Science

At the Federation, we are enthusiastic in our approach to teaching Science and each year group endeavours to link their science lessons as closely to the topic as possible. Children are given the opportunity to develop their enquiry skills and scientific knowledge through hands-on activities and practical experiences. Children are encouraged to apply their learning to real-life contexts and to understand the importance and significance of science in everyday life. Current affiliation with the Primary Science Quality Mark (PSQM) scheme is maintaining the profile of science and ensuring that our teaching and learning is celebrated.The annual Science Event is a reflection of how we value science within our community and the broad diversity that it represents. Throughout the year and across the federation we collaborate with a variety of partners on school projects; this is something that the children enjoy enormously.

Red - Concept Cartoon for Cold/Warm task assessment

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	**Nursery** 30 - 50 Months Statements (The World - Understanding of the World) ● **Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.** ● **Can talk about some of the things they have observed such as plants, animals, natural and found objects.** ● **Talks about why things happen and how things work.** ● **Developing an understanding of growth, decay and changes over time.** ● **Shows care and concern for living things and the environment.**					

	Provision - Floating and Sinking - Seasons - Planting/ growing - Forces- Magnets - How to look after minibeasts - Melting/ ice - Ramps and cars - Gardening/ mud kitchen - Observing changes i.e when putting water in dry sand what happens? **Reception** <u>Understanding the World</u> Past and Present ELG Children at the expected level of development will: • Talk about the lives of the people around them and their roles in society; • Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class; • Understand the past through settings, characters and events encountered in books read in class and storytelling; People Culture and Communities ELG Children at the expected level of development will: • Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts, and maps; • Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class; • Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps. The Natural World ELG Children at the expected level of development will: • Explore the natural world around them, making observations and drawing pictures of animals and plants; • 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; • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. ● Provision - Forest School - Basic human bodies/facial features - Exercise & its effect on the body - Healthy eating - Seasonal walks & exploring seasonal items/nature - Sorting man-made and natural resources - Changes in weather - Melting ice/snow - Exploring mixtures - Growing plants/veg - Floating & sinking - Animal habitats - Animal life cycles - Taking care of the environment - Minibeasts
Working Scientifically FOCUS4TAPS	Autumn 1 - Me and my body - Scooping sounds, Senses walk Autumn 2 - Celebrations - Taste tests Spring 1 - On the move - Toy Forces, Forensic footprints Spring 2 - Once upon a time - Mixing materials, Brown apples Summer 1 - In my little garden - Scavenger sort Summer 2 - Minibeasts - Incy Spider, Shelter test Any time - Mixing materials, Making butter, Frozen balloons

Year 1	I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. I can observe changes across the four seasons I can observe and describe weather associated with the seasons and how day length varies. **Seasons picture explanation**	I can distinguish between an object and the material from which it is made I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock I can describe the simple physical properties of a variety of everyday materials I can compare and group together a variety of everyday materials on the basis of their simple physical properties. Spring 2: I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals I can identify and name a variety of common animals that are carnivores, herbivores and omnivores I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) **Which is the best material?**	I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees. I can observe changes across the four seasons focusing on the summer. I can observe and describe weather associated with the summer. I can observe how day length changes during the summer. **Plants – odd 1 out**
Termly Enquiry Opportunities	Who am I / body parts: **Research and classifying** Start changes across the seasons (autumn): **Observation over**	Start changes across the seasons summer: **Observation over time/identifying and classifying.**	Identify and name common animals: fish, amphibians, reptiles, birds and mammals: **Grouping and classifying**

	time/identifying and classifying. Weather : i**dentifying and classifying**	Which material is best for different objects? : **Comparative test** Looking at materials, what are objects: **Comparative test**	Carnivores, herbivores, omnivores: **Grouping and classifying** Start changes across the seasons (spring): **Observation over time/identifying and classifying.** Plants - diary of a plant , basic structure of a sunflower and trees: **Observation over time/identifying and classifying.** Are leaves on trees always bigger than leaves on plants? (order and compare smallest to largest leaves - links to maths vocab): **Pattern matching**
Working Scientifically FOCUS4TAPS	**Autumn Term (Human Body, Senses and Seasonal Change)** **Topic:** Animals including Humans Title: Body Parts Working Scientifically: Use observations and ideas to suggest answers to questions. **Topic:** Plants Title: Leaf looking Working Scientifically: Observing closely. **Spring Term (Materials, Animals and Seasonal Change)** **Topic:** Materials Title: Floating and Sinking Working Scientifically: Perform simple tests to compare and group **Topic:** Materials Title: Ways to test transparency Working Scientifically: Recognise that sorting questions can be answered in different ways. **Topic:** Animals including Humans Title: Animal Classification Working Scientifically: Identify and Classify **Summer Term (Plants and Seasonal Change)** **Topic:** Plants (Outdoor learning: Colour in Nature). Title: Shades of colour in the playground Working Scientifically: Observation **Topic:** Seasons throughout the Year Title: Seasonal Change Working Scientifically: Observe over time and record data to help in answering questions.		

Year 2	I can explore and compare the differences between things that are living, dead, and things that have never been alive I can 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 I can identify and name a variety of plants and animals in their habitats, including micro-habitats I can 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. I can notice that animals, including humans, have offspring which grow into adults I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air) I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Concept Cartoon – food chains 2.3**	I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **Materials – odd 1 out** Our unit of science this half term is focused on animals in their environments, making connections with our Geography learning. We will be covering the following knowledge areas: • Identify how animals survive in the desert, rainforest and polar regions, and explore the conditions that woodlice prefer in their habitat. • Explore the different stages in an animal's life cycle • Explore the living things within our school's microclimate	I can observe and describe how seeds and bulbs grow into mature plants I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy **Concept Cartoon - Seeds in the dark 1.1** Our unit of science this half term is focused on consolidating our learning from our unit on animals, including humans. We will be working scientifically to explore the importance of exercise on humans and consider the right amounts of different foods that humans need to be healthy. We will also look at hygiene and how humans can keep themselves clean.
Termly Enquiry Opportunities	Building and observing snail habitats. Grouping alive, once alive, never alive : **Observation over time/identifying and classifying.** Do taller people have bigger hands?	Materials- testing materials for waterproof. Testing how the shape of materials can be changed (twisting, pulling, pushing): **Comparative Testing** Animals and their habitats- which animals	What do plants need to grow healthily? **Comparative test** Do bigger seeds grow into bigger plants? **Pattern seeking/ observation over time.**

	Pattern seeking Food groups:**Grouping and classifying**	belong to which habitat. Researching how they survive : **Researching.**	BFG linked experiments. **Perform simple tests**
Working Scientifically FOCUS4TAPS	**Autumn 1 (Living things and their habitats)** - Living and nonliving (Review, Conclusion and Evaluate) Animal Home build (Plan: Ask questions and plan enquiry), Nature Spotters??? **Autumn 2 (Animals including humans)** - The Feeding Simulation (Plan: Set up and predict), _____ **Spring 1 (Materials)** - Material hunt (Do, Record), Waterproof (Plan, Ask simple questions and recognise that they can be answered in different ways) Rocket Mice (Plan: Set up and predict) **Spring 2 (Living things and their habitats)**- woodlice habitats (Do Record), Ice Escape (Do, observe and measure) **Summer 1 (Plants)** - plant growth (Do, Observe and Measure), _____ **Summer 2 (Animals including humans)**- handspan (Review, Conclusion and Evaluate), _____		
Year 3	I can notice that some forces need contact between two objects, but magnetic forces can act at a distance I can observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles I can predict whether two magnets will attract or repel each other, depending on which poles are facing. I can 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 I can compare how things move on different surfaces	I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers I can explore the requirements of plants for life and growth light, water, nutrients from soil, and room to grow) and how vary from plant to plant I can investigate the way in which water is transported with plants I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Concept Cartoon – plants 1.5**	I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties I can describe in simple terms how fossils are formed when things that have lived are trapped within rock I can recognise that soils are made from rocks and organic matter. **Rock prediction**

	Concept Cartoon – magnets 6.3 I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.	I can 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 **Nutrition odd 1 out**	I can recognise that we need light in order to see things and that dark is the absence of light. I can notice that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes. I can recognise that shadows are formed when the light from a light source is blocked by a solid object. I can find patterns in the way that the size of shadows change. **Concept Cartoon – Light 7.1**
Termly Enquiry Opportunities	Magnets/forces - Friction, pushes and pulls - changing variables (materials/distance): **Fair testing** Muscles and skeletons - Do all animals have the same skeleton?: **Research**	Topic link - Mummifying a tomato : **Observing over time/fair testing** How does water travel? Food dye experiment : **Pattern seeking Observation over time** Nutrition/Digestive system:**Identifying and**	Physical properties of rocks: **Identifying and classifying / Fair testing** Explain how and why rocks change over time: **Research/observation**

		classifying	Fossils **Research** Soils: **identifying and classifying** Light and dark - natural/manmade light emitters/reflectors: **Identifying and classifying** How does a shadow change? Shadow puppets (English link): **Observing over time**
Working Scientifically FOCUS4TAPS	AUTUMN 1 - Forces ● Cupcake parachutes (Ask Qs and plan enquiry) ● Magnet tests (Set up + predict) ● Cars down ramps (Record) ● Balloon rockets (Evaluate) AUTUMN 2 - Animals (including humans) ● Investigating skeletons (Ask Qs and plan enquiry) SPRING 1 and 2 - Plants ● Measuring plants (Observe and measure) ● Plants close obs (Observe and measure) SUMMER 1 - Rocks, fossils and soils ● Rock reports - (Interpret + Report) SUMMER 2 - Light ● Making shadows (Record)		

Year 4	I can describe the simple functions of the basic parts of the digestive system in humans **Digestive system odd 1 out** I can identify the different types of teeth in humans and their simple functions **Concept Cartoon – solids, liquids, gases 3.4**	I can identify common appliances that run on electricity I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers I can 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 I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit I can recognise some common conductors and insulators, and associate metals with being good conductors. **Concept Cartoon – electricity 5.1**	I can identify how sounds are made, associating some of them with something vibrating I can recognise that vibrations from sounds travel through a medium to the ear I can find patterns between the pitch of a sound and features of the object that produced it I can find patterns between the volume of a sound and the strength of the vibrations that produced it I can recognise that sounds get fainter as the distance from the sound source increases. **Concept Cartoon – sound 8.2**	I can construct and interpret a variety of food chains, identifying producers, predators and prey.	I can compare and group materials together, according to whether they are solids, liquids or gases I can 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)	I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
Termly Enquiry Opportunities	Understanding what tooth decay is and how to prevent it - chn use eggs, and	Interactive circuits. Experiments to find out what things you would need to	Experimenting with different ways to make sound.	Living things and their habitats Classifying and grouping animals	Balloon weighing to explore the 'weight' of gas: **Fair testing**	Environmental issues - **Researching and**

	toothpaste to see changes over time and the effect of toothpaste: **Observing over time**	complete different types of circuits : **Fair testing**	**Pattern seeking** Effect of using a string telephone on volume; Different sound insulation : **Fair testing**	and plants into groups according to characteristics using a Classification Key. **Identifying and classifying**	Observing condensation (and evaporation): **Observing over time**	**Pattern Seeking**
Working Scientifically FOCUS4TAPS	Autumn term 1 - Digestion and Teeth observe and measure Autumn 2 - electricity set up and enquiry evaluate Spring 1 - sound evaluate and ask questions and plan enquiry Spring 2 - Living things and their habitats, living in environments interpret and report Summer 1 - states of matter Observe and measure and recording Summer 2 - environmental change Interpret and report					
Year 5	I can 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 I know that some materials will dissolve in liquid to form		I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system I can describe the movement of the Moon relative		I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird I can describe the life process of	

	a solution, and describe how to recover a substance from a solution I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic I can demonstrate that dissolving, mixing and changes of state are reversible changes I can 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. **Concept Cartoon – materials 4.5**	to the Earth I can describe the Sun, Earth and Moon as approximately spherical bodies I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky **Concept Cartoon – Earth 9.11** I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Concept Cartoon – forces 6.11**	reproduction in some plants and animals. I can describe the changes as humans develop to old age. **Draw and label life cycle of a frog**
Termly Enquiry Opportunities	Properties and changes of materials - How does the size of the solute affect the rate of dissolving? (Jelly cubes). How does the type of chocolate affect the melting rate? (chocolate frogs): **Fair testing**	Planets: **research** Shadow stick investigation: **Observing over time**	How do plants change as they grow? **Observing over time.** Animal life cycles and reproduction - using keys to classify plants and animals: **Identifying and classifying.**

		Forces - DO BIGGER MAGNETS EXERT A STRONGER FORCE? (paper clip challenge): **Pattern Seeking**	
Working Scientifically FOCUS4TAPS	A1: A2: Cleaning Coins, Sp1: Space craters, Space travel Qs Sp2: Aquadynamics, Spinner Dropping Sum1: Seed dispersal Sum2: Life cycles, Human growth survey		
Year 6	I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood I can describe the ways in which nutrients and water are transported within animals, including humans **Concept Cartoon – circulation 1.4**	I can 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 I can give reasons for classifying plants and animals based on specific characteristics. **Classification** I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents I can identify how animals and plants are adapted to suit their environment in different ways and that	I can 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 I can 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 I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Concept Cartoon – light 7.3** I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit I can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off

		adaptation may lead to evolution. **Evolution and inheritance odd 1 out**	position of switches I can use recognised symbols when representing a simple circuit in a diagram. **Concept Cartoon – electricity 5.7** I can recognise the impact of drugs on the way bodies function (*this will be addressed through the PSHE curriculum)*
Termly Enquiry Opportunities	Circulatory system - analyse the change in heart rate over time: **Observing over time.** Investigations - carrying out different experiments (does a plane fly further, depending on paper type, size etc?) Children plan, conduct and evaluate their own experiments. **Fair testing**	Classifying plants and animals based on their characteristics. **Identifying and classifying.** Evolution and Inheritance/Fossils **Identifying and classifying.** As part of this unit, the children find out about Charles Darwin and his findings. **Researching**	Electricity - do higher voltage batteries create a brighter light? **Pattern seeking.** Light - carry out experiment to identify what causes changes in shadow sizes. **Fair testing.**
Working Scientifically FOCUS4TAPS	Autumn 1: Stationery exercise and heart rate. TAPS: Heart rate poses (Focus: Make predictions and set up a fair test)	TAPS: Create own adapted animal (Focus: report and present) TAPS: Creating keys (Focus: record data)	TAPS: Bulb brightness (Focus: plan an enquiry and control variables) TAPS: Investigating shadows (Focus: recording measurements and plotting data focus)

	TAPS: Digestion modelling (Report collaboratively/individually)		