Oakfield Primary School Progression in Scientific Knowledge

Year group	Working scientifically	Biology	Chemistry	Physics
Nursery	To begin to know what it means to ask a question. To begin to know how to ask a 'why' question. To begin to know how to listen to the response of a question. To begin to ask questions about things around them.	To begin to know the names of some animals. To begin to know that animals live in different places. To begin know which animals may live in certain places. Eg: Farm, zoo. To begin to know what a plant/flower is. To begin to know how to recognise a plant or flower in their surroundings.	To begin to know that objects are made of different materials. To begin to know which materials are hard or soft. To begin to know what can happen to things in water.	To begin to know that during the day it is light outside and at night it is dark. To begin to know that lights in rooms (bulbs, lamps) can make a room lighter.
Reception	To begin to know how to ask simple questions linked to scientific enquiry. To begin to know how to use simple equipment. To begin to know how to make an observation of something and ask questions surrounding this. To begin to know how to 'test' something.	To begin to know parts of the body. To begin to know how to label parts of the body. To begin to know what it means to be healthy. To begin to know how they can stay healthy. To begin to know what a simple life cycle is. To begin to know how to comment on a simple life cycle. To know which animals may live in certain places and their names. Eg: Farm, zoo. To begin to name some animals that live under water. To begin to know what a mini beast is. To begin to know what a sunflower is and what happens to it.	To begin to know what a material is. To begin to know that objects have different textures/materials. To begin to know that water can turn to ice. To begin to know that ice can melt to water. To begin to know what it means to float or sink. To begin to know what can float or sink in water.	To begin to know that there are a variety of light sources. To begin to know the difference between light and dark. To begin to know what might happen when it is light or dark outside. To begin to know what space is. To begin to know some ideas linked to space.

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<table>
<tr>
<td rowspan="2">Year 1</td>
<td rowspan="2">To know how to ask simple scientific questions.
To know how to use simple equipment to make observations.
To know how to carry out simple tests.
To know what it means to 'classify'
To know how to identify and classify things.
To know how to form some suggestions of findings.
To know how to use simple data to answer questions.</td>
<td><u>Plants</u>
To know what a plant is.
To know where you can find plants.
To know the names of a variety of common, wild and garden plants.
To know the terms petal, stem, leaf and root of a plant and can label these.
To know the terms roots, trunk, branches and leaves of a tree and can label these.</td>
<td rowspan="2"><u>Everyday materials</u>
To know what a material is.
To know a range of objects with different materials.
To know how to distinguish between an object and the material it is made from.
To know how to explain the materials that an object is made from.
To know the name wood, plastic, glass, metal, water and rock.
To know the properties of everyday materials and describe these.
To know how to group objects based on the materials they are made from.</td>
<td><u>Seasonal changes</u>
To know what a season is.
To know what seasons there are.
To know how to observe and comment on changes in the seasons.
To know a range of weather conditions.
To know the names of seasons and suggest the type of weather in each season.</td>
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<tr>
<td><u>Animals including humans</u>
To know what an animal, fish, amphibian, reptile, bird and mammals are.
To know the name of a variety of animals including fish, amphibians, reptiles, birds and mammals.
To know what it means to classify.
To know that animals eat different things.
To know how to classify and name animals by what they eat (carnivore, herbivore, omnivore).
To know how to sort animals into categories (including fish, amphibians, reptiles, birds and mammals).
To know what it means to be living or non-living.
To know how to sort living and non-living things.
To know the parts of a human body that I can see and can name these.
To know what a sense is.
To know how many senses you have.</td>
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Oakfield Primary School Progression in Scientific Knowledge

		To know how to link the correct part of the human body to each sense.		
Year 2	To know how to ask simple scientific questions. To know how to use simple equipment to make observations. To know how to carry out simple tests. To know how to identify and classify things. To know how to form some suggestions of findings. To know how to use simple data to answer questions.	**Plants** To know what a seed and bulb is. To know the difference between a bulb and a seed. To know how seeds and bulbs grow into plants and can describe this. To know what plants need in order to grow and stay healthy (water, light and suitable temperature) and can describe this. **Animals including humans** To know that animals including humans have different stages in life. To know the basic stages in a life cycle for animals including humans and can explain these stages. To know what it means to survive.	**Uses of everyday materials** To know how to identify and name a range of materials including wood, metal, plastic, glass, brick, rock, paper and cardboard. To know that materials might or might not be used for different jobs and to suggest reasons. To know how shapes can be changed by squashing, bending, twisting and stretching.	

		To know what animals and humans need to survive and describe this. To know what a balanced diet is. To know what hygiene means. To know what it means to have good hygiene. To know why exercise, a balanced diet and good hygiene are important for humans and can describe this.		
		Living things and their habitats To know the difference between living, dead or never lived. To know how to identify things that are dead, living and never lived. To know what a habitat is. To know how a specific habitat provides for the basic needs of things living there (plants and animals) and can describe these. To know and identify the names of plants and animals and a range of habitats. To know how to match living things to their habitat. To know how to describe where animals find their food. To know and name some different sources of food for animals. To know what a food chain is. To know how to explain the simple food chain.		

Oakfield Primary School Progression in Scientific Knowledge

Year 3	To know how to ask relevant scientific questions. To know how to use observations and knowledge to answer scientific questions. To know how to set up a simple enquiry to answer to explore a scientific question. To know how to set up a test to compare two things. To know how to set up a fair test and explain how it is fair. To know how to make careful and accurate observations include the use of standard units. To know how to use equipment including thermometers and data loggers to make measurement. To know how to gather, record, classify and present data in different ways to answer scientific questions. To know how to use diagrams, keys, bar charts and tables using scientific language. To know how to use findings to report in different ways using oral and written explanations/presentations. To know how to draw conclusions and suggest improvements. To know how to make a prediction with a reason. To know how to identify differences, similarities and changes relating to an enquiry.	**Plants** To know what a flowering plant is. To know the function of different parts of flowering plants and trees and can describe them. To know the needs of different plants for survival and can describe this. To know how water is transported within plants and can describe this. To know what a life cycle is. To know and can describe the plant life cycle and especially the importance of flowers.	**Rocks** To know what a rock is. To know the term 'properties'. To know how to compare and group rocks based on their appearance and physical properties giving a reason. To know what a fossil is. To know how and describe the formation of fossils. To know what soil is. To know and describe how soil is made. To know what a sedimentary rock is. To know what an igneous rock is. To know how to describe and explain the difference between sedimentary and igneous rock.	**Light** To know what dark is (the absence of light) and describe this. To know the part that light plays in helping us see. To know what the term 'reflection' means. To know that light is reflected from a surface and explain this. To know what a shadow is. To know how to explain and demonstrate how a shadow is formed. To know how to explore shadow size and explain this. To know what it means to be protected from the sun. To know the danger of direct sunlight and describe how to keep protected.
				Forces and Magnets To know how objects move on different surfaces, exploring and describing this To know what a force is. To know how some forces require contact and some do not, giving examples and explanations. To know the terms attract and repel. To know what a magnet is.

		Animals including humans To know what nutritious means. To know what makes something nutritious. To know the importance of a nutritious balanced diet and can explain this. To know how nutrients, water and oxygen are transported within humans and can explain this. To know how to describe and explain the skeletal system of a human. To know how to describe and explain the muscular system of a human. To know the purpose of the skeletal system in humans and animals and can describe this.		To know and explain how objects attract and repel in relation to objects and other magnets. To know how to make a prediction whether objects will be magnetic and carry out an enquiry to test this out. To know how magnets work and can describe this. To know how to predict whether magnets will attract or repel and give a reason.

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Year 4	To know how to ask relevant scientific questions. To know how to use observations and knowledge to answer scientific questions. To know how to set up a simple enquiry to answer to explore a scientific question. To know how to set up a test to compare two things. To know how to set up a fair test and explain how it is fair. To know how to make careful and accurate observations include the use of standard units.	**Animals including humans** To know what a digestive system is. To know the names and parts of the human digestive system and can identify these. To know what an organ is. To know the functions of the organs in the human digestive system and can describe these. To know to identify and describe the different types of teeth in humans. To know the functions of different human teeth and can describe these. To know how to use food chains to identify producers, predators and prey.	**States of matter** To know the different states of matter. To know how to group materials based on their state of matter (solid, liquid, gas). To know how some materials change state and describe this. To know how to explore how materials change state. To know how to measure the temperature at which materials change state. To know and describe the stages of the water cycle.	**Sound** To know how sound is made and describe this. To know and explain how sound travels from a source to our ears. To know what vibration is. To know and explain the place of vibration in hearing. To know to explore the correlation between pitch and the object producing the sound. To know how to explore the correlation between the volume of the sound and the strength of the vibrations that produced it.

Oakfield Primary School Progression in Scientific Knowledge

	To know how to use equipment including thermometers and data loggers to make measurement. To know how to gather, record, classify and present data in different ways to answer scientific questions. To know how to use diagrams, keys, bar charts and tables using scientific language. To know how to use findings to report in different ways using oral and written explanations/presentations. To know how to draw conclusions and suggest improvements. To know how to make a prediction with a reason. To know how to identify differences, similarities and changes relating to an enquiry.	To know how to construct food chains to identify producers, predators and prey.	To know the part played by evaporation and condensation in the water cycle and explain this.	To know what happened to a sound as it travels away from its source and describe this. **<u>Electricity</u>** To know what electricity is. To know what makes something an appliance. To know the names of appliances that require electricity to function and identify these. To know what a circuit is. To know how to construct a series circuit. To know the names of components in a series circuit (including cells, wires, bulbs, switches and buzzers) and identify these. To know how to draw a circuit diagram. To know how to predict and test whether a lamp will light within a circuit. To know the function of a switch in a circuit and describe this.

Oakfield Primary School Progression in Scientific Knowledge

		Living things and their habitats To know how to group living things in different ways. To know what a classification key is. To know how to use classification keys to group, identify and name living things. To know how to create classification keys to group, identify and name living things (for others to use) To know how changes to an environment could endanger living things and describe these.		To know what a conductor is. To know what an insulator is. To know the difference between a conductor and insulators, describing and giving examples of each.
Year 5	To know how to plan different types of scientific enquiry. To know how to control variables in an enquiry.	**Animals including humans** To know how to create a timeline to indicate the stages of growth in humans. To Know what puberty is. To know about the changes in puberty.	**Properties and changes of materials** To know how to compare and group materials based on their properties (e.g. hardness, solubility,	**Forces** To know what gravity is and explain its impact on our lives.

Oakfield Primary School Progression in Scientific Knowledge

	To know how to measure accurately and precisely using a range of equipment. To know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. To know how to use the outcome of test results to make predictions and set up a further comparative fair test. To know how to report findings from enquiry's in a range of different ways. To know how to explain a conclusion from an enquiry. To know how to explain causal relationships in an enquiry. To know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory. To know how to read, spell and spell scientific vocabulary accurately. To know how to research gestation periods of other animals and compare them to humans.	To know the term 'gestation' **Living things and their habitats** To know the lifecycle of different things e.g. mammals, amphibians, insects, birds and describe these. To know how describe the differences between various lifecycles. To know what reproduction is. To know the process of reproduction in plants and describe this. To know the process of reproduction in animals and describe this.	transparency, conductivity, [electrical and thermal], and response to magnets). To know how a material dissolves to form a solution: explaining the process of dissolving. To know how to describe and show how to recover a substance from a solution. To know how some materials can be separated and describe this. To know how materials can be separated e.g. through filtering, sieving and evaporating and demonstrate this. To know and demonstrate that some changes are reversible and some are not. To know and explain how some changes result in the formation of a new material and that it is usually irreversible. To know and discuss irreversible and reversible changes. To know how to give evidenced reasons why materials should be used for specific purposes.	To know and understand the term air resistance, identifying and explaining the effect. To know and understand the term water resistance, identifying and explaining the effect. To know and understand the term air friction, identifying and explaining the effect. To know and explain how lever, pulleys allow a smaller force to produce a greater effect. **Earth and Space** To know the movement of the Earth and other planets relative to the sun, describing and explaining this. To know the movement of the moon relative to the Earth, describing and explaining this. To know how night and day are created, explaining and demonstrating this. To know what the term spherical means. To know how to use the term spherical to describe the sun, Earth and moon.

Oakfield Primary School Progression in Scientific Knowledge

Year 6	To know how to record data and results using scientific diagrams and labels, classification keys, tables. To know how to plan different types of scientific enquiry. To know how to control variables in an enquiry. To know how to measure accurately and precisely using a range of equipment. scatter graphs, bar and line graphs.	**<u>Animals including humans</u>** To know the names of the main parts of the human circulatory system and to identify these. To know the function of the heart, blood vessels and blood and describe these. To know how to discuss the impact of diet, exercise, drugs and lifestyle on health. To know how to describe the ways in which nutrients and water are transported in animals including humans.		**<u>Light</u>** To know and explain how light travels. To know how we see objects demonstrating and explaining this. To know and explain how shadows have the same shape as the object which casts them. To know how to explain how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Oakfield Primary School Progression in Scientific Knowledge

	To know how to use the outcome of test results to make predictions and set up a further comparative fair test. To know how to report findings from enquiry's in a range of different ways. To know how to explain a conclusion from an enquiry. To know how to explain causal relationships in an enquiry. To know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory. To know how to read, spell and spell scientific vocabulary accurately.	**Living things and their habitats** To know how to classify living things into broad groups according to observable characteristics and based on similarities and differences. To know how to describe how living things have been classified. To know how to give reasons for classifying plants and animals in a specific way.		**Electricity** To know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer and explain this. To know how to compare and give reasons for why components work and do not work in a circuit. To know how to draw circuit diagrams using correct symbols.

		Evolution and inheritance To know how the earth and living things change over time and describe these. To know how fossils can be used to find out about the past and explain this. To know and explain about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents). To know how animals and plants are adapted to suit their environment and explain this. To know the terms adaptation and evolution. To know the link between adaptation overtime and evolution. To know and can explain the term evolution.		