Bury and Whitefield
JEWISH PRIMARY SCHOOL

Science

Curriculum Overview

Our Curriculum Celebrates

Resilience

Creativity

Critical Thinking

Curiosity

Challenge

Culture

Cycle A			
Autumn			
EYFS	**KS1**	**LKS2**	**UKS2**
All About Me/ Autumn Light and Dark/ Winter	Uses of everyday materials Animals including humans (How they grow and reproduce)	Forces and Magnets Animals including Humans	Properties and Changes of Materials
Spring			
EYFS	**KS1**	**LKS2**	**UKS2**
Colours Spring	Plants (What they need to survive)	Light Rocks	Living Things and their Habitats Light
Summer			
EYFS	**KS1**	**LKS2**	**UKS2**
Life Cycles and Growing Under the Sea	Living things and their Habitats	Plants	Animals, including Humans Evolution & Inheritance

Cycle B			
Autumn			
EYFS	**KS1**	**LKS2**	**UKS2**
Autumn Night and Day Winter	Seasonal Changes	Animals Including Humans States of Matter	Earth and Space
Spring			
EYFS	**KS1**	**LKS2**	**UKS2**
Keeping Healthy Spring	Animals including Humans (Parts of body)	Sound Living Things and their Habitats	Living Things and their Habitats Forces
Summer			
EYFS	**KS1**	**LKS2**	**UKS2**
Planting and Growing The Environment	Plants (Parts) Everyday Materials	Electricity	Animals, including Humans Electricity

In each topic each class will learn about a scientist or inventor that is appropriate to this topic. This is highlighted in each overview of the topic.

There will be STEM sessions incorporated into learning including looking at STEM careers and how science could be used in different real life situations.

Cycle A - KS1

Autumn	Spring	Summer
Topic: Uses of Everyday Materials Overview Children will learn that when choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness. Charles MacIntosh - Invented waterproof fabric – great example of inventing with materials.	**Topic:** Plants (What they need to survive) Overview Children will learn that plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy. Barbara McClintock - Made discoveries in plant genetics—perfect for deeper exploration of how plants grow and adapt.	**Topic:** Living things and their habitats Overview Children will learn that all objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers Rachel Carson - Environmentalist who raised awareness of habitats and conservation.
Topic: Animals including humans (How they grow) Overview Children will learn that animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order		

to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses. Florence Nightingale - Improved healthcare and hygiene – supports learning about the human body and health.		

Cycle A - LKS2

Autumn	Spring	Summer
Topic: Forces and Magnets Overview A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts. William Gilbert - Early researcher on magnetism – helps build foundational knowledge of forces.	**Topic: Light** Overview We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface Ibn al-Haytham - Studied how light travels – considered the “father of optics.”	**Topic: Plants** Overview Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant’s food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth. Joseph Banks - Botanist who explored and classified plants – reinforces plant knowledge and observation.
Topic: Animals Including Humans Overview Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and	**Topic: Rocks** Overview Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The	

muscles which help them move and provide protection and support. Marie Curie - Her work in health and the human body can inspire learning about bones and nutrition.	type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water. Mary Anning - Discovered Jurassic fossils on the British coast—an excellent local historical figure for rocks and fossils.

Cycle A - UKS2		
Autumn	**Spring**	**Summer**
Topic: Properties and Changes of Materials	Topic: Living things and their Habitats	Topic: Animals including Humans
Overview Children will learn that materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.	Children will learn as part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. Plants reproduce both sexually	Overview Children will learn that he heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart

Stephanie Kwolek – Invented Kevlar – shows changing properties and applications of materials.	and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. Carl Linnaeus (again) – Revisiting and extending plant/animal classification.	and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins. William Harvey – Discovered how blood circulates – matches the topic exactly.
	Topic: Light	Topic: Evolution and Inheritance
	Children will learn that light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object. Isaac Newton – Studied light and colour – links well with the science of reflection and spectrum. Zheng Ruocao - Contributed to laser development and optics research—modern, global representation in the field.	Children will learn that over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution. Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics. Children will learn that all living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best

		suited survive in greater numbers to reproduce and pass their characteristics on to their young. Charles Darwin – Father of evolution – essential for explaining adaptation and inheritance.

Cycle B - KS1

Autumn	Spring	Summer
Topic: Seasonal changes	Topic: Animals including Humans (Parts of the body)	Topic: Plants (Parts)
Overview In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until midwinter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. Anders Celsius - Developed the Celsius temperature scale – links to measuring weather changes.	Overview Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. Leonardo da Vinci – Studied human anatomy in detail – introduces careful study of the human body.	Overview Locally there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. Carl Linnaeus - Developed a system to classify plants and animals – introduces naming and sorting.
		Topic: Everyday Materials
		Overview All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. John Boyd Dunlop – Invented the pneumatic tyre – shows everyday use of materials like rubber.

Cycle B - LKS2

Autumn	Spring	Summer
Topic: Animals including Humans Overview Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support. William Beaumont – Pioneered research on human digestion – links directly to the topic.	**Topic: Sound** Overview In this unit, children will learn how sounds are made and how they travel, through carrying out demonstrations of vibrations. They will encounter how sounds are made on a variety of instruments and objects, and how they can be changed in volume, through different materials, and over distance. For instance, by having the opportunity to make a string telephone. The children will explore pitch, and will use their understanding of how to produce high and low sounds. The children will work scientifically and collaboratively, for example, to investigate the best material for soundproofing, in the context of making a music studio quieter. Alexander Graham Bell – Invented the telephone – introduces sound and vibration concepts.	**Topic: Electricity** Overview In this unit about electricity, children will learn about common electrical appliances and how to construct simple series circuits. They will become familiar with the key words linked to the topic and how to apply them appropriately. Children will learn about cells, wires, bulbs and buzzers and about the different types of switches. They will be able to troubleshoot and identify whether or not a bulb will light in a simple series circuit and be able to identify a complete circuit. The children will also learn about conductors and insulators and know that metals are very good electrical conductors. Thomas Edison and Lewis Latimer – inventors of the light bulb.
Topic: States of Matter Overview This 'States of Matter' unit will enable children to learn about the differences between solids, liquids and gases. They will classify objects and identify their properties. The children will work scientifically and collaboratively to explore how water changes state, exploring melting, freezing, condensing. . Furthermore, they will learn about the stages of the water cycle.	**Topic: Living Things** Overview In this unit children explore a variety of ways to identify, sort, group and classify living things. They learn how animals are split into 'vertebrates' and 'invertebrates' and begin to consider the differences between living things within these classifications. They use and create classification keys to group, identify and name living things from the local habitat and beyond. This unit also introduces children to the idea that environments are subject to human-made and natural changes, and that these changes can have a significant	

Daniel Fahrenheit – Developed temperature measurement and thermometers – essential to understanding states.	impact on living things. Throughout the unit children work scientifically by gathering, recording and presenting information in different ways David Attenborough – Famous for documenting life on Earth – ideal for inspiring habitat studies.

Cycle B - UKS2

Autumn	Spring	Summer
Topic: Earth and Space	Topic: Living Things	Topic: Animals including Humans
Overview Children will learn that the Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical. Dr. Maggie Aderin-Pocock - Inspiring contemporary British scientist passionate about space education.	Overview Children will learn as part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. Jane Goodall – Strong example of studying life cycles in animals.	Overview When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. This needs to be taught alongside PSHE. Ben Carson - Famous for separating conjoined twins; great for discussions around the human body and development.
	Topic: Forces	Topic: Electricity
	Overview Children will learn that a force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or	Children will learn that adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open)

	water, or the air and water may be moving over a stationary object. A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines. Isaac Newton - Developed the laws of motion—crucial for foundational understanding of forces.	breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. You can use recognised circuit symbols to draw simple circuit diagrams. Nikola Tesla – Innovated alternating current and electrical circuits – inspires deep understanding.