RADDLEBARN PRIMARY SCHOOL PROGRESSION OF KNOWLEDGE IN SCIENCE

Year Group Area of Study	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Resources
Biology **Animals including humans**	**DM:** **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.** **Use all their senses in hands-on exploration of natural materials.** **Begin to make sense of their own life-story and family's history.** **Understand the key features of the life cycle of a plant and an animal.** **Make healthy choices about food, drink, activity and toothbrushing.**	**DM:** **Recognise some environments that are different to the one in which they live.** **Manage their own needs. • Personal hygiene** **Know and talk about the different factors that support their overall health and wellbeing: • regular physical activity • healthy eating • toothbrushing • sensible amounts of 'screen time' • having a good sleep routine • being a safe pedestrian** **Talk about members of their immediate family and community.** **Name and describe people who are familiar to them.** **Natural World ELG:** **• 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**	**To identify and name common animals (birds, fish, amphibians, retiles, mammals)** **To classify animals by what they eat (carnivore, herbivore, omnivore)** **To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)** To sort some animals by structure and body covering, for example, scales, fur and skin and describe and compare/ contrast the observable features of animals from a range of groups. **To identify, name, draw and label parts of the human body and say which part of the body is associated with each sense**	**To notice that animals, including humans, have offspring which grow into adults** Observe growth of offspring (chick / caterpillar / tadpole) measuring and recording growth **To describe the basic needs of animals inc humans for survival (water, food, air)** and the main changes as young animals, including hums, grow in to adults **To describe the importance of exercise, balanced diet and hygiene for humans** To identify and name different sources of food	**To identify that animals, including humans, need the right types and amount of nutrition and they cannot make their own food; they get nutrition from what they eat** **To identify that humans and some other animals have skeletons and muscles for support (musculoskeletal), protection and movement** Identify and group animals with and without skeletons and compare their movement Compare diets of different animals or pets Design healthy meals for humans	**To name and describe the functions of the main parts of the digestive system** (including mouth, tongue, teeth, oesophagus, stomach, small and large intestines,) **To describe the simple functions of the organs of the human digestive system** **To identify the different types of teeth in humans and their simple functions** Compare carnivore and herbivore teeth, explaining reasons for differences **To construct and interpret a variety of food chains, identifying producers, predators and prey**	**To describe the changes as humans develop to old age** Research and compare gestation periods Represent the growth of a baby Recognise changes experienced in puberty Recognise changes during old age and recognise misconceptions (eg: being ill is normal)	**To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood** **To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function** **To describe the ways in which nutrients and water are transported within animals, including humans** To construct and interpret food chains and webs Make links between knowledge of skeletal, muscular and digestive systems and how the circulatory system enables the body to function	Binoculars Skeleton Chart Flower Chart Seed Germination kits Soil Seeds Pots Soil samples Food Pyramids Fruit and Veg resources Food chain charts Teeth

		changes in the natural world around them, including the seasons and changing states of matter.							
<u>Biology</u> **Living things and their habitats** **Plants**	**DM:** **Use all their senses in hands-on exploration of natural materials.** **Explore collections of materials with similar and/or different properties.** **Begin to understand the need to respect and care for the natural environment and all living things.** **Plant seeds and care for growing plants.** **Understand the key features of the life cycle of a plant and an animal.**	**DM:** **Explore the natural world around them.** **Describe what they see, hear and feel whilst outside.** **Recognise some environments that are different to the one in which they live.** **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.**	**To identify and name a range of common wild and garden plants including deciduous and evergreen trees** **To identify and describe the basic structure of a variety of common flowering plants, including trees** (petals, stem, leaf, root, trunk, branch) Compare familiar plants, describing how they can be grouped. Keep a record of how plants change over time. *Make a home for an insect *Go on a hunt for small insects and creatures	**To explore and compare differences between things that are alive, dead or have never been alive.** **To identify that most living things (animals and plants) 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** **To identify and name a variety of plants and animals in their habitats, including microhabitats** **To 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** Compare animals found in local / familiar habitats with animals found in seashore / rainforest / ocean. Mrs Gren – 7 life processes To identify and name a variety of plants	**To identify and describe the functions of different parts of flowering plants, for example roots, stem/trunk, leaves and flowers** **To 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** **To investigate the way in which water and nutrients are transported within plants** **To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal** Set up test comparing the effects of different amounts of water, light, fertilizer on growth. Identify pattern between types of fruit and seed dispersal. *Eat something you have grown	**To recognise that living things can be grouped in a variety of ways** (eg: vertebrates and invertebrates) **To explore,** make **and use classification keys to help group, identify and name a variety of living things in their local and wider environment** **To recognise that environments can change and that this can sometimes pose dangers to living things** (explain impact of human activity, such as ecology or littering) *Explore inside a cave	**To describe the differences in life cycles of a mammal, an amphibian, an insect and a bird** **To describe the life process of reproduction processes and life cycles in some plants and animals** (understanding that some reproduction is sexual / asexual in plants, but sexual in animals) Name and describe the function of parts of plants and animals involved in reproduction Compare life cycles of local living things with that of living things around the world and suggest reasons for differences Research naturalists and conservationists, eg Jane Goodall / David Attenborough. *Climb something that is taller than you *Walk to the top of a hill	**To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and difference, including micro-organisms, plants and animals** **To give reasons for classifying plants and animals based on specific characteristics** To use the observable features of plants, animals and micro-organisms to group, classify and identify then into broad groups, using keys or in other ways Explain why living things are classified in one group and not another.	

				and describe how they are suited to different habitats **To find out and describe basic needs of plants for** germination, growth and **survival (water, light, temperature)** and the impact of changing these. **To observe and describe how seeds and bulbs grow into mature plants** Set up comparative tests to determine that plants need water and light to stay healthy. *Take a trip to the seaside or walk alongside a river *Become a nature detective *Start a vegetable patch *Go bird watching					
<u>Chemistry</u> **Materials** **States of matter (Y4)**	**DM:** **Use all their senses in hands-on exploration of natural materials.** **Explore collections of materials with similar and/or different properties.** **Talk about the differences between materials and changes they notice.**	**DM:** **Explore the natural world around them.** **Describe what they see, hear and feel whilst outside.** **Natural World ELG:** **• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.**	**To distinguish between an object and the material from which it is made.** **To identify and name a variety of everyday materials, including wood, plastic glass, metal, water and rock.** **To describe the simple physical properties of a variety of everyday materials** e.g. hard/soft stretchy/stiff Shiny/dull Rough/smooth	**To identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.** Find out how one material can be used for several different purposes (metal), or how one objects can be made by using various materials (eg: spoons). **To find out how the shapes of solid objects made from**	*Light a candle *Make something out of wood *Produce rubbings of fossils	**To compare and group the materials together according to their state (solids liquids and gases)** To describe the characteristics and behaviours of different states of matter and group materials on this basis **To observe that some materials change state when they are heated and measure or research the temp at which it happens in**	**To 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** **To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution**	*Make a dessert	Concave mirrors Magnifying glasses Thermometers Syringes Measuring jugs Cylinders Funnels Stop watches Filter paper Fossils/Rocks/ Minerals

			Waterproof/non Bendy/not Absorbent/not Opaque/transparent **To compare and group together a variety of everyday materials on the basis of their simple physical properties.** To investigate which material is used for a specific job and why, through simple tests, eg: umbrella, clothing, water bottle….	**some materials can be changed by squashing, bending, twisting and stretching** Identify, compare, clarify materials by recording observations.		**degrees Celsius** **To identify the part played by evaporation and condensation in the water the cycle and associate the rate of evaporation with temperature** *Skim stones *Make chocolate	**To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating** **To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic** **To demonstrate that dissolving, mixing and changes of state are reversible changes** **To 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** Explain the difference between melting and dissolving, or mixture and solution and suspension. Investigate the effectiveness of certain materials for a particular purpose by carrying out tests *Visit a science laboratory		
<u>Chemistry</u> Rocks	**DM: Talking about what they see using a wide vocabulary.**	**DM: Explore the natural world around them.**			**To compare and group together different kinds of rocks on the basis**				

		Describe what they see, hear and feel whilst outside.			**of their appearance and simple physical properties** (eg: do they have grains or crystals, or do they have fossils in them) **To describe in simple terms how fossils are formed when things that have lived are trapped within rock** **To recognise that soils are made from rocks and organic matter** Closely observe rocks (including used in buildings and gravestones) and explore how they might have changed over time Investigate what happens when rocks are rubbed together or what changes colour when wet Raise and answer questions about the way soils are formed				
<u>Physics</u> **Seasonal changes**	**DM:** **Talking about what they see using a wide vocabulary.**	**DM:** **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.** **Natural World ELG:** **• Understand some important processes and changes in the natural world around them, including the seasons and**	**To observe changes across the four seasons** **To observe & describe weather associated with seasons & how day length varies** To explain why it is not safe to look at the Sun even with sunglasses on Make tables and charts about the weather and changes	*Build a bridge and test its strength	*Make a pinhole camera		*Make and launch an air powered rocket *Make papier mache *Design and make an electric model	*See the sunset *see the sunrise	Prism Magnets Springs Newton apples Stop watches Compasses Tunings forks Torches Electricity resources (wires, bulbs) Batteries

		changing states of matter.							
Physics **Forces and Magnets**	**DM:** **Explore how things work.** **Explore and talk about different forces they can feel.** **Talk about the differences between materials and changes they notice.**	**DM:** **Explore the natural world around them.** **Describe what they see, hear and feel whilst outside.**			**To compare how things move on different surfaces** (set up tests) **To notice that some forces need contact between 2 objects, but magnetic forces can act at a distance** **To observe how magnets can attract/repel each other & attract some materials & not others** **To compare & group together a variety of everyday materials on the basis of whether they are attracted to a a magnet & identify some magnetic materials** **To describe magnets as having two poles** **To predict whether 2 magnets will Attract/repel each other, depending on which poles are facing** Set up a fair test to compare the strengths of different magnets Identify how magnets are useful in everyday items, and suggest creative uses for different magnets.		**To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object** **To identify the effects of air resistance, water resistance and friction, that act between moving surfaces** Practical tests where possible, eg: streamlined boat, surface of parachute, how friction is used everyday in shoes / cars **To recognise that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect** Design a product that uses above mechanics.		
Physics **Light**	**DM:** **Explore how things work.** **Talk about the differences in materials and changes they**	**DM:** **Explore the natural world around them.** **Describe what they see, hear and feel whilst outside.**			**To recognise that they need light in order to see things that dark is the absence of light** **To notice that light is reflected from**			**To use the idea that light travels in straight lines to explain that objects are seen because they give out reflect light**	

	notice.				**surfaces** **To recognise that light reflected from the sun can be dangerous & that there are ways to protect their eyes** **To recognise that shadows are formed when the light from a light source is blocked by an opaque object** **To find patterns in the way that the size of shadows changes**			**into the eye** **To 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** **To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them** Design and make a periscope, explaining how it works due to light travelling in straight lines. Set up a puppet show and explain how and why it works.	
<u>Physics</u> **Electricity**	**DM:** **Explore how things work.** **Talking about what they see using a wide vocabulary.**	**-**				**To identify common appliances that run on electricity** **To construct a simple series electrical circuit, identifying & naming its basic parts, including cells, wires, bulbs, switches & buzzers** **To identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp lights in a simple circuit** **To recognise that a switch opens & closes a circuit & associate this with whether or not a lamp lights in a**		**To use associate the brightness of a lamp or volume of a buzzer with the number & voltage of cells used in the circuit** **To compare & give reasons for variations in how components function, including the brightness of bulbs, loudness of buzzers & the on/off position of switches** To use recognised symbols when representing a simple circuit in a diagram To construct & control a series circuit, and describe how the circuit may be affected when	

						simple series circuit **To recognise some common conductors & insulators & associate metals with being good conductors** Find patterns, eg brightness of lamp and number of cells		changing one component at a time. Find patterns associated with these changes. Use this knowledge to make a useful object that lights up, eg traffic light or torch.	
<u>Physics</u> **Sound**	**DM:** **Explore how things work.**	**DM:** **Explore the natural world around them.** **Describe what they see, hear and feel whilst outside.**				**To identify how sounds are made, associating some of them with something vibrating** **To recognise that vibrations from sounds travel through a medium to the ear** **To find patterns between the pitch of a sound and features of the object that produced it** **To find patterns between the volume of a sound and the strength of the vibrations that produced it** **To recognise that sounds get fainter as the distance from the sound source increases**			
<u>Physics</u> **Earth and Space**	**DM:** **Talking about what they see using a wide vocabulary.**	**DM:** **Explore the natural world around them.** **Describe what they see, hear and feel whilst outside.**					**To describe the movement of the Earth & other planets, relative to the Sun in the solar system** **To describe the**		

							movement of the Moon relative to the Earth **To describe the Sun, Earth & Moon as approximately spherical bodies** **To use the idea of the Earth's rotation to explain day & night & the apparent movement of the sun across the sky** Research or reenact the development of astronomy, especially the shift between the geocentric to heliocentric models. Discuss key figures. Compare times of day at different locations or construct a simple shadow clock or sundial.		
<u>Biology</u> **Evolution and Inheritance**	-	-	-	-	-	-	-	**To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago** **To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents** **To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution** Explain how variation in offspring over time	

								can lead to animals being more or less suited to their habitat, eg giraffe neck, polar bear coat, beaks changing… To explain how environmental changes may have an impact on living things (eg: moths changing colour to camouflage against buildings)	