

# St. Luke's C of E (Aided) Primary School



## Science Information 2023

SEPTEMBER 2023

## Overview

Science is one of the core subjects of the National Curriculum, along with English and Maths. At St. Luke's we are passionate in enabling children to develop the skills to become independent scientists who are enthusiastic at exploring and investigating questions that they may have.

## Intent

At St. Luke's we strive to develop children's enjoyment and interest in the science subjects. We aim to ensure that a full curriculum is planned and taught throughout school while building on children's prior knowledge and capabilities. At St. Luke's we encourage children to become independent, curious learners who ask questions to develop their thinking of the world. Our curriculum is purposeful and allows the children to develop their skills in a range of ways including investigating key questions, recording findings in a variety of ways, analysing results, making predictions and hypothesising. We incorporate our outdoor space in our learning of Science by using the eco garden to fulfil our wider learning experiences.

## Implementation

At St. Luke's we ensure that staff have a good, up to date knowledge of the curriculum and the content taught at each year group. Teachers develop children's thinking and understanding by asking differentiated questions to challenge all children's abilities. Misconceptions are addressed and children are encouraged to develop their thinking and make links between knowledge taught in previous year groups. Children are encouraged to use the correct terminology and have a good understanding of the skills that they will need to complete a task. Work completed in science shows clear differentiation and progress across year groups and is presented in class displays, whole school

displays and in workbooks. Children are given verbal and written feedback on the work that they have produced and understand the steps they must take to make progress in each lesson.

## Impact

At St. Luke's teachers regularly assess children and upload data onto our assessment programme. Clear progress is demonstrated across the year groups using this system. We aim to ensure that children progress through year groups feeling ready to develop and build on their knowledge and skills. All children are given the opportunity to succeed and make good progress in Science. Evidence of good quality of work including a progression of skills can be found in the children's topic books. By the time children leave St. Luke's they will have an in depth knowledge of scientific concepts and have the ability to reach clear conclusion and develop a reasoned argument to discuss their findings.

## Science Curriculum Coverage by Year Group

### Foundation Two

#### Disciplinary Skills and Knowledge Overview: To be taught during every topic

Pupils should:

- Begin to classify using names.
- Observe changes.
- Use picture books and images to ask questions.
- Use equipment such as sand timers, sieves and measuring jugs.
- Make marks which will be used for simple counts.

| Biology | Chemistry                                                                                                                                                                                        | Physics                                                                                                                                                                                    | Vocabulary                                                                                                                        |
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|         | <b>Autumn 1- Materials</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know how to identify materials around the home.</li> <li>• Know how to name and sort materials.</li> </ul> |                                                                                                                                                                                            | <b>Material</b> (wood, plastic, glass, metal, water, rock), hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy. |
|         |                                                                                                                                                                                                  | <b>Autumn 2- The Natural World</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know how to explore the natural world and talk about the things that are noticed.</li> </ul> | Explore, changes, world, seasons.                                                                                                 |

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|                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Know how to ask questions about the natural world.</li> <li>• Know how to recognise change and describe what is happening.</li> <li>• Know how to explore the natural world and talk about the things that they have noticed.</li> <li>• Know how familiar things work.</li> </ul> |                                                               |
|                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                     | <b>Spring 1- Light and Dark</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know what light and dark is.</li> <li>• Know sources of light.</li> <li>• Know how we see in the dark.</li> <li>• Know about the sun.</li> </ul>                                                                                 | Light, dark, day, night, sun, moon.                           |
| <b>Spring 2- Plants and Seasons</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know how to identify plants</li> <li>• Know and observe the growing cycle of a plant</li> <li>• Know the four seasons.</li> </ul> |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                             | Plants, flowers, stem, petal, spring, summer, autumn, winter. |
|                                                                                                                                                                                                                                  | <b>Summer 1- States of Matter</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know, name and observe objects that float or sink.</li> <li>• Know and name waterproof items.</li> <li>• Know how to test waterproof items.</li> </ul> |                                                                                                                                                                                                                                                                                                                             | Heavy, light, float, sink, dry, wet, waterproof, investigate. |

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| <b>Summer 2- Animals</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know the structure of an animal</li> <li>• Know the names of a range of animals.</li> </ul> |  |  | Animal names, body parts. |
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## Year 1

### Disciplinary Skills and Knowledge Overview: To be taught during every topic

Pupils should:

- Use simple features to compare objects, materials and living things.
- Record observations over time.
- Make and record patterns and start to question these.
- Understand fairness.
- Ask questions and use simple secondary sources to find answers.

| Biology                                                                                                                                                                                                         | Chemistry | Physics | Vocabulary                                                                                                                                                                                                                            |
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| <b>Autumn 1- Plants</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know how to identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> </ul> |           |         | Common, wild plants, garden plants, deciduous, evergreen, <b>tree</b> (deciduous evergreen, trunk, branches, leaf, root), <b>plant</b> (leaf, root, leaves, bud, flowers, blossom, petals, root, stem, fruit, vegetables, bulb, seed) |

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| <ul style="list-style-type: none"> <li>• Know how to identify and describe the basic structure of a variety of common flowering plants, including trees</li> <li>• Know the names of different parts of a flower</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>Autumn 2- Animals Including Humans</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know how to identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>• Know how to identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>• Know how to describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</li> <li>• Know how to identify, name, draw and label the basic parts of the human body</li> <li>• Know which part of the body is associated with each sense</li> </ul> |  |  | <p>Common animals, fish, amphibians, reptiles, birds, mammals, pets, <b>carnivores</b> (meat, cat, dog, lion, tiger, fox, shark, killer whale, eagle, hawk, snake, tyrannosaurus rex), <b>herbivores</b> (plants, cow, hamster, guinea pig, tortoise, triceratops), <b>omnivores</b> (meat and plants, badger, human, bear, chickens), head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth.</p> |

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|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>Spring 1- Seasonal Changes</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know the four seasons</li> <li>• Know the changes that occur as seasons change</li> <li>• Know and describe weather associated with the seasons and how day length varies</li> </ul> | <p>Fog, sun, hot, warm, summer, winter, autumn, spring, cold, air, day, daylight, rain, sleet, snow.</p>                                                                                                                                                 |
|  | <p><b>Spring 2- Everyday Materials</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know how to distinguish between an object and the material from which it is made</li> <li>• Know how to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>• Know the simple physical properties of a variety of everyday materials</li> <li>• Know a variety of everyday materials and compare and group these based on their simple physical properties</li> </ul> |                                                                                                                                                                                                                                                                                              | <p><b>Material</b> (wood, plastic, glass, metal, water, rock), <b>properties</b> (hard/soft, stretchy/ stiff), shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/ not absorbent, brick, paper, fabrics, elastic, foil.</p> |

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| <p><b>Summer 1- Sustainability</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know where food comes from.</li> <li>• Know the effective growing conditions for plants and vegetables.</li> <li>• Know and observe the planting done this year.</li> <li>• Know and understand the importance of looking after the planet.</li> <li>• Know about the recycling process and which materials can be recycled.</li> </ul> |                                                                                                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>Summer 2- Significant Scientists</b></p> <ul style="list-style-type: none"> <li>• Plants- Jan Ingenhousz- To know the steps of photosynthesis.</li> <li>• Animals Including Humans- Linda Brown Buck-To know the different senses and their uses.</li> </ul> |  |  |

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|  | <ul style="list-style-type: none"> <li>Seasonal Changes- Johannes Kepler- To know the function of the sun and moon.</li> <li>Materials- Ole Kirk Christiansen- To know the material and design process used to create Lego.</li> <li>Sustainability- Rittenhouse Family- To know steps that I can take to ensure sustainability for future generations.</li> </ul> |  |  |
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Year 2

## Disciplinary Skills and Knowledge Overview: To be taught during every topic

Pupils should:

- Use simple features to compare objects, materials and living things, and, with help, decide how to sort and group them.
- Come to helpful conclusions, beginning to use simple scientific vocabulary and ask effective questions.
- Make observations and record.
- Use simple equipment such as rulers, magnifying glasses and simple timers.
- Make and record patterns and start to provide answers to questions that are asked.
- To understand fairness and will 'think aloud'.
- Ask questions and start to gather evidence to answer.

| Biology                                    | Chemistry | Physics | Vocabulary                                                                                                  |
|--------------------------------------------|-----------|---------|-------------------------------------------------------------------------------------------------------------|
| Autumn 1- Living Things and Their Habitats |           |         | Living, dead, never alive, habitats, micro-habitats, food, food chain, sun-grass-cow-human, alive, healthy, |

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| <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know, explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>• Know 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</li> <li>• Know and name a variety of plants and animals in their habitats, including microhabitats</li> <li>• Know how animals obtain their food from plants and other animals, using the idea of a simple food chain</li> <li>• Know and name different sources of food</li> </ul> |  |  | <p>stony path, under bushes, shelter, seashore, woodland, ocean, rainforest, conditions, hot/warm/cold, dry/damp/wet, bright/shade/dark</p>                                                                                       |
| <p><b>Autumn 2- Animals Including Humans</b></p> <p>Pupils should:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  | <p>Offspring, grow, adults, nutrition, reproduce, <b>survival</b> (water, food, air, exercise, hygiene, egg-chick-chicken, egg-caterpillar-pupa-butterfly, spawn-tadpole-frog, lamb-sheep, baby-toddler-child-teenager- adult</p> |

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| <ul style="list-style-type: none"> <li>• Know that animals, including humans, have offspring which grow into adults</li> <li>• Know and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>• Know the importance for humans of exercise and eating the right amounts of different types of food</li> <li>• Know the importance for humans to maintain basic hygiene</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>Spring 1- Materials</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know how to distinguish between an object and the material that it is made from</li> <li>• Know and name a variety of materials</li> <li>• Know and describe the physical properties of a material</li> <li>• Know and compare the suitability of a variety of everyday materials,</li> </ul> |  | <p>Wood, metal, plastic, glass, brick, rock, paper, cardboard, squashing, bending, twisting, stretching, <b>metal</b> (coins, cans, cars, table legs), <b>wood</b> (matches, floors, telegraph poles), <b>John Dunlop</b>- rubber, <b>Charles Macintosh</b>- waterproof</p> |

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|  | <p>including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <ul style="list-style-type: none"> <li>• Know and explore how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                   |  |
|  |                                                                                                                                                                                                                                                                                                | <p><b>Spring 2- Changes</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know how the Earth's rotation creates day and night.</li> <li>• Know how day length varies and why this happens.</li> <li>• To know the differences between solids, liquids and gases.</li> <li>• To know how liquid can evaporate.</li> <li>• To know how to change a liquid to a gas.</li> </ul> |  |

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| <p><b>Summer 1- Plants</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know and describe how seeds and bulbs grow into mature plants</li> <li>• Know the basic structure of a plant and flower, including roots, stem and trunk</li> <li>• Know, explore and describe how plants need water, light and a suitable temperature to grow and stay healthy</li> <li>• Know and describe how seeds and bulbs grow into mature plants</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                            |  | <p>Water, light, suitable temperature, grow, healthy, germination, reproduction.</p> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p><b>Summer 2- Significant Scientists</b></p> <ul style="list-style-type: none"> <li>• Living Things and their Habitats- George Washington Carver- To know the methods for soil depletion.</li> <li>• Animals Including Humans- Ignaz Semmelweis- To know the benefits of antiseptic.</li> <li>• Materials- Charles Goodyear- To know the properties of rubber and investigate the durability.</li> </ul> |  |                                                                                      |

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|  | <ul style="list-style-type: none"> <li>• Changes- Nils Wallerius- To know the stages of evaporation.</li> <li>• Plants- Agnes Arber- To know how to compare the anatomy of plants.</li> </ul> |  |  |
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Year 3

## Disciplinary Skills and Knowledge Overview: To be taught during every topic

Pupils should:

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

| Biology                            | Chemistry | Physics | Vocabulary                                                                                  |
|------------------------------------|-----------|---------|---------------------------------------------------------------------------------------------|
| Autumn 1- Animals Including Humans |           |         | Nutrition, vitamins, minerals, fat, protein, carbohydrates, fibre, water, <b>skeletons-</b> |

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| <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know 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</li> <li>• Know that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>• Know how to construct a simple food chain</li> <li>• Know different parts of the human body and their use</li> </ul> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>(support, protection), <b>skull</b> (brain), <b>ribs</b> (heart, lungs, movement), joint, <b>muscles</b> (movement, pull, contract, relax), diet.</p>          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | <p><b>Autumn 2- Light</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know that they need light in order to see things and that dark is the absence of light</li> <li>• Know that light is reflected from surfaces</li> <li>• Know that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>• Know that shadows are formed when the light from a light source is blocked by an opaque object</li> </ul> | <p>Light, see, dark, reflect, surface, natural, star, sun, moon, shadow, blocked, solid, artificial, torch, candle, lamp, sunlight, dangerous, protects eyes.</p> |

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|  |                                                     | <ul style="list-style-type: none"> <li>Know and explore patterns to identify how the size of shadows change</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                   |
|  |                                                     | <p><b>Spring 1- Forces</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>Know how things move on different surfaces</li> <li>Know that some forces need contact between 2 objects, but magnetic forces can act at a distance</li> <li>Know how magnets attract or repel each other and attract some materials and not others</li> <li>Know, 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</li> <li>Know that magnets have 2 poles</li> <li>Know how to make a prediction as to whether 2 magnets will attract or repel each other, depending on which poles are facing.</li> </ul> | Force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, North and South               |
|  | <p><b>Spring 2- Rocks</b></p> <p>Pupils should:</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Appearance, physical properties, <b>properties</b> (soft/hard, shiny/dull, rough/smoot, absorbent/not absorbent), |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• Know, compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>• Know how fossils are formed</li> <li>• Know that soils are made from rocks and organic matter</li> <li>• Know how to explore the soil samples.</li> </ul> |  | <b>fossils</b> (sedimentary rock),<br><b>soils</b> (rock, organic matter),<br><b>uses</b> (buildings, grave stones, grains), crystals                                                                                                                                                                                                           |
| <b>Summer 1- Plants</b><br><br>Pupils should: <ul style="list-style-type: none"> <li>• Know and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>• Know 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</li> <li>• Know and investigate the way in which water is transported within plants</li> <li>• Know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</li> </ul> |                                                                                                                                                                                                                                                                                                                                         |  | <b>Structure</b> (flowering plants, roots, stem/trunk, leaves, flowers) <b>function</b> (nutrients, support, reproduction makes its own food) <b>requirements for life and growth</b> (air, light, water, nutrients from soil, room to grow), needs vary, fertiliser, <b>life cycle</b> (flowers, pollination, seed formation, seed dispersal). |

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|  | <p><b>Summer 2- Significant Scientists</b></p> <ul style="list-style-type: none"> <li>• Animals Including Humans- Andreas Vesalius- To know the function of arteries.</li> <li>• Light- Thomas Edison- To know the steps taken to create the lightbulb.</li> <li>• Forces- William Gilbert- To know what the electroscope is used for.</li> <li>• Rocks- Mary Anning- To know the significance of fossil discoveries.</li> <li>• Plants- Francis Bacon- To know how to participate in an experiment using the Bacon Method.</li> </ul> |  |  |
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Year 4

## Disciplinary Skills and Knowledge Overview: To be taught during every topic

Pupils should:

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gather, recording, classifying and presenting data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

| <ul style="list-style-type: none"> <li>• use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• identify differences, similarities or changes related to simple scientific ideas and processes</li> <li>• use straightforward scientific evidence to answer questions or to support their findings.</li> </ul>                                                                |           |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Biology                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Chemistry | Physics | Vocabulary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>Autumn 1- Living Things and Their Habitats</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know that living things can be grouped in a variety of ways</li> <li>• Know, explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>• Know that environments can change and that this can sometimes pose dangers to living things</li> </ul> |           |         | <p>Environment, flowering, non-flowering, plants, animals, vertebrate, environment, dangers, <b>vertebrate</b> (fish, amphibians, reptiles, birds, mammals), <b>invertebrates</b> (snails, slugs, worms, spiders, insects), <b>plants</b> (flowering plants-including grasses, non-flowering plants- including mosses and ferns), human impact, <b>positive</b> (nature reserves, ecologically planned parks, garden ponds), <b>negative</b> (population, development, litter, deforestation.</p> |
| <p><b>Autumn 2- Animals Including Humans</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know the simple functions of the basic parts of the digestive system in humans</li> </ul>                                                                                                                                                                                                                                                   |           |         | <p>Human digestive system, mouth, <b>tongue</b> (mixers, moistens, saliva), <b>teeth</b> (incisors- cutting, slicing, canines-ripping, tearing, molars-chewing, grinding), oesophagus, transports, stomach, acid, enzymes, small</p>                                                                                                                                                                                                                                                              |

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| <ul style="list-style-type: none"> <li>• Know the different types of teeth in humans and their simple functions</li> <li>• Know that humans and animals have skeletons and muscles for support, protection and movement</li> <li>• Know how to construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | <p>intestine, large intestine, carnivore, herbivore, brush, floss, food chain, sun, producers, prey, predators.</p>                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                       | <p><b>Spring 1- States of Matter</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know, compare and group materials together, according to whether they are solids, liquids or gases</li> <li>• Know 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)</li> <li>• Know the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</li> </ul> |  | <p><b>Solid</b> (iron, ice, melt, freeze, liquid, evaporate, condense, gas, container), <b>changing state</b> (chocolate, butter, cream, heated, heat, cooled, cool, degrees Celsius, thermometer), <b>water cycle</b> (evaporate, evaporation, condense, condensation, <b>temperature</b> (melting, melt), <b>ice</b> (warm/cool), <b>water</b> (warm/cool, water vapour)</p> |

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|  |  | <p><b>Spring 2- Sound</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know how sounds are made, associating some of them with something vibrating</li> <li>• Know that vibrations from sounds travel through a medium to the ear</li> <li>• Know how to find patterns between the pitch of a sound and features of the object that produced it</li> <li>• Know how to find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>• Know that sounds get fainter as the distance from the sound source increases</li> </ul> | <p>Vibrate, vibration, vibrating, air, medium, ear, hear, sound, volume, pitch, faint, loud, string, percussion, woodwind, brass, insulate.</p>              |
|  |  | <p><b>Summer 1- Electricity</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know common appliances that run on electricity</li> <li>• Know how to construct a simple series electrical circuit, identifying and naming its</li> </ul>                                                                                                                                                                                                                                                                                                                                    | <p>Electrics, cell, circuit, wire, bulb, buzzer, danger, sign, insulators, wood, rubber, plastic, glass, conductors, metal, water, switch, open, closed.</p> |

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|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>basic parts, including cells, wires, bulbs, switches and buzzers</p> <ul style="list-style-type: none"> <li>• Know 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</li> <li>• Know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>• Know some common conductors and insulators, and associate metals with being good conductors</li> </ul> |  |
|  | <p><b>Summer 2- Significant Scientists</b></p> <ul style="list-style-type: none"> <li>• Living things and their habitats- Jane Colden- to know and understand the classification system of Jane Colden.</li> <li>• Animals Including Humans- William Beaumont- To complete an experiment mirroring the digestive process.</li> <li>• States of Matter- Joseph Priestley- To know the gases needed for survival and to understand how they were discovered.</li> <li>• Sound-Christian Doppler- To know and study the Doppler effect.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |

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|  | <ul style="list-style-type: none"> <li>Electricity- Nikola Tesla-<br/>To know and debate whether electric cars and more sustainable than petrol or diesel cars.</li> </ul> |  |  |
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## Year 5

### Disciplinary Skills and Knowledge Overview: To be taught during every topic

Pupils should:

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

| Biology                                                                                                                                                                                              | Chemistry | Physics | Vocabulary                                                                                                                                            |
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| <b>Autumn 1- Living Things and Their Habitats</b><br>Pupils should: <ul style="list-style-type: none"> <li>Know how living things are classified into groups according to characteristics</li> </ul> |           |         | <b>Life cycles</b> (mammals, amphibian, insect, bird, life process of reproduction, plants, animals), vegetable garden, flower boarder, <b>animal</b> |

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| <ul style="list-style-type: none"> <li>• Know how to classify plants and animals and can give reasons for this</li> <li>• Know the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>• Know the life process of reproduction in some plants and animals</li> </ul>                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>naturalists-</b> David Attenborough, <b>animal behaviourist-</b> Jane Goodall, <b>reproduction plants</b> (sexual, asexual), <b>lifecycles around the world</b> (rainforest, oceans, desert, prehistoric, similarities, differences) |
| <b>Autumn 2- Animals Including Humans</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know the changes as humans develop to old age</li> <li>• Know how nutrients are transported around the body</li> <li>• Know the importance of diet, exercise, drugs and lifestyle on how humans' function</li> </ul> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Human development, baby-toddler-child-teenager-adult, puberty, gestation, length, mass, grows, grow, growing.                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                           |  | <b>Spring 1- Forces</b><br>Pupils should: <ul style="list-style-type: none"> <li>• Know that magnets have two poles and can predict whether magnets will repel or attract each other</li> <li>• Know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>• Know the effects of air resistance, water resistance and friction, that act between moving surfaces</li> </ul> | Gravity, air resistance, water resistance, friction, surface, force, effect, move, accelerate, mechanism, pulley, gear, spring, Isaac Newton, Galileo Galliei                                                                           |

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|  |                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>• Know that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</li> <li>• Know why moving objects that are not driven can slow down</li> <li>• Know that force and motion can be transferred through mechanical devices such as gears, pulleys, leavers and springs</li> </ul>                                                                                                                    |                                                                                                                                                                                                                                                                             |
|  |                                                                                                                                                                                                                                                                                              | <p><b>Spring 2- Earth and Space</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know the movement of the Earth and other planets relative to the sun in the solar system</li> <li>• Know the movement of the moon relative to the Earth</li> <li>• Know the sun, Earth and moon as approximately spherical bodies</li> <li>• Know about the Earth's rotation and use this to explain day and night and the apparent movement of the sun across the sky</li> </ul> | <p>solar system, dwarf planets, movement, rotate, orbit, axis, celestial body, spherical, sphere, eclipse, satellite.</p>                                                                                                                                                   |
|  | <p><b>Summer 1- Properties of Materials</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• Know, compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p><b>Properties</b> (hardness, solubility, transparency, conductive- electrical and thermal, response to magnets, <b>dissolve</b> (liquid, solution), separate, separating, <b>solids, liquids, gases</b> (filtering, sieving, evaporating), <b>reversible changes</b></p> |

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|  | <p>and thermal), and response to magnets</p> <ul style="list-style-type: none"> <li>• Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• Know how to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>• Know how to give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• Know that dissolving, mixing and changes of state are reversible changes</li> <li>• Know that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes</li> </ul> |  | <p>(dissolving, mixing, evaporation, filtering, sieving, melting), <b>irreversible</b> (new material, burning, rusting, magnetism, electricity, <b>chemists</b> (Spencer Silver, Ruth Benerito), <b>quantitative measurements</b> (conductivity, insulation, chemical</p> |
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|  | associated with burning and the action of acid on bicarbonate of soda                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |
|  | <p><b>Summer 2- Significant Scientists</b></p> <ul style="list-style-type: none"> <li>• Living things and their habitats- Gregor Mendel- To know and understand genetics.</li> <li>• Animals including humans- William Harvey- To know the importance of the circulatory system.</li> <li>• Forces- Galileo Galilei- knowing about forces, discuss how the proportional compass works.</li> <li>• Earth and Space- Nicolaus Copernicus- To know about the heliocentric system.</li> <li>• Properties of Materials- Ruth Benerito- to study the work of Ruth Benerito.</li> </ul> |  |  |

## Year 6

### Disciplinary Skills and Knowledge Overview: To be taught during every topic

Pupils should:

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

| Biology | Chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Physics | Vocabulary                                                                                      |
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|         | <b>Autumn 1- Evolution and Inheritance</b><br>Pupils should: <ul style="list-style-type: none"> <li>• know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</li> <li>• know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</li> <li>• know that animals and plants are adapted to suit their environment in</li> </ul> |         | Vary, non-identical, characteristics, variation, change, fossils, offspring, evolution, evolve. |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>different ways and that adaption may lead to evolution.</p> <ul style="list-style-type: none"> <li>• know theories of evolution.</li> </ul> |  |                                                                                                                                                                                                                                                                                                                             |
| <p><b>Autumn 2- Living Things and Their Habitats</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• know 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</li> <li>• know reasons for classifying plants and animals based on specific characteristics</li> </ul>                                                                                                                  |                                                                                                                                                |  | <p>Micro-organisms, plants, animal, classification, classify animals, <b>invertebrates</b> (insects, spiders, snails, worms), <b>vertebrates</b> (fish, amphibians, reptiles, birds, mammals), <b>scientists</b>- Carl Linnaeus</p>                                                                                         |
| <p><b>Spring 1- Animals Including Humans</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• know how the human body changes as it ages</li> <li>• know and name the main parts of the human circulatory system</li> <li>• know and describe the functions of the heart, blood vessels and blood.</li> <li>• know the impact of diet, exercise, drugs and lifestyle have on the way their body's function.</li> <li>• know the ways in which nutrients and water are transported within animals, including humans.</li> </ul> |                                                                                                                                                |  | <p><b>Human internal organs</b> (heart, lungs, liver, kidney, brain), skeletal, skeleton, muscle, muscular, digest, digestion, digestive, <b>human circulatory system</b> ( heart, blood, vessels, blood), <b>impact</b> (diet, exercise, drugs), lifestyle, nutrients, water, <b>damage</b> (drugs, alcohol substance)</p> |

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|  |  | <p><b>Spring 2- Electricity</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• know the recognised symbols when representing a simple circuit in a diagram.</li> <li>• know and make connections between the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</li> <li>• know, compare and give reasons for variations in how components function, including brightness of bulbs, the loudness of buzzers and then on/off position of switches.</li> </ul>                                 | <p>Voltage, brightness, volume, switches-on/off, danger, series circuit, working safely with electricity, circuit diagram, switch, bulb, buzzer, motor, recognised, symbols, electrical safety, sign.</p> |
|  |  | <p><b>Summer 1- Light</b></p> <p>Pupils should:</p> <ul style="list-style-type: none"> <li>• know that light appears to travel in straight lines.</li> <li>• know that light travels in straight lines and use this idea to explain that objects are seen because they give out or reflect light into the eye.</li> <li>• know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</li> <li>• know that light travels in straight lines and use this to explain why shadows have</li> </ul> | <p>Reflection, light source, object, shadows, travel, transparent, translucent, opaque.</p>                                                                                                               |

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|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | the same shape as the objects that cast them. |  |
|  | <p><b>Summer 2- Significant Scientists</b></p> <ul style="list-style-type: none"> <li>• Evolution and Inheritance- Alfred Russel Wallace- know and compare the theory of evolution with Charles Darwin.</li> <li>• Living Things and their Habitats- Carl Linnaeus- to know the outlines of taxonomy and how the work of Carl Linnaeus changes classification.</li> <li>• Animals Including Humans- Michael Servetus- to know and explore the impact that exercise has on the heart.</li> <li>• Electricity- Michael Faraday- To know and explore the work of Michael Faraday and electromagnetism.</li> <li>• Light- Sir Isaac Newton- To compare the work of Sir Isaac Newton to our understanding of light.</li> </ul> |                                               |  |

## Working Scientifically

| Key Stage | Terminology                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| KS1       | Question, answer, observe, observing, equipment, identify, classify, sort, group, <b>record</b> (diagram, chart, map), data, compare, contrast, describe, biology, chemistry, physics.                                                                                                                                                                                                                                                                                                  |
| LKS2      | <b>Research</b> (relevant questions, scientific enquiry), comparative and fair test, systematic, careful observation, accurate measurements, <b>equipment</b> (thermometer, data logger), <b>data</b> (gather, record, classify, present), <b>record</b> (drawings, labelled diagrams, keys, bar charts, tables), oral and written explanations, conclusion, predictions, differences, similarities, changes, evidence, improve, secondary sources, guides, keys, construct, interpret. |

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| UKS2 | <p>Plan, variables, measurements, accuracy, precision, repeat readings, <b>report data</b> (scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph and line graph), predictions, further comparative and fair test, <b>report and present</b> (conclusions, causal relationship, explanations, degree of trust, oral and written display, presentation), <b>evidence</b> (support, refute ideas or arguments), identify, classify and describe, patterns, systematic, quantitative measures.</p> |
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