St Luke's CE Primary

Characteristics of a Scientist

At St Luke's CE Primary,
we are scientists…

At St Luke's CE Primary School, we value Science. We believe that science is key to developing children's curiosity and we want our children to work as scientists to develop their way of thinking. All children should and are given the opportunity to discover the wider world which we live in. Here at St Luke's we focus on real life application making science relatable and fun through high quality teaching. Through our engaging and enquiry-based themes for each term, children are able to fully immerse themselves in to exciting and relevant topics. A fundamental role of Science at St Luke's CE Primary is to allow children to discover explain and develop their knowledge and skills through investigations and working scientifically. Our curriculum is a spiral curriculum (It is ambitious and empowers our children to become independent and resilient – like all curriculum areas), which allows the children to become fluent in their knowledge and fully immerse themselves with the new learning. Within these units we use knowledge organisers to recall knowledge and to continuously revisit throughout the year to ensure knowledge is embedded into their long-term memory. Our topics are currently enhanced with site visits, visitors and through our links with the Ogden Trust and the Arch Alliance. The children at St Luke's also have the opportunity to show case their learning and learn from peers in inter-school events such as Science Olympics and the Great Science share.

At St Luke's CE, we are Scientists. We…

- 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.
- are to be familiar with, and use, technical terminology accurately and precisely. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely.
- we are to also apply mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.
- are encouraged to answers to questions through collecting, analysing and presenting data.

EYFS – An Early Scientist	Key Stage 1 – An Early Scientist	Lower Key Stage 2 - A Developed Scientist	Upper Key Stage 2 - A Developed Scientist
Reception • **Human body** - Senses - Growing from babies to adults • **Earth and Space** - Observe seasonal changes with support - Continue to learn about senses • **Animals and humans** - Look at growth basic needs, exercise, food and hygiene with support • **Habitats** - Develop an awareness of the suitability of environments - Compare animals in different countries - Recognise that some environments that are different to the one in which they live • **Materials** - Name and begin to describe properties and changes - Explore the practical uses of everyday materials • **All living things** - Investigate types of animals - Discuss and look at life cycles of a butterfly, bee and frog - Identify and classifying minibeasts	**Year 1** • **Materials** - distinguish between an object and the material from which it is made - identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock - describe the simple physical properties of a variety of everyday materials - compare and group together a variety of everyday materials on the basis of their simple physical properties • **Building things** - Investigate and experiment what materials are best for a specific use • **Seasons and weather** - observe changes across the 4 seasons - observe and describe weather associated with the seasons and how day length varies • **Sound** - Explore senses - Look at what sound is • **Plants** - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - identify and describe the basic structure of a variety of common flowering plants, including trees • **Animal Kingdom** - Investigate types of animals - Investigate differences - Identify, classify and observe - describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	**Year 3** • **Practical Skills** - Working scientifically • **Raw and Synthetic Materials** - Look at raw and synthetic materials - Use of raw and synthetic materials - Look at recycling and the importance of it • **Sound** - Look at sources, vibration, volume and pitch - identify how sounds are made, associating some of them with something vibrating - recognise that vibrations from sounds travel through a medium to the ear - find patterns between the pitch of a sound and features of the object that produced it - find patterns between the volume of a sound and the strength of the vibrations that produced it - recognise that sounds get fainter as the distance from the sound source increases • **Forces** - Describe basic movements - Look at contact and distant forces, attraction and repulsion, comparing and grouping materials - Look at poles, attraction and repulsion. – - Look at the effect of gravity and drag forces. - Look at transference of forces in gears, pulleys, levers and springs • **Plants** - identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - explore the requirements of plants - for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - investigate the way in which water is transported within plants - explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal • **Ecosystems** - Look at the suitability of environments and at food chains - describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and	**Year 5** • **Separating Mixtures** - compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets - know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution - use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating - give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • **Physical and Chemical Changes** - explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda - Work scientifically - Collect, analysis and evaluate data • **Magnetism** - compare how things move on different surfaces - notice that some forces need contact between 2 objects, but magnetic forces can act at a distance - observe how magnets attract or repel each other and attract some materials and not others - compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - describe magnets as having 2 poles - predict whether 2 magnets will attract or repel each other, depending on which poles are facing • **Electrical Circuits** - Look at appliances, circuits, lamps, switches, insulators and conductors - Look at circuits, the effect of the voltage in cells and the resistance and conductivity of materials - identify common appliances that run on electricity - construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers - identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery

		identify and name different sources of food - construct and interpret a variety of food chains, identifying producers, predators and prey	- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • **Humans and Animals Over Time** - describe the changes as humans develop to old age. - look at resemblance in offspring - look at differences in offspring - look at adaptation and evolution - look at changes to the human skeleton over time • **Reproductive Cycles** - Look at the life cycle of animals and plants - Look at reproduction in plants and animals, and human growth and changes
•	**Year 2** • **Light** - Look at sources and reflections - Look at sources use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky. • **Space** - Define space - Identify the planets in the universe - Look at how the Earth rotates - Explore how stars' form constellations. • **Human lifestyles** - Look at growth, basic needs, exercise, food and hygiene. • **Habitats** - explore and compare the differences between things that are living, dead, and things that have never been alive - identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other - identify and name a variety of plants and animals in their habitats, including microhabitats - describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food • **Changing Materials** - identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses	**Year 4** • **Phases of Matter** - compare and group materials together, according to whether they are solids, liquids or gases - observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • **The Rock Cycle** - compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - describe in simple terms how fossils are formed when things that have lived are trapped within rock - recognise that soils are made from rocks and organic matte - look at the water cycle • **Light** - recognise that they need light in order to see things and that dark is the absence of light - notice that light is reflected from surfaces - recognise that light from the sun can be dangerous and that there are ways to protect their eyes - recognise that shadows are formed when the light from a light source is blocked by a solid object - find patterns in the way that the size of shadows changes • **Space** - describe the movement of the Earth, and other planets, relative to the Sun in the solar system - describe the movement of the Moon relative to the Earth - describe the Sun, Earth and Moon as approximately spherical bodies - use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky	**Year 6** • **Chemical Reactions** - Examine the properties of materials using various tests. - Look at solubility and recovering dissolved substances - Examine changes to materials that create new materials that are usually not reversible • **Sustainability** - Explore sustainability - Explore how everyday materials are made - Look at recycling - Discuss global warning and climate change • **Heat** - recognise some common conductors and insulators, and associate metals with being good conductors • **Energy** - Look at energy - Explore how energy is stored, transformed and transferred - Describing motions - speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time) - Investigate and calculate kinetic energy • **Cells** - Identify and name plants and animals. - Look at the life cycle of animals and plants. - Look at classification of plants, animals and microorganisms - Look at the organ systems - Discuss and explore cells (human, animal and plants) • **Diet and Lifestyle** - Look at nutrition, transportation of water and nutrients in the body, and the muscle and skeleton system of

	- compare how things move on different surfaces - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching • **Mixing and making** - Look at phases of matter - Changing states - Discuss and observe the changes of state	• **Adaptations** - Look at changes in animals over time - look at adaptation to environments • **Human Anatomy** - Look at the digestive system in humans - Look at teeth - Look at the human circulatory system	humans and animals - Look at the effect of diet, exercise and drugs