



Primary Science
Whole School
Continuum
2016



<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Plants Animals and humans Materials Seasonal changes/Earth and space	Living things and their habitats Plants Animals and humans Materials	Plants Animals and humans Rocks Light Forces and magnets
<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
Living things and their habitats Animals and humans States of matter Sound Electricity	Living things and their habitats Animals and humans Materials Seasonal changes/Earth and space Forces and magnets	Living things and their habitats Animals and humans Inheritance Light Electricity



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living things and their habitats.		Explore and compare the differences between things that are living, dead and have never been alive. Identify that most living things live in habitats to which they are suited and describe how habitats cater for the needs of animals and how they depend on each other. Identify and name a variety of plants and animals in their habitats/microhabitats. Describe how animals obtain food from plants and other animals, simple food chains and identify and name sources of food.		Recognise living things can be grouped in a variety of ways. Explore and use classification keys to group, identify and name a variety of living things in local and wider environment. Recognise that environments change and this can pose dangers to living things.	Describe the differences of life cycles in mammals, amphibians, insects and birds. Describe the life process of reproduction in some plants.	Describe the classification of living things according to observable characteristics and based on similarities and differences. Give reasons for classifying plants and animals based on specific characteristics.
Plants	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.	Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and heat to grow and stay healthy.	Identify and describe the functions of different parts of plants. Explore the requirements of plants for life and growth and how this varies from plant to plant. Investigate the way water is transported in plants. Explore the part of flowers in the life cycle of flowering plants, including pollination, seed formation and dispersal.			
Animals and humans	Identify and name a variety of common animals, including fish, amphibians, reptiles birds and mammals. Identify and name common carnivores, herbivores and omnivores. Describe and compare the structure of common animals. Identify, name, draw and label the basic parts of the human body and link them to senses.	Notice that animals have offspring which grown into adults. Find out and describe the basic needs of animals for survival (food, water, air). Describe the importance of exercise and health eating for humans and the role of hygiene	Identify that animals need the right types of amount of nutrition and that they cannot make their own food so must eat. Identify that some animals have skeletons and muscles for support, protection and movement	Describe the simple functions of basic parts of the digestive system in humans. Identify the different types of teeth in humans and their basic functions. Construct and interpret a variety of food chains, identifying producers, predators and prey	Describe the changes as humans develop to old age.	Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.
Materials	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. Describe the simple physical properties of a variety of everyday materials. Compare and group materials on the basis of physical properties.	Identify and compare the suitability of materials for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching			Compare and group materials on basis of properties, including hardness, solubility, transparency, conductivity and response to magnets. Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated. Give reasons for the uses of everyday materials. Demonstrate that dissolving, mixing and changes of state and reversible. Explain some changes result in the formation of new materials and that this is not usually reversible, including changes associated with burning and action of acid on bicarb of soda.	



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal changes/Earth and space	Observe changes across the four seasons. Observe and describe weather associate with seasons. Observe how length of the day varies.				Describe the movement of the earth and other planets relative to the sun. Describe the movement of the moon relative to the earth. Describe the sun, earth and moon as approximately spherical bodies. Use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Rocks			Compare and group 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.			
Light			Recognise you need light to see things and dark is the absence of light. Notice that light is reflected from surfaces. Recognise light from the sun can be dangerous and there are ways to protect their eyes. Recognise shadows are formed when light is blocked. Find patterns in the way that size of shadows change.			Recognise that light appears to travel in straight lines. Use this idea to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources, to objects, to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as objects that cast them.
Forces and magnets			Compare how things move on different surfaces. Notice some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some, but not all, materials. Compare and group a variety of materials on magnetic basis and identify magnetic materials. Describe magnets as having two poles. Predict whether magnets will attract or repel each other.		Explain that unsupported objects fall towards the Earth because of gravity. 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 greater effect	
States of matter				Compare and group materials together, according to whether they are solid, liquid or gas. Observe some materials change state when heated or cooled and measure or research the temperature where this happens. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		



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Sound				Identify how sounds are made, associating some of them with vibration. 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 vibration that produced it. Recognise that sounds get fainter as distance from the source increases.		
Electricity				Identify common appliances that run on electricity. Construct a simple series circuit, identifying and naming its basic parts. Identify whether a lamp will light based on complete circuit knowledge. Recognise the role of switches in opening/closing circuits and associate this with whether a lamp will light. Recognise common conductors and insulators, and associate metals with being good conductors.		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells. Compare and give reasons for variations in how components function, including the brightness of bulbs etc. Use recognised symbols when representing a simple circuit in a diagram.
Inheritance						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

**Skills**

Year 1 and 2	Year 3 and 4	Year 5 and 6
Ask simple questions and recognise they can be answered in different ways <u>Observe</u> closely, using simple equipment Perform simple tests Identify and classify Use observations and ideas to suggest answers to questions <u>Gather and record data</u> to help answer questions	Use a range of scientific enquiry <u>Set up practical enquiries</u> , comparative and <u>fair tests</u> Make systematic and careful observations, taking accurate measurements using units, equipment and data loggers Gather, record, classify and present data in a variety of ways Record findings using language, drawing, labelled diagrams, keys, <u>bar charts and tables</u> Report on findings from enquiries (written and spoken) and display results and conclusions Use results to draw conclusions, make predictions, suggest improvements and ask further questions Identify differences, similarities or changes related to ideas and processes Use scientific evidence to answer questions or support findings	Plan scientific enquiries to answer questions, including <u>recognising and controlling variables where necessary</u> Take measurements using a range of equipment, taking repeat measurements where necessary <u>Record data and results using scientific diagrams and labels</u> , classification keys, tables, scatter graphs, bar and line graphs Use test results to make predictions to set up further tests Report and present findings from enquiries including conclusions, relationships and degree of trust in results Use scientific evidence to support or refute ideas or arguments

Working Scientifically in each Year Group:**Year 1**

Plants – Observe how plants grow from a seed. The differences between different plants (flowers, leaf formation, height etc). How conditions effect the growth of plants, plan and carry out simple experiment. Observe and identify the differences between different types of trees (evergreen, deciduous, fruit). Observe how different plants, trees and flowers grow in different climates (think about what they see while on holiday)

Animals and humans – Observe the differences and similarities between different animals and humans. Plan a simple questionnaire to see what hair colour/eye colour each child has and then display the information in pictograph. Identify and label the features of animals and humans. What do animals and humans need to live. Plan and carry out an experiment to test the different senses, identifying what part of the body we use for each sense.

Materials – Observe and identify the qualities of different materials. Discuss how different materials are good for different jobs. Plan a simple experiment to see what material is best to keep warm (or dry)

Seasonal changes/Earth and space – Identify the differences in weather, clothes, food at different times of the year. Discuss and display the months of the year, showing which are during each season. A simple tally chart to show which is your favourite season, for the whole class or year group. Observe the difference in hours of daylight during different seasons, this can be displayed in a bar chart. Research how the temperature changes in countries that have extreme changes with the seasons. Here you could take the temperature at different times of the day and year and plot a simple line graph. Observe how plants and animals change through the seasons, why could this happen?

Year 2

Living things and their habitats – Identify how we know if something is living or not. Observe the habitats of different living things, identifying the features of the habitat that suite that living thing. Predict what animals you might find under a log or in a pond (thinking about the reasons why), investigate and record results in a table or tally chart.

Plants – Predict what will happen to plants grown in different environments, giving reasons (extend for year 1). Carry out simple experiment and record the results in a table, then display in a bar chart (or similar). Observe and discuss how different plants reproduce (seeds) what helps? (wind, insects etc)

Animals and humans – Identify what foods have been grown and what are produced by animals. Observe the differences and similarities between them when they were a baby and how they are now. Discuss and understand how different foods effect our bodies (fruit, biscuits, choc etc). Produce tally charts, bar charts to show peoples favourite sport/food/colour etc.

Materials – Observe and identify different materials, their qualities and why they are used for their purpose. Produce a table to show that different items can be made from different materials.



Year 3

Plants- Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

Animals and humans - Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy, and design meals based on what they find out.

Rocks - Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.

Light - Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.

Forces and Magnets - Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.

Year 4

Living things and their habitats - Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched

Animals and humans - Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.

States of Matter - Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.

Sound - Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.

Electricity - Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.



Year 5

Living things and their habitats - Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.

Animals and humans - Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.

Materials - Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.

Seasonal changes/Earth and Space - Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.

Forces and magnets - Pupils might work scientifically by: exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.

Year 6

Living things and their habitats Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.

Animals and humans - Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Inheritance - Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

Light - Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Electricity- Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.