





National Curriculum Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Dimensions – Science knowledge building – processes and changes

| | | Communication | Competency/ NC Essential | Culture | Competency/ NC Essentials | Conflict | Competency/ NC Essentials | Competency/ NC Essential | Conservation |
|--------|---|---|--------------------------|---|---------------------------|---|---------------------------|--------------------------|--|
| | |  | |  | |  | | |  |
| | Composite | Key Knowledge | | | | | | | |
| Year 1 | Identify simple processes and explain in basic terms how they happen | <p>To know that birds lay eggs.</p> <p>To know the developmental changes in bird.</p> | | <p>To know that some materials can undergo simple changes, such as being torn or broken.</p> <p>To know that some materials can be changed without breaking e.g. squashing, bending twisting</p> <p>To know there are four seasons and identify their change linked to the weather.</p> <p>To have a very basic understanding of the Earth's tilt in explaining seasonal changes.</p> <p>To know that the colour of some Arctic animals' fur changes in different seasons e.g. fox.</p> <p>To know why the colour of some Arctic animals' fur changes in different seasons.</p> | | <p>To know that plants as well as animals, grow and they need food and water in order to do so.</p> <p>To know that plants need suitable temperatures and god light sources to be healthy and growth.</p> | | | <p>To know that light levels change throughout the day and light is needed in order to see.</p> <p>To know that shadows form when light is blocked by a solid object.</p> |
| Year 2 | | | | <p>Know that circuits need a power source e.g. battery</p> <p>Know that switches stop the electricity from flowing</p> | | <p>To understand the force of push and pull to increase speed.</p> <p>To know that different surfaces affect the way things move.</p> <p>To know that sounds can increase and decrease in volume.</p> <p>To understand how and why sounds</p> | | | <p>To know that the first animal growth stage is a baby and that it eventually becomes an adult.</p> <p>To understand that humans and other animals go through different developmental stages in growth.</p> |





Dimensions – Science knowledge building – **processes and changes**

| | | | | | | | | | |
|--------|---|--|--|--|---|---|--|--|--|
| | | | | | | increase and decrease in volume. | | | |
| Year 3 | Understand more complex scientific processes and know some factors that can affect change | | | <p>Know that animals are part of food chains and this is how they gain the right type and amount of food</p> <p>Know that food chains and webs start with a producer followed by prey and predator</p> | | <p>Know that the process of displacement has an effect on water level</p> <p>Understand that the mass of an object has an effect on the displacement of water</p> | <p>Rocks: Know that rocks have developed from other parts of organic matter, such as sand</p> <p>Know, in simple terms, how fossils are formed</p> <p>States of Matter: Know that evaporation and condensation play a key role in the water cycle</p> <p>Know that changes in temperature can affect how quickly condensation and evaporation happen</p> | | <p>Know the life cycle of plants, including the process of pollination and seed dispersal</p> <p>Know how animals and environmental factors affect the pollination / seed dispersal process</p> |
| Year 4 | | <p>Know that circuits need to be complete in order for the components to work</p> <p>Understand how using a switch affects an electrical circuit</p> | | <p>Know that shadows can change size and shape</p> <p>Understand how and why shadows change size and shape.</p> | | | <p>Know that magnets can attract or repel other magnets, depending on their poles</p> <p>Know that forces are affected by distance</p> | | <p>Understand the link between the production of sounds and vibration and how sounds can be changed e.g. volume</p> <p>Know that sounds travel in order to reach our ears and that materials they travel through affect what we hear</p> |
| Year 5 | Understand that numerous factors can | <p>Know that the Earth orbits the sun and the Earth rotates, creating the change between day and night</p> <p>Know that the relationship between the Moon and the Earth causes the tides</p> | | <p>Know the basic changes that cotton undergoes as part of the manufacturing process</p> <p>Know that some man-made materials are made to be useable for items</p> | <p>Know how the human body changes as we age</p> <p>Understand that drugs / medicine can speed up and slow down the aging process, depending on what is taken</p> | | | | <p>Know that, while some materials can be changed and made into new materials, others cannot</p> <p>Know that some changes are not always reversible and explain why</p> |

Dimensions – Science knowledge building – **processes and changes**

| | | | | | | | | | |
|-------------------|--|--|--|---|--|---|--|--|--|
| <p>Year 6</p> | <p>affect or prevent change</p> | <p>Know that unsupported objects fall towards Earth because of gravity</p> <p>Know that air resistance affects the speed at which items fall towards Earth</p> | | <p>Know that offspring can vary in appearance to its parents</p> <p>Know that animal reproduction can be more or less successful depending on external factors such as poor nutrition, climate change</p> | | <p>Know how the position of the sun in the sky affects the size of a shadow</p> <p>Know that objects are seen through reflected or given out light and that a shiny surface reduces the absorption of light</p> | | | <p>Know that the brightness of a bulb or volume of a buzzer can be changed by altering components</p> <p>Understand how the brightness of a bulb or volume of a buzzer is affected when components are changed</p> |
|-------------------|--|--|--|---|--|---|--|--|--|





Dimensions – Science knowledge building – **Methods**

| | | Project 1  | Project 2 Competency/ NC Essential | Project 3  | Project 4 Competency/ NC Essentials | Project 5  | Project 6 Competency/ NC Essentials | Project 7 Competency/ NC Essential | Project 8  |
|--------|---|--|--|--|---|--|---|--|--|
| | Composite | Key Knowledge | | | | | | | |
| | | <p>To understand and describe what birds need to stay alive.</p> <p>To understand and expand on the needs of birds and compare to other animals, including humans.</p> | | <p>To know that it is possible to suggest what might happen in a simple materials experiment.</p> <p>To know how to pose questions and attempt to answer using simple evidence in a materials experiment.</p> <p>To know how to pose questions and attempt to answer using simple evidence in a weather experiment.</p> <p>To know how to make suggestions on what might happen in a simple weather experiment.</p> <p>To know how to make suggestions as to why changes occur in the Arctic.</p> <p>To know that drawing accurate diagrams can support understanding.</p> | | <p>To know the simple methodology of planting a seed or bean.</p> <p>To know the process of growth and, through investigation, explain where a seed or bulb would grow best.</p> | | | <p>To know the importance of taking and recording measurements in science investigations.</p> <p>To know how to demonstrate that the sun creates heat.</p> |
| Year 2 | To know the key parts of a simple scientific method | | | <p>Know how to make a basic circuit</p> <p>Know how to give a simple explanation of what is happening when a circuit is complete</p> | | <p>To know how to make a simple prediction for a moving object experiment.</p> <p>To know how to record a simple conclusion for a moving object experiment.</p> <p>To know how to make predictions about sounds we may hear in familiar places.</p> <p>To know different ways of investigating volume and sound.</p> | | | <p>To know ways in which we behave in order to stay alive, linked to basic needs.</p> <p>To know how the basic needs of humans compare with those of another animal and explain a method of keeping that animal alive.</p> |

Dimensions – Science knowledge building – **Methods**

| | | | | | | | | |
|--------|--|--|--|---|--|--|---|--|
| Year 3 | Understand that methods are a key part of safe experimentation and have a secure knowledge of features | | | Understand how food is processed through the digestive system by observation Know how to carry out a fair test showing the effects of sugar on teeth | | Know that prediction is an important element and predict whether a range of materials will float or sink Understand why some materials float and why some sinks, using evidence to draw conclusions | <p>Rocks: Know how to fairly test rocks for their different qualities, such as permeability</p> <p>Know how to pose an hypothesis about the properties of different rocks, using observation and touch beforehand</p> <p>States of Matter: Know how to safely experiment with evaporation and condensation</p> <p>Know how to produce detailed results following an investigation</p> | <p>Know how to conduct a fair test when growing a plant from seed by using the requirements for life</p> <p>Understand how plant species grow differently and how deprivation of certain life requirements can affect growth</p> |
| Year 4 | | <p>Know how to safely experiment with basic components to make a circuit</p> <p>Understand how some components work within the circuit and how their use affects the effectiveness of it</p> | | <p>Know that different surfaces are able to reflect light and know how to test this</p> <p>Understand and give some reasons as to why some surfaces reflect light better than others</p> | | | <p>Know how to make predictions and give reasons why they think some materials are not magnetic</p> <p>Know how to draw conclusions based on an experiment involving magnets</p> | <p>Understand the factors that can affect how well sound travels, through experimentation</p> <p>Know that sounds that are too loud can affect hearing so safety is important when experimenting with sound</p> |
| Year 5 | Know what makes a good methodology and explain how adaptations can lead to improvements | <p>Know how to explain a theory well by backing it up with evidence, such a diagrams and clear labeling</p> <p>Understand that learning about other methods can lead to adaptations and improvements</p> | | <p>Know how to develop an experiment based on cotton, showing a clear focus on one quality of the material</p> <p>Know how to improve an investigation through making adaptations e.g. change one thing</p> | <p>Know how to plan an investigation involving height and arm span, making hypotheses</p> <p>Know how to plan and carry out an experiment involving head circumference and height, drawing conclusions from observations</p> | | | <p>Know how adaptations can be used in an investigation to separate solids and liquids</p> <p>Know that dissolving and mixing can often be reversible and, therefore, helpful when separating solids, liquids or gases</p> |
| Year 6 | | <p>Know how to carry out a fair test on air or water resistant objects</p> <p>Know how to provide a clear hypothesis and conclusion linked to an investigation and suggest improvements 'If we...'</p> | | <p>Understand how some animals have adapted to suit their environments and know the ways that some animals have done this</p> <p>Know what a biome is and understand how adaptations differ in different biomes</p> | | <p>Know how to make adaptations to create an experiment about shadows</p> <p>Understand how to use previous knowledge to support a methodology when conducting an experiment about light</p> | | <p>Know how to construct a circuit and introduce a larger number of or higher voltage of cells to make a bulb brighter</p> <p>Understand why it can be beneficial to use lower voltage bulbs in certain situations</p> |





Dimensions – Science knowledge building – **Observing and**

| | | Project 1  | Project 2 Competency/ NC Essential | Project 3  | Project 4 Competency/ NC Essentials | Project 5  | Project 6 Competency/ NC Essentials | Project 7 Competency/ NC Essential | Project 8  |
|--------|--|--|--|---|---|--|---|--|---|
| | Composite | Key Knowledge | | | | | | | |
| Year 1 | | <p>To know how to observe birds using simple equipment, such as binoculars, identifying their key features.</p> <p>To know some similarities and differences between some birds through observation and recording.</p> | | <p>To know how to make simple recordings of how materials perform in simple tests.</p> <p>To know how to make more detailed observations of materials in order to explain why some are more suited to tasks than others.</p> <p>To know how to observe seasonal changes using the senses.</p> <p>To know how simple weather recording equipment works e.g rain gauges and sun dials.</p> <p>To know that some plants can survive in harsh conditions.</p> <p>To know some examples of plants that can survive in harsh conditions</p> | | <p>To understand how to record their observations of growing plants.</p> <p>To understand how careful observation can ensure a plant grows successfully.</p> | | | <p>To know how to observe and record shadows throughout the day.</p> <p>To understand that there is a link between the time of day and length of shadows, by looking at findings.</p> |
| Year 2 | To know how to use simple equipment in observing and recording | | | <p>To know how to observe a range of light sources safely</p> <p>To know that a bulb requires electricity in order to light</p> | | <p>To know which objects move fastest in a moving objects experiment.</p> <p>To know how to order objects by speed or distance in a moving objects experiment.</p> <p>To know that we can find different sounds in certain places through observation (listening).</p> <p>To know how to record simple findings from a sound experiment.</p> | | | <p>To know how to use simple comparing and recording techniques to distinguish between different animal types.</p> <p>To understand how sorting and classifying can be used to determine which things are alive and those that are not.</p> |

Dimensions – Science knowledge building – **Observing and**

| | | | | | | | | |
|--------|--|--|--|--|---|---|---|--|
| Year 3 | Know that clear observations and recordings support findings and prove theories | | | <p>Know how to group things using classification</p> <p>Understand how classification keys are used to support findings about features of animals and plants</p> | | <p>Observe and make recordings of floating and sinking objects</p> <p>Observe and record objects that sink or float using volume and mass recordings</p> | <p>Rocks: Understand how observation of fossils and their location can help us to determine what kind of creature it was</p> <p>Understand how, by observing and recording the properties of rocks and soils, we can check their suitability for different uses</p> <p>States of Matter: Know how to make clear recordings of the evaporation process to prove theories regarding temperature and if possible, wind speed</p> <p>Know how to use recordings and observations of evaporation and condensation to monitor changes</p> | <p>Observe growth in plants and make some simple recordings</p> <p>Observe and record water transportation in plants and explain what can affect it</p> |
| Year 4 | | <p>Identify parts of a circuit and know the effect of an open and closed circuit</p> <p>Know how to draw a simple circuit using correct symbols</p> | | <p>Know how to make observations and record in detail changes in shadow sizes.</p> <p>Know how and why observations and recordings of shadows proves that they change according to the location of the light source.</p> | | | <p>Observe and record a range of magnetic materials from around the school</p> <p>Know how to use observations to prove hypotheses about magnetic and non-magnetic materials</p> | <p>Understand how to observe patterns between volume and vibration strength, and object features and pitch</p> <p>Know how to hypothesise regarding volume and vibration strength or object size and pitch and test them out, recording findings</p> |
| Year 5 | Identify, analyse and explain findings that support or dismiss theories or arguments | <p>Know the basis of Copernicus's theory of planetary motion</p> <p>Know about the 'Flat Earth' theory and present basic evidence to support or dismiss this</p> | | <p>Understand, through observation, why cotton is a good material for moisture control in hot weather</p> <p>Discuss and compare materials, both man-made and natural, to explain why some materials are chosen for certain purposes</p> | <p>Know how to make clear recordings for a range of body tests to support hypotheses and analyse health</p> <p>Understand how to make clear recordings for a range of body tests and link them to taking averages and making charts</p> | | | <p>Know how to use a range of recording methods when sorting and analysing materials</p> <p>Know how to use comparative testing to sort materials and give evidence for placing materials in certain categories</p> |
| Year 6 | | <p>Know that simple pulleys, levers and gears make it easier to move larger or heavier objects using less force</p> <p>Know how to build a lever, pulley or gear system and explain how it is making it easier to move heavier or larger items</p> | | <p>Understand why animals, birds, plants and insects are classified and give reasons for such classifications</p> <p>Know the basic theory of evolution and compare it to alternative theories and arguments about the existence of life</p> | | <p>Understand how reflections work by exploring light and supporting findings with clear and concise diagrams and labels</p> <p>Know how to analyse and identify how light can be refracted</p> | | <p>Understand why some circuits work better than others by analyzing the components being used</p> <p>Understand how a circuit can be improved to make it more efficient or produce more power</p> |





Dimensions – Science knowledge building – **Scientific Vocabulary**

| | | Project 1  | Project 2 Competency/ NC Essential | Project 3  | Project 4 Competency/ NC Essentials | Project 5  | Project 6 Competency/ NC Essentials | Project 7 Competency/ NC Essential | Project 8  |
|--------|---|---|--|---|---|--|---|--|--|
| | Composite | Key Knowledge | | | | | | | |
| Year 1 | | <p>To know language related specifically to birds e.g. beak, feathers, eggs.</p> <p>To know language related to living things including more scientific language such as 'respiration' and 'nutrition'.</p> | | <p>To know and understand language related to simple materials e.g. hard, soft, rough, smooth.</p> <p>To know and understand more complex language related to materials including rigid, opaque and brittle,</p> <p>To know and understand vocabulary such as 'hemisphere', 'Earth' 'tilt'</p> <p>To know and understand vocabulary linked to seasons e.g. summer, autumn, winter, spring as well as simple weather language.</p> <p>To know and understand the terms 'habitat' and 'prey'.</p> <p>To know and understand the terms 'micro habitat' and 'camouflage'.</p> | | <p>To know and understand vocabulary linked to the structure of plants e.g. stem, root.</p> <p>To know the names of different plant species and understand the term 'deciduous' and 'evergreen'.</p> | | | <p>To know and understand the terms 'dark', 'light source', 'nocturnal, and 'shadow'.</p> <p>To know and understand the terms 'energy' 'sustainable' 'solar' and renewable.</p> |
| Year 2 | To understand some vocabulary linked to specific area of science e.g. animals - species | | | <p>To know and understand the terms 'power source', 'bright' and 'dull'</p> <p>Know and understand the terms 'bulb' and 'battery'</p> | | <p>To know and understand the terms 'push', 'pull', 'faster' and 'slower'.</p> <p>now and understand the terms 'surface', 'launch', 'transporter' and 'compare'</p> <p>To know and understand the terms 'sound source', 'louder' and 'quieter'.</p> <p>To know and understand the terms 'volume', 'distance', 'increase' and 'decrease'.</p> | | | <p>To know simple language relating to the human body and terms such as 'carnivore', 'herbivore' and 'omnivore'.</p> <p>To know more complex vocabulary such as 'producer' and 'consumer'.</p> |

Dimensions – Science knowledge building – **Scientific Vocabulary**

| | | | | | | | | | |
|--------|--|--|--|---|--|---|---|---|--|
| | | | | | | | | | |
| Year 3 | Know how scientific language learned relates to new science concepts and ideas | | | <p>Know the names of the different types of teeth e.g. canine, incisor</p> <p>Know and use a wide range of vocabulary relating to digestion e.g. oesophagus</p> | | <p>Know and understand the terms 'buoyancy' and 'displacement'</p> <p>Know, understand and use the terms 'mass' and 'volume' appropriately</p> | <p>Rocks: Know and use vocabulary relating to rocks and soil, such as "crumbling", "smooth" and "coarse"</p> <p>Know and use vocabulary relating to soil and rocks such as "permeability", "loamy" and "erosion"</p> <p>States of Matter: Know and use vocabulary relating to states of matter e.g: "molecule", "evaporate" and "condensation"</p> <p>Know and use vocabulary relating to states of matter, such as using Celsius as a measure of temperature and "precipitation"</p> | <p>Know a range of vocabulary relating to the structure of flowering plants e.g. stigma, stamen</p> <p>Understand and use a range of vocabulary relating to the functions of flowering plants e.g. carbon dioxide</p> | |
| Year 4 | | <p>Learn new vocabulary relating to electricity, such as 'components' and 'current'</p> <p>Know and understand a range of vocabulary relating to electricity such as 'circuit' and 'current'</p> | | <p>Know and explain the words 'light' and 'shadow'</p> <p>Know and understand more complex terms such as 'block', 'solid' and 'opaque'</p> | | | <p>Know and use language relating to magnets and force, such as 'attract' and 'repel'</p> <p>Know and use language relating to magnets and force, such as 'poles' and 'repulsion'</p> | <p>Know and understand the terms 'vibration', 'volume' and 'pitch'</p> <p>Know and understand the terms 'insulate' and 'sound waves'</p> | |
| | Know how to use a range of scientific vocabulary in various contexts | <p>Know and understand the terms 'orbit', 'spherical' and 'solar system'</p> <p>Know and understand the terms 'cycle', 'galaxy', 'constellations' and 'axis'</p> | | <p>Know and understand the terms 'man-made', 'natural' and use in different contexts</p> <p>Know and understand the terms 'classify', 'criteria', 'properties', 'flexibility' and 'absorbency'</p> | <p>Know and understand the terms 'skeletal', 'digestive' and 'circulatory', relating to systems</p> <p>Know and understand the terms 'platelet', 'plasma', 'white blood cell' and 'red blood cell'</p> | | | <p>Know and understand the terms 'recycling' and 'reusing'</p> <p>Know language that connects to other subjects to support scientific knowledge e.g. 'dredging', 'pollution'</p> | |
| Year 6 | | <p>Know and understand the terms 'accelerate', 'decelerate', 'brake' and 'gravity'</p> <p>Know and understand the terms 'pulley', 'gear', 'spring' and 'resistance'</p> | | <p>Know and understand the terms 'classification', 'hereditary', 'environment' and 'theory of evolution'</p> <p>Know a wider range of vocabulary relating to specific species, such as 'tendrils' and 'gills'</p> | | <p>Know and understand the terms 'reflect', 'periscope' and 'transparent'</p> <p>Know the names of different parts of the eye and understand the terms 'refraction' and 'translucent'</p> | | <p>Know and understand the terms 'voltage' and 'circuit diagram'</p> <p>Use a wider range of vocabulary related to electricity, including interpreting symbols used in circuit diagrams</p> | |





Dimensions – Science knowledge building – **Uses and Implications**

| | | Project 1  | Project 2 Competency/ NC Essential | Project 3  | Project 4 Competency/ NC Essentials | Project 5  | Project 6 Competency/ NC Essentials | Project 7 Competency/ NC Essential | Project 8  |
|--------|--|---|--|--|---|---|---|--|--|
| | Composite | Key Knowledge | | | | | | | |
| Year 1 | | <p>To understand the importance of birds in the local area and know some ways to protect them.</p> <p>To know about the work of local bird charities and how their work protects birds.</p> | | <p>To understand the importance of suitable materials for different jobs.</p> <p>To know, in more depth, why certain materials are selected for certain jobs.</p> <p>To know that understanding the weather can help in everyday situations.</p> <p>To understand the uses for weather detecting equipment and forecasts.</p> <p>To know that observing the weather helps us choose what clothes to wear.</p> <p>To understand how the study of animal adaptations affects the materials we wear to keep us warm or dry.</p> | | <p>To know where humans obtain their plant based food from and why it is important to eat plants.</p> <p>To understand that food chains make sure that everyone has enough to eat.</p> | | | <p>To know some ways in which we can save electricity.</p> <p>To know that there are different ways of producing electricity and that some are better for the environment than others.</p> |
| Year 2 | <p>To know that science is used in a range of everyday situations, both in and outside the classroom</p> | | | <p>To know that some toys need electricity in order to work</p> <p>To understand the basic impact that the electric light bulb had on the modern world</p> | | <p>To know that being able to increase / decrease the speed of a moving object has important benefits in real life situations e.g. a car</p> <p>To know simple ways in which the speed of a moving object can be increased / decreased.</p> <p>To know some ways in which we make sounds louder or clearer.</p> <p>To know that hearing aids are used to help people who have poor hearing.</p> | | | <p>To understand what humans do to destroy habitats and endanger animals.</p> <p>To know some ways in which we can change human behaviour to prevent endangering animal species.</p> |

Dimensions – Science knowledge building – Uses and Implications

| | | | | | | | | | |
|--------|---|---|--|--|--|---|--|--|---|
| Year 3 | Understand how science affects our lives and the implications its use has on them | | | Know that poor dental and digestive health can lead to problems in both animals and humans, such as weight gain Know that lack of the right food for animals in a food chain can have an impact on the biodiversity of an area | | Know that displacement is factored into the manufacture of boats and ships Understand why some boats and ships are manufactured to make them displace less water | Know that a paleontologist does and how their work helps us understand pre-historic creatures and plants Know how studying rocks and fossils in more depth and detail leads to greater understanding of the past States of Matter: Know why we add salt to ice on icy days Know why water conservation is important as the planet experiences global warming | | Know that plants can require a wide range of growing conditions and can either thrive or die in various environments Know how environments can be managed to ensure successful plant growth and reproduction |
| Year 4 | | Understand how important the availability and use of electricity is in our everyday lives Understand how electricity can make a range of appliances perform different tasks e.g. move, heat up, make a noise | | Know that shade/darkness is important to living things. Understand why some animals prefer to live in dark places | | | Know that magnets are used in a range of industries Understand why magnets are important to a range of industries | | Know that noise can be a pollutant in a similar way to light Understand how noise can be a pollutant and suggest some ways that this can be stopped or improved |
| Year 5 | Know that science has implications for world issues and that it can be used for good or bad | Know that the research of the Earth and Moon is used by space agencies and companies globally Know that research by global space agencies of the Earth, Sun and Moon develops our understanding of other planets | | Know that the cotton industry developed into a manufacturing process that involves many countries Understand how the cotton industry has had an impact on farming in the Americas | Know that being aware of your own health (resting heart rate etc.) is important Know how developments in understanding the human body has improved our health care system | | | | Know that recycling can change a material so it can be used for something else Know the process of recycling paper or glass and what can be made from these substances |
| Year 6 | | Find and describe other uses for pulleys, lever and gears in everyday situations Compare gear, lever or pulley systems in a range of everyday situations and find those that are most effective | | Know that some animals are at risk due to changes in their biome and, therefore, reproduction rates and births are decreasing Understand how humans can affect habitats and biomes and know some solutions to help save animals and plants living there | | Understand how periscopes work and how their use has been influential e.g. World War 1 Know that studying how light behaves can support a wide range of industries and technologies such as improving eye health | | | Know about ways of producing energy that have a better global impact Know about renewable and non-renewable energy sources and give pros and cons for their use |

Dimensions – Science knowledge building – **Cross Curricular**

| | | Project 1  | Project 2 Competency/ NC Essential | Project 3  | Project 4 Competency/ NC Essentials | Project 5  | Project 6 Competency/ NC Essentials | Project 7 Competency/ NC Essential | Project 8  |
|--------|--|---|--|--|---|---|---|--|---|
| | Composite | Key Knowledge | | | | | | | |
| Year 1 | | <p>To know how to use simple charts and pictograms when recording bird observations.</p> <p>To know how charts, pictograms, tally charts and other graphical recordings can help with scientific experimentation.</p> | | <p>Design / Technology links – know how to design and make simple objects using different materials</p> <p>Design / Technology links - know how to design and make simple objects with suitable materials with reasons for choice</p> <p>To understand that the findings of experiments can be used to create simple charts that can relate to maths concepts</p> <p>To know how to create a tally chart of particular types of weather (rainy, sunny, cloudy) in a week .</p> <p>To understand that the findings of experiments can be used to create simple charts that can relate to maths concepts.</p> <p>To know that products develop through experimentation (Design Technology).</p> <p>To understand that the findings of experiments can be used to create simple charts that can relate to maths concepts.</p> | | <p>Know how to measure how much water is given to their growing seedling (Maths)</p> <p>Know hot to measure temperature (thermometer) and light (Luk, Maths)</p> | | | <p>To know how to measure using non-standard units of measurement (Maths)</p> <p>Know how to measure using sticks or tape measures (Maths).</p> |
| Year 2 | Identify clear connections between science, technology and mathematics for basic experimenting | | | <p>To know why Thomas Edison worked so hard on developing his light bulb</p> <p>To know that working models can use electricity e.g. buggy - motor (Design Technology)</p> | | <p>To know how to build a simple transporter (Design Technology).</p> <p>To know how to measure distance traveled by a moving object (Maths).</p> <p>To understand less and more, relating this to sound (Maths).</p> <p>To know how to use tables for comparisons (Maths.)</p> | | | <p>To know some animals that have long life spans (maths link).</p> <p>To identify some ways that can help humans increase their life spans (PSHE and maths links).</p> |

Dimensions – Science knowledge building – Cross Curricular

| | | | | | | | | | |
|--------|---|--|--|---|--|---|---|--|--|
| Year 3 | Understand that the links between science, technology, engineering and mathematics are key to many industries | | | Understand, in simple terms, how the medical industry works to protect our teeth Know how zoos and safari parks ensure animals get the right types and amounts of nutrition | | Know how to make an object that floats e.g. boat (Design Technology) Know how to develop an object that floats so that is more efficient in water (Design Technology) | Rocks: Know a range of rock types that would be best suited to building structures Understand how different plants need different soils and, therefore, how humans can engineer soils to be best for food plants States of Matter: Know how to read a thermometer in Celsius and explain how it works (Maths) Know how to collate data from a thermometer to create a detailed graph (Maths) | | Know how to use data from plant experiments to create charts and graphs Know how to use data collected from plant experiments to suggest ways of improving plant growing conditions |
| Year 4 | | Know how simple conductors and insulators work and how they can keep us safe Know that metals in general are better conductors and begin to learn which are better conductors than others | | Know some ways in reflection and reflective surfaces are used in safety practices. Know how to make accurate measurements of shadows using meters and centimeters | | | Know how to design and make a fishing game using magnets (Design Technology) Know that magnets are used for lifting, holding, separating and moving (Engineering) | | Know how factors can affect the travel of vibrations and explore ways these could be improved Know that we can send sound without wires/strings, through wireless sound systems |
| Year 5 | Understand how their own STEM skills can benefit future science work in school and beyond | Know how to put together a presentation of findings, share it with a group and prepare for questions Know how to put together an argument for a particular theory e.g. spherical Earth | | Know how to make clear graphs and calculate averages (Maths) Know that companies design advertising campaigns to encourage consumers to buy their food and drink products (DT) | | Understand how STEM has an impact on developing energy sources and consider ways of making their own energy sources Know how electricity gets to our homes and school and how it is measured | | | Explore ways of producing materials so they have a global benefit Know that technology is being developed to ensure manufacturing is becoming more environmentally friendly |
| Year 6 | | Know how to make a useable pulley, lever or gear system Know how to use a Newton Meter and take measurements | | | Know that light is needed to make a range of objects work e.g. camera Know how adaptations have lead to improvements in the use and quality of light-emitting devices | | Know how use ratios to create solutions (Maths) Know how to record findings correctly, using mathematical diagrams (Maths) | | Know how to find more in-depth information about a specific animal, plant, insect or bird Understand that information needs to be relevant and carefully read to ensure that theories are supported by evidence |