Whole School Curriculum Progression Plan

Subject: Science **Subject Leader: Nicola Bywater** **Year group: Whole School**

Whole School Overview:

	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
EYFS	Animals including humans Seasonal changes	Materials Animals including humans	Seasonal changes Materials	Seasonal changes Forces	Materials Plants	Seasonal changes Plants
Year 1	Animals, including humans	Seasonal changes	Everyday materials	Seasonal changes	Plants	Recap as necessary / investigations
Year 2	Animals, including humans	Everyday materials	Living things and their habitats	Living things and their habitats	Plants	Recap as necessary / investigations
Year 3	Forces and magnets	Animals, including humans	Rocks	Plants	Light	Recap as necessary / investigations
Year 4	Living things and their habitats	Electricity	Animals, including humans	States of Matter	Sound	Recap as necessary / investigations
Year 5	Earth and space	Forces	Living things and their habitats	Animals, including humans	Properties and changes of materials	Recap as necessary / investigations
Year 6	Light	Electricity	Living things and their habitats	Animals including humans	Evolution and inheritance	Recap as necessary / investigations

Whole School Vocabulary Map:

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**Animals, including humans (1)** head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, meat, plants, animal, human,	**Seasonal changes (1)** Table, weather, length of day, season, winter, autumn, dress, temperature, wind, rain, danger	**Everyday materials (1)** hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; see-through / not see-through; wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil, material, object	**Seasonal changes (2)** Table, weather, length of day, season, summer, spring, dress, temperature, wind, rain, danger	**Plants (1)** Deciduous and evergreen trees, plant, leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem	**Recap as necessary / investigations**
Year 2	**Animals, including humans (2)** Baby, toddler, child, teenager, adult, elderly, nutrition, exercise, hygiene, survival, life cycle, offspring, reproduce	**Everyday materials (2)** Twist, scientists, stretch, bend, purpose, categorise, material, properties, squash	**Living things and their habitats (1)** Habitat, microhabitat, living, dead, plant, animal		**Plants (2)** Seed, bulb, life cycle, spout, spreading, growth, life cycle, plant, leaves, shoot	**Recap as necessary / investigations**
Year 3	**Forces and magnets (1)** Surface, forces, magnetic force, contact, friction, magnet, pole, magnetic, magnetic field, repel, attract, balanced, unbalanced	**Animals, including humans (3)** Protection, support, movement, skeleton, vertebrae, joints, contract and relax, fats, carbohydrates, fruit and vegetables, protein, dairy, rib cage, skull	**Rocks (1)** Classify, mass, texture, fossils, organic matter	**Plants (2)** Flowering plant, attract, support, anchor, function, reproduction, pollination, seed formation and seed dispersal, life cycle, roots, stem, leaves, flower, nutrients, fertilisation, petal, pollinator, germination, absorb	**Light (1)** Dark, absence, reflect, opaque, transparent, translucent, shadow	**Recap as necessary / investigations**

Year 4	**Living things and their habitats (2)** fish, amphibians, birds, mammals, invertebrates, vertebrates, insects, habitat, classify, environment, flowering plant, non-flowering plant, impact, deforestation	**States of Matter(1)** Evaporation, condensation, gas, solid, liquid, particles, temperature, degrees Celsius, water cycle, state	**Sound (1)** Pitch, volume, vibrate, particles, distance, high / low, loud / quiet, materials	**Electricity (1)** Bulb, switch, conductor, insulator, safety, circuit, closed / open circuit, electrical appliance, simple series, wires, buzzers, cell, battery, electricity, current, component	**Animals, including humans (4)** Herbivore, omnivore, carnivore, oesophagus, stomach, large and small intestines, digestive system, teeth, molar, premolar, incisor, canine, tooth decay, producer, prey, predator, food chain, digest, rectum	**Recap as necessary / investigations**
Year 5	**Earth and space (1)** Earth, planet, moon, solar system, geocentric model, heliocentric model, sphere, astronomical clock, sun, star, satellite, orbit, rotate, axis,	**Forces (2)** Gravity, air resistance, friction, water resistance, gravitation, lever, pulley, gears, weight, mass, buoyancy, streamlined, cogs	**Living things and their habitats (3)** Amphibian, mammal, insect, bird, gestation, pollination, reproduction, fertilise, life cycle, metamorphosis	**Animals, including humans (5)** Puberty, adolescent, gestation period, pre-natal, mammal, reproduce, life cycle, adulthood	**Properties and changes of materials (1)** Hardness, solubility, transparency, conductivity, thermal, dissolve, solution, substance, mixture, filter, reversible change, irreversible change	**Recap as necessary / investigations**
Year 6	**Light (2)** Reflect, straight line, light source, periscope	**Electricity (2)** Voltage, symbols, motors, components, electrical circuit, open / closed circuit, current, function, cell, battery, diagram	**Living things and their habitats (4)** fish, amphibians, birds, mammals, invertebrates, vertebrates, insects, habitat, classify, environment, flowering plant, non-flowering plant, classification	**Animals including humans (6)** Circulatory system, heart, blood vessels, drugs, lifestyle, nutrients, substance, oxygenated, veins, arteries	**Evolution and inheritance (1)** Inheritance, genes, adaptation, evolution, fossil, generation	**Recap as necessary / investigations**

Early Years Foundation Stage

Statutory Educational Program – Understanding the World

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society, such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Early Learning Goal – 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.

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**.**

Reception

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject content Progression in green Ideas in orange Working Scientifically					
Animals including humans (B) Learn new vocabulary in relation to their own features and bodies. Draw and paint self portraits using mirrors to look carefully at features. Compare their features to their friends. ▲ Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing Jigsaw, PE and topic lessons. Compare their features to their friends. ▲ **Seasonal changes** (P) Explore the natural world around them. Describe what they see, hear and feel while they are outside. Understand the effect of the changing seasons on the natural world around them. Autumn walk around the school environment. Explore collections of materials with similar and/or different properties. ▲ ▲ ▲	**Materials** (C) Learn new vocabulary in relation to materials e.g. liquid, solid, gas. Articulate their ideas and thoughts in well-formed sentences. Describe what they saw using some detail. Melting chocolate to make Christmas themed sweets. Children to use observation skills and discuss what they see. ▲ **Animals including humans** (B) Learn new vocabulary in relation to animals that live in the cold. Recognise some environments that are different to the one in which they live. Draw their environment and an Arctic environment. Draw an Arctic animal and identify the features specific to their environment e.g. white fur, blubber etc Compare the features. ▲ ▲	**Seasonal changes** (P) Explore the natural world around them. Describe what they see, hear and feel while they are outside. Understand the effect of the changing seasons on the natural world around them. Winter walk around the school environment (Beginning of Spring 1). Explore collections of materials with similar and/or different properties and compare them to the photos and items taken from the Autumn walk. ▲ ▲ ▲ **Materials** Learn new vocabulary in relation to materials e.g. floating and sinking. Articulate their ideas and thoughts in well-formed sentences. Describe what they saw using some details. Explain how things work and why they might happen. Floating and sinking to find a material that would be good for a pirate ship. Group work based on properties – testing and discussing observations. ▲	**Seasonal changes** (P) Explore the natural world around them. Describe what they see, hear and feel while they are outside. Understand the effect of the changing seasons on the natural world around them. Ask questions to find out more. Spring walk around the school environment (End of Spring 2). Explore collections of materials with similar and/or different properties and compare them to the photos and items taken from the Autumn and Winter walks. ▲ ▲ ▲ **Forces** (P) Learn new vocabulary in relation to materials e.g. magnets, magnetic. Articulate their ideas and thoughts in well-formed sentences. Describe what they saw using some details. Explore and talk about forces they feel Finding magnetic objects. Group work based on properties – testing and discussing observations. ▲	**Materials** (C) Learn new vocabulary in relation to materials e.g. dissolve. Articulate their ideas and thoughts in well-formed sentences. Describe what they saw using some details. Explain how things work and why they might happen. Understand some processes in relation to changes of states of matter. Ask questions to find out more and to check what has been said to them. What would happen if a letter fell in the river? Children to make predictions based on previous knowledge. Group work based on properties – testing and discussing observations ▲ **Plants** (B) Understand the key features of the life cycle of a plant. Plant a seed and care for it while it grows. Children observe changes over time. ▲ ▲	**Seasonal changes** (P) Explore the natural world around them. Describe what they see, hear and feel while they are outside. Understand the effect of the changing seasons on the natural world around them. Begin to understand the need to respect and care for the natural environment and all living things. Summer walk around the school environment. Explore collections of materials with similar and/or different properties and compare them to the photos and items taken from the Autumn, Winter and Spring walk. ▲ ▲ ▲ **Animals including humans** (B) Learn new vocabulary in relation to life cycles. Recognise different stages of growth. Draw a lifecycle of an animal. Compare the features. ▲ ▲

AIMS

B C P develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics

● are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

KS1 Working Scientifically - aim 2: 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

▲ asking simple questions and recognising that they can be answered in different ways

▲ observing closely, using simple equipment

▲ performing simple tests

▲ identifying and classifying

▲ using their observations and ideas to suggest answers to questions

▲ gathering and recording data to help in answering questions

Year 1

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject content Progression in green Ideas in orange Working Scientifically					
Animals including humans (1) B identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals use the garden and field to find different animals - use pictures and what they observe to name animals. What other questions do you want to ask about the animals? identify and name a variety of common animals that are carnivores, herbivores and omnivores group animals based on what they eat – plants, animals or both (Scientific lang. in Animals including humans (4)) describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) compare and contrast animals – looks, sizes, ears, number of legs, ears, mouths, whiskers, scales identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense use songs to know the parts of the body then label and draw human bodies - head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth	**Seasonal changes (1)** P observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies discuss autumn and winter – leaves changing, weather, lengths of days, how we should dress weather chart each term table of weather observations throughout the week– temperature, wind, rain	**Everyday materials (1)** P - distinguish between an object and the material from which it is made name objects and the materials that they're made from have materials for children to see and match the object to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock children to recognise the materials and have chances to feel and experience them. Use of magnifying glasses. describe the simple physical properties of a variety of everyday materials hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent group materials based on the properties – testing and discussing observations compare and group together a variety of everyday materials on the basis of their simple physical properties group objects based on the properties – testing and discussing observations 'What is the best material for an umbrella? … for lining a dog basket? … for curtains? … for a bookshelf? … for a gymnast's leotard?' – explain using the properties learnt	**Seasonal changes (2)** P observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies discuss spring and summer – weather, lengths of days, how we should dress, dangers of the sun and looking at the sun (sun cream and glasses) discuss weather chart table of weather observations throughout the week – temperature, wind, rain	**Plants (1)** B identify and name a variety of common wild and garden plants, including deciduous and evergreen trees children to observe plants growing and discuss what they see compare and contrast features of different plants – using magnifying glasses What is a plant? Prove it Look at leaves / patterns identify and describe the basic structure of a variety of common flowering plants, including trees plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem) compare the parts of the same plant at different times of the year – how do plants change?	**Recap as necessary / investigations**

Year 2

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject content Progression in green Ideas in orange Working Scientifically					
Animals including humans (2) B notice that animals, including humans, have offspring which grow into adults life cycle of a human – how humans grow throughout their lives. Baby, toddler, child, teenager, adult, elderly. This is a cycle and continues to go round Life cycle of different animals (fish, dog, butterfly) Measure and compare the size of different people in school – use of tape measures, metre sticks and rulers Be given measurements to compare for animals at different ages find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ask questions about survival of animals and suggest ways to find this out – research using the internet? describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene importance of exercise, hygiene and nutrition – what happens if we don't do these things? (Unfit, dirty, illness, lazy) Don't use food groups but discuss healthy food and unhealthy food. research and present findings of their own	**Everyday materials (2)** P C identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses children given different objects to Y1 – which material is best? Why? Which material is used for most / least objects? Why do you think this happens? Can objects be made by more than one material? Why does this have to be the case? (e.g. spoons) Research scientists who have developed new materials - John Dunlop, Charles Macintosh or John McAdam find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching children to recognise the materials and have chances to feel and experience them – which materials can we bend, twist and stretch? Present findings and group objects	**Living things and their habitats** B explore and compare the differences between things that are living, dead, and things that have never been alive classify, using a table, things depending on whether they are living, dead or never been alive. Search outside for things which are living, dead or never been alive explore questions like: 'Is a flame alive? Is a deciduous tree dead in winter?' Distinguish between living (breathe, eat, reproduce, move, grow), dead (have lived before) or 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 understand the difference between a habitat and a microhabitat understand what animals need to be alive and how habitats provide these things e.g. logs identify and name a variety of plants and animals in their habitats, including microhabitats go on a mini beast hunt / plant using magnifying glasses and identify where they live and why – what conditions make these the best places? 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 develop simple food chains including a plant and two animals e.g. grass, cow, human	**Plants (2)** B observe and describe how seeds and bulbs grow into mature plants observe plants growing from a seed / bulb – use magnifying glasses to identify timely differences and complete a table using the times and differences – measure the height of the plant each day life cycle of a plant based on observations – spreading of seeds, spouting and growing – scientific vocab not needed at Y2 find out and describe how plants need water, light and a suitable temperature to grow and stay healthy Expt: one plant has everything, one no water, one no light, one no heat – what's the difference? How did the removals change the plants growth? Why do bulbs / seeds grow with no light? They have a food source in them – light is used to make food which is why the leaves don't go green	**Recap as necessary / investigations**

AIMS

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Lower KS2 Working Scientifically - aim 2: 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

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

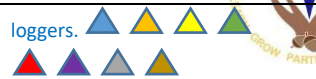
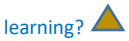
Year 3

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject content Progression in green Ideas in orange Working Scientifically					
Forces and Magnets (1) P compare how things move on different surfaces move wheels (e.g. toy car) along different surfaces – wood, carpet, chair, foil, cotton wool, mirror notice that some forces need contact between 2 objects, but magnetic forces can act at a distance how do cars slow down? Relate friction to contact and gravity magnetic forces to non-contact Relate to park – where do we need to use contact? Push the roundabout. Don't use contact? Fall off the monkey bars. Children to draw explanations. observe how magnets attract or repel each other and attract some materials and not others Predict which materials will be magnetic and why then test the materials. Surprises? Looking at opposite poles. Work in pairs / groups to tell each other predictions and results. compare and group together a variety of everyday materials on	**Animals including humans (3)** B 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 we have to eat for our nutrition – plants make their own food Learn food groups and the amounts of each we need food groups – categorise foods and put on a graph how much of each food we should eat identify that humans and some other animals have skeletons and muscles for support, protection and movement use straws to model movement – the bends are the joints parts of the skeleton to protect – skull, rib cage, main joints to move – ankle, knee, elbow, support – vertebrae muscles move through contracting and relaxing compare animals with and without skeletons – how do they move? What would happen if humans had no skeleton? Vertebrae and invertebrate	**Rocks (1)** P compare and group together different kinds of rocks on the basis of their appearance and simple physical properties rock hunt outside – how can we classify the rocks? Looks, texture, mass – use microscopes, scales, water for whether or not it can float, rubbing the rocks together presenting findings to the class describe in simple terms how fossils are formed when things that have lived are trapped within rock B Bread and jelly worm investigation – explain what has happened and how this relates to fossils over thousands of years. Weigh the bread before and after to compare. Present results and conclusions. recognise that soils are made from rocks and organic matter use flow charts to identify different types of soils and rocks collected from the school field / gardens	**Plants (3)** B identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers functions of the parts of a plant, everything has a job to do – should know the parts from Y1 plants make their own food – children do not need to know how 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 expt as with Y2 – no air, no nutrients (soil), no room to grow (two different types of plant per control to explore differences) Present results and conclusions orally to the class in groups investigate the way in which water is transported within plants food colouring in carnations – observe the water travel through the stem and to the flower. Measure the amount of food colouring / water.	**Light (1)** P recognise that they need light in order to see things and that dark is the absence of light take children into the cupboard without light - what happens? Children to write conclusion about the darkness notice that light is reflected from surfaces children to investigate different materials –reflect, transparent, opaque, translucent? What type of surface does light reflect off? Children to share results and conclusions in groups orally. recognise that light from the sun can be dangerous and that there are ways to protect their eyes warning that light can be dangerous even with glasses – poster / leaflet / assembly warning others? recognise that shadows are formed when the light from a light source is blocked by an opaque object children to investigate and define what a shadow is thinking about darkness and how they're formed	**Recap as necessary / investigations**

the basis of whether they are attracted to a magnet, and identify some magnetic materials Predict which materials will be magnetic and why then test the materials. Surprises? Looking at opposite poles. Work in pairs / groups to tell each other predictions and results.  describe magnets as having 2 poles predict whether 2 magnets will attract or repel each other, depending on which poles are facing using iron filings to show the magnetic field. Draw results and conclusions. 			explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal more detailed life cycle using the scientific vocab – include how flowers are used for the growth different types of seed dispersal make own seed – how will it pollinate?	find patterns in the way that the size of shadows change measure size of shadows on playground throughout the day or pencil shadows changing depending on the distance away from the light – why does this happen? 	

Year 4

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject content Progression in green Ideas in orange Working Scientifically					
Living things and their habitats (2) B 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 use a quadrant to identify living things in the school field / garden and classify what they find – group different types of plants and animals recognise different animal / plant groups – fish, amphibians, birds, mammals, invertebrates, vertebrates, insects, flowering plant, non-flowering plant (learn the scientific terms) raising and answering questions based on their observations of animals recognise that environments can change and that this can sometimes pose dangers to living things explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation	**Electricity (1)** P identify common appliances that run on electricity Discuss and show children electrical appliances in schools / work places / houses / factories. How do we keep safe using electricity? Leaflet to show how to keep safe. construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Symbols can be introduced but only to draw circuits in books – children to use a key Make 'children circuits' to name the different parts 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 children to make set circuits and explain why they do / don't work Create own investigation: how do more bulbs / more wires affect the brightness of a bulb? Different groups to explain what they found and compare the results as a class. Make 'children circuits' – would the light come on? Why/why not? Holding hands, straight line. recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit children to investigate with switches – do the circuits work or	**Animals including humans (4)** B describe the simple functions of the basic parts of the digestive system in humans mouth, tongue, teeth, oesophagus, stomach, large and small intestines with their functions locate in the body compare digestive systems in different animals. Written explanations. identify the different types of teeth in humans and their simple functions molar, incisors, canines, premolars – label and describe the functions how should we look after our teeth? Plaque. Relate to different food groups from Animals including humans (3) compare teeth in different animals – herbivores and carnivores what damages teeth and how can we look after them? Egg in coke expt. Measure mass of the glasses with coke and egg at different stages of the investigation. construct and interpret a variety of food chains, identifying producers, predators and prey understand producers, prey and predator – starts of food chains are usually producers explain food chains make own food chains using knowledge about animals and their		**States of matter (1)** C compare and group materials together, according to whether they are solids, liquids or gases investigate different materials and know that solids hold their shape; liquids form a pool not a pile and gases escape from an unsealed container – children should be able to categorise given materials Children to have a basic understanding of particles in a solid, liquid and gas to be able to give scientific explanations 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) measure the temperature (using a thermometer) at which chocolate / ice / candles / crayons / ice with salt in / ice cream / butter melt. Draw a bar chart to show the temperatures. Children to measure in groups then listen and explain findings of each of the groups and write up explanation. identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature P observe and record evaporation over a period of time – use evaporation basins / puddles in the playground. Draw bar chart to show the amount of water measures each	**Sound (1)** P identify how sounds are made, associating some of them with something vibrating explain how instruments / classroom noises work using vibrations recognise that vibrations from sounds travel through a medium to the ear C use particles from states of matter to explain how sounds travel find patterns between the pitch of a sound and features of the object that produced it understand pitch – high / low and difference to volume thickness of elastic bands making different pitches, sizes of saucepans making different pitches – measure using data loggers? use this information to investigate pitch in different instruments find patterns between the volume of a sound and the strength of the vibrations that produced it how can we make sounds quieter and why? Best material for ear muffs – best insulation for sound. Measure sound using data

	not and why / why not? Written explanations.  Make 'children circuits' – would the light come on? Why/why not? recognise some common conductors and insulators, and associate metals with being good conductors investigate different materials within a circuit – do they allow electricity to flow through or not? Why / why not? Written explanations.  Metals make good conductors generally – what are the exceptions?	foods – include 4 or more animals per food chain		day. Write an explanation of what has happened.  observe evaporation and condensation using cling film over a bowl – children to explain what's happening and relate to the water cycle 	loggers.  recognise that sounds get fainter as the distance from the sound source increases on field – how far away can you stand before you can't hear a sound? What's the same between everyone's results? What's different?  Make instruments based on all learning? 

AIMS

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Upper KS2 Working Scientifically - aim 2: 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

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

Year 5

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject content Progression in green Ideas in orange Working Scientifically					
Earth and Space (1) P describe the movement of the Earth and other planets relative to the sun in the solar system act out using children the movement of the planets and non-movement of the sun understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus – research and present findings describe the movement of the moon relative to the Earth act out using children Put on a scatter graph the number of moons each planet has 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 act out using children the movement of the planets and non-movement of the sun – explain day and night research how Stonehenge may have been used as an astronomical clock Compare the time across Earth and present on a scatter graph	**Forces (2)** P explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Measuring the force of different objects using newton metres. Predictions based on previous findings. Research how Galileo Galilei and Isaac Newton helped to develop the theory of gravitation identify the effects of air resistance, water resistance and friction, that act between moving surfaces making parachutes – different sizes – which falls slowest, why? Present data on line graph As Y3 expt. using different surfaces but explaining using friction Design and test a boat using the idea of water resistance recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect Model using a door – where is the door easiest to push? Why? Design and make a car which uses gears – which gear do you need to be in to get up a hill? Why do tractors go so slow?	**Living things and their habitats (3)** B describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird research life cycles – compare and contrast relate life cycles to the animal's habitat describe the life process of reproduction in some plants and animals observe the life cycle of different plants as planted by children in the garden and describe replant part of their plant to try and grow another - seeds, stem or root cuttings. Present findings to other groups. describe the process of reproduction in two different types of plants following observations describe the process of sexual reproduction in animals – humans and animals research the life and work of David Attenborough	**Animals including humans (5)** B describe the changes as humans develop to old age life cycle with detailed changes including puberty present data of gestation periods of different animals using bar charts record the data of a baby's size as it grows using a line graph	**Properties and changes of materials (1)** P C 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 investigate various materials and recognise trends of particular properties. Re-test to test further predictions know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution relate to cups of tea and sugar? Use different methods to recover substances and explain why it happens – test further substance. Are predictions accurate? use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Explain choices give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Research scientists who invented new materials – e.g. Spencer Silver or Ruth Benerito. Explain why they chose particular materials	**Recap as necessary / investigations**

				demonstrate that dissolving, mixing and changes of state are reversible changes Prove through observations Understand the difference between melting and dissolving 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 discuss how chemical changes have an impact on our lives, for example, cooking	

Year 6

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Subject content Progression in green Ideas in orange Working Scientifically					
Light (2) P recognise that light appears to travel in straight lines use of small mirrors to investigate. Use to make predictions and test using different objects. Draw diagrams to explain 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 Following mirror investigation, draw a diagram and write an explanation of how we see, relating to light reflecting into our eyes	**Electricity (2)** P associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit how do more batteries affect the brightness of a bulb / volume of a buzzer? What's the relationship? Why? Do one investigation with bulbs then predict what will happen with a buzzer and test Relate to Y4 more bulbs in a 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	**Living things and their habitats (4)** B 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 Categorising as with year 4 but explain why they are in one group and not another Research and present findings on Carl Linnaeus give reasons for classifying plants and animals based on specific characteristics	**Animals including humans (6)** B identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood heart, lungs, arteries, veins, blood vessels – to be identified in the body heart – pump blood around the body. Takes in poorly oxygenated blood and sends it to the lungs and pumps oxygenated blood around the rest of the body blood - to provide fuel for muscles and other organs blood vessels – carry blood around the body	**Evolution and inheritance** B recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago research Charles Darwin and evolution recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents investigate how you are given particular genes (don't need to know detail) from parents but	**Recap as necessary / investigations**

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 ● Following mirror investigation, draw a diagram and write an explanation of how we see, relating to light reflecting into our eyes (same activity as above) use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them investigating shadows – try different objects, with the same light, to explain why the shadow is the same shape as the object ▲▲▲▲▲▲ using the idea that light travels in straight lines and using reflection: decide where to place rear-view mirrors on cars ▲▲▲ design and make a periscope and explain how it works ▲▲▲	investigations chosen and planned by children – moving the components around / adding or removing different components ▲▲▲▲▲ use recognised symbols when representing a simple circuit in a diagram ● may have been used in Y4 but children should now be able to build a circuit given to them in symbols and recognise and use the symbols without being given without a key Make 'children circuits' where children have the symbols on them	collect plants / animals from around school and classify them, giving reasons for their classification ▲▲▲▲ research animals from around the world and classify them, giving reasons for their classification. Share findings with the class. ▲▲▲▲	compare circulatory systems in other animals ▲▲▲▲▲ Is there a relationship between particular animals – make predictions then check ▲▲▲ 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 ● explore scientific research regarding healthy lifestyles and substance misuse ▲▲▲	not exactly the same ▲▲▲ look at inheritance in dogs – e.g. what happens when poodles are mixed with Labradors? ▲▲▲▲ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution ● Explore how giraffes' necks have got longer over time or artic fur on a fox – relate to adaptation ▲▲▲▲ How do animals suit their environment? Camels, polar bears etc. ▲▲▲▲	