Cycle A

SHAWLANDS PRIMARY SCHOOL

Long Term Year Plan
Science
Cycle A
Even-Odd years (e.g 2022-2023)

Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2\
Nursery	Local Area Walks- Show more confidence in new social situations. Begin to understand the need to respect and care for the natural environment and all living things. Timelines – about my family - Begin to make sense of their own life-story and family's history.	Bonfire Night – Guy Fawkes- Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"	Seasons Melting (changes states of matter) -Talk about the differences between materials and changes they notice.	Plants Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things.	Mini Beasts Begin to understand the need to respect and care for the natural environment and all living things.	Different environments Know that there are different countries in the world and talk about the differences they have experienced or seen in photos. Use a wider range of vocabulary.. Explore how things work.
Reception	Local Area Walks- explore the natural world around them. Describe what they see, hear and feel whilst outside. *Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps*[ELG]. Seasons - Understand the effect of changing seasons on the natural world around them.		Seasons - Understand the effect of changing seasons on the natural world around them. Melting (changes states of matter) – *understand some important processes and changes in the natural world around them, including the seasons and changing states of matter [ELG]*	Plants – *explore the natural world around them, making observations and drawing pictures of animals and plants [ELG]*	Mini Beasts – explore the natural world around them. Describe what they see, hear and feel whilst outside.	Different environments - recognise some similarities and differences between life in this country and life in other countries. Recognise some environments that are different to the one in which we live. *Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class [ELG]*
Year 1 and 2 Investigation	Human body parts and senses. **Senses investigation – identifying objects without sense of touch.**	Weather and seasons. **Measuring rainfall**	Plants – labelling and naming plants. Common wild and garden plants & deciduous and ever green trees. Plant structures.	Materials – everyday materials. **Make and test parachutes.**	Animals – types of animals. Herbivores, carnivores, omnivores. Structure of animals. **Observing animals**	Weather – floods etc. **Investigate the effects of weather on a castle.**
Year 3 and 4 Investigation	Magnets notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing. **Strength of Magnets**	Forces compare how things move on different surfaces **Friction- different surfaces**	Skeleton/Muscles identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Does person with longest legs jump the furthest**	Rocks/Fossils Pupils should be taught to: compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter. **Testing Rocks**	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 an opaque object find patterns in the way that the size of shadows change. **Size of shadows**	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. **Conditions for growth**

Year 5 and 6 **Investigation**	**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 **How do shadows change through the day?** **Nicolaus Copernicus- Proposed that the Sun was the centre of our universe.** **Galileo -created powerful telescopes and spotted distant moons. Galileo was able to prove that the Earth orbited the Sun.** **Katherine Johnson - helped NASA put an astronaut into orbit around Earth. And then she helped put a man on the Moon.**	**Forces** Pupils should be taught to: explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect **How does the size of the parachute change the speed of the fall?** **Isaac Newton - discovered gravity**	**Animals including humans** Pupils should be taught to: describe the changes as humans develop to old age **Comparison of age investigation.** **Child vs adult competition**	**Living things and their habitats** Pupils should be taught to: describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals **Sir David Attenborough- Naturalist and broadcaster** **Sarah Fowler- research identified the global threat to sharks and shares strategies of how we can protect them.**	**Properties and changes of materials** Pupils should be taught to: compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution **Which is the best material for retaining heat?**	**Properties and changes of materials continued** use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda **Which is the best material?**

Cycle B

SHAWLANDS PRIMARY SCHOOL

Long Term Year Plan
Science
Cycle B
Odd-Even years (e.g 2021-2022)

Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Local Area Walks- Show more confidence in new social situations. Begin to understand the need to respect and care for the natural environment and all living things. Timelines – about my family - Begin to make sense of their own life-story and family's history.	Bonfire Night – Guy Fawkes- Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"	Seasons Melting (changes states of matter) -Talk about the differences between materials and changes they notice.	Plants Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things.	Mini Beasts Begin to understand the need to respect and care for the natural environment and all living things.	Different environments Know that there are different countries in the world and talk about the differences they have experienced or seen in photos. Use a wider range of vocabulary.. Explore how things work.
Reception	Local Area Walks- explore the natural world around them. Describe what they see, hear and feel whilst outside. *Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps*[ELG]. Seasons - Understand the effect of changing seasons on the natural world around them.		Seasons - Understand the effect of changing seasons on the natural world around them. Melting (changes states of matter) – *understand some important processes and changes in the natural world around them, including the seasons and changing states of matter [ELG]*	Plants – *explore the natural world around them, making observations and drawing pictures of animals and plants [ELG]*	Mini Beasts – explore the natural world around them. Describe what they see, hear and feel whilst outside.	Different environments - recognise some similarities and differences between life in this country and life in other countries. Recognise some environments that are different to the one in which we live. *Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class [ELG]*
Year 1 and 2 **Investigation**	Materials – compare suitability. Uses of everyday materials – find out how the shapes of solid objects can be changed (e.g. squashing, squeezing). **Which fabric will be best for a superhero cape? (Bank end)**	Humans – exercise, food and hygiene. **Exercise – how heart rate changes.**	Animals including humans – offspring, basic needs of animals. **Visit from baby/child – plan and answer scientific questions** **Butterfly life cycle investigation.**	Plants – observe and describe how seeds and bulbs grow in to mature plants. **Growing bean plants – what plants need to grow**	Living things. Food chains. **Investigation what animals might live in our school grounds. Link to food chains.**	Habitats. **Make and observe a wormery.**
Year 3 and 4 **Investigation**	describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey. **Testing drinks on teeth.**	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) **.Changing materials by heating- record different temperatures/times for whit/milk/dark chocolate**	identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things. **Evaporation- different temperatures** **Record living things in environment-** **Record changes through year**	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. **Sound travelling through different 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 recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors. **Testing circuits- materials for switch**	

Year 5 and 6 **Investigation**	Electricity associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram **Do the number of cells/bulbs affect the brightness?** **Michael Faraday – worlds first electric motor** **Alessandro Volta – invented the first electric cell** **Battled over competing electric power transmission systems (a/c and d/c) and developed the electric light bulb** **Peter Rawlinson – electric vehicles**	Light & shadow recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them **How does the time of day effect the length of shadow? Focus on selecting appropriate graphs.** **Alhazen – pioneer of modern optics. Also invented need for hypothesis.** **Ernesta Jonkute- Developed Vantablack®, a super-black coating that holds the world record as the darkest human-made substance.** **Patricia Bath- co-founded the American Institute for the Prevention of Blindness and invented laser cataract treatment.**	Living things and their habitats (classification) describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals give reasons for classifying plants and animals based on specific characteristics **Which bug house has the best conditions for an insect? Locate around school** **Carl Linnaeus- Developed the modern system of classifying and naming organisms** **Chris Nelson - Director of Growing Underground, which uses hydroponic techniques to grow pesticide-free crops in a central London air-raid shelter.**	Evolution & adaptation recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution Mr Men/Dog DNA – Dog Traits activity **Which beak is the best type?** **Chop sticks, tweezers, spoons,** **Record results on graph** **Alfred Wallace and Charles Darwin- Proponents of evolution by natural selection** **Professor Nazneen Rahman - identifyies genes and genetic factors that increase the risk of cancers**	Animals including humans (circulatory system / healthy lifestyles) identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans **How does exercise affect your heart rate?** **Graph of results** **William Harvey- English physician who was the first to recognize the full circulation of the blood in the human body.** **Karl Landsteiner – founder of human blood groups.**	Research a famous scientist https://planbee.com/products/great-british-scientists (6 sessions)