics.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Using test results to make predictions to set up further comparative and fair tests		

Year 6 – Autumn 2 – Electricity and changing circuits			
Scientist – Nikola Tesla			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Use recognised symbols when representing a simple circuit in a diagram. • 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	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 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	Symbols Circuit Diagram Brightness Bulb Lamp Buzzer Voltage Cells Components Battery Wire Conductor Insulator	How is the brightness of a lamp/volume of a buzzer affected by number/voltage of cells used in a circuit?

loudness of buzzers and the on/off position of switches	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate		

Year 6 – Spring 1 – Light and Sight			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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 • 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 • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 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	Light source Reflection Shadow Reflective Periscope Observation	What is refraction? Does light travel in straight lines? How can we see round corners?

Year 6 – Spring 2 - Our bodies			
Scientist – Christiaan Barnard			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	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	Circulatory System Heart Blood vessel Vein Artery Capillary Oxygen	How does exercise affect your heart rate? Why does heart rate have to increase during exercise?

• Describe the ways in which nutrients and water are transported within animals, including humans. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	accuracy and precision, taking repeat readings when appropriate 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	Oxygenated blood Deoxygenated blood Aorta Pulmonary Nutrients Exercise Blood flow Drugs Medication Antibiotics	

Year 6 – Summer 2 – Evolution and Inheritance			
Scientist – Charles Darwin			
Knowledge	**Skills**	**Vocabulary**	**Scientific enquiry**
• 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.	Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 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 presentation	Fossils Evolution Offspring DNA Chromosomes Adaptation Inheritance Natural selection Selective breeding	How have animals evolved over time or adapted to suit their environment? (Finches) Use secondary reliable sources and produce presentations.

The Christ Church, Walshaw Science Curriculum

By the end of year 6 pupils will…
Be able to work scientifically in a number of different ways and plan and carry out a fair test; collecting data accurately and drawing scientific conclusions. They will be able to use a range of scientific equipment correctly in order to provide accurate data which they can present in a variety of different ways. **They will understand electricity and how the brightness or volume can be affected by cells or voltage and can represent this as a circuit diagram. The will also be able to talk about variations in circuits and know how switches work.** **Pupils will understand that light travels in straight lines from a light source to the eye and that objects are seen because they give out or reflect light and understand that because of all this shadows cast the same shape as the object blocking the light.** **They will know the main parts of the circulatory system and their function and the impact of diet, lifestyle, drugs and exercise on health and a healthy heart.** **They will understand that living things have adapted and evolved over time and fossils provide evidence of this from millions of years ago. Also, they will know that living things produce offspring and that these vary and that animals/plants have adapted to suit their environment which can lead to evolution. Finally, they will be able to describe how living things are classified according to observable similarities and differences and will be able to justify their reasons for classifying based on specific characteristics.**