Dovecote Primary Science Progression Document

Substantive Knowledge, Key Vocabulary, Procedural Knowledge

See long term overview for : **Substantive knowledge** **Procedural Knowledge** **Key Vocab**	**EYFS- Nursery**	**EYFS- Reception**
	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice	• 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. Recognise some environments that are different to the one in which they live **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

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Theme						
Working Scientifically	**Develop (Y1)/ Deepen (Y2)** To ask simple questions and recognising that they can be answered in different ways. To observe closely, using simple equipment. To perform simple tests. To identify and classify. To use their observations and ideas to suggest answers to questions. To gather and record data to help in answering questions.		**Develop (Y3)/ Deepen (Y4)** To ask relevant questions and use different types of scientific enquiries to answer them. To set up simple practical enquiries, comparative and fair tests. To make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. To gather, record, classify and present data in a variety of ways to help in answering questions. To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.		**Develop (Y5)/ Deepen (Y6)** To plan different types of scientific enquiries to answer questions including recognising and controlling variables where necessary. To take measurements, using a range of scientific equipment, with increasing accuracy and precision. To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs. To use test results to make predictions to set up further comparable and fair tests. To use simple models to describe scientific ideas.	

			To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. To identify differences, similarities or changes related to simple scientific ideas and processes. To use straightforward scientific evidence to answer questions or to support their findings.		To report and present findings from enquiries, including conclusion, causal relationships and explanations of results, in oral and written forms such as displays and other presentations. To identify scientific evidence that has been used to support or refute ideas or arguments	
Types of Enquiry	***Observation*** over ***time***	***Pattern seeking***	***Identifying, classifying and grouping***	***Comparative and fair testing***	***Research using secondary sources***	
Biology **PLANTS and Living things in their habitats** **Substantive knowledge** **Procedural Knowledge** **Key Vocab**	**Y1 Plants** **To know that a plant is a living thing.** **To know the names of parts of a plant.** **To know the names of different trees and how they differ from each other.** **To know that some trees are deciduous and others are evergreen,** I can Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees, I can Identify and describe the basic structure of a variety of common flowering plants, including trees Vocab Buds, bulbs, deciduous Evergreen, trunk, vegetable wild plants, environment blossom, petals, branches	**Y2 Plants** **To know and explain how seeds and bulbs grow into plants.** **To know what a plant needs in order to grow and stay healthy. (water, light, suitable temperature)** I can observe and describe how seeds and bulbs grow into mature plants. I can set up a test to find out how plants need water, light and a suitable temperature to grow and stay healthy. Vocab Roots, crown, deciduous Evergreen, blossom, bulb, trunk, stem, woodland, habitat, oxygen, germination, reproduction **Y2 Living things and their habitat** **To know that all living things have certain characteristics that are essential for keeping them alive and healthy.** **To know that living things depend on each other** **To create simple food chains** I can explore and compare the differences between things that are living, dead, and things that have never been	**Y3 Plants** **To know the relationship between the structure and the function of different parts of a plant.** **To know the requirements of plants for life and growth.** **To know the different stages of the life cycle of a flowering plant.** I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can compare the effect of different factors on plant growth and how it varies 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. Vocab Roots, stem, nutrients pollination, seed dispersal fertiliser, seed formation stigma, anther, soil	**Y4 Living things and their habitats** **To know the difference between invertebrates and invertebrates** **To know how to construct and interpret a food chain** **To know the difference between flowering and non-flowering plants** **To know that environments can change and that this can sometimes pose dangers to living things** I can recognise that living things can be grouped in a variety of ways I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment I can explore ways of grouping a selection of flowering and non-flowering plants I can explore examples of human impact (both positive and negative) on Environments. Vocab Habitat, environment, fish, amphibians, reptiles, birds, mammals, invertebrates, flowering plants, non-flowering plants, ecology,	**Y5 Living things and their habitats** **To know and describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird** **To know specific facts about their life cycle.** **To describe the life process of reproduction in some plants and animals** I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird I can use my local environment to observe life-cycle changes in a variety of living things I can find out about the work of naturalists and animal behaviourists I can find out about different types of reproduction in plants and animals. Vocab Mammal, insect, amphibian, bird, life cycle, reproduction (sexual and asexual), environment, David Attenborough, Jane Goodall	**Y6 Living things and their habitats** **To know that living things are classified into broad groups (including micro-organisms)** **To use classification systems and keys to identify some animals and plants in the immediate environment** I can describe how living things are classified into broad groups according to common observable characteristics I can give reasons for classifying plants and animals based on specific characteristics I can find out about the work of Carl Linnaeus Vocab micro-organism, vertebrates invertebrates, species, fungi, bacteria, algae, Carl Linnaeus

		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 name a variety of plants and animals in their habitats, including micro- habitats. I can create a simple food chain Vocab Dinosaur, indigenous, rivers Woodland, ponds, sea, rainforest, desert, species Microhabitats, habitat, food chain		deforestation, classification		
BIOLOGY **Animals, Including humans** **Substantive knowledge** **Procedural Knowledge**	**Y1 Animals including Humans** **To know which animals lay eggs and which do not.** **To understand that animals can be grouped as fish, amphibian, reptiles, birds and mammals** **To know the basic parts of the human body** **To use senses to compare different textures, sounds and smells** I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 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) I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	**Y2 Animals including Humans** **To know what a balanced diet is.** **To know the importance of a balanced diet for humans.** **To know the importance of hygiene for humans.** **To know that animals have offspring which grow into adults** I can name the different stages that animals go through from birth to adulthood I can find out about the basic needs of animals, including humans, for survival I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene Vocab Healthy, balanced diet, off-spring, reproduction, exercise, ,nutrition, survival, hygiene,	**Y3 Animals including humans** **To know the importance of nutrition** **To know that animals including humans, get nutrition from what they eat** **To know 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 I can compare and contrast the diets of different animals I can find out how different parts of the body have special functions. Vocab Nutrition, nutrients, carbohydrates, proteins, fats (saturated/unsaturated), skeleton, muscles Diet, joint, pelvis, cartilage rib cage, tendon, spine	**Y4 Animals including humans** **To know the main body parts associated with the digestive system and understand their special functions** **To know how to interpret a variety of food chains, identifying producers, predators and prey** I can identify the different types of teeth in humans and their simple functions I can compare the teeth of carnivores and herbivores, and suggest reasons for differences I can construct and interpret a variety of food chains, identifying producers, predators and prey Vocab Pancreas, oesophagus, intestine, teeth, organ, molars, canine, food chain, predators, prey, producer, carnivore, herbivore, salivary gland	**Y5 Animals, including humans (this builds on the learning in Living things and their habitat)** **To know there are different stages in the growth and development of Humans** **To know the changes experienced in puberty** I can research the gestation periods of other animals and comparing them with humans I can draw a timeline to indicate stages in the growth and development of humans Vocab Puberty, gestation Reproduction, adolescence obese, Toddler, embryo,	**Y6 Animals including humans** **To know which organs make up the circulatory system** **To know that the blood transports oxygen around the body** **To know how the heart works and explain this using key vocabulary** **To know that exercise increases the heart rate and the impact that exercise has on the body.** **To know how to perform CPR and how to use a defibrillator** **To know who William Harvey is and how his discoveries shaped our understanding of the heart.** I can identify and name the main parts of the human circulatory system I can describe the functions of the heart, blood vessels and blood I can recognise the impact of diet exercise, drugs and lifestyle on the way their

Key Vocab	Vocab fish, amphibians reptiles, birds, mammals, carnivore, herbivore Omnivore, tame, wild Nocturnal, head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth					bodies function I can describe the ways in which nutrients and water are transported within animals, including humans Vocab blood vessels, drugs atriums, William Harvey Cardiovascular, ultrasound Cardiologists, capillaries Pulse, ventricles, veinsarteries, circulatory system **Y6 Evolution and inheritance** **To know that fossils are the impressions of the remains of prehistoric animals or plants embedded in rock and preserved in petrified form** **To know that animals change over time and adapt to the surroundings in which they live.** **To know that characteristic traits are genetically passed to offspring from their parents and this is known as inheritance or natural selection.** **To know that animals change over time and adapt to the surroundings in which they live** I can recognise that living things 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 I can identify how animals and plants are adapted to suit their environment in

						different ways and that adaptation may lead to evolution Vocab off-spring, adaptation, genes, evolution, inheritance, genotype palaeontologist, syndrome Charles Darwin, chromosomes
CHEMISTRY **Substantive knowledge** **Procedural Knowledge** **Key Vocab**	**Y1 Everyday materials** **To know the names of different materials and name the material of a variety of objects.** **To know the physical properties of a variety of everyday materials and that they have opposite properties (e.g hard or soft) and be able to compare and describe them.** I can distinguish between an object and the material from which it is made. I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock I can describe the simple physical properties of a variety of everyday materials. I can compare and group together a variety of everyday materials on the basis of their simple physical properties. Vocab Materials, wood, plastic, metal Liquid, gas, stretch, stiff, bend Waterproof, shiny	**Y2 Uses of everyday materials** **To know the correct vocabulary to describe a material.** **To know that the property of a material is how it behaves (soft, stretchy, waterproof.)** **To know that different materials have different properties.** **To know that materials are what objects are made from.** **To know that suitability means having the properties that are right for a specific purpose.** **To know that Dunlop invented the rubber tyre.** **To know that Charles Macintosh invented waterproof fabric.** **To know about the life of John Dunlop and Charles Macintosh.** **To know that squashing, twisting, bending and stretching changes the shape of an object.** **I can i**dentify 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	**Y3 Rocks** **To know rocks, including those used in buildings and gravestones, might have changed over time.** **To know how to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them (and use microscopes or magnifying glasses to investigate).** **To know how fossils are formed.** **To know that soils are made from rocks and organic matter.** 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 Vocab Fossil, soil, crystals Sedimentary, metamorphic Igneous, organic matter	**Y4 States of matter** **To know the differences between solids, liquids and gases** **To know the different states that water particles can exist in and how they can change state** **To know about melting and what happens to the particles** **To know about evaporation and what happens to the particles** **To know about condensation and what happens to the particles** **To know about freezing and what happens to the particles** 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 Vocab water vapour, condensation precipitation, evaporation substance, matter, lava, solid liquid, gas, substance	**Y5 Properties and changes of materials** **To know the definition of mixture and solution and their differences.** **To know the different features of solids, liquids and gases.** **To know three different methods of separation (filtering, sieving and evaporating)** **To know that some changes are reversible and some are irreversible (dissolving, mixing and changes of state)** **To know what happens when different materials are put together and how certain objects can change state.** **To know what a magnet is, how it works and which specific materials repel or attract.** 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 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	

		Vocab Metal, plastic, wood, Charles Macintosh John Dunlop, squashing, bending, twisting. stretching John McAdam			Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic I can demonstrate that dissolving, mixing and changes of state are reversible changes I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda Vocab Solubility, conductivity Transparency, thermal Evaporation, dissolve bicarbonate of soda, thermal filtering, melting, separate	
PHYSICAL PROCESSES **Substantive knowledge** **Procedural Knowledge** **Key Vocab**	**Y1 Seasonal Change** **To know the four seasons and changes in Autumn** **To know which clothing is suitable for different weather types** **To know the different types of weather and their associated season** **To know how rainfall can be measured** **To know how weather can be a danger to living things** I can observe changes across the four seasons I can observe and describe weather associated with the seasons and how day length varies Vocab Autumn, Spring, Summer Winter, fall, weather Temperature, thermometer weather symbol, deciduous coniferous		**Y3 Light** **To know that darkness is the absence of light** **To know that smooth surfaces are more reflective** **To know that shadows are formed when light can't pass through an opaque object.** **To know that a shadow is larger when a light source is closer to an object.** **To know what opaque, translucent and transparent mean.** I can recognise that we need light in order to see things and that dark is the absence of light I can notice that light is reflected from surfaces I can recognise that light from the sun can be dangerous and that there are ways to protect my eyes I can recognise that shadows are formed when the light	**Y4 Sound** **To know how sound is made through vibration in a range of different musical instruments (from around the world).** **To know how the pitch and volume of sounds can be changed in a variety of ways.** **To know that there are patterns between the pitch of a sound and features of the object that produced it.** **To know that there are patterns between the volume of a sound and the strength of the vibrations that produced it.** **To know which material provides the best insulation against sound.** I can identify how sounds are made, associating some of them with something vibrating	**Y5 Forces** **To know what a force is.** **To know what gravity is and how it impacts us and the wider world.** **To know what makes a force unbalanced and the impact that has.** **To know what friction is and where we see this in everyday life.** **To know how car tyres and shoe grips work.** **To know what force is needed to keep a boat floating.** **To know how density impacts on floating and sinking.** **To know the names of specific objects that float and sink.** **To know how air resistance works and how it impacts on objects like parachutes.** **To know that some**	**Y6 Light** **To know that light travels in straight lines and create a model to demonstrate how light travels to allow us to see.** **To know how a prism affects a ray of light and use a colour wheel to explain what it shows about light.** **To know and explain how shadows change throughout the day.** **To know how light is reflected and explore how a periscope allows us to see objects we would not usually see.** **To know** I can recognise that light appears to travel in straight lines I can use the idea that light travels in straight

			from a light source is blocked by an opaque object I can find patterns in the way that the size of shadows change Vocab Reflection, shadows, light source, opaque, refraction periscope, nocturnal, orbits convex, concave **Y3 Forces and magnets** **To know that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary.** **To know how different things move and use this to group them** **To know the effects of friction on different surfaces.** **To know how to investigate the strength of magnets** **To know that magnets have two poles.** **To know that magnets attract some materials.** I can compare how things move on different surfaces. 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. 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 describe magnets as having two poles	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 Find patterns between the volume of a sound and the strength of the vibrations that produced it I can recognise that sounds get fainter as the distance from the sound source increases Vocab Vibrating, pitch, volume Insulation, auditory outer, middle and inner ear cochlea, frequency, hammer **Y4 Electricity** **To know a variety of common appliances that run on electricity.** **To know how to construct a simple series electrical circuit, identifying and naming its basic parts** **To know that a circuit must make a complete loop in order for components to work. And that a switch can open or close a loop.** **To know how to work safely with electricity.** **I can i**dentify 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	**mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.** I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object I can 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 Vocab Friction, gravity, parachute air resistance, levers, gears water resistance, pulleys Galileo, Newton	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 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 Vocab light wave, light source concave, convex, filters, lens retina, cornea, iris, pupil **Y6 Electricity** **To know what the components in an electrical circuit are, and their function.** **To know that the brightness of a lamp or the volume of a buzzer can increase or decrease with the number and voltage of cells used in the circuit** **To know the recognised symbols for electrical components and use them in a simple circuit in a diagram.** **To know how to work safely with electricity.** I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit I can compare and give reasons for variations in how components function, including the brightness of bulbs, the loud of buzzers and the on/off position of

			I can predict whether two magnets will attract or repel each other, depending on which poles are facing Vocab Magnetic pole, attract, repel repulsion, friction, resistance	associate this with whether or not a lamp lights in a simple series circuit I can recognise some common conductors and insulators, and associate metals with being good conductors Vocab Circuit, buzzers, conductor Battery, cells. Switch, socket Appliance, series circuit, insulator **Y4 Earth and space** **To know that the rotation of the earth creates day and night** **To know how the position of the moon affects how much light is reflected** **To know that the Sun is a star at the centre of our solar system and that it has eight planets** **To know that we are part of a solar system that orbits the sun** **To know that a moon is a celestial body that orbits a planet** 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 use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky Vocab Orbit, solar system, planet Astronomical, rotation Spherical, crescent moon gibbous moon, eclipse, lunar		switches I can use recognised symbols when representing a simple circuit t diagram Vocab Conductor, insulator, socket, components, lamps, series circuits, cells, volts, generator, turbine, fuses, Thomas Edison