



Newton-le Willows Primary School

Nurture the Potential to Succeed

Science Long Term Plan



	Autumn	Spring	Summer
EYFS Nursery	Autumn 1 - Seasons Talk about the differences between seasons and changes they notice. Autumn 2 -Healthy Choices Make healthy choices about food, drink, activity and toothbrushing.	Spring 1 - Materials Explore collections of materials with similar and/or different properties. Explore how things work. Explore and talk about different forces they can feel. Use all their senses in hands-on exploration of natural materials. Understand 'why' questions and talk about what they see, using a wide vocabulary. Spring 2 - growth Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Talk about the differences between animals and changes they notice. Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" Talk about what they see, using a wide vocabulary.	Summer 1- Care of Nature Begin to understand the need to respect and care for the natural environment and all living things. Understand 'why' questions and talk about what they see, using a wide vocabulary. Summer 2- Seasons and healthy choices Talk about the differences between seasons and changes they notice. Make healthy choices about food, drink, activity and toothbrushing.
EYFS Reception	Autumn 1 All About Me/Seasons Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of the changing seasons on the natural world around them. Manage their own basic hygiene and personal needs, including dressing, going to the toilet. Autumn 2 Recognise some environments are different to the one in which they live. Begin to make comments about what they have heard and ask questions to clarify their understanding. Compare materials showing an understanding of 'why' questions.	Spring 1 Healthy choices Explore the natural world around them. Begin to understand the importance of healthy food choices. Spring 2 – Growth & Changes Explore the natural world around them, making observations and drawing pictures of animals and plants. Describe what they see, hear and feel whilst outside. Describe what they see, hear and feel whilst outside. Understand the effect of the changing seasons on the natural world around them. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Contrasting Environments (Summer 1&2) 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. Make comments about what they have heard and ask questions to clarify their understanding.

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Self-motivation Teamwork Resilience Independence Vision Emotional Intelligence

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Year 1	Seasonal Changes (Autumn 1) Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies. Observing closely, using simple equipment. Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions. Asking simple questions and recognising that they can be answered in different ways. Everyday materials (Autumn 2) Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Observing closely, using simple equipment. Identifying and classifying. Performing simple tests. Asking simple questions and recognising that they can be answered in different ways. Using their observations and ideas to suggest answers to questions. Gathering and recording data to help in answering questions.	Plants (Spring 1&2) Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. Observing closely, using simple equipment Identifying and classifying.	Animals Inc. Humans (Summer 1&2) 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. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense
Year 2	Animals Inc. Humans (Autumn 1) Explore and compare the differences between things that are living, dead, and things that have never been alive. Notice that animals, including humans, have offspring which grow into adults. Identifying and classifying. Using their observations and ideas to suggest answers to questions. Gathering and recording data to help in answering questions. Observing closely, using simple equipment. Living Things and their Habitats (Autumn 2) Explore and compare the differences between things that are living, dead, and things that have never been alive. Notice that animals, including humans, have offspring which grow into adults. 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. Identify and name a variety of plants and animals in their habitats, including micro-habitats. Identifying and classifying. Gathering and recording data to help in answering questions. Observing closely, using simple equipment. Asking simple questions and recognising that they can be answered in different ways.	Living Things and their Habitats (Spring 1) Explore and compare the differences between things that are living, dead, and things that have never been alive. Notice that animals, including humans, have offspring which grow into adults. 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. Identify and name a variety of plants and animals in their habitats, including micro-habitats. Identifying and classifying. Gathering and recording data to help in answering questions. Observing closely, using simple equipment. Asking simple questions and recognising that they can be answered in different ways.	Plants (Summer 1) Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Observing closely, using simple equipment. Asking simple questions and recognising that they can be answered in different ways. Performing simple tests Using their observations and ideas to suggest answers to questions. Uses of everyday materials (Summer 2) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Identifying and classifying. Asking simple questions and recognising that they can be answered in different ways. Observing closely, using simple equipment. Performing simple tests. Using their observations and ideas to suggest answers to questions. Gathering and recording data to help in answering questions.

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Year 3	Animals Inc. Humans (Autumn 1) Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Using straightforward scientific evidence to answer questions or to support their findings. Rocks and soils (Autumn 2) Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Setting up simple practical enquiries, comparative and fair test.	Magnets and forces (Spring 1) Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. Observe how magnets attract or repel each other and attract some materials and not others. 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. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Setting up simple practical enquiries, comparative and fair tests. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Using straightforward scientific evidence to answer questions or to support their findings. Identifying differences, similarities or changes related to simple scientific ideas and processes. Asking relevant questions and using different types of scientific enquiries to answer them. Plants (Spring 2) Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Asking relevant questions and using different types of scientific enquiries to answer them. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Using straightforward scientific evidence to answer questions or to support their findings.	Light and shadows (Summer 1) Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that shadows are formed when the light from a light source is blocked by a solid object. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Find patterns in the way that the size of shadows changes. Setting up simple practical enquiries, comparative and fair tests. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

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Year 4	Animals Inc. Humans (Autumn 1) Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Electricity (Autumn 2) Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 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 some common conductors and insulators, and associate metals with being good conductors. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Using straightforward scientific evidence to answer questions or to support their findings. Asking relevant questions and using different types of scientific enquiries to answer them. Identifying differences, similarities or changes related to simple scientific ideas and processes.	Sound (Spring 1) Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. 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. Recognise that sounds get fainter as the distance from the sound source increases. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Setting up simple practical enquiries, comparative and fair tests. Identifying differences, similarities or changes related to simple scientific ideas and processes. States of matter (Spring 2) Compare and group materials together, according to whether they are solids, liquids or gases. 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). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Identifying differences, similarities or changes related to simple scientific ideas and processes. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	<u>Living things and their habitats (Summer)</u> Recognise that environments can change and that this can sometimes pose dangers to living things. Construct and interpret a variety of food chains, identifying producers, predators and prey. Asking relevant questions and using different types of scientific enquiries to answer them. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Setting up simple practical enquiries, comparative and fair tests. Using straightforward scientific evidence to answer questions or to support their findings.

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Year 5	Earth and space (Autumn 2) Describe the Sun, Earth and Moon as approximately spherical bodies. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Describe the movement of the Moon relative to the Earth. Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests.	Materials (Spring 1) 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. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Using test results to make predictions to set up further comparative and fair tests. Forces (Spring 2) Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Identifying scientific evidence that has been used to support or refute ideas or arguments. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Using test results to make predictions to set up further comparative and fair tests. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.	Living things and their habitats (Summer 1) Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Identifying scientific evidence that has been used to support or refute ideas or arguments. Animals inc. Humans (Summer 2) Describe the changes as humans develop to old age. When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. This needs to be taught alongside PSHE. The new statutory requirements for relationships and health education can be found below: statutory guidance on Physical health and mental wellbeing (primary and secondary). Physical health and mental wellbeing (Primary and secondary) - GOV.UK (www.gov.uk)

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Year 6	Animals inc. humans (Autumn 1) Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. Identifying scientific evidence that has been used to support or refute ideas or arguments. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Using test results to make predictions to set up further comparative and fair tests. Living things and their habitats (Autumn 2) Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Describe the ways in which nutrients and water are transported within animals, including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.	Evolution and inheritance (Spring 1&2) Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.	Light (Summer 1) 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. Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Electricity (Summer 2) Use recognised symbols when representing a simple circuit in a diagram. 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. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentation. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.