Great Barton CE Primary Academy

#Growth, #Respect, #Enjoy, #Achieve, #Team

"The Lord has done great things for us; we are glad" Psalm 126:3

Science Progression Map

EYFS Progression Overview		
Working Scientifically	**Knowledge**	**Vocabulary**
1.Ask questions Demonstrate curiosity about the world around them **2.Make Predictions** With support talk about what they think might happen based on own experiences **3. Decide how to carry out an enquiry** Respond to prompts to say what happened to objects, living things or events. **4. Take measurements** Use senses and simple equipment to explore the world around them e.g. magnifying glasses **5. Record Data** Talk to an adult/class about what has been found **6. Present data** Talk to an adult about what has been found/found out **7.Answering questions using data** With support explain why things have occurred **8.Draw conclusions** With support talk about what might happen next/or changes based on their own experiences	**Understanding the World: The Natural World ELG** ➢ 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.	
	Animals excluding humans: • Recognise some environments that are different Name and describe animals that live in different habitats Describe different habitats	Names of animals, live, on land, in water, jungle, desert, North Pole, South, sea, hot, cold, wet, dry, snow, ice. Supplementary vocabulary: Environment, polar regions, ocean, camouflage.
	Humans: • Talk about members of their immediate family and community • Name and describe people who are familiar to them • Learn about how to take of themselves	Hair (black, brown, dark, light , blonde, ginger, grey, white, long, short, straight, curly), eyes – blue, brown, green, grey, skin, black, brown, white, big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman.

	Living things and their habitats: • Draw information from a simple map • Explain the natural world around them • Describe what they see, hear and feel whilst outside • Recognise some environments that are different to the own in which they live • Explore the plants in the surrounding natural environment • Explore the animals in the surrounding environment • Explore plants and animals in contrasting natural environments	Plant, tree, bush, flower, vegetables, herb, weed, animals, names of plants and animals they see, name of contrasting environment e.g. beach, forest.
	Seasonal changes: • Explore the natural world around them • Describe what they see, hear and feel whilst outside • Understand the effect of changing seasons on the natural world around them • Play and explore outside in all seasons and in different weather • Observe living things throughout the year.	Spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, steel, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers
	Materials, including changing materials: • Explore the natural world around them • Describe what they see, hear and feel whilst outside • Explore a range of materials, including natural materials • Make objects from different materials, including natural materials • Observe, measure and record how materials change when heated and cooled • Compare how materials change over time and in different conditions	Ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back.
	Light: • Describe what they see, hear and feel whilst outside. • Explore shadows • Explore rainbows	Sun, sunny, light, shadow, shady, clouds, torch, see-through, non-see-through, source, light source Casting a shadow, pale, dark, transparent, opaque

	Forces: • Explore the natural world around them • Describe what they see, hear and feel whilst outside • Explore how to change how things work • Explore how the wind can move objects • Explore how objects move in water	Float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow
	Sound: • Describe what they see, hear and feel whilst outside • Listen to sounds outside and identify the source • Make sounds	Sound, noise, listen, hear, music, voices, birdsong. Traffic, sirens, thunder, high, low loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar.
	Earth & Space: • Explore the natural world around them • Describe what they see, hear and feel whilst outside • Learn about the Solar System and the stars • Learn about space travel	Sun, moon, Earth, star, planet, sky, day, night, space, round, light, heavy, fall, bounce, float, rise, fall, air. Sunrise, sunset, astronaut, astronomer, constellation, orbit, nocturnal, slow-motion, magnify

Year 1 Progression Overview		
Working Scientifically	**Knowledge**	**Vocabulary**
1.Ask questions Ask simple questions stimulated by their exploration of their world. They can be answered in different ways. **2.Make Predictions** Respond to suggestions to connect what has been observed with possible further actions or observations **3. Decide how to carry out an enquiry** Perform simple tests to explore a question or idea **4. Take measurements** Observe objects, living things, events and the world around them closely, using their senses and simple equipment. Make measurements using non-standard units of measure **5. Record Data** Present evidence they have collected in simple templates provided for them to help in answering questions. Draw or photograph evidence, label, video or in writing **6. Present Data** Present findings in simple templates to complete or to orally present **7. Answer questions using data** Respond to suggestions to connect what has been observed with possible further actions or observations. **8. Draw conclusions** Use their ideas to suggest to questions. Say what has changed when observing objects, living things or events.	**Plants (Common plants & plant structure)** ➢ Identify and name a variety of common wild and garden plants including deciduous and evergreen trees. ➢ Identify and describe basic structure of a variety of common flowering plants including trees.	Leaf, flower, blossom, petal, fruit, berry, root, seeds, trunk, branch, stem, stalk, bud. Name of trees in local area Names of garden and wild flowering plants in local area.
	Animals including humans (Name common animals/carnivores etc) ➢ Know how to classify a range of animals by amphibian, reptile, mammal, fish and bird. ➢ Classify a variety of common animals that are carnivores, herbivores and omnivores	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales feathers, fur, beak, paws, hooves. Names of animals from each group.
	Animals including humans (Human body & senses) ➢ Know the names of parts of the human body that can be seen and say which part of the body is associated with each sense.	Parts of the body including those linked to PSHE teaching (see separate planning) Senses: touch, sight, smell, taste, hearing, fingers (skin), eyes, nose, ear and tongue.
	Everyday materials (Properties of materials/grouping materials) ➢ Know the name of the materials an object in made from including wood, plastic, glass, metal, water and rock, ➢ Describe the simple physical properties of a variety of everyday materials ➢ Compare and group together materials based on their physical properties.	Object, material, wood, plastic, glass, metal, water rock, brick, paper, fabric, plastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, rough, smooth, stiff, bendy, floppy, waterproof, absorbent, tears, shiny, dull, see-through/not see-through
	Seasonal Changes (The four seasons/seasonal weather) ➢ Name and observe the changes across the four seasons ➢ Describe the weather associated with each season	Weather- sunny, rainy, windy, snowy etc. Seasons – winter, summer, spring, autumn. Sun, sunrise, sunset, day, length.

Year 2 Progression Overview		
Working Scientifically	**Knowledge**	**Vocabulary**
1.Ask questions Ask questions about their experiences and observations and with support use these observations to suggest ways to discover an answer or solve a problem, recognising that some can be answered in a variety of ways. **2.Make Predictions** Use their observations and ideas to make predictions. Use understanding of what has been observed or own experiences to predict outcomes of further actions or observations **3. Decide how to carry out an enquiry** Identify things to measure or observe that are relevant to the questions or ideas they are investigating using a simple test. Suggest a practical way of how to find things out, or collect data to answer a question or idea they are investigating. **4. Take measurements** Observe closely and use equipment provided for observation and measuring correctly. Make measurements using non-standard and standard units of measure. **5. Record Data** Gather and record data in appropriate ways with increasing independence to help in answering questions **6. Present data** Report on and record findings as drawings, photos, labelled diagrams, orally, as displays or in simple prepared tables or charts. **7. Answer questions using data** Use understanding of what has been observed/or experienced/ideas to answer questions **8. Draw conclusions** Respond to suggestions to identify some evidence needed to answer a question.	**Animals including humans (Animal reproduction/healthy living and basic needs)** ➢ Notice that animals, including humans have offspring which grow into adults ➢ Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ➢ Describe the importance of humans of exercise, eating the right amount of different types of food and hygiene.	Offspring, reproduction, growth, child, young/old (examples – chick/hen, baby/child/adult, caterpillar/butterfly, exercise, heartbeat, breathing, hygiene germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)
	Living things and their habitats (Alive or dead, habitats, adaptions & food chains) ➢ Classify things by living, dead or never alive ➢ Know how a specific habitat provides for the basic needs of things living there (plants & animals) ➢ Match living things to their habitat including micro-habitats ➢ Name some different sources of food for animals ➢ Know about and explain a simple food chain.	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed. Names of local habitats e.g. pond, woodland etc. Names od micro-habitats e.g. under logs in bushes etc.
	Uses of everyday materials (identify different materials/name everyday materials/properties of materials. Compare the use of different materials/compare movement on different surfaces). ➢ Know how materials can be changed by squishing, bending, twisting and stretching. ➢ Know why a material might or might not be used for a specific job.	Wood, metal, glass, brick, paper, cardboard. Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid. Shape, push/pull, twist//twisting, squash/squashing, bend/bending, stretch/stretching
	Plants (plant & seed growth/plant reproduction/keeping plants healthy) ➢ Know and explain how seeds and bulbs grow into plants ➢ Know what plants need in order to grow and stay healthy (water, light & suitable temperature)	As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy. germination

Year 3 Progression Overview		
Working Scientifically	**Knowledge**	**Vocabulary**
1.Ask questions Within a group, suggest relevant questions that can be explored further using different types of scientific enquiry **2.Make Predictions** Use straightforward scientific evidence to make predictions. With support, use results, observations or own experience to prompt new questions and predictions for a further test. **3. Decide how to carry out an enquiry** Plan and carry out simple practical enquiries, comparative and fair test relevant to the questions or ideas they are investigating with support **4. Take measurements** Use a range of equipment for measuring and observing. Take simple accurate measurements and or careful observations using whole number standard units relevant to questions or ideas under investigation **5. Record Data** Gather and present evidence and data using simple scientific language and vocabulary as writing, drawings labelled diagrams, and displays and through computing, keys bar charts or tables with support/as a group. **6. Present data** Report findings from enquiries, including oral and written explanations, displays or presentation of results and conclusions with support/as a group. Record findings using simple scientific language, drawings, labelled diagrams bar charts and tables with support/as a group **7. Answer question using data**	**Plants (basic structure & functions, lifecycle and water transportation)** ➢ Know the function of different parts of flowering plants ➢ Know the requirements of plants for life and growth (air, light, water etc) and how they vary from plant to plant ➢ Know how water is transported within plants ➢ Know the lifecycle of flowering plants – pollination, seed formation and seed dispersal.	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)
	Animals, including humans (skeleton & muscles, nutrition, exercise & health) ➢ Know that animals including humans need the right types and amount of nutrition and that they cannot make their own food -they get their nutrition from what they eat. ➢ Identify that humans and some animals have skeletons and muscles for support, protection and movement	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joint, support, protect, move, skill, ribs, spine.
	Rocks (fossil formation/compare and group rocks/soil) ➢ Compare and group together rocks based on their appearance and physical properties, giving reasons. ➢ Know how soil is made and how fossils are made ➢ Know about and explain the difference between sedimentary, metamorphic and igneous rock.	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil.
	Light (reflections and shadows) ➢ Know that dark is the absence of light ➢ Know that light is needed in order to see and is reflected from a surface ➢ Know and demonstrate how a shadow is formed and explain how a shadow changes shape ➢ Understand that the light from the sun can be dangerous and that there are ways to protect the eyes.	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, malt, surface, shadow, reflect, mirror, sunlight, dangerous.

Use straightforward scientific evidence and results of enquiries to answer questions **8. Draw conclusions** Say whether what happened was what they expected, acknowledging any unexpected outcomes. **9. Evaluate their enquiry** Use results of enquiries to consider whether they meet predictions and explain why.	**Forces and Magnets** ➢ Know about and describe how objects move on different surfaces ➢ know how some forces require contact and some do not, giving examples. Magnetic forces can act at a distance ➢ Know about and explain how magnets attract and repel. Predict whether magnets will attract or repel and give a reason.	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole.

Year 4 Progression Overview		
Working Scientifically	**Knowledge**	**Vocabulary**
1.Ask questions Ask relevant questions that can be answered by the appropriate scientific enquiry, research or experiment **2.Make Predictions** Use straightforward scientific evidence to make further predictions. Use results to make predictions for new values and raise further questions **3. Decide how to carry out an enquiry** Plan and carry out simple practical enquiries, comparative and fair tests relevant to the questions or ideas they are investigating. Identify one or more control variables from those provided when conducting the test **4. Take measurements** Make systematic and careful observations of objects, living thins and events. Choose from a range provided, appropriate equipment for measuring and observing, including data loggers and thermometers. Take accurate measurements using more complex standard units and parts of units **5. Record Data** Gather and present simple scientific data in a variety of ways as Year 3, including tables and bar charts where intervals and ranges are agreed through discussion to help in answering questions	**Living things and their habitats (grouping living things/classification keys/adaptation of living things)** ➢ Use classification keys to group, identify and name living things ➢ Know how changes to an environment could endanger living things	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.
	Animals including humans (digestive system, teeth & food chains) ➢ Know the functions of the basic parts of the digestive system in humans ➢ Identify the different types of teeth in humans and their simple functions ➢ Construct and interpret a variety of food chains identifying producers, predators and prey.	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestines. Rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain.
	States of matter (compare and group materials, solids, liquids & gases, changing state & water cycle) ➢ Compare and group materials together, according to whether they are solids, liquids or gases ➢ Know the temperature at which materials change state ➢ Know about and explore how some materials change state ➢ Know the part played by evaporation and condensation in the water cycle	Solid, gas, liquid, state, change, melting, freezing, melting point, evaporation, temperature, water cycle.
	Sound (how sounds are made, sound vibrations & pitch and volume) ➢ Know how sounds is made, associating some of the with something vibrating ➢ Know how sound travels from a source to our ear ➢ Know the correlation between pitch and the object producing the sound ➢ Know the correlation between the volume and a sound, and the strength of the vibrations that produced it ➢ Know what happens to a sound as it travels away from its source	Sound, source vibrate vibration, travel, pitch (high, low), volume, faint, loud, insulation

6. Present Data Report on findings from enquiries, including oral and written explanations, displays or presentations With support talk about what might happen next/or changes based on their own experiences **7. Answer questions using data** Use results to answer questions **8. Draw conclusions** Identify and use straightforward scientific evidence to support and explain their findings **9. Evaluate their enquiry** Use results to suggest improvements	**Electricity (uses of, simple circuits and switches, conductors and insulators)** ➢ Identify and name appliances that require electricity to function ➢ Construct a series simple electrical circuit ➢ Identify and name the components in a series circuit including: bulbs, switches and buzzers) ➢ Predict and test whether a lamp will light within a circuit ➢ Know the function of a switch ➢ Know the difference between a conductor and an insulator; giving examples of each.	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connections, short circuits, crocodile clips, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol

Year 5 Progression Overview		
Working Scientifically	**Knowledge**	**Vocabulary**
1.Ask questions Refine a scientific question so that it can be investigated, choosing an appropriate type of scientific enquiry to provide the best evidence **2.Make Predictions** Recognise when scientific evidence supports an idea or not and use this to support predictions. Use test results to prompt new questions and make predictions for setting up further tests **3. Decide how to carry out an enquiry** Plan enquiries, deciding when it is appropriate to carry out a fair test or another type of practical enquiry from a range suggested. Identify one or more control variables in investigations when conducting a fair test. **4. Take measurements** Take measurements using a range of scientific equipment with increasing accuracy and precision, identifying the ranges and intervals used. With support, recognise that some measurements and observations may need to be repeated. **5. Record Data** Select appropriate ways of gathering and presenting scientific data through models, writing, drawings, displays, computing, tables or graphs (choosing appropriate ranges and intervals). Use correct scientific symbols where appropriate in recording **6. Present Data** Present findings in written form, displays and other presentations including orally, explaining results and conclusions drawn from results. Identify causal relationships in reporting outcomes where appropriate **7. Answer question using data**	**Living things and their habitats (life cycles- plants and animals, reproductive processes)** ➢ Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird ➢ Describe the life process of reproduction in some plants and animals	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings.
	Animals including humans (changes as humans develop from birth to old age) ➢ Create a timeline to indicate stages of growth in humans	
	Properties and change of materials (compare properties of everyday materials, soluble/dissolving/reversible and irreversible substances) ➢ Compare and group materials based on their properties (e.g. hardness, solubility, transparency. Conductivity, (electrical & thermal) and response to magnets ➢ Know and explain how a material dissolves to form a solution ➢ Know and show how to recover s substance from a solution ➢ Know and demonstrate how some materials can be separated through filtering, sieving and evaporating. ➢ Know and demonstrate that some changes are reversible and some are not and that some changes result in the formation of a new material and that this is usually irreversible	Thermal/electrical insulator/conductor. Changes of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material
	Earth (movement of the Earth and the planets, movement of the Moon, night and day) ➢ Describe the movement of the Earth, and other planets relative to the Sun in the solar system ➢ Describe the movement of the Moon relative to the Earth ➢ Describe the Sun, Earth and Moon as approximately spherical bodies ➢ \use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets.

Use results to answer questions **8. Draw conclusions** Recognise when scientific evidence is for or against an argument **9. Evaluate their enquiry** Recognise that the test may need improvements to improve reliability	**Forces (gravity, friction, forces and motion of mechanical devices)** ➢ Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. ➢ Identify the effects of air resistance, water resistance and friction that act between moving surfaces. ➢ Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	Force, gravity, Earth, air resistance, friction, mechanism, simple machines, levers, pulleys, gears,

Year 6 Progression Overview		
Working Scientifically	**Knowledge**	**Vocabulary**
1.Ask questions Recognise scientific questions which do not yet have definitive answers and use a range of scientific enquiries to explore possible answers **2.Make Predictions** Identify scientific evidence that has been used to support or refute ideas or arguments and use this to support predictions. Use test results to make predictions for setting up further comparative and fair tests **3. Decide how to carry out an enquiry** Recognise significant variables in investigations, selecting the most suitable to investigate. Controlling variables where appropriate Recognise which type of practical enquiry is most appropriate to the question or idea being investigated, before planning and carrying out the enquiry **4. Take measurements** Correctly choose and use appropriate equipment to support observation and data collection with increasing accuracy. Decide whether it is appropriate to repeat observations or measurements and explain how this impacts on data collection. **5. Record Data** Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	**Living things and their habitats (classification of living things and the reasons for it)** ➢ Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals ➢ Give reasons for classifying plants and animals based on specific characteristics.	Vertebrates, fish amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering.
	Animals, including humans (the circulatory system, water transportation, impact of exercise on body) ➢ Identify and name the main parts of the human circulatory system and describe the function of the heart, blood vessels, and blood. ➢ Recognise the impact of diet, exercise, drugs and lifestyle on the way our bodies function. ➢ Describe the ways in which nutrients and water are transported within animals, including humans.	Heart, blood, blood vessels, rate, pump, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle.
	Evolution and inheritance (identical and non-identical, fossil evidence and evolution, adaptation and evolution_ ➢ Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. ➢ Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ➢ Identify how animals and plants are adapted to suit their environment in different ways and that adaption may lead to evolution.	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils.

6. Present Data Report and present findings from enquiries, including conclusions, causal relationships and explanations of results in oral and written form, such as displays and other presentations **7. Answer question using data** Use results to answer questions **8. Draw conclusions** Provide straightforward explanations for differences in repeated measurements or observations **9. Evaluate their enquiry** Compare their results with others and give reasons why they may be different	**Electricity (electrical components, simple circuits, fuses and voltage)** ➢ Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cell used in the circuit. ➢ Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on//off or switches ➢ Use recognised symbols when representing a simple circuit in a diagram.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage. NB: children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words 'cell' and 'batteries' are now use interchangeably.