



Year 4 Science Curriculum

WORKING SCIENTIFICALLY

NC Objective/Milestone	Basic	Advancing	Deep
L.O. TBAT ask relevant questions.	With support, questions that are relevant begin to be asked. With the support of a teacher, questions can be sorted into those that can be answered by trying it out and those that cannot.	Relevant questions that lead to scientific investigation are generally asked. Generally, there is an awareness that there are different ways of asking scientific questions.	Questions for scientific investigations are asked and personal ideas are offered without support. Questions are beginning to be improved in order to clarify exactly what is being investigated.
L.O. TBAT Set up simple practical enquiries and comparative and fair tests.	With support, very simple practical enquiries and comparative and fair tests are set up.	Simple practical enquiries and comparative and fair tests are set up, with prompts if necessary.	Without support, practical enquiries and comparative and fair tests are set up and The most appropriate approach to an investigation is chosen.
L.O. TBAT make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers.	With support, accurate measurements using standard units and simple equipment begin to be made.	Generally, accurate measurements are made using standard units and a range of equipment.	Without support, accurate measurements using standard units are made and accurate readings are taken.
L.O. TBAT gather, record, classify and present data in a variety of ways to help in answering questions.	With support, data begins to be gathered, recorded, classified and presented in a variety of ways to help in answering questions. Generally, the most appropriate way to present data once collected is selected.	Generally, simple scientific language, drawings, labelled diagrams, bar charts and tables are used to record findings.	Data is gathered, recorded, classified and presented in a variety of ways to help in answering questions without support.
L.O. TBAT record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.	Very basic/simple scientific language, drawings or tables are used to record findings. With support, line graphs are used to record observations.	Generally, observations are recorded, and data is classified and presented, using tables, charts, text and labelled diagrams. A series of observations are made using standard measuring equipment for measuring most quantities.	Without support, the most appropriate way to present data once collected is selected. Points are plotted to make simple line graphs.
L.O. TBAT report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	With support, reports on findings from enquiries are given, including oral and written explanations, displays or presentations of results and conclusions.	Generally, it is recognised why it is important to collect data in order to answer a question, and data is gathered, recorded, classified and presented in a variety	Without support, observations, including those for repeat readings, are recorded using tables and bar charts. Without support, reports on findings

			of ways to help in answering questions. Reports on findings from enquiries are given, including oral and written explanations, displays or presentations of results and conclusions.	from enquiries are given, including oral and written explanations, displays or presentations of results and conclusions.
	L.O. TBAT use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests.	With prompts, results are used to draw simple conclusions and suggest Improvements. With prompts, predictions about what will happen are made.	Results are used to draw simple conclusions and suggest improvements. Generally, predictions are made as to what may happen before any tests are carried out. Reasons are suggested for predictions and further predictions are made about new, simple contexts.	Sometimes, patterns found in results are related to previous scientific knowledge, where possible. Independently, results are used to draw simple conclusions and suggest improvements, and conclusions are related to the patterns found in the results. Predictions are made without support and reasons for these predictions are offered.
	L.O. TBAT identify differences, similarities or changes related to simple, scientific ideas and processes.	With support, differences or similarities related to simple, scientific ideas are identified.	Differences, similarities or changes related to simple, scientific ideas and processes are identified.	Without support, differences, similarities or changes related to more complex scientific ideas and processes are identified.
	L..O. TBAT use straightforward, scientific evidence to answer questions or to support their findings.	With prompts, very basic/simple scientific evidence is used to support findings and answer questions.	Generally, appropriate scientific language and straightforward, scientific evidence is used to answer questions or to support findings.	Scientific evidence is used to answer questions or to support findings

Notes and guidance (non-statutory)

Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should 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. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.

With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer 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. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for every area of study.

Year 4 Science Curriculum

Rocks and Soils	NC Objective/Milestone	Basic	Advancing	Deep
	L.O. TBAT compare and group together different kinds of rocks on the basis of their simple, physical properties.	With support, different kinds of rocks are grouped together on the basis of their simple physical properties, e.g. soft, hard, permeable, and impermeable.	Generally, different kinds of rocks are grouped together and compared on the basis of their simple physical properties, e.g. soft, hard, permeable, and impermeable.	Independently, different kinds of rocks are grouped together and compared on the basis of their physical properties.
	L.O. TBAT relate the simple physical properties of some rocks to their formation (igneous or sedimentary).	With the support of a teacher, the simple physical properties of some rocks begin to be related to their formation.	The simple physical properties of some rocks are related to their formation.	Without support, the physical properties of some rocks are related to their formation and comparisons begin to be made where appropriate.
	L.O. TBAT describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock.	With support, what a fossil is and how fossils are formed begin to be described.	Generally, there is an ability to describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock.	The way in which fossils are formed is described and explained independently.
	L.O. TBAT recognise that soils are made from rocks and organic matter.	There is some awareness that soil is created from rocks and organic matter.	Soils are generally described accurately as being made of rocks and organic matter.	The composition of soils are described and understood. There is some awareness that different proportions of rock and organic matter give rise to different soil types.

Notes and guidance (non-statutory)

Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.

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.

Year 4 Science Curriculum

Forces & Magnets	NC Objective/Milestone	Basic	Advancing	Deep
	L.O. TBAT compare how things move on different surfaces.	With the support of a teacher, objects are moved on different textures of surface and their movement compared.	The term friction is used to describe how things move on different surfaces.	The terms friction and texture are used without prompt to explain the difference in the way that things move on different surfaces.
	L.O. TBAT notice that some forces need contact between two objects and some forces act at a distance.	With the support of a teacher, it begins to be noticed that some forces need contact between two objects and some forces act at a distance. (E.g. it may be observed that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary, e.g. opening a door or pushing a swing.)	Generally, it is noticed that some forces need contact between two objects and some forces act at a distance. (E.g. it is observed that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary, e.g. opening a door or pushing a swing.)	Without support, it is noticed that some forces need contact between two objects and some forces act at a distance. Questions begin to be asked about forces that make things begin to move, get faster or slow down.
	L.O. TBAT observe how magnets attract or repel each other and attract some materials and not others.	The way in which magnets attract or repel each other and attract some materials and not others begins to be observed.	The way in which magnets attract or repel each other and attract some materials and not others is observed.	The way in which magnets attract or repel each other is explained.
	L.O. TBAT 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.	With the support of a teacher, a variety of everyday materials are grouped together on the basis of whether or not they are attracted to a magnet. Some magnetic materials begin to be identified.	Generally, a variety of everyday materials are compared and grouped together on the basis of whether they are attracted to a magnet.	Some magnetic materials are identified. A variety of everyday materials are compared and grouped together on the basis of whether they are attracted to a magnet. Some magnetic materials are identified without support.
	L.O. TBAT describe magnets as having two poles.	With the support of a teacher, magnets are experienced and described as having two poles.	The term poles is generally used to describe magnets.	The term poles is fully understood and used without prompt to describe magnets.
	L.O. TBAT predict whether two magnets will attract or repel each other, depending on which poles are facing.	With the support of a teacher, predictions are made as to whether two magnets will attract or repel each other.	Generally, the term poles is used to help explain predictions as to whether magnets will attract or repel each other.	The rule that like poles repel and opposite poles attract is used fluently to explain predictions as to whether magnets will attract or repel each other.

Notes and guidance (non-statutory)

Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).

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 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 Science Curriculum

Electricity	NC Objective/Milestone	Basic	Advancing	Deep
	L.O. TBAT 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. .	With the support of a teacher, it is identified whether or not a lamp will light in a simple series circuit and this begins to be based on whether or not the lamp is part of a complete loop with a battery.	Generally, it is identified whether or not a lamp will light in a simple series circuit and this is based on whether or not the lamp is part of a complete loop with a battery.	Independently, it is identified whether or not a lamp will light in a simple series circuit and this is based on whether or not the lamp is part of a complete loop with a battery
	L.O. TBAT recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.	With support, it is understood that a switch opens and closes a circuit.	It is recognised that a switch opens and closes a circuit and this is associated with whether or not a lamp lights in a simple series circuit.	Without support, it is recognised that a switch opens and closes a circuit and this is associated with whether or not a lamp lights in a simple series circuit. A simple circuit is represented in a diagram using recognised symbols.
	L.O. TBAT recognise some common conductors and insulators and associate metals with being good conductors.	With support, some common conductors, e.g. steel and aluminium and insulators, e.g. plastic and wood, are recognised.	Generally, some common conductors and insulators are recognised, and metals are associated with being good conductors.	A wide variety of conductors and insulators are independently recognised and metals are associated with being good conductors.
	L.O. TBAT identify common appliances that run on electricity.	With structured activity, a range of appliances, both battery and mains powered are named.	Generally, all common electrical appliances are named and described as battery, solar or mains powered.	The terms battery, solar and mains powered are fully understood and used to describe a range of common appliances.
	L.O. TBAT construct a simple series circuit identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.	With the help of a teacher, simple series circuits are constructed and their parts named. .	Generally, the terms cells, wires, bulbs, switches and buzzers are used to describe simple circuits that have been constructed independently.	The terms cells, wires, bulbs, switches and buzzers are used fluently and without prompt to plan, construct and diagnose problems with simple circuits

Notes and guidance (non-statutory)

Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6.

Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with 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 4 Science Curriculum

States of matter	NC Objective/Milestone	Basic	Advancing	Deep
	L.O. TBAT compare and group materials together, according to whether they are solids, liquids or gases. .	With the support of a teacher, materials are grouped together according to whether they are solids, liquids or gases	Materials are compared and grouped together according to whether they are solids, liquids or gases.	Materials are independently and accurately grouped and compared according to their state of matter.
	L.O. TBAT observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C), building on the teaching in mathematics.	With the support of a teacher, there is an ability to observe that some materials change state when they are heated or cooled. With the support of a teacher, the temperatures at which some materials change state is measured in degrees Celsius.	Generally, it is observed that some materials change when they are heated or cooled and the temperature at which this happens is measured in degrees Celsius. This builds on the teaching in mathematics.	It is observed that some materials change when they are heated or cooled and the temperature at which this happens is measured in degrees Celsius. This builds on the teaching in mathematics.
	L.O. TBAT identify the part played by evaporation and condensation in the water cycle, and associate the rate of evaporation with temperature.	With the support of a teacher, the water cycle begins to be understood. The terminology 'evaporation' and 'condensation' begin to be used.	Generally, the four main stages of the water cycle are understood and the part played by evaporation, condensation and precipitation in the water cycle is identified. Generally, the rate of evaporation is associated with temperature.	The four main stages of the water cycle are understood independently and this process can be articulated and explained clearly and accurately. Without support, the part played by evaporation and condensation in the water cycle is identified, and the rate of evaporation is associated with temperature.

Notes and guidance (non-statutory)

Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.

Note: Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning.

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.

Year 4 Science Curriculum

Animals including Humans (Digestion including teeth)	NC Objective/Milestone	Basic	Advancing	Deep
	L.O. TBAT describe the simple functions of the basic parts of the digestive system in humans.	With support, the simple functions of the basic parts of the digestive system in humans, e.g. mouth, stomach, intestines, is described.	The simple functions of the parts of the digestive system in humans, e.g. mouth, oesophagus, liver, stomach, small intestine, large intestine and rectum, are described and identified.	The functions of the parts of the digestive system in humans, e.g. mouth, oesophagus, liver, stomach, small intestine, large intestine and rectum, are described and identified accurately and without support.
	L.O. TBAT construct and interpret a variety of food chains, identifying producers, predators and prey.	With the support of a teacher, food chains are constructed. There is some awareness of the terms predator and prey.	A range of food chains are constructed or interpreted The terms predator and prey are used correctly.	A wide range of food chains are constructed and interpreted. The terms predator and prey are fully understood and used accurately.
	L.O. TBAT identify the different types of teeth in humans and their simple functions.	With the support of a teacher, the different types of teeth in humans, e.g. molars, incisors and canines, are identified. Their simple functions begin to be recognised.	Generally, the different types of teeth in humans, e.g. molars, incisors and canines, and their simple functions, are identified. Generally, it is recognised that: canines are used for tearing and ripping food, incisors are to help bite off and chew pieces of food and molars are to help crush and grind food.	The different types of teeth in humans, e.g. molars, incisors and canines, and their simple functions, are identified independently. Without support, it is recognised that: canines are used for tearing and ripping food, incisors are to help bite off and chew pieces of food and molars are to help crush and grind food.

Notes and guidance (non-statutory)

Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions.

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.