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	Exploring the natural world around them. Noticing and learning about the different seasons. Drawing plants and animals. Exploring how things work. Predicting what might happen next. Learning about life cycles. Setting up science activities in continuous and enhanced provision e.g. floating and sinking activity, magnets etc. Sharing stories and non-fiction books about the weather / people and bodies. Recording data e.g. pictures, numbers, tally lines.					

	Core provision - mud kitchen, forest school, gardening, sand, water, construction, exploring natural materials, playdough, vehicles, baking, high-quality selected texts		
Working Scientifically FOCUS4TAPS **Reception**	Autumn 1 - Marvellous Me - Scooping sounds, Senses walk Autumn 2 - Celebrations - Taste tests Spring 1 - On the move - Toy Forces, Forensic footprints Spring 2 - Journeys - 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		
Early Learning Goals - expectation at end of EYFS: **Communication and language (Speaking)** ● Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. **Understanding the world (The natural world)** • 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.			
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	I can distinguish between an object and the material from which it is made I can identify and name a variety of	I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

	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**	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?** **Animals including Humans**	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 summer: **Observation over time/identifying and**	Identify and name common animals: fish, amphibians, reptiles, birds and mammals:

	Start changes across the seasons (autumn): **Observation over time/identifying and classifying.** Weather : i**dentifying and classifying**	**classifying.** Which material is best for different objects? : **Comparative test** Looking at materials, what are objects: **Comparative test**	**Grouping and classifying** 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	**<u>Autumn Term (Human Body, Senses and Seasonal Change)</u>** **<u>Topic:</u>** Animals including Humans Title: Body Parts Working Scientifically: Use observations and ideas to suggest answers to questions. **<u>Topic:</u>** Plants Title: Leaf looking Working Scientifically: Observing closely. **<u>Spring Term (Materials, Animals and Seasonal Change)</u>** **<u>Topic:</u>** Materials Title: Floating and Sinking Working Scientifically: Perform simple tests to compare and group **<u>Topic:</u>** 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	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,	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

	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**	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	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? **Pattern seeking** Food groups:**Grouping and classifying**	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 belong to which habitat. Researching how they survive : **Researching.**	What do plants need to grow healthily? **Comparative test** Do bigger seeds grow into bigger plants? **Pattern seeking/ observation over time.** 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 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 and growth (air, light, water, nutrients from and room to grow) and how they vary from plant to plant I can investigate the way in which water is transported within 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** I can recognise that we need light in order to see things and that dark is the absence of light.

	I can compare how things move on different surfaces **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 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 classifying**	Physical properties of rocks: **Identifying and classifying / Fair testing** Explain how and why rocks change over time: **Research/observation** 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	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	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.	

		circuit I can recognise some common conductors and insulators, and associate metals with being good conductors. **Concept Cartoon – electricity 5.1**	increases. **Concept Cartoon – sound 8.2**			
Termly Enquiry Opportunities	Understanding what tooth decay is and how to prevent it - chn use eggs, and toothpaste to see changes over time and the effect of toothpaste: **Observing over time**	Interactive circuits. Experiments to find out what things you would need to complete different types of circuits : **Fair testing**	Experimenting with different ways to make sound. **Pattern seeking** Effect of using a string telephone on volume; Different sound insulation : **Fair testing**	Living things and their habitats Classifying and grouping animals and plants into groups according to characteristics using a Classification Key. **Identifying and classifying**	Balloon weighing to explore the 'weight' of gas: **Fair testing** Observing condensation (and evaporation): **Observing over time**	Environmental issues - **Researching and Pattern Seeking**
Working Scientifically FOCUS4TAPS	Autumn term 1 - Digestion and Teeth: Engaging with scientific and technological evidence (research) Autumn 2 - electricity set up and enquiry evaluate: Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.					

	Spring 1 - sound evaluate and ask questions and plan enquiry. Making Predictions. Spring 2 - Living things and their habitats, living in environments interpret and report: Classifying data in a variety of ways to help in answering questions. Summer 1 - states of matter: Setting up a fair test. 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 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	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 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	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**	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 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**

	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**	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**		
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** Forces - DO BIGGER MAGNETS EXERT A STRONGER FORCE? (paper clip challenge): **Pattern Seeking**		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.**
Working Scientifically FOCUS4TAPS	A1: Dunking biscuits - evaluating methods and suggesting how investigations could have been improved. A2: Cleaning Coins - evaluating the reliability of methods and suggesting possible improvements.			

	Sp1: Space craters, Space travel Qs Sp2: Aquadynamics, Spinner Dropping - Measuring and taking repeated readings. Sum1: Seed dispersal - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar graphs. Sum2: Life cycles, Human growth survey: Report and present findings from enquiries, in oral and written forms such as displays and other presentations, using appropriate scientific language.		
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	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

		their parents I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Evolution and inheritance odd 1 out**	variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off 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: Digestion modelling (Report collaboratively/individually)	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)