



Science Progression at Collingwood



Year 1	Key Knowledge	Key Skills
<p>Almost all pupils: (WT and EXE)</p>	<p><u>PLANTS:</u> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p><u>ANIMALS INCLUDING HUMANS:</u> 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</p> <p><u>EVERYDAY MATERIALS:</u> 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 together a variety of everyday materials on the basis of their simple physical properties.</p> <p><u>SEASONAL CHANGES:</u> Name the four seasons Identify and describe typical changes that occur in each season Name, identify and describe weather associated with each season and how daylight hours vary across the year</p>	<p>ask simple questions</p> <p>observe closely</p> <p>use simple equipment</p> <p>label diagrams clearly</p> <p>perform simple tests</p> <p>identify and classify</p> <p>gather and record data</p> <p>describe similarities and differences</p> <p>use all 5 senses to describe</p>
<p>Some pupils: (GD)</p>	<p>Identify and name a variety of plants and animals in their habitats begin to describe the basic needs of humans describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>recognising questions can be answered in different ways</p> <p>use observations and ideas to suggest answers to questions</p> <p>use observations to help in answering questions</p>
Key Vocabulary		Common Misconceptions
<p>local environment , year, explore, answer, questions, plants, growing, habitat, observe, growth,flowers,vegetables common names, deciduous and evergreen trees, plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem),work scientifically, observing closely, comparing and contrasting, describing,identify, group, diagrams, records, change over time.</p>		<p>Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.</p>

<p>Animals, habitat, fish, amphibians, reptiles, birds and mammals, pets, main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) Omnivore, herbivore, carnivore, senses, textures, sounds, smells.</p> <p>materials, properties, hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent, brick, paper, fabrics, elastic, foil.</p>	
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Year 2	Key Knowledge	Key Skills
<p>Almost all pupils: (WT and EXE)</p>	<p><u>Living things and their habitats</u> Explore and compare the differences between things that are living, dead, and things that have never been alive 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 microhabitats describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p> <p><u>Plants</u> 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.</p> <p><u>Animals inc humans</u> notice that animals, including humans, have offspring which grow into adults find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><u>Uses of everyday materials</u> identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Explore and compare Observe and describe Identify and name Work scientifically Sorting and classifying Record their findings using charts Exploring questions Talk about ways of answering their questions. Raise and answer questions that help them to become familiar observing, through video or first-hand observation and measurement, asking questions and suggesting ways to find answers to their questions.</p>
<p>Some pupils: (GD)</p>	<p>explore the part that flowers play in the life cycle of flowering plants identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	
	<p>Key Vocabulary</p>	<p>Common Misconceptions</p>
	<p>living, characteristics, alive, healthy. life processes, 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). local environment plants and animals. seashore, woodland, ocean, rainforest. living, dead or were never alive, food chain, humans, conditions, affect. basic needs, survival, exercise, nutrition, reproduction, growth. egg, chick,</p>	<p>The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs.</p>

chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing, baby, toddler, child, teenager, adult. everyday materials, metal, wood, plastic, glass), properties of materials, suitable or unsuitable, purposes	
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Year 3	Key Knowledge	Key Skills
<p>Almost all pupils: (WT and EXE)</p>	<p>Everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions.</p> <p><u>Plants</u> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 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 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.</p> <p><u>Animals</u> identify that humans and some other animals have skeletons and muscles for support, protection and movement. 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</p> <p><u>Rocks</u> 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.</p> <p><u>Light</u> 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 light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change</p> <p><u>Forces and magnets</u> compare how things move on different surfaces notice that 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 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 describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing</p>	<p>Exploring, talking about, testing and developing ideas Ask their own questions about what they observe Make some decisions about which types of scientific enquiry are likely to be the best ways of answering them.</p> <p>Observe changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.</p> <p>Draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</p> <p>Read and spell scientific vocabulary correctly and with confidence</p> <p>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.</p> <p>use 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.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using results to draw simple conclusions.</p> <p>Make predictions for new values, suggest improvements and raise further questions.</p>

		Identify differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.
Some pupils: (GD)	Describe the simple functions of the basic parts of the digestive system in humans identify, predators and prey.	
Key Vocabulary		Common Misconceptions
<p>relationship, structure, function, roots, stem, nutrition, support, leaves, nutrition, flowers, reproduction. factors, growth, light, fertiliser, seeds, life cycles, patterns, fruits, dispersed, water, transported, Body parts skeleton, muscles, diets, healthy.</p> <p>rocks, buildings, gravestones, classify, grains, crystals, fossils, sedimentary rock, soils, similarities and differences formed</p> <p>light, reflects, reflective surfaces, shadows, formed, change, patterns, shadows, source, plants, animals, habitat, year, flowering plants, non-flowering plants, vertebrate animals, fish, amphibians, reptiles, birds, mammals, invertebrates, snails, slugs, worms, spiders, insects.</p> <p>human impact, positive and negative, environments, nature reserves, ecologically planned parks, ponds, and the negative effects, population, development, litter, deforestation,</p>		Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.

Year 4	Key Knowledge	Key Skills
Almost all pupils: (WT and EXE)	<p><u>States of matter</u> 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.</p> <p><u>Animals inc humans</u> 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 construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p><u>Electricity</u> 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 that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p><u>Sound</u></p>	<p>Exploring, talking about, testing and developing ideas Ask their own questions about what they observe Make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, Observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. Draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. Read and spell scientific vocabulary correctly and with confidence asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests making</p>

	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.	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 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 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 identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.
Some pupils: (GD)	Describe the differences in the life cycles of mammals Describe the changes as humans develop to old age	
Key Vocabulary		Common Misconceptions
Materials, effect, temperature, substances, state, melts, oxygen, condenses, liquid, evaporation. digestive system, mouth, tongue, teeth, oesophagus, Stomach and small and large intestine, functions. teeth, carnivores, herbivores, sound, vibration, musical instruments, pitch, volume		Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning

Year 5	Key Knowledge	Key Skills
Almost all pupils: (WT and EXE)	<p>Develop a deeper understanding of a wide range of scientific ideas. Begin to recognise that scientific ideas change and develop over time.</p> <p><u>Living things and their habitats</u> Describe the differences in the life cycles of mammal, amphibian, insect and bird. Describe the life process of reproduction in some plants and animals. <u>Animals including humans</u> Describe the changes as humans develop to old age. Learn about the changes experienced in puberty. <u>Properties and changes of materials</u> 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</p>	<p>Study and raise questions about their local environment throughout the year. Exploring and talking about their ideas; asking their own questions about scientific phenomena Analyse functions, relationships and interactions more systematically. Begin to recognise how abstract ideas help them to understand Predict how the world operates. Select the most appropriate ways to answer science questions using different types of scientific enquiry.</p>

	<p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>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.</p> <p><u>Mixtures and solutions</u></p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p><u>Earth and space</u></p> <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p><u>Intro to Gravity, resistance and mechanical forces</u></p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p>Observe changes over different periods of time.</p> <p>Notice patterns</p> <p>Group and classify things, carry out comparative and fair tests</p> <p>Find things out using a wide range of secondary sources of information.</p> <p>Draw conclusions based on their data and observations,</p> <p>Use evidence to justify their ideas.</p> <p>Use their scientific knowledge and understanding to explain their findings.</p> <p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements.</p> <p>Use a range of scientific equipment, with increasing accuracy and precision</p> <p>Take 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.</p> <p>Use 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</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Design and make products that use levers, pulleys, gears and/or springs and explore their effects.</p>
Some pupils: (GD)	<p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>describe the functions of the heart, blood vessels and blood</p>	
Key Vocabulary		Common Misconceptions
observing, comparing, life cycles, plants, animals, local environment, world, rainforest, oceans, desert, prehistoric times, questions, reasons, similarities, differences, Sun, star, solar system, planets: Mercury, Venus, Earth, Mars,		Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.

<p>Jupiter, Saturn, Uranus, Neptune, Pluto, reclassified, 'dwarf planet', moon, celestial body, orbits , Galileo Galilei and Isaac Newton</p>	<p>Recognising that melting and dissolving are different processes. Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials. Pluto was reclassified as a 'dwarf planet' in 2006</p>
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Year 6	Key Knowledge	Key Skills
<p>Almost all pupils: (WT and EXE)</p>	<p>Develop a deeper understanding of a wide range of scientific ideas. Begin to recognise how abstract ideas help them to understand <u>Living things and their habitats</u> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics. Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. <u>Animals including humans</u> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Build on their learning from years 3 and 4 about the main body parts and internal organs to explore and answer questions that help them to understand how the circulatory system enables the body to function. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. Describe the ways in which nutrients and water are transported within animals, including humans. <u>Evolution and inheritance</u> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Building on what they learned about fossils in the</p>	<p>Exploring and talking about their ideas; asking their own questions about scientific phenomena Analyse functions, relationships and interactions more systematically. Predict how the world operates. Begin to recognise that scientific ideas change and develop over time. Select the most appropriate ways to answer science questions using different types of scientific enquiry. Observe changes over different periods of time. Notice patterns Group and classify things, carry out comparative and fair tests Find things out using a wide range of secondary sources of information. Draw conclusions based on their data and observations, Use evidence to justify their ideas. Use their scientific knowledge and understanding to explain their findings. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements. Use</p>

	<p>topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p><u>Light</u></p> <p>Recognise that light appears to travel in straight lines</p> <p>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.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p><u>Electricity</u></p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>a range of scientific equipment, with increasing accuracy and precision</p> <p>Take 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.</p> <p>Use 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</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p>
Some pupils: (GD)		
Key Vocabulary		Common Misconceptions
<p>Carl Linnaeus, pioneer, classification, insects, spiders, snails, worms, fish, amphibians, reptiles, birds, mammals, skeletal, muscular and digestive system, palaeontologists, Mary Anning, Charles Darwin, Alfred Wallace, evolution, switches, bulbs, buzzers, motors</p>		<p>At this stage, pupils are not expected to understand how genes and chromosomes work.</p> <p>They do not need to explain why the range of light phenomena occur</p> <p>Pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity.</p>