Werneth Primary School Curriculum Synopsis for Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	**Children in Early Years explore the natural world around them, developing their understanding of how things works, compare and contrast a range of environments and explore the materials that make up the world around them. Through a range of carefully planned activities, every child is encouraged to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. In the Autumn term, children describe what they see, hear and feel whilst outside through listening walks. Children explore a range of man made and natural resources. They explore collections of materials with similar and/or different properties. Children look at which materials float sink; which materials can stretch; hold water and materials which are waterproof. In Spring children learn about different countries around the world and make comparisons between land animals and sea creatures. They make comparisons between countries- comparing climate, weather and the animals which live there. During the Summer term children explore the natural world around them making observations of plants and animals. Children learn about and care for growing plants as well as caring for caterpillars. Children look at a variety of fruits, vegetables and plants and make their own predictions about growth and decay. Children continue to explore the world around them by drawing on their experiences to make comparisons between environments when they look at a range of animal habitats. Children are encouraged to ask questions about why things happen and how things work. They are also asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.**					
Nursery	During our All About Me topic children in Nursery explore and talk about different forces they can feel. Children explore a range of cause and effect toys, explaining which forces are used when exploring these toys. Children talk about the differences between materials and changes they notice when making self-portraits using a variety of materials e.g. playdough, pom poms, paint, clay, card. This links in to the Reception Unit All About Me children describe what they see, hear and feel whilst outside through listening walks. Children explore a range of manmade and natural resources through transient art trays to create their own pictures. Children describe the materials they are exploring in the malleable areas and transient art area. Activities include ● self/family portraits ● Use of ramps/cars/balls ● naming and labelling parts of the body ● Making porridge	During our Songs, Stories and Celebrations topic children in Nursery learn to use their senses in hands-on exploration of natural materials e.g. leaves, jelly, ice, porridge and talk about what they see using a wide vocabulary. Children explore what happens when water is frozen. This links to the Reception Topic Songs, Stories and Celebrations where children explore collections of materials with similar and/or different properties. Children look at which materials float sink; which materials can stretch; hold water and materials which are waterproof. Activities include ● freezing and melting ● using sense to describe and discuss e.g. snakes in jelly decorating biscuits/cakes (icing)	During our Under the sea topic children in Nursery, learn there are different countries in the world and talk about the differences they have experienced or seen in photos. Children sort a range of animals based on the countries they come from. This links to the Reception topic Under the Sea where children sort animals into land animals and under the sea creatures. Children learn about a range of animals and countries they come from. They create their own fact files about under the sea creatures and land animals. Links are also made with the Reception Superhero topic where children make comparisons between England and Africa comparing climate, weather and the animals which live there. Activities include ● sorting sea animals and land animals ● naming sea animals looking at different bodies of water) sea, river, pond) e.g. would we find a shark in the river? etc	During our Superheroes topic children in Nursery will learn about and explore how things work. They will look at different tools and equipment associated with different everyday hero jobs. Children comment on and discuss weather changes each morning during their Early Morning Activity. This links in to the Reception Superhero topic where children comment on and document the changing weather each morning as part of their morning activity. Children make their own weather vanes and record the changes in the weather. Activities include ● what do I want to be when I grow up? ● comparing different roles looking at job specific tools and equipment	During our Growth topic children in Nursery learn about and care for butterflies. Children learn about the different stages of the butterfly life cycle. They compare and contrast a range of different minibeasts. This links in to the Reception Unit Growth where children observe the life cycle of a butterfly. Children learn how to care for caterpillars and butterflies. They draw and label their own butterfly life cycles and have the experience of seeing this first hand. Activities include ● butterfly life cycle (pasta) ● looking at changes over time e.g. caterpillars ● mini-beast hunts in school workshop	During our Wild Things topic, children explore collections of materials with similar and/or different properties. Children look at a range of natural materials found in woodlands e.g. tree, sticks, branches. Children explore these in the transient art area and use their senses to comment on the variety of materials. Children look at a range of habitats e.g. woodland, caves and rivers. This links to the Reception unit Wild Things where children learn about woodland animals and their habitats. They learn about contrasting environments, drawing on their experiences by making comparisons between woodlands and their local area. Activities include ● in school farm visit ● exploring different habitats from the story transient art using natural resources
Reception	During our All About Me topic children in Reception explore the natural world around them by visiting their local area. Children describe what they see, hear and feel whilst outside through listening walks. Children explore a range of man-made and natural resources through transient art trays to create their own pictures. Children describe the materials they are exploring in the malleable areas and transient art area. This links in to the Year 1 unit on Everyday Materials, where children learn about and describe materials by their properties: hard/soft, weak/strong, dull/shin	During our Songs, Stories and Celebrations topic children in Reception, learn to understand the effect of changing seasons on the natural world around them. Children explore collections of materials with similar and/or different properties. Children look at which materials float sink; which materials can stretch; hold water and materials which are waterproof. This links in to the Year 1 unit on Everyday Materials , where children learn to sort and compare materials according to their properties and learn that the shape of some materials can be altered by forces such as twisting, squashing, stretching and bending	During our Under the sea topic children in Reception explore the natural world around them, making observations and drawing pictures of animals. Children sort animals into land animals and under the sea creatures. Children learn about a range of animals and countries they come from. They create their own fact files about under the sea creatures and land animals. This links in to the Year 1 unit on Animals including Humans, where children learn that animals can be classified and grouped by their characteristics.	During our Superheroes topic children in Reception learn about different countries. They make comparisons between England and Africa comparing climate, weather and the animals which live there. Children comment on and document the changing weather each morning as part of their morning activity. Children make their own weather vanes and record the changes in the weather. This links in to the Year 1 unit Seasonal Changes, where children learn about different aspects of the weather and learn how different weather is associated with different seasons. They give different weather forecasts for different times of the year.	During our Growth topic children in Reception learn about and care for growing plants. Children plant and take care of their own bean plant where they learn about the key features of the life cycle of a plant. Children observe the life cycle of a butterfly. Children learn how to care for caterpillars and butterflies. They draw and label their own butterfly life cycles and have the experience of seeing this first hand. Children look at a variety of fruits, vegetables and plants and make their own predictions about growth and decay This links in to the Year 1 unit on Plants where children learn that plants grow from seeds and bulbs and have a basic structure consisting of roots, stem, leaves and flowers.	During our Wild Things topic, children learn about woodland animals and their habitats. They learn about contrasting environments, drawing on their experiences by making comparisons between woodlands and their local area. This links in to the Year 1 unit Animals including Humans where children learn that animals look different, live in different places and eat different things
Year 1	**<u>Everyday Materials</u>** Pupils develop vocabulary to describe material properties. They carry out a range of simple tests on materials and investigate the best material to make a particular object. **<u>Working Scientifically - Comparative and Fair Testing</u>** Does it absorb water? Pupils test a variety of materials and sort them based on whether they are absorbent or not.	**<u>Seasonal changes</u>** ***<u>Autumn/Winter Weather and Our Environment</u>*** Pupils study different types of weather through making and using a weather station and looking at the weather around the World. They study different aspects of the weather and learn how different weather is associated with different seasons. They give different weather forecasts for different times of the year.	**<u>Animals including humans</u>** **<u>The Animal Kingdom</u>** In this unit pupils describe the external parts of the human body and learn the basic needs of human beings. They look at a range of familiar and unfamiliar British animals and establish some basic ideas about what constitutes an animal. They learn that animals belong to one of six main groups: birds, fish, amphibians, reptiles, mammals and invertebrates and that each class has different characteristics and sometimes different body parts. They learn the names of some common British animals and research one animal in more detail. **<u>Working Scientifically - Observing Over Time</u>** Pupils observe the life cycle of a reptile. **<u>Working Scientifically - Identifying, classifying and grouping</u>**		**Plants** Pupils learn the names of some common native flowering plants and trees. They plant bulbs and/or seeds and observe their growth over a period of weeks. They go outside to study flowers and trees in wild and cultivated areas, making sketches and notes.	**Seasonal changes** **Spring/Summer Weather and Our Environment** Pupils study different types of weather through making and using a weather station and looking at the weather around the World. They study different aspects of the weather and learn how different weather is associated with different seasons. They give different weather forecasts for different times of the year.

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		Working Scientifically - Observing over time Pupils make a rain gauge. Make predictions about how much rain will fill the gauge in a week in autumn. Gather data and record the findings.	Pupils investigate the senses by testing a range of foods using all the senses.	**Working Scientifically - Observing Over Time** Pupils plant sunflower seeds and observe the growth.	**Working Scientifically - Pattern Seeking** To investigate and record the temperature every week in the playground and compare with African Savannah. Observe how the temperature increases every week and what the weather is like.
Year 2	**Living things** Pupils classify things as living, once alive and never alive. They learn about the characteristics of living things and building and observing a wormery and going outside to hunt for examples of living and non-living things. They look for characteristics of life in plants and establish that plants are living things. **Working Scientifically - Identifying, classifying and grouping** Pupils classify items as living things, things that were alive and things that have never been alive. **Working Scientifically - Observing Over Time** Pupils make and observe a wormery.	**Materials** Uses of everyday materials Pupils explore different materials and begin to link properties with the use of the material, carrying out an investigation to decide on the best material for a particular use and imagining what objects would be like if they were made from "silly" materials. **Working Scientifically - Comparative and Fair Testing** To investigate the most suitable material to make a spoon. **Working Scientifically – Classifying** Malleability test. Pupils find out how shapes of solid objects made from some materials can change by squashing, bending, twisting and stretching.	**Animals including humans** **Animals and their needs** In this unit pupils begin by learning about the stages of human growth. They learn that animals grow until they are adult and that different animals start life in different forms, some as eggs and some as live births and they look at the needs of the young of different species. Throughout the unit they observe some animals as they grow. **Working Scientifically – Classifying** Pupils classify a variety of common animals (Linking back to Year 1 objectives and progress by including the category of invertebrates). **Working Scientifically - Observing Over Time** Pupils learn that animals have offspring, which grow into adults (use a video to observe the life cycle of a Robin).	**Plants** Pupils think about the difference between seeds and other objects and work out what a seed is. They plant beans and monitor them weekly, observing, measuring, sketching and photographing them to provide a record of growth. They investigate the basic needs of plants for healthy growth and explore the way that plants change through the seasons. **Working Scientifically – Observing over time** Pupils plant beans and place each pot in different conditions. Monitor and observe them weekly.	**Habitats** Pupils spend time learning about familiar and unfamiliar habitats such as woodland and the seashore. They work in the classroom and outdoors to look at animals and plants and further their knowledge of the variety of life in different places. They extend their knowledge of the diets of different animals to understand about food chains. **Working Scientifically – Classifying** Which animals live in which habitats? Pupils learn about familiar and unfamiliar habitats and microhabitats and decide which animals and plants would live there.
Year 3	**Light** Pupils learn to distinguish a light source from reflected light. They learn that light travels in straight lines, study how we see and are taught how to protect their eyes. They investigate the transparency of fabrics using and carry out some experiments to find out about shadow formation. **Working Scientifically – Comparative and fair testing** Pupils plan a fair test to investigate how the distance between an object and a light source affects the size of the shadow it forms.	**Rocks- Rocks and Soils** Pupils explore the characteristics of rocks and learn their names. They carry out simple tests on different rocks and use chocolate to model how rocks are made. They explore the composition of soil and think about how soil is made. They learn about the formation of fossils and make their own model fossils. They look at pictures of dinosaur fossils and try to come to some conclusions about the living dinosaurs the fossils came from. **Working Scientifically – Identifying, grouping and classifying** Pupils identify and group rocks based on their properties.	**Plants** Pupils carry out a long-term investigation of the factors that affect the growth of plants, observing and measuring their plants for the course of the unit. They learn about the main functions of the different parts of a plant and will study the life cycle of a flowering plant, including studying the structure of a flower and the different methods of seed dispersal. **Working Scientifically – Observing over time** Longitudinal study. Pupils investigate the factors that affect the growth of plants, observing and measuring plants for the course of the unit.	**Animals and skeletons** **Animals including humans. Skeleton and movement** Pupils revisit the classification of animals according to diet as carnivores, herbivores or omnivores, researching the diets of animals in more detail. They look at human dietary requirements and begin to identify different food types and their different uses in the body. Dissecting an owl pellet provides a link between learning about diets and the study of skeletons. Pupils learn about external and internal skeletons, making a life size skeleton diagram and studying the names and functions of the major bones in the human skeleton. **Working Scientifically - Identifying, grouping and classifying** Pupils group animals based on whether they have a skeleton or exoskeleton. **Working Scientifically - Identifying, grouping and classifying** Pupils dissect an owl pellet to provide a link between learning about diets and the study of skeletons. They use the Owl Pellet Bone Sorting Chart to group different types of bone.	**Forces and magnets** Pupils explore magnetism and non-contact forces, suspending magnetic items in mid-air under the influence of magnetic forces. They test materials for magnetic properties and think about what materials are magnetic. They describe the properties of a magnet in simple terms and learn about the uses of magnets. Working Scientifically – Comparative and fair testing Pupils test for magnetic properties and investigate what materials are magnetic.
	Longitudinal study- observing an animal home/habitat at different times of the year. **Live stream of bird feeder and children record results on a tally chart.** **1 lesson per term should be allocated to this (Autumn 2, Spring 2 and Summer 2)**				
Year 4	**Animals including humans**-(teeth/ digestion) **Digestion** In this unit pupils learn about the structure of the mouth and about how to care for their teeth, investigating which drink stains teeth the most. They learn about the structure of the digestive system, using their new knowledge to produce a piece of creative writing. The explore interrelationships in food, constructing food chains and food webs. **Working Scientifically - Observing over time** Pupils explore which drink stains teeth the most (using egg shells).	**States of Matter** Pupils learn that materials come in three states of matter: solid, liquid or gas. They identify materials as solids, liquids or gases, including some that are harder to classify such as sand or sponge. They learn how to use a thermometer and investigate changes of state. They learn about the water cycle. **Working Scientifically – Comparative and fair testing** Pupils explore the effect of temperature on substances such as chocolate, butter and cream. They use a thermometer to investigate changes of state. Compare which temperature is best for melting and freezing.	**Sound** Pupils listen to and identify sounds and learn how our ears work to detect sounds. They carry out experiments to help them learn about loudness and pitch and use data loggers to investigate the best material for muffling sound. They make and play musical instruments- wind, percussion and string. **Working Scientifically – Comparative and fair testing** Pupils carry out experiments to help them learn about loudness and pitch. Telephone cups – how sound travels through vibration.	**Living things and their habitats** Classification Pupils learn about the variety of living things and how they can be grouped according to shared characteristics. They use and construct keys to identify unfamiliar animals and plants. **Working Scientifically – Identifying, grouping and classifying** Pupils create classification keys to understand the difference between plants and animals from the local and wider environment.	**Respecting our Environment** **Key Concepts:** That humans have an impact on the environment This can sometimes be positive or negative for the flora and fauna in the area There are moral aspects to the way that we treat our environment Environments can change and that this can sometimes pose dangers to living things. **Includes local area litter pick**	**Electricity** Pupils learn that some materials allow electricity through them and others do not. They learn about the history of electricity and they make and test electrical circuits with a variety of components. **Working Scientifically – Pattern Seeking** Observe that bulbs get brighter as more cells are added and that metals tend to be conductors of electricity.
Year 5	**Living things and their habitats.** Life Cycles Pupils revisit the life cycle of plants, and learn about pollination. They compare the life cycles of birds, mammals, insects and amphibians and learn that insects and amphibians undergo metamorphosis. **Working Scientifically – Observing over time** Pupils set up their longitudinal study on decay and recycling.	**Forces** Pupils learn more about the forces of gravity and friction and investigate the friction of different surfaces. They study air resistance, investigate paper spinners falling and look at floating and sinking. Learning about simple forces includes activities to study pulleys, gears and other simple machines. **Working Scientifically – Comparative and Fair Testing** Pupils carry out an air resistance investigation. They design and make a parachutes using carrier bags.	**Animals including humans. Life cycles** Human Developments Pupils learn about the human life cycle and about the changes of the body during puberty. They learn about the development of a baby during pregnancy and about the birth of a baby. This unit has been written to match lessons in Personal, Social and Health Education on puberty and the feelings associated with growing up. **Working Scientifically – Research** Pupils find out about the gestation periods of other animals and compare them with humans by finding out and recording the length and mass of a baby as it grows.	**Properties and changes of materials.** Mixtures and reactions After reviewing and extending their knowledge of materials from previous years, pupils study dissolving and learn how to recover materials from a solution. They look at other methods of separating mixtures –decanting, evaporation, condensing , magnetism filtering and sieving They investigate chemical reactions including burning and use a key and a series of simple tests to identify some mystery powders. They also learn about reversible and irreversible changes. **Working Scientifically – Comparative and fair testing** Pupils investigate which material is the best thermal insulator. **Working Scientifically – Comparative and fair testing** Pupils understand how to separate a solute from a solution.	**Earth and Space** Pupils study our solar system, learning about the relative movements of the planets and the Moon and relating these to the way we experience the Sun and the Moon on Earth. They carry out some research into planets and investigate the way meteorites have shaped the surface of the Moon. **Working Scientifically – Observing over time** Pupils record the phases of the moon over a month. Staff also record to ensure accurate recordings completed.
	Longitudinal study- Decay and recycling- observing the decay of materials over time				

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	Key concept: That decay is an essential aspect of nature; that some materials can be recycled instead of being thrown away; that throwing things away has an environmental impact that can be reduced by waste management. **1 lesson per term should be allocated to this (Autumn 2; Spring 2 and Summer 2), plus 1 lesson in Autumn 1 to introduce and set up the study.**				
Year 6	**Animals including humans (Circulatory system)** Heart and Lungs Pupils study the circulatory system, learning about the basic components that make up blood, how the heart works and how blood circulates round the body. They learn about the lungs and the process of breathing and investigate the effect of exercise on the heart and breathing rates. They learn about the effects of smoking and alcohol. **Working Scientifically – Comparative and fair testing** Pupils investigate the effect that exercise has on heart rate.	**Light** Pupils build on their work on light in Year 3 to make more detailed investigations of shadows. They study reflectivity, build a periscope and investigate the effectiveness of sunglasses, learning about the dangers of UV light. **Working Scientifically – Comparative and fair testing** To understand how the distance from a light source affects the size of a shadow.	**Electricity** Pupils build on their learning from Year 4 to learn more about circuits, including how to use recognised symbols to represent circuits. They investigate how to change the amount of electricity flowing round a circuit, looking at how different components affect the flow of electricity and at the difference that the length and thickness of wires can make. They learn about series and parallel circuits. **Working Scientifically – Comparative and fair testing** To investigate how voltage affects the brightness of a bulb.	**Living things and their habitats** Classification Pupils build on their knowledge of classification from previous years and look at the classification of invertebrates and microorganisms in more detail. **Working Scientifically – Identifying, grouping and classifying** Pupils read and answer the questions on a classification key to decide which groups animals belong to. They explore ways of classifying animals and plant according to their characteristics.	**Evolution and inheritance** Pupils learn about the life and work of Charles Darwin and what is meant by the terms evolution and survival of the fittest. They learn how animals and plants are adapted to their environment. **Working Scientifically – Research** Pupils research the evolution of the whale and present their findings to the class. Pupils research Darwin's finches to show evidence of natural selection and present their findings to the class.

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