

Working Scientifically: Assessment and Progression of Enquiry Skills

Lower Key Stage 2 NC WS references	Lower Key Stage 2	Upper Key Stage 2	Upper Key Stage 2 NC WS references	Assessment Framework 2018-9: The pupil can	
asking relevant questions and using different types of scientific enquiries to answer them	Raise their own relevant questions about the world around them	Use their science experiences to explore ideas and raise different kinds of questions	planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	ask their own questions about the scientific phenomena they are studying, and select and plan the most appropriate ways to answer these questions, or those of others, recognising and controlling variables where necessary - including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources of information.	Planning
	Should be given a range of scientific experiences including different types of science enquiries to answer questions	Talk about how scientific ideas have developed over time			
	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions			
	Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact			
setting up simple practical enquiries, comparative and fair tests	Set up simple practical enquiries, comparative and fair tests Recognise when a simple fair test is necessary and help to decide how to set it up	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why			
	Talk about criteria for grouping, sorting and classifying; and use simple keys	Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment			
making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Make systematic and careful observations Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used	Make their own decisions about what observations to make, what measurements to use and how long to make them for	taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate	use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate.	Doing
	Take accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers/ thermometers appropriately	Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate.			
- 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	Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data	Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	
	Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them	Look for different causal relationships in their data and identify evidence that refutes or supports their ideas			
- identifying differences, similarities or changes related to simple scientific ideas and processes - Using straightforward scientific evidence to answer questions or to support their findings	With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions	Identify scientific evidence that has been used to support or refute ideas or arguments	identifying scientific evidence that has been used to support or refute ideas or arguments	describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.	Reviewing / Concluding
reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions	Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results.	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.	- draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways. - Raise further questions that could be investigated, based on their data and observations.	
using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.	Use their results to make predictions and identify when further observations, comparative and fair tests might be needed	using test results to make predictions to set up further comparative and fair tests.		

Based on CIEC material and a document by Liz Lawrence ASE, adapted by Allie Beaumont, October 2018

Biology Y3 curriculum statements	Biology-Y4 curriculum statements	Biology - Y5 curriculum statements	Biology Y6 curriculum statements	Assessment framework 2018-9: The pupil can:-
identify that humans and some other animals have skeletons and muscles for support, protection and movement.	describe the simple functions of the basic parts of the digestive system in humans	- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - describe the life process of reproduction in some animals - 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 - describe the ways in which nutrients and water are transported within animals, including humans	name, locate and describe the functions of the main parts of the digestive (Y4), musculoskeletal(Y3), and circulatory systems(Y6), and can describe and compare different reproductive processes and life cycles, in animals(Y5).
identify that animals, including humans, need the right types and amount of nutrition,			recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	describe the effects of diet, exercise, drugs and lifestyle on how their bodies function (Y6).
- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - investigate the way in which water is transported within plants. - explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.		describe the life process of reproduction in some plant		name, locate and describe the functions of the main parts of plants, including those involved in reproduction (Y5) and transporting water and nutrients (Y3).
	- recognise that living things can be grouped in a variety of ways - explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment		- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals - give reasons for classifying plants and animals based on specific characteristics	use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods. (Y6)
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	construct and interpret a variety of food chains, identifying producers, predators and prey			construct and interpret food chains (Y4).
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	recognise that environments can change and that this can sometimes pose dangers to living things.		identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	describe the requirements of plants for life and growth. (Y3) and explain how environmental changes may have an impact on living things. (Y4)
describe in simple terms how fossils are formed when things that have lived are trapped within rock			- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago - recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents - identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved (Y6); and describe how fossils are formed (Y3) and provide evidence for evolution (Y6).

Chemistry - Y3 curriculum statements	Chemistry - Y4 curriculum statements	Chemistry - Y5 curriculum statements	Chemistry - Y6 curriculum statements	Assessment framework 2018-9: The pupil can:-
- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - 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	recognise some common conductors and insulators, and associate metals with being good conductors	- 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		group and identify materials (Y5), including rocks (Y3), in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties. (Y5)
	- 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			describe the characteristics of different states of matter and group materials on this basis; and can describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle. (Y4)
		- 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, including through filtering, sieving and evaporating		identify, and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components. (Y5)
		- demonstrate that dissolving, mixing and changes of state are reversible changes - 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.		identify, with reasons, whether changes in materials are reversible or not. (Y5)

Physics- Y3 curriculum statements	Physics- Y4 curriculum statements	Physics- Y5 curriculum statements	Physics- Y6 curriculum statements	Assessment framework 2018-9: The pupil can:-
- notice that light is reflected from surfaces - recognise that shadows are formed when the light from a light source is blocked by a solid object - find patterns in the way that the size of shadows change.			- 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.	use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects (Y6), and the formation (Y3), shape (Y6) and size of shadows. (Y3)
	- identify how sounds are made, associating some of them with something vibrating - recognise that vibrations from sounds travel through a medium to the ear			use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard. (Y4)
	- 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.			describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source. (Y4)
- 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. - predict whether two magnets will attract or repel each other, depending on which poles are facing.		- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. - identify the effects of air resistance, water resistance and friction, that act between moving surfaces		describe the effects of simple forces that involve contact (air and water resistance, friction) (Y5), and others that act at a distance (magnetic forces, including those between like and unlike magnetic poles) (Y3); and gravity (Y5).
		recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect		identify simple mechanisms, including levers, gears and pulleys that increase the effect of a force. (Y5)
	- 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		- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. - use recognised symbols when representing a simple circuit in a diagram.	use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams. (Y6)
		- describe the movement of the Earth, and other planets, relative to the Sun in the solar system - 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 that apparent movement of the sun across the sky.		describe the shapes and relative movements of the sun, moon, earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the earth's rotation and that this results in day and night. (Y5)