

Key Science Concepts	Early Years Foundation Stage	Years 1 and 2	Years 3 and 4	Years 5 and 6
Light & Seeing (Physics) Eyes See		 Children identify parts of the human body, including eyes. They will understand that eyes enable you to see. 	Children will learn that the sun is dangerous for eyes and that there are ways to protect our eyes.	
Light & Seeing (Physics) Light			 Children learn that we need light to recognise things and that darkness is the absence of light. Children learn that light travels in straight lines and enters our eyes so we can see. (no diagram) 	 Children learn that light travels in straight lines and enters our eyes so we can see, (with diagram.) Explain that we see things because light travels from a light source to our eyes or from an object and then to our eyes. (Mirror diagrams.) To know how a prism changes a ray of light to show the spectrum.



Light & Seeing (Physics) Reflection		•	Notice that light is reflected from surfaces, (shiny surfaces, mirrors,) (Don't do mirror diagrams.)	•	Explain that we see things because light travels from a light source to our eyes or to an object and then to our eyes. (Mirror diagrams.)
Light & Seeing (Physics) Shadows		•	Recognise that shadows are formed when the light from a light source is blocked by an opaque or translucent object. Find patterns in the way shadows change size.	•	Use the idea that light travels in straight lines to explain why shadows have the same shape as an object.
Investigate Materials including Rocks, Soils and Fossils (Chemistry) Materials and their Functions	 Distinguish between objects and the material they are made of Identify and name different materials. 	•	Know about different types of soil.		



Investigate Materials including Rocks, Soils and Fossils (Chemistry Properties	Use their senses in hands on exploration of natural materials. (3-4) Explore collections of materials with similar or different properties. (3-4) Talk about what they see, using a wide vocabulary (3- 4). Talk about the differences between materials	 Describe the simple properties of a variety of everyday materials, (hard, soft, rough and smooth, shiny and dull, rigid and flexible, absorbent and non-absorbent, stretchy, elastic, transparent and opaque and waterproof and non-waterproof.) Compare and group together a variety of everyday materials on the basis of their simple physical properties. Recap properties of materials (wood, glass, plastic, metal, paper, cardboard, fabric, rubber). To understand why particular materials are used for different purposes e.g. glass for a window. (Link to properties.) 	 Describe, compare and group together different kinds of rocks on the basis of their appearance and simple physical properties, (hard soft, rough, smooth, texture flexible, rigid, shiny, dull, transparent, opaque, particle/grain size, crystalline or not,) Know that some rocks are durable. Know that some rocks are permeable/porous. 	 To know how to use scientific language that relates to properties of materials, (hardness, solubility, transparency, conductive properties, thermal properties.) To know what the terms soluble and insoluble mean. To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution To show my understanding of materials and their properties.
Investigate Materials including Rocks, Soils and Fossils (Chemistry		 To explore how materials can be changed by squashing, bending, twisting and stretching. 	 Know that materials change state when they are heated or 	 To know what an irreversible change is and that it can



Change		•	cooled and know the temperature at which this happens in degrees Celsius (°C) for water Understand the processes of melting, freezing, evaporation and condensation. Identify the part played by evaporation and condensation in the water cycle.	form a new material. • To understand the difference between heating and burning.
Investigate Materials including Rocks, Soils and Fossils (Chemistry Alive or Dead	 To identify and sort objects/materials which are living, dead, and things that have never been alive.) 	•	Recognise that soil is made from rocks and organic material.	
Investigate Materials including Rocks, Soils and Fossils (Chemistry Fossils		•	Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Explain Mary Anning's	



	contribution to
	palaeontology.
Investigate Materials including Rocks, Soils and Fossils (Chemistry) States of Materials: Solids, Liquids and Gases	 Identify solids, liquids and gases. Looking at their properties, (solids = fixed shape, cut or torn, liquids = pour, fit container, gases = no fixed shape, fill space.) Know that gases have mass. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
Investigate Materials including Rocks, Soils and Fossils (Chemistry Temperature and its Effects	 Know that materials change state when they are heated or cooled and know the temperature at which this happens in degrees Celsius (°C) for water. Associate the rate of evaporation with temperature. Understand the processes of melting, freezing, To understand the terms thermal conductor and thermal insulators.



		•	evaporation and condensation. Identify the part played by evaporation and condensation in the water cycle.	
Movement, Forces and Magnets Types of Forces	 Participate in small group, class and one-to- one discussions, offering their own ideas, using recently introduced vocabulary; ELG Offer explanation s for why things might happen ELG Understand how things work. 3-4 Explore and talk about 	•	Identify the forces acting on objects, (pushes and pulls.) Notice that some forces need contact between two objects and that some forces act at a distance.	 To know what gravity and resistance are and identify balanced and unbalanced forces Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object



	forces they can feel 3-4		
Movement, Forces and Magnets Using Forces: Pulleys, levers and gears.	•		 Recognise that gear mechanisms allow a smaller force to have a greater effect Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Movement, Forces and Magnets Friction and Resistance	•	• Explore movement across different surfaces/friction	 Identify the effects of friction, that acts between moving surfaces Identify the effects of air resistance, water resistance and friction, that act between moving surfaces



Movement, Forces and Magnets Magnetic Forces: Attraction and Repulsion	 Magnets attract some materials but repel others, (iron, nickel and cobalt) Describe magnets as having two poles. Magnets attract or repel each other. Compasses use magnets to determine direction.
Electrical Circuits (Physics) Electrical Appliances and Safety	 Identify common appliances that run on electricity. Electricity can be dangerous.
Electrical Circuits (Physics) Electrical Components	 Construct a simple series electrical circuit, identifying and naming its basic parts, including batteries, wires, bulbs, switches and buzzers. Use recognised symbols when representing a simple circuit in a diagram.



Electrical Circuits (Physics) Circuits		•	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. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp/bulb lights in a simple circuit.	•	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells 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 position of switches
Electrical Circuits (Physics) Insulators and Conductors		•	Recognise some common conductors and insulators and associate metals with being good conductors.		
Sound (Physics) Vibrations make sound	Types of Sound.	•	Identify how sounds are made by vibrations. Recognise that vibrations from sounds travel		



			through a medium to the ear.	
Sound (Physics) Hearing	Perform songs, rhymes, poems and stories with others, and – when appropriate try to move in time with music. ELG	 Identify, name, draw and label the basic parts of the human body. Name the part of the body associated with each sense covering sight, hearing, touch, taste, feel. 	• How we hear.	
Sound (Physics) Pitch	Perform songs, rhymes, poems and stories with others, and – when appropriate try to move in time with music. ELG		 High notes are made by short lengths/tight objects whereas low notes are made by long lengths/loose objects. 	
Sound (Physics) Volume	Perform songs, rhymes, poems and stories with others, and – when appropriate try to move in time with music. ELG		The harder you hit an object, the louder the sound. Gentle strikes make quieter sounds.	



Sound (Physics) Sound and distance		 Recognise that sounds get fainter when the distance from the sound source increases. Identify aspects of science used within particular jobs or roles, (Alexander Bell and the telephone.) 	
Sound (Physics) Soundproofing		 Materials with air pockets such as sponge or bubble wrap insulate against sound. (Soundproofing.) 	



Understanding Evolution and Inheritance Human Life Cycle: Inheritance and Variation	Notice that animals, including humans, have offspring which grow into adults.	Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents in the context of inheritance
Understanding Evolution and Inheritance Adaption and Evolution	Describe how animals are suited to different habitats.	 Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Identify how adaptation may lead to evolution by examining the theories of evolution constructed by



				Darwin and Wallace. Identify the advantages and disadvantages the role of human intervention has on the process of evolution.
Understanding Evolution and Inheritance Fossils and Fossilisation			 Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Explain Mary Anning's contribution to palaeontology. 	 Recognize that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
Understand the Earth's Movement in Space (Physics)	Use all their senses in hands on exploration of natural materials. 3-4	 There are 4 seasons. Winter, Spring, Summer and Autumn. Explore local environment. Describe the changes, e.g. 		



Seasonal Change	Say what they can see, hear and feel when outside. R Explore the natural world around them. R Understand the effects of the changing seasons on the world around them.R Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. (ELG)	 colours changing etc, changing weather conditions. Identify and name a variety of deciduous and evergreen trees. (Plants Y1) To observe signs of Autumn. To observe signs of Winter. To compare and observe patterns of weather during Winter. To observe signs of Spring To compare and observe patterns of weather during Spring. To observe signs of Summer. Compare season of Summer. Compare season of Summer to previous knowledge of seasons, including the weather. 		
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Understand the Earth's		The superior of the second
Movement in Space. (Physics) Day Length	 Seasonal patterns - changes in the length of a day. The length of the day is shorter in winter and longer in summer. 	• To understand why the length of day and night changes during the year.
Understand the Earth's Movement in Space (Physics) Movement of Earth, Sun and Moon.		 Recognise that shadows are formed when the light from a light source is blocked by an opaque or translucent object. Find patterns in the way shadows change size over a day. To know the movements of the earth, moon and sun. To understand how the earth faces the sun at different times of the day.
Understand the Earth's Movement in Space. (Physics) Size of Spherical Bodies		 To understand the size differences between the earth, moon and sun and that they are spherical bodies. To know the different



			 phases of the moon. To know the names of the planets. To know the order of planets
Understanding Animals and Humans, (Biology) Structure and Function of the Human Body.	 Identify, name, draw and label the basic parts of the human body. Name the part of the body associated with each sense covering sight, hearing, touch, taste, feel. 	 Identify that humans have skeletons and muscles for support, protection and movement. Identify and name bones. Identify and explain the three main functions of a skeleton. Know why we need muscles to move. Identify and name parts of the human digestive system: tongue, teeth, oesophagus, 	 Identify main parts of the circulatory system Identify main functions of the circulatory system To describe and explain how nutrients are transported within animals including humans.



			 stomach, small and large intestines, liver, pancreas and rectum. Explain the functions of the digestive system. Identify the types and functions of teeth: incisors bite, canines rip and tear, premolars and molars grind. Understand the causes of tooth decay. Know how to look after your teeth. 	
Understanding Animals and Humans, (Biology) Staying Healthy	Be increasingly independent in meeting their own care needs, eg brushing teeth, using the toilet, washing and drying hands	 Understand the importance of staying healthy through hygiene, diet and exercise. (taught with bodies and senses unit) Find out about and describe the basic needs of animals, including humans, for survival. (water, food and air) 	 Recap that animals, including humans, cannot make their own food; they get nutrition from what they eat. 	 Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Recognise the negative effect



thoroughly. (3- 4) Make healthy choices about food, drink, activity and tooth brushing. (3-4) Know and talk	 Learn the 3 basic needs of animals for survival, including how to look after pets. The importance of healthy life-styles, including healthy food, hygiene and exercise. (taught with bodies and senses unit) 	 Explain how living things obtain food. State why animals, including humans, need the right type and the right amount of 	 of substances on body e.g. drugs, alcohol, sugar, salt. Recognise the positive effects of doing exercise and eating healthily on body.
and well-being -regular physical exercise, healthy eating, tooth brushing, sensible amounts of 'screen time', having a good sleep routine, being a safe pedestrian. (R).			



Understanding Animals and Humans, (Biology)	Notice that humans, have offspring which grow into	Describe the changes as
Human Change	 adults. Explore how animals change as they grow up, including humans. Learn the life-cycle of animals and a human. 	 humans develop to old age by drawing a timeline to indicate stages in the growth and development of humans. To describe the changes as humans develop to old age in the context of the development of babies in their first year. To describe the changes as humans develop to old age by comparing the changes that take place to boys and girls during puberty.



Understanding Animals and Humans, (Biology) Vertebrates Structure and Function	Explore the natural world around them, making observations and drawing pictures of animals and plants; (ELG)	 Name common animals including fish, amphibians, reptiles, birds and mammals. Describe and compare the structure of a variety of common animals including fish, amphibians, reptiles, birds and mammals. Look at animal young and compare them to their adults. 	 Identify that some animals have skeletons and muscles for support, protection and movement. Identify and explain the three main functions of a skeleton. Look at other animal's teeth. 	 To describe the changes as humans develop to old age by understanding the changes that take place in old age.
Understanding Animals and Humans, (Biology) Food Chains		 Describe how animals obtain their food from plants and other animals in order to survive. (food chains) 	 Compare animals by their diet. 	



Living Things and their Habitats. (Biology) Environments	Talk about what they see, using a wide vocabulary (3- 4). Explore the natural world around them. (R)	 Name different animals in specific environments. Describe how animals are suited to different habitats. 	
	Say what they see, hear and feel when outside. (R). Describe their immediate environment using knowledge from observation, discussion, stories, non- fiction texts and maps; (ELG)		
	Explore the natural world around them,		



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	making observations and drawing pictures of animals and plants; (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; (ELG)		
Living Things and their Habitats. (Biology)	Explore the natural world around them,	 Recognise that living things can be grouped in a 	 Identify the characteristics of different
Classification/Similaritie	making	variety of ways.	types of
s and Differences.	observations	Explore and use	animals.
	and drawing	classification	Describe how
	pictures of animals and	keys to help	living things are classified into
	plants; (ELG)	group, identify and name a	broad groups
		variety of living	according to
		i anory or inting	according to



	Know some similarities and differences between the natural world around them.		things in their local, (Wicksteed Park) and wider environment, Sywell Park, including woodland, grassland and a pond.)	 common observable characteristics and based on similarities and differences, including microorganisms , plants and animals by grouping organisms found in the local habitat. To understand the Linaean system for classification.
Living Things and their Habitats. (Biology) Food Chains		 Find out about and describe the basic needs of animals, including humans, for survival. (water, food and air) 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. 	 Construct and interpret a variety of food chains, identifying producers, consumers, predators and prey, in parkland, wooded areas and ponds. 	



		 Identify and name a variety of common animals that are carnivores, herbivores and omnivores. To use simple food chains to describe the relationship between animals and plants. 	 Understand food chains and the role of different plants and animals within them, in parkland, wooded areas and ponds. 	
Living Things and their Habitats. (Biology) Reproduction and Life Cycles	Understand the key features of the life cycle of a plant and an animal (3-4). (Butterfly)	 Life cycle of animal e.g. frog. Life cycle of a plant- e.g. oak, apple, sycamore or Silver Birch tree. To identify the behaviours of animals (life-cycles) during Spring, Frog life cycle) 	 Observe plant/tree life cycles in the park. 	 The life process of reproduction in some plants and animals by exploring sexual reproduction in plants. The life process of reproduction in some plants and animals by exploring asexual reproduction in plants. The life cycle of a mammal by exploring the



		life cycles of
		mammals in different
		habitats.
		 The life process
		of reproduction
		in some plants
		and animals by
		describing
		sexual
		reproduction in
		mammals.
		The life process of reproduction
		in some plants
		and animals by
		exploring Jane
		Goodall's work
		with
		chimpanzees.
		Describe the
		differences in the life cycles
		of an
		amphibian,
		(newt) and an
		insect
		(dragonfly) by
		exploring
		complete and
		incomplete



			metamorphosis
			Describe the differences in
			the life cycles of a mammal,
			an amphibian, an insect and a
			bird by describing and
			Compare different life
			cycles, including birds.
Living Things and their Habitats. (Biology)			 To describe and investigate
Micro-organisms			helpful and harmful micro-
Micro-organisms			organisms.
Living Things and their Habitats. (Biology)	Begin to understand	 Recognise that environments 	
	the need to	can change	
Environmental Change	respect and care for the	and that this can sometimes	
	natural	pose dangers to	
	environmen t and all	living things by identifying	
	living things	changes and	
	(3-4).	dangers in the local habitat.	
		Know the	
		positives of	



Living Things and their	Understand	• There are 4 seasons. Winter,	 nature reserves, parks, ponds and the negatives of development, traffic and litter. Understand the
Habitats. (Biology) Seasonal Change	the effect of the changing seasons around them. (R). Understand some important processes and changes in the natural world around them, including the seasons	 Spring, Summer and Autumn. Explore local environment. Describe the changes, e.g. colours changing etc, changing weather conditions. Identify and name a variety of deciduous and evergreen trees. (Plants Y1) To observe signs of Autumn/Winter/Spring/Summ er To compare and observe patterns of weather during each season. To understand how animals source their food during Autumn. (e.g. squirrels/hedgehogs 	change in plant stages over the year and the changes in the environment.
	and changing states of matter (ELG) • Understand	 hibernation) Seasonal patterns - changes in the length of a day. The length of the day is shorter in winter and longer in summer. 	



Investigate Living Things/Plants Plant Variety	Explore the natural world around them. (R) Say what they see, hear and feel when outside. (R). Explore the natural world around them, making observations and drawing pictures of animals and plants; (ELG) Know some similarities and differences between the natural world around them and	 Identify common plants and trees in the garden and in the wild. Identify deciduous and evergreen trees. 	 Look at a range of plants and know that some are flowering, (including grasses) and some are non- flowering. 	



	contrasting environments, drawing on their experiences and what has been read in class; (ELG)			
Investigate Living Things/Plants Structure/Function	Identify the main parts of a flowering plant eg flower, stem, root and leaf.	 Identify the main parts of a flowering plant and tree. 	 Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers by labelling the parts of a plant. Know how water is transported in plants. Know plants can make food. Know the parts that flowers play in the life cycle of flowering plants, stem/trunk 	 Identify and describe the functions of different parts of flowering plants: stigma, style, ovary, ovules,



			including pollination	
Investigate Living Things/Plants Growth	 Plant seeds and care for growing plants (3-4). 	 Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Seed germination.) 	 Understand that plants need air, light, water, nutrients from soil and room to grow. (Plant growth) Know that plants vary in their needs. 	
Investigate Living Things/Plants Life Cycles	 Understand the key features of the life cycle of a plant and an animal (3-4). (Butterfly) 	 Recap lifecycle of a tree Observe and describe how seeds and bulbs grow into mature plants. 	 Know the parts that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	 The life process of reproduction in some plants by exploring sexual reproduction in plants. The life process of reproduction in some plants by exploring asexual reproduction in plants.



Investigate Living Things/Plants	Begin to understand the need to	•	 Care and respect plants and living 	
Care and Respect	respect and care for the natural environmen t and all living things (3-4).		things.	