



# Toftwood Infant and Junior School Federation Science Curriculum

# Toftwood Infant and Junior School Federation



Science			
Term			
1	Autumn	Spring	Summer
<p><b>Working Scientifically Pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</b></p> <p><i>Asking simple questions and recognising that they can be answered in different ways</i></p> <p><i>Observing closely, using simple equipment</i></p> <p><i>Performing simple tests</i></p> <p><i>Identifying and classifying</i></p> <p><i>Using their observations and ideas to suggest answers to questions</i></p> <p><i>Gathering and recording data to help in answering question</i></p>			
	<p><b>Animals, including humans</b> 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><b>Seasonal changes</b> Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies.</p>	<p><b>Animals, including humans</b> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).</p> <p><b>Seasonal changes</b> Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies.</p> <p><b>Everyday materials</b> 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><b>Plants</b> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p><b>Seasonal changes</b> Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies.</p> <p><b>Everyday materials</b> 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>

2	Autumn	Spring	Summer
<p><b>Working Scientifically Pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</b></p> <p><i>Asking simple questions and recognising that they can be answered in different ways</i></p> <p><i>Observing closely, using simple equipment</i></p> <p><i>Performing simple tests</i></p> <p><i>Identifying and classifying</i></p> <p><i>Using their observations and ideas to suggest answers to questions</i></p> <p><i>Gathering and recording data to help in answering question</i></p>			
	<p><b>Living things and their habitats</b> 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.</p> <p>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><b>Plants</b> Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p><b>Uses of everyday materials</b> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p><b>Living things and their habitats</b> Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>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.</p> <p>Identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p><b>Plants</b> Observe and describe how seeds and bulbs grow into mature plants.</p> <p><b>Animals, including humans</b> Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the</p>	<p><b>Plants</b> Observe and describe how seeds and bulbs grow into mature plants.</p> <p><b>Living things and their habitats</b> Identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>Explore and compare the differences between things that are living, dead and things that have never been alive.</p> <p><b>Animals, including humans</b> Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>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>

		right amounts of different types of food, and hygiene.	
--	--	--------------------------------------------------------	--

Science			
Term			
3	Autumn	Spring	Summer
<p><b>Working Scientifically Pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</b></p> <p><i>Asking relevant questions and using different types of scientific enquiries to answer them</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>			
	<p><b>Forces and magnets</b></p> <p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p><b>Light</b></p> <p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p>	<p><b>Plants</b></p> <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p><b>Rocks</b></p> <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p><b>Animals including humans</b></p> <p>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>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>

	<p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows change.</p>		
4	Autumn	Spring	Summer
<p><b>Working Scientifically Pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</b></p> <p><i>Asking relevant questions and using different types of scientific enquiries to answer them</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>			
	<p><b>States of matter</b></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>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)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p><b>Sound</b></p> <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	<p><b>Electricity</b></p> <p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p><b>Living things and their habitats</b></p> <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p><b>Animals including humans</b></p> <p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>

5	Autumn	Spring	Summer
<b>Working Scientifically</b> <i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</i> <i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</i> <i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</i> <i>Using test results to make predictions to set up further comparative and fair tests</i> <i>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</i> <i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i>			
	<b>Earth and space</b> 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 the apparent movement of the sun across the sky. <b>Properties and changes of materials</b> 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 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 Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic 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	<b>Forces</b> 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 Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	<b>Animals including humans</b> Describe the changes as humans develop to old age. <b>All living things and their habitats</b> Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life processes of reproduction in some plants and animals.

	changes associated with burning and the action of acid on bicarbonate of soda.		
<b>6</b>	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
<b>Working Scientifically</b> <i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</i> <i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</i> <i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</i> <i>Using test results to make predictions to set up further comparative and fair tests</i> <i>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</i> <i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i>			
	<b>Animals, including humans</b> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. <b>Light</b> 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 emit 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.	<b>Evolution and inheritance</b> 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.	<b>Electricity</b> 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. <b>Living things and their habitats</b> Describe how living things are classified into broad groups according to common observable characteristics and base on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.

### Progression of working scientifically objectives

Working scientifically	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Plan</b>	<p>Ask simple questions when prompted- use everyday language and begin to use scientific words</p> <p>Suggest ways of answering a question</p>	<p>Ask simple questions, by suggesting ideas and know they can be answered / investigated in different ways including by asking people questions and secondary sources, such as books and video clips.</p> <p>Recognise that questions can be answered in different ways.</p>	<p>Ask relevant questions when prompted- use ideas to pose questions independently about the world around them.</p> <p>Use different types of scientific enquiry to answer them.</p> <p>Discuss enquiry methods and describe what a simple fair test is.</p>	<p>Ask and suggest relevant questions and know that they can be answered in a variety of ways, using secondary sources such as ICT when questions cannot be answered through practical investigations.</p> <p>Suggest questions about the world around them using scientific experiences.</p> <p>Use different types of scientific enquiries to answer their questions.</p>	<p>Collaboratively plan different types of scientific enquiries to answer questions. With support, recognise and control variables where necessary.</p> <p>Raise different types of scientific questions and hypotheses.</p> <p>Plan a range of scientific enquires including comparative and fair tests.</p>	<p>Explore and discuss different types of scientific enquiries to answer questions. Select and plan the most suitable line of enquiry.</p> <p>Recognise, explain and control variables where necessary in a variety of comparative and fair tests.</p> <p>Pose and select the most appropriate line of enquiry to investigate questions.</p>

Do	<p>Observing- observing objects, materials, and living things and explain what they see.</p> <p>Follow simple instructions to complete a simple test individually or in a group. Conduct simple tests, with support.</p> <p>Identifying- Sort objects, materials and living things into groups with help according to the observational features.</p> <p>Equipment- Make relevant observations using simple equipment e.g. thermometers, rain gauges, wind vanes.</p>	<p>Observing-Observe something closely and describe changes over time.</p> <p>Carry out steps in the correct order when performing a simple test and begin to recognise when something is unfair.</p> <p>Identifying-Decide with help how to group materials, living things and objects, noticing changes over time and begin to see patterns and relationships.</p> <p>Equipment- Use simple equipment such as hand lenses, egg/sand timers, digital microscopes, and quadrants to take measurements.</p>	<p>Observing- Make decisions about what to observe in an investigation.</p> <p>Set up simple and practical enquiries, comparative and simple fair tests with support. Use standard units when taking measurements.</p> <p>Identifying- talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.</p> <p>Equipment- Make systematic and careful observations using simple equipment such as magnets, hand lenses, torches, mirrors and data loggers.</p>	<p>Observing-Make systematic and careful observations.</p> <p>Set up simple and practical enquiries, comparative and fair tests. Take accurate measurements using standard units, where appropriate.</p> <p>Make decisions about different enquiries including recognising when a fair test is necessary and begin to identify variables.</p> <p>Identifying- Identifying similarities, differences and changes when talking about the different processes. Use and begin to create simple keys.</p> <p>Equipment- Make systematic and careful observations</p>	<p>Observing-Plan and carry out comparative and fair tests, making systematic and careful observations.</p> <p>Take measurements using standard units with a range of scientific equipment, with increasing accuracy, and begin to understand the need for repeat readings.</p> <p>Identifying-use and develop keys and other information records to identify, classify and describe living things and materials.</p> <p>Equipment- Select, with prompting, appropriate equipment, for example, (but not limited to) measuring beakers, tape measures, filtration</p>	<p>Observing-make their own decisions about which observations to make, using test results and observations to make predictions or set up further tests.</p> <p>Take measurements with a range of scientific equipment with increasing accuracy and precision. Take repeat readings when appropriate.</p> <p>Identifying- use and develop keys and other information records to identify and explain patterns seen in the natural environment.</p> <p>Equipment- Select and use a range of scientific equipment to take measurements, including those used</p>
----	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

				using a range of equipment, including thermometers, data loggers and circuit equipment.	devices, Newton meters and stopwatches.	in previous learning e.g. torches, prisms, mirrors, stopwatches, circuit equipment.
<b>Record</b>	Gather and record data with support, which has been modelled	<p>Gather and record data to help answer questions.</p> <p>Record and communicate their findings in a range of ways and begin to use simple scientific language.</p>	<p>Record findings using simple scientific language in note form, drawings, labelled diagrams, tables, pictograms and tally charts.</p> <p>With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions.</p> <p>With prompting, use various ways of recording, grouping and displaying evidence and suggest how findings may be tabulated.</p>	<p>Record findings using simple scientific language, drawings and labelled diagrams, keys, bar charts, and tables.</p> <p>Gather, record, classify and present data in a variety of ways to help to answer questions.</p> <p>Present information, findings and conclusions for a variety of different audiences. Displays, oral presentations or written explanations.</p>	<p>Take and process repeat readings with modelling.</p> <p>Record data using labelled diagrams, keys, tables and charts.</p> <p>With support, use line graphs to record data, scientific diagrams, labels, classification keys and models.</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, line and bar graphs.</p> <p>Choose the most effective approach to record and report results- use mathematical knowledge too.</p>

<b>Review</b>	<p>Discuss findings. Use their observations and ideas to suggest answers to simple questions.</p> <p>Explain, with help, what they think they have found out.</p>	<p>Discuss findings. Use their observations and ideas to suggest answers to simple questions.</p> <p>Explain what they think they have found out using simple scientific language and how they found it out.</p>	<p>With prompting, suggest conclusions from enquiries. Suggest how findings could be reported.</p> <p>Suggest possible improvements or further questions to investigate.</p> <p>Draw a simple conclusion based on evidence from an enquiry or observation with help.</p>	<p>Report on findings from enquiries, including oral and written explanations, displays or presentation of results and conclusions.</p> <p>Use straightforward scientific evidence to answer questions or to support their findings.</p> <p>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries.</p>	<p>Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships.</p> <p>With support, present findings from enquiries orally and, in writing, suggest further comparative or fair tests.</p> <p>Use a simple mode of communication to justify their conclusions on a hypothesis.</p> <p>Begin to recognise how scientific ideas change over time.</p>	<p>Report and present findings from enquiries, including conclusions and causal relationships in oral and written forms, such as in displays and other presentations.</p> <p>With support, suggest further comparative or fair tests based on findings.</p> <p>Identify validity of conclusion and required improvement to methodology and predictions for what would happen.</p> <p>Discuss how scientific ideas develop over time.</p>
---------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

