Curriculum Map Science

Carrdyke Federation

Science Statement of Intent

Our Science curriculum will enable children to:

- Develop their curiosity about scientific ideas
- Become critical thinkers, through scientific enquiry
- Acquire and apply scientific knowledge
- Confidently communicate their scientific understanding

Our science curriculum is based on individual unit plans. These plans include the key knowledge, process knowledge and questions to be used in the unit. Individual class teachers deliver these units in a way which suits their class and cohort. Through our planning we include ample opportunities for problem solving, questioning and creating curiosity. Our curriculum units build on the skills and knowledge from previous years and are organized in a way which enables our entire curriculum to be cohesive. Our classes in Key Stage One and Two are mixed age classes and so the units for these age groups are mixed together. Work scientifically and using scientific knowledge is of high importance and so the key knowledge for each unit is specified on the plan and is displayed in the classroom. Science is taught once every week, the length of these sessions might differ due to the learning objective the teacher has selected. Each child has a specific Science book where learning is recorded, this is often in the form of diagrams, tables or graphs.

Class 2 Year A	The Human Body	Materials	Trees	Human Health	Plants (growing seeds)	Living Things
	Know the names for each part of the body. Know that humans have five senses which help us find out about the world. Know which part of the body is associated with each sense. Know how we can explore sounds, sights, smells, tastes and textures using our different senses. Know how to use observations to answer questions Know how to gather and record data in answering questions	Know that everyday materials have many properties which can be recognised using our senses. To know the simple physical properties of a variety of everyday materials Know that materials can be used in a variety of ways. Describe using scientific vocabulary Ask simple questions and use observations to suggest answers. Perform simple tests. Observe closely.	To know that there are different plants in the immediate environment. To know how to identify and classify trees. To know and recognise some simple characteristics of plants. To know and recognise some simple characteristics of plants. To know different parts of plants. To know that plants change throughout the year. To observe closely, using simple equipment. To identify and classify. To identify and classify and use their observations and idea to suggest answers to questions. To observe changes across the four seasons with regards to the structure of plants.	To find out about and describe the basic needs of animals (including humans) To know that to grow into healthy adults, humans also need the right amounts and types of food. To know that to keep healthy, humans need to do the right amount of exercise. To know that good hygiene is important in preventing infections and illnesses. To ask simple questions. To identify and classify. Gather and record data to help in answering questions.	To know what a seed is. To know where seeds comes from. To know how seeds, grow. To know how seeds and bulbs grow into mature plants To know that plants provide food for humans. Observe closely, using simple equipment. Ask simple questions and recognise that they can be answered in different ways. Observe and describe how seeds and bulbs grow into mature plants. Use their observations and ideas to suggest answers to questions. Pupils work scientifically by observing and recording similar plants at different stages of growth.	Know life processes that identify things that are living, dead or never been alive. Know living things are suited to different habitats in the local area. To ask simple questions and recognise that they can be answered in different ways. To identify and classify. To use their observations and ideas to suggest answers to questions. To observe closely, using simple equipment.
Class 2 Year B	Animals and Humans	Seasonal Change (ongoing unit)	Grouping Animals	Changing Materials	Plants (how they survive)	Habitats
	Know that the term 'animal' includes humans. Know that animals, including humans, have offspring. Know that animals, including humans, need air, food and water to stay alive. To identify whether images are of animals or not animals (to sort pictures of various animals including humans and other living things such as plants, trees) To identify and name young and adults of familiar animals, including humans. To identify and classify.	Know that there are four seasons in a year. Know the features of Autumn. Know the features of Winter. Know the features of Spring. Know the features of Summer. Observe closely. Gather data to answer questions. Ask and answer simple questions.	To be able to name a variety of common animals. To be able to group animals based on their characteristics/structure. Know that animals can be grouped based on their diet. To be able to name some common animals. To be able to identify and classify. To ask simple questions and recognise that they can be answered in different ways.	Know there are a range of materials with different characteristics. Know that different materials are suitable for particular uses. Know that objects made from some materials can be altered by squashing, bending, twisting and stretching. Identify and classify. Identify and name a variety of everyday materials. Describe the simple physical properties of a variety of everyday materials Identify and compare the suitability of a variety of everyday materials. Ask and answer simple questions. To make observations and comparisons.	To know that there are different kinds of plants. To know that seeds produce new plants. To know that plants need water to grow. To know that plants need light to stay healthy. To know that seeds need a suitable temperature to grow. To gather and record data to help in answering questions. Perform simple tests. To find out and describe how plants need water to grow and stay healthy. To know how to record their findings. To know how to draw conclusions from their observations. To use their observations and ideas to suggest answers to questions	Know that living things depend on each other to stay alive. Know that animals obtain food from plants and other animals. Know what a simple food chain is. To ask simple questions and recognise that they can be answered in different ways. To identify and classify. To gather and record data to help answer questions.

Class 3 Year A	Electricity	Light	Living things and their habitats	Living things (classification & food chains)	Sound
	Know common appliances that run on electricity. Know how to construct a simple series circuit. Know that a switch must be closed to create a complete circuit and for the circuit to work. Know some common conductors and insulators. Identify common appliances that run on electricity. Ask relevant questions and use different types of scientific enquiries to answer them. 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. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.	Know light sources give out light. Know that the sun is a light source. Know that light from the sun can damage our eyes. Know that light has three important properties. Know we need light in order to see things and dark is an absence of light Know some materials reflect light. Know different materials allow different amounts of light to pass through them Know when the path of light from a light source is blocked, a shadow is formed. To recognise that they need light in order to see things and that the dark is the absence of light. Ask relevant questions and use different types of scientific enquiries to answer them. Recognise that they need light in order to see things and that the dark is the absence of light. Make systematic and careful observations. Identify differences, similarities or changes related to simple scientific ideas and processes. To notice that light is reflected from surfaces. To set up simple practical enquiries, comparative and fair tests.	Know that animals can be classified as vertebrates (having a spine) or invertebrates (lacking a spine). To know that animals can be; fish, amphibians, reptiles, bird, or mammals. Know how habitats change throughout the year. Know how global warming is affecting habitats. To be able to explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. To be able to gather, record, classify and present data in a variety of ways to help in answering questions. To be able to recognise that environments can change and that this can sometimes pose dangers to living things. To be able to identify differences, similarities or changes related to simple scientific ideas and processes. To be able to recognise that environments can change and that this can sometimes pose dangers to living things.	Know how to use a classification key to identify organisms and animals. Know how to create a classification key. Know how a food chain works To be able to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment. To be able to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. To be able to gather, record, classify and present data in a variety of ways to help in answering questions. To be able to explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Be able to construct a food chain. Identify producers, predators and prey in a food chain.	Know that sound happens when something vibrates Sound travels in waves Sounds are transmitted through gases, liquids and solids to reach the ear Know we hear sounds when the vibrating air hits our ear drums Know pitch is how high or low a note is Know Volume is a measure of how loud or how soft/ quiet a sound is Know sound gets fainter as the distance from the sound increases Know sound can be insulated To be able to ask relevant questions and use different types of scientific enquiries to answer them. To be able to identify differences, similarities or changes related to simple scientific ideas and processes. To be able to recognise that vibrations from sounds travel through a medium to the ear. Set up simple practical enquiries, comparative and fair tests. To be able to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. To be able to find patterns between the pitch of a sound and features of the object that produced it. To be able to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions To be able to find patterns between the volume of a sound and the strength of the vibrations that produced it.

Class 3 Year B	Plants	Forces & Magnets	States of Matter	Animals including humans	Rocks & Soils
	Know the functions of different parts of flowering plants . Know that plants need air, light, water, nutrients and room to grow. Know how water is transported within plants. Know that flowers receive pollen from another plant and produce seeds. Know that seeds need to be dispersed away from parent plant to grow. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Make systematic and careful observations. Record findings using simple scientific language, drawings, labelled diagram. Ask relevant questions and use different types of scientific enquiries to answer them Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Set up simple practical enquiries, comparative and fair tests. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Investigate the way in which water is transported within plants.	Know a force is either a push or a pull Forces can make things 1. Speed up 2. Slow down 3. Change direction 4. Change shape Know friction occurs when two surfaces touch each other. Know magnets have two poles and can attract or repel each other. Know that some materials are magnetic. To be able to ask relevant questions To be able to identify differences, similarities or changes related to simple scientific ideas and processes. Compare how things move on different surfaces. To be able to make systematic and careful observations. To be able to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. To be able to describe magnets as having two poles. To predict whether two magnets will attract or repel each other, depending on which poles are facing. To 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 on whether they are attracted to a magnet, and identify some magnetic materials.	Know materials can be sorted into 3 groups. Each group has different properties. Know materials can change state when heated. Know materials can change state when cooled. Know water always freezes at 100 degrees Celsius. Know liquids evaporate to become gases when warmed Know water always boils at 100 degrees Celsius know the higher the temperature the quicker the material will evaporate To be able to compare and group materials together, according to whether they are solids, liquids or gases. To be able to ask relevant questions and use different types of scientific enquiries to answer them. Describe how water exists as a liquid, a solid and a gas. 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). To be able to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers To be able to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. 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). 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). To be able to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Know humans and some other animals have skeletons. Know the purpose of a skeleton. Know humans have muscles for movement. Know the simple functions of parts of the digestive system in humans. Know animals need right types of nutrition and that they cannot make their own food. Ask relevant questions and make simple predictions based on our everyday experience and knowledge of how our bodies work. Make careful observations and where appropriate take accurate measurements using a ruler or tape measure Recording findings using simple scientific language, drawings, labelled diagrams. Gather, record and present data in a variety of ways to help in answering questions related to skeletons and muscles. To be able to compare and contrast the teeth of carnivores and herbivores Suggest reasons for differences. Identify differences, similarities or changes related to simple scientific ideas and processes. To be able to compare and contrast the teeth of carnivores and herbivores. Ask relevant questions and make simple predictions based on our everyday experience and knowledge of how our bodies work.	Know different rocks have different properties. Know the terms 'permeable' and 'impermeable'. Know that scientists classify rocks by sorting them into 3 different types. Know the characteristics of each category of rock. Know what fossils are. Know why fossils are important. Know how fossils are formed. Know why soil is important and how it is formed. Know soils are different because not all rocks are the same. To be able to ask relevant questions and use different types of scientific enquiries to answer them. To be able to set up simple practical enquiries, comparative and fair tests. Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. To be able ask relevant questions and use different types of scientific enquiries to answer them. To identify differences, similarities or changes related to simple scientific ideas and processes. 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 To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

Class 4 Year A	Earth & Space	Forces	Evolution & Inheritance	Light	Living things and their habitats
	Know about and explain the movement of the Earth and other planets relative to the Sun. Know about and explain the movement of the Moon relative to the Earth. Know and demonstrate how night and day are created. Describe the Sun, Earth and Moon (using the term spherical). Identify scientific evidence that has been used to support or refute ideas or arguments report and present findings in oral and written forms such as displays and other presentations. Describe the movement of the Moon relative to the Earth. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using tables and bar graphs. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms.	Know what gravity is. Know why unsupported objects fall towards the centre of the Earth. Know that an object's weight (force) changes due to gravity but its mass (amount of matter) does not. Know the effect friction has between moving objects. Know what water resistance is and the effects of it. Know what air resistance is and the effect of it. Know adaptations due to water/air resistance. Know that an object floats when up thrust (force on an object from the water) equals weight of object. Know how a machine can give a mechanical advantage. 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 friction when it acts between moving surfaces and objects. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Identify the effects of air resistance and water resistance that act between moving surfaces. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	Know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Know some ways animals and plants are adapted to their environment. Know that adaption is a process that has taken place over generations to enable the animal / plant to survive. In order to survive, animals need to make sure they have food, water, oxygen, shelter, and a place to raise their offspring. Know that many scientists have had differing views about evolution Know that Charles Darwin developed 'the theory of evolution'. Present findings from enquiries in oral and written forms such as displays and other presentations. 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. Identify scientific evidence that has been used to support or refute ideas or arguments.	Know about different light sources. Know how light travels. **Know three ways light's path can be altered.** **Know the difference between light reflection, refraction and absorption.** **Know that objects are seen because they give out light or reflect light into the eye.** **Know that we see things because light travels from light sources to our eyes.** **Know what a shadow is.** **Know why shadows have the same shape as the objects that cast them.** Recognise that light appears to travel in straight lines. Report and present findings from enquiries 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. 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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Know the life process of sexual reproduction in plants Know the names and function of some parts of a flower Know the process of asexual reproduction in plants Know how to classify plants **Know the process of reproduction in animals** **Know the changes as humans develop to old age.** **Know the differences in the life cycles of mammal, an amphibian, an insect and a bird.** Record data using scientific diagrams and labels Record data and results of increasing complexity using and classification keys Give reasons for classifying plants and animals based on specific characteristics Describe the changes as humans develop to old age Observe and compare 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), Ask pertinent questions and suggesting reasons for similarities and differences.

Class 4 Year B	Properties of & changed in materials	Electricity	Human Health
	Know how to group together materials based on their properties based on conductivity (electrical and thermal) Know some materials make good thermal conductors Know some materials make good thermal insulators Know what dissolving and what soluble means. Know why materials dissolve in liquid to form a solution. Know a range of methods to separate mixtures (filtration & evaporation) Know which type of separating method to use based on a material's property. Know how to recover a substance from a solution and that this is a reversible change. Know that when some materials are mixed they create an irreversible change. Know what an irreversible change is. Know how Spencer Silver created the glue for sticky notes. Know Ruth Benerito invented wrinkle-free cotton. 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. Report and present 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. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Demonstrate that dissolving, mixing and changes of state are reversible changes. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Know the symbols representing key components in a circuit. Know that the brightness of the lamp or volume of a buzzer depends on the number or voltage of cells used in a series circuit. 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 Report and present findings from enquiries Identify the effect of changing a component. 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 Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Know the main parts of human circulatory system and their function Know how nutrients and water are transported around the body Know the impact of diet and exercise on body Know the impact of drugs on the body 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 Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Identify scientific evidence that has been used to support or refute ideas or arguments

	Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.		