

# Year 2

## Science Programme of Study

**Inc. Core-Standard Coverage of Enquiry Types and 'Working Scientifically' Skills:**

Enquiry Types	
Research Using Secondary Sources	✓✓
Observing Over Time	✓✓✓
Pattern Seeking	✓✓✓
Identifying, Classifying and Grouping	✓✓✓
Comparative and Fair Testing	✓✓✓✓

Working Scientifically	
Conducting Secondary Research	✓✓✓
Asking Enquiry Questions	✓✓
Making Predictions and Hypothesising	✓✓
Setting up an Investigation	✓✓
Observing and Measuring	✓
Recording Data	✓✓
Interpreting and Communicating Results	✓✓
Evaluating and Questioning Further	✓

## Aims

**‘The National Curriculum for Science’ aims to ensure that all pupils:**

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics
- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

**Scientific Knowledge and Conceptual Understanding:**

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils’ engagement with and motivation to study science.

**The Nature, Processes and Methods of Science:**

‘Working Scientifically’ specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how ‘working scientifically’ might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. ‘Working Scientifically’ will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Year 2– Science Programme of Study - *Timelines of Learning (The Bigger Picture)*

Unit	Prior learning...	What I will learn now...	What I don't need to learn yet...
<p><b>Animals inc. Humans</b></p>	<p><b>Pupils should already have been taught to:</b></p> <ul style="list-style-type: none"> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores (1- <u>Animals including Humans</u>)</li> <li>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (1- <u>Animals including Humans</u>)</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults (2-<u>Animals including Humans</u>)</li> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) (2-<u>Animals including Humans</u>)</li> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (2-<u>Animals including Humans</u>)</li> </ul>	<p><b>In Year 3 pupils will be taught to:</b></p> <ul style="list-style-type: none"> <li>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. (3-<u>Animals including Humans</u>)</li> </ul> <p><b>In Year 5 pupils will be taught to:</b></p> <ul style="list-style-type: none"> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (5- <u>Living things and their Habitats</u>)</li> <li>Describe the life process of reproduction in some plants and animals. (5- <u>Living things and their Habitats</u>)</li> </ul> <p><b>In Year 6 pupils will be taught to:</b></p> <ul style="list-style-type: none"> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (6-<u>Animals including Humans</u>)</li> </ul>
<p><b>Living Things and their Habitats</b></p>	<p><b>Pupils should already have been taught to:</b></p> <ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (1-<u>Plants</u>)</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees (1-<u>Plants</u>)</li> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (1-<u>Animals including Humans</u>)</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores (1-<u>Animals including Humans</u>)</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) (1-<u>Animals including Humans</u>)</li> <li>Observe changes across the four seasons (1-<u>Seasonal Changes</u>)</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>Explore and compare the differences between things that are living, dead, and things that have never been alive (2-<u>Living things and their Habitats</u>)</li> <li>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 (2-<u>Living things and their Habitats</u>)</li> <li>Identify and name a variety of plants and animals in their habitats, including micro-habitats (2-<u>Living things and their Habitats</u>)</li> <li>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 (2-<u>Living things and their Habitats</u>)</li> </ul>	<p><b>In Year 4 pupils will be taught to:</b></p> <ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways (4- <u>Living things and their Habitats</u>)</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (4- <u>Living things and their Habitats</u>)</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things (4- <u>Living things and their Habitats</u>)</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey. (4-<u>Animals, including Humans</u>)</li> </ul>
<p><b>Plants</b></p>	<p><b>Pupils should already have been taught to:</b></p> <ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (1-<u>Plants</u>)</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees (1-<u>Plants</u>)</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants. (2-<u>Plants</u>)</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (2-<u>Plants</u>)</li> </ul>	<p><b>In Year 3 pupils will be taught to:</b></p> <ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (3- <u>Plants</u>)</li> <li>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. (3- <u>Plants</u>)</li> <li>Investigate the way in which water is transported within plants. (3- <u>Plants</u>)</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (3- <u>Plants</u>)</li> </ul>
<p><b>Uses of Everyday Materials</b></p>	<p><b>Pupils should already have been taught to:</b></p> <ul style="list-style-type: none"> <li>Distinguish between an object and the material from which it is made. (1-<u>Everyday materials</u>)</li> <li>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (1-<u>Everyday materials</u>)</li> <li>Describe the simple physical properties of a variety of everyday materials. (1-<u>Everyday materials</u>)</li> <li>Compare and group together a variety of everyday materials on the basis of their simple physical properties. (1-<u>Everyday materials</u>)</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (2-<u>Everyday materials</u>)</li> <li>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (2-<u>Everyday materials</u>)</li> </ul>	<p><b>In Year 3 pupils will be taught to:</b></p> <ul style="list-style-type: none"> <li>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (3-<u>Rocks</u>)</li> <li>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. (3-<u>Forces</u>)</li> </ul> <p><b>In Year 5 pupils will be taught to:</b></p> <ul style="list-style-type: none"> <li>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 (5- <u>Properties of everyday materials</u>)</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (5-<u>Properties of everyday materials</u>)</li> </ul>

## Year 2 – Science Programme of Study - *Timelines of Learning (Working Scientifically)*














	Plan		Do			Review		
Stages	Recognise the best type of enquiry to answer a question	Choose equipment, select tests, use secondary sources to decide how to obtain accurate observations and measurements	Obtain observations and measurements using equipment and/or secondary sources	Record observations and measurements	Present observations and measurements	Draw conclusions and make explanations	Evaluate the data collected	Evaluate the process used (including next steps)
<p>Prior learning...</p> <p><b>End of Year 1</b></p>	With help and encouragement, I ask simple questions that begin with why, what if, how or when.	I make suggestions about how to do things when we plan a simple test.	<p>With help, I use simple equipment and non-standard units to find things out.</p> <p>I observe using my senses.</p>	With help, I can gather and record data to help me answer my questions.		I talk about what happened and/or what I saw.		I talk about what I did.
<p>What I will learn now...</p> <p><b>End of Year 2</b></p>	I ask simple questions and recognise these questions can be answered in different ways.	I decide with help, what to find out, observe or measure.	<p>I observe closely, using simple equipment and non-standard units.</p> <p>I can identify and classify.</p> <p>I can perform a simple test.</p>	<p>I gather data and record data to help me answer my questions.</p> <p>I record what I have found out using e.g., words or pictures, tables or simple prepared formats.</p>		I use my observations and ideas to suggest answers to my questions.		I talk about how I found out what I found out.
<p>What I don't need to learn yet...</p> <p><b>End of Year 3</b></p>	I can ask questions and I recognise that there are different types of enquiry.	<p>I can set up a simple practical enquiry and I am beginning to understand how to make a test fair.</p> <p>I make suggestions about what observations and measurements to make and what equipment I need.</p>	<p>I am beginning to make systematic and careful observations.</p> <p>I sometimes use standard units.</p> <p>With help, I can use information sources provided to find things out.</p>	<p>I gather data and using a pre-prepared table, I can record data.</p> <p>I record my findings using a drawing and/or words.</p>	With help, I can present my data.	I can use my results when I talk about what happened.		<p>I can talk about what went wrong.</p> <p>I have ideas about what else I would like to find out.</p>

**KEY:** NAVY BLUE – EYFS Framework (pre-2021) or National Curriculum - **statutory**  
**RED** – Non-statutory to support progression

## Year 2– Science Programme of Study – Yearly Overview (*Knowledge and Understanding*)

Year 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Uses of Everyday Materials</b>		<b>Animals inc. Humans</b>	<b>Plants</b>		
	<p>Identify &amp; compare the suitability of a variety of everyday materials, including wood, metal, plastics, 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 style="text-align: center;"><b>Cross Curricular Links:</b></p> <p><i>Maths – Construct and interpret simple pictograms, tally charts, block diagrams and tables depicting properties of different materials.</i></p> <p><i>Maths - Create Venn diagrams to group and sort materials based on their properties.</i></p>		<p>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 right amounts of different types of food, and hygiene.</p> <p style="text-align: center;"><b>Cross Curricular Links:</b></p> <p><i>Maths - Set up a pet shop involving money, whereby pupils must consider how much it would cost to look after a dog (food, shelter for a week).</i></p> <p><i>PE / Maths - Keep a food diary for a week and use tally charts to record common food groups (fruits, veg etc.) Use tally chart to create block diagram.</i></p> <p><i>PE – Research the diets of different athletes and consider how these foods enable them to be good at their jobs.</i></p> <p><i>Maths / PSHE - Look at food labels and read information about amount of sugar, fat, carbohydrates. Measure these amounts using simple scales.</i></p>	<p>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 style="text-align: center;"><b>Cross Curricular Links:</b></p> <p><i>Maths - Choose and use appropriate standard units to estimate and measure length/height by measuring the growth of plants throughout the year - change 1 variable e.g. sunlight/no sunlight and measure: stem length, leaf length and width, petal length and width – record results in a simple table.</i></p> <p><i>Maths - Choose and use appropriate standard units to estimate and measure temperature by measuring the temperature of the environment in which plants grow best – record results in a simple table.</i></p> <p><i>Geography – Identify a range of plants that are native to counties around the world before investigating why these plants are suited to these particular environments.</i></p>		
			<b>Plants</b>	<b>Living Things &amp; their Habitats</b>		
			<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p style="text-align: center;"><b>***ENSURE THAT SEEDS / BULBS ARE PLANTED TO ENSURE THAT THEY FLOWER DURING THE SUMMER TERM***</b></p> <p style="text-align: center;"><b>Cross Curricular Links:</b></p> <p><i>SEE ABOVE (RIGHT)</i></p>	<p>Identify &amp; name a variety of plants and animals in their habitats, including micro-habitats.</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>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 style="text-align: center;"><b>Cross Curricular Links:</b></p> <p><i>Maths - Ask and answer questions by counting the number of objects in a category (number of flowering plants in a garden, number of flying insects in an environment, etc.) and sorting the categories by quantity.</i></p> <p><i>Maths - Use a Venn Diagram to sort living and non-living and to use the results of sorting to discuss the difference between dead and never lived.</i></p> <p><i>Maths - Use classification keys to sort living things from top to bottom so that they understand how they are structured.</i></p> <p><i>Geography – Research a range of habitats from around the world and identify animals that live in these places. How are they suited to these environments?</i></p>		

## Exemplification of 'Scientific Enquiry Types' and 'Working Scientifically'

5 Enquiry Types		Working Scientifically – Processes of Science	
	<p><b>Research Using Secondary Sources</b> Where the answer is found or developed using secondary sources. This is usually where it is impossible or unsafe for pupils to fully answer with first-hand enquiries, or where confirmation of the conclusions drawn during first-hand enquires is sought. This enquiry skill helps pupils to evaluate sources, distinguish between fact and opinion and recognise conflicting evidence and bias.</p>		
	<p><b>Observing Over Time</b> Pupils identify and measure events and changes in living things, materials and physical process or events. These observations may take place over time spans of minutes or hours (e.g., puddles evaporating) up to several weeks or months (e.g., rearing young chicks).</p>		<p><b>Asking Questions</b> Asking questions that can be answered using a scientific enquiry. E.g., how does the road surface affect the speed at which a car travels?</p>
	<p><b>Pattern Seeking</b> Pupils observe, measure and record events and systems when carrying out pattern seeking enquires. They also collect and interpret data from secondary sources. They make observations and conduct surveys where the variables can't easily be controlled for practical or ethical reasons.</p>		<p><b>Making Predictions and Hypothesising</b> Using prior knowledge (inc. that developed through secondary research) to suggest what will happen in a scientific enquiry. E.g., I think that a smoother road surface will allow a car to travel faster.</p>
	<p><b>Identifying, Classifying and Grouping</b> Pupils make sense of how the world is organised. Identification is the process of using differences to name something and classification is organising things into groups. Opportunities to identify arise when pupils recognise not all birds are the same for example and can identify and name them. They can then use observable and behavioural similarities to group them and add new things.</p>		<p><b>Setting up an Investigation</b> Deciding on the method and equipment to use to carry out an enquiry. E.g., children may use a timing ramp, different surface coverings and a data logger to test how the road surface affects the speed at which a car travels.</p>
	<p><b>Comparative and Fair Testing</b> Helps pupils explore relationship between variables. Comparative tests children compare one event with another. E.g., does the red car go faster than the green car? A fair test identifies the causal relationship between two variable. E.g., does the height of the ramp affect how quickly the toy car rolls down the ramp and everything else remains the same?</p>		<p><b>Observing and Measuring</b> Using measuring equipment and the senses to make observations or take measurements relating to the enquiry. E.g., the car took 1.5 seconds to travel between point A and point B on a smooth surface.</p>
<p><i>Definitions adapted from 'It's not fair - or is it?' (Turner, Keogh, Lawrence &amp; Naylor, 2011) Enquiry Symbols - © University of Manchester Working Scientifically Symbols - © - Primary Science Teaching Trust</i></p>			<p><b>Recording Data</b> Using tables, drawing and other means to note observations and measurements. E.g., children record the results of their investigation using a two-way table.</p>
<p>The <b>Working Scientifically Wheel</b> may be used in lessons to draw attention to the focused 'working scientifically' skill being covered.</p>			<p><b>Interpreting and Communicating Results</b> Using information from the recorded data to say what you found out and presenting this in an appropriate form. E.g., children draw and explain a bar chart showing how the time taken for a car to travel between points A and B changes depending on the surface covering.</p>
<p>Colouring or dating a section for each focused skill provides an opportunity to check that all of the skills are covered across the year, and also track children's progress in relation to the identified skills.</p>			<p><b>Evaluating and Questioning Further</b> Reflecting on the success of the enquiry approach and identifying further questions for enquiry. E.g., children may ask how the angle of the ramp may also affect the speed at which the car travels between points A and B.</p>



## Year 2– Core Investigations– Coverage of ‘Working Scientifically’ and ‘Scientific Enquiry’

Uses of Everyday Materials	Animals inc. Humans	Plants	Living Things and their Habitats
<p><b>NC OBJ</b> - Identify &amp; compare the suitability of a variety of everyday materials, including wood, metal, plastics, glass, brick, rock, paper and cardboard for particular uses.</p> <p><b>Enquiry Type:</b> <i>Comparative / Fair Testing</i>  <b>Working Scientifically Skill:</b> <i>Setting up an Investigation</i>  <b>(1) Investigation Overview:</b> <i>TAPS Focussed Assessment – Waterproof Materials</i>                      Children will plan and carry out a simple test to measure the waterproofness of different materials – groups may try a range of different approaches to answering the question.</p>	<p><b>NC OBJ</b> - Notice that animals, including humans, have offspring which grow into adults.</p> <p><b>Enquiry Type:</b> <i>Pattern Seeking</i>  <b>Working Scientifically Skill:</b> <i>Asking Questions</i>  <b>(1) Investigation Overview:</b> <i>TAPS Focussed Assessment – Hand Spans</i>                      Children compare the size of their hands before asking and testing questions such as: Do taller children have bigger hands? Etc.</p>	<p><b>NC OBJ</b> - Observe and describe how seeds and bulbs grow into mature plants.</p> <p><b>Enquiry Type:</b> <i>Pattern Seeking</i>  <b>Working Scientifically Skill:</b> <i>Setting up an Investigation</i>  <b>(1) Investigation Overview:</b> <i>Ogden Trust – Do Bigger Seeds Grow into Bigger Plants?</i>                      Children set up an investigation to investigate if bigger seeds grow into bigger plants. This will involve measuring a selection of seeds before planting them all in the same environment and observing and measuring their growth over time.</p>	<p><b>NC OBJ</b> - Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p><b>Enquiry Type:</b> <i>Identifying, Classifying and Grouping</i>  <b>Working Scientifically Skill:</b> <i>Interpret/ Communicate Results</i>  <b>(1) Investigation Overview:</b> <i>Ogden Trust – How Would You Group Things?</i>                      Children identify, classify / group things that are living, dead and have never been alive. They should come up with their own ways of presenting this information / communicating it to others- i.e., Venn or Carrol diagram, table, etc. Choose the most appropriate.</p>
<p><b>NC OBJ</b> - Identify &amp; compare the suitability of a variety of everyday materials, including wood, metal, plastics, glass, brick, rock, paper and cardboard for particular uses.</p> <p><b>Enquiry Type:</b> <i>Comparative / Fair Testing</i>  <b>Working Scientifically Skill:</b> <i>Interpreting and Communicating Results</i>  <b>(2) Investigation Overview:</b> <i>TAPS Focussed Assess. – Boats</i>                      Children work in groups to make a boat that will carry an orange. Discuss materials whilst testing the boat designs with a focus on the suitability of the materials for the purpose.</p>	<p><b>NC OBJ</b> - Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p><b>Enquiry Type:</b> <i>Research Using Sec. Sources</i>  <b>Working Scientifically Skill:</b> <i>Conduct Sec. Research</i>  <b>(2) Investigation Overview:</b> <i>OWN PLANNING - Looking After a Newborn Baby</i>                      A child's parent should be invited into school and the children given the opportunity to ask them all about how they look after the baby, inc. it's basic needs. This may be repeated at a later date so that children can also see changes over time.</p>	<p><b>NC OBJ</b> - Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p><b>Enquiry Type:</b> <i>Observing Over Time</i>  <b>Working Scientifically Skill:</b> <i>Predicting and Hypothesising</i>  <b>(2) Investigation Overview:</b> <i>TAPS Focussed Assessment – Plant Growth</i>                      Children grow plants in a range of different conditions, measuring and observing their development over time (height, droopiness, etc). They use their findings to suggest how healthy plants are and suggest reasons why this may be the case.</p>	<p><b>NC OBJ</b> - Identify &amp; name a variety of plants and animals in their habitats, including micro-habitats.</p> <p><b>Enquiry Type:</b> <i>Identifying, Classifying and Grouping</i>  <b>Working Scientifically Skill:</b> <i>Recording Data</i>  <b>(2) Investigation Overview:</b> <i>TAPS Focussed Assessment – Nature Spotters</i>                      Children use 'spotter sheets' to identify a variety of plants and animals. They could explore leaves/blossom, flowers, pond life, etc. and may visit different habitats and compare findings.</p>
<p><b>NC OBJ</b> - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p><b>Enquiry Type:</b> <i>Identifying, Classifying and Grouping</i>  <b>Working Scientifically Skill:</b> <i>Recording Data</i>  <b>(3) Investigation Overview:</b> <i>OWN PLANNING – Will It Squash, Bend, Twist or Stretch?</i>                      Investigate the properties of different materials by testing if they can be squashed, bent, twisted or stretched. Children to record their results using an appropriate method.</p>	<p><b>NC OBJ</b> - Notice that animals, including humans, have offspring which grow into adults.</p> <p><b>Enquiry Type:</b> <i>Observing Over Time</i>  <b>Working Scientifically Skill:</b> <i>Conduct Sec. Research</i>  <b>(3) Investigation Overview:</b> <i>Ogden Trust – How Does a Tadpole Change over Time?</i>                      Children observe how frogspawn changes over time, recognising that frogspawn is eggs that have been laid by frogs, which change into tadpoles, froglets, frogs with legs, etc. Children then use secondary sources to find out more about their observations.</p>	<p><b>NC OBJ</b> - Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p><b>Enquiry Type:</b> <i>Observing Over Time</i>  <b>Working Scientifically Skill:</b> <i>Observing and Measuring</i>  <b>(3) Investigation Overview:</b> <i>Ogden Trust – What Happens to a Bean when it is Planted?</i>                      Children plant beans and observe their growth carefully as they become mature plants, linking each stage of growth the life cycle of a bean.</p>	<p><b>NC OBJ</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... [see more].</p> <p><b>Enquiry Type:</b> <i>Pattern Seeking</i>  <b>Working Scientifically Skill:</b> <i>Predicting and Hypothesising</i>  <b>(3) Investigation Overview:</b> <i>TAPS Focussed Assessment – Where the Woodlice Are</i>                      Children make predictions about where woodlice may live before exploring a range of habitats, recording how many woodlice were present and looking for commonalities.</p>
	<p><b>NC OBJ</b> - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><b>Enquiry Type:</b> <i>Comparative / Fair Testing</i>  <b>Working Scientifically Skill:</b> <i>Evaluating / Questioning Further</i>  <b>(4) Investigation Overview:</b> <i>Ogden Trust - Do Bananas Make Us Run Faster?</i>                      Children test the difference between their running speed having eaten bananas and then again having eaten an unhealthy food. Once complete, they must evaluate the test that they conducted and pose further questions linked to their results.</p>		<p><b>NC OBJ</b> - 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>Enquiry Type:</b> <i>Research Using Sec. Sources</i>  <b>Working Scientifically Skill:</b> <i>Conduct Sec. Research</i>  <b>(4) Investigation Overview:</b> <i>ASE PLAN – Constructing Food Chains</i>                      Children are given images of a producer / consumers and order them according to what they eat. Info. about what diff. animals eat is then used to construct further food chains.</p>

Year  
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**Small Steps Overview – Uses of Everyday Materials (Y2)**

(1)	Identify & compare the suitability of a variety of everyday materials, including wood, metal, plastics, glass, brick, rock, paper and cardboard for particular uses.
(2)	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
(3)	<b>Providing further depth and breadth of understanding</b>

**NOTE – SOME STEPS WILL TAKE MORE THAN 60 MINUTES**

Pupils will know...		Key Vocab (MUST be introduced*)
<b>All knowledge (inc. key vocab) linked to prior learning (see page 3 for linked objectives)</b>		
that objects can be grouped based on the material from which they are made. (2)	Step 1	grouped, classified, material, wood, plastic, paper, fabric, glass, metal, cardboard, rubber
that materials can be used to make things. (1)	Step 2	manufacture, use  *Ensure clarification between 'material' and 'object'
that all objects are made from a material. (1)		
which materials common objects are made from. (1)		
that the same material can be used to make a variety of different objects. (1)	Step 3	
that different materials can be used to make the same object. (1)		
that different materials have different properties: (1) <ul style="list-style-type: none"> <li>• <b>Wood</b> is hard, stiff, strong, opaque and can be carved into any shape.</li> <li>• <b>Plastic</b> is waterproof and strong and can be made to be flexible, stiff, smooth or strong.</li> <li>• <b>Paper</b> is lightweight and flexible.</li> <li>• <b>Fabric</b> is soft, flexible and hard-wearing and can be stretchy and absorbent.</li> <li>• <b>Glass</b> is waterproof, (often) transparent, hard and smooth.</li> <li>• <b>Metal</b> is strong, hard and can be shiny or dull.</li> <li>• <b>Cardboard</b> is strong, light and stiff (rigid).</li> <li>• <b>Rubber</b> is hard-wearing (durable), (sometimes) stretchy, flexible and strong.</li> </ul>	Step 4	properties, hard, stiff (rigid), strong, opaque, waterproof, flexible, smooth, lightweight, flexible, hard-wearing (durable), stretchy, absorbent, transparent, shiny, dull  *And associated words: <ul style="list-style-type: none"> <li>• <b>flexible -&gt; flexibility</b></li> <li>• <b>absorbent -&gt; absorbency</b></li> <li>• <b>Etc.</b></li> </ul>
that materials can be grouped according to their physical properties. (3)		
that the physical properties of a material help to determine what it is used for. (1)		
that some properties are more important than others when determining what a material is used for. (1)		
that the shape of materials can be changed. (2)	Step 5	
that changing the shape of a material can be done by: (2) <ul style="list-style-type: none"> <li>• <b>Squashing</b> is to crush something so that it becomes flat, soft, or out of shape.</li> <li>• <b>Bending</b> is to change a straight object so that it is curved.</li> <li>• <b>Twisting</b> is to change the shape of an object by turning it.</li> <li>• <b>Stretching</b> is to make an object longer or wider without tearing or breaking.</li> </ul>		
that changing the shape of a material can make it more suitable for certain uses. (2)	Step 6	squash, bend, twist, stretch
that some materials can be recycled and used again for different purposes. (3)	Step 7	suitability
	Step 8	recycle, reuse

← Core Investigation 1

← Core Investigation 2

← Core Investigation 3

\*Vocabulary may already have been introduced but must be covered in the given context

## Year 2 – Science Lesson Objectives

### Uses of Everyday Materials (Y2)

To identify uses of different everyday materials. (TAPS – materials hunt)
To compare the suitability of different everyday materials.
To explain how the shapes of objects made from some materials can be changed.
To explain the process of recycling.
1. Decide the method and equipment to use to carry out an enquiry. (TAPS – Waterproof Materials)
2. Evaluate the success of our boat design. (TAPS – materials)
3. To compare and group materials by their physical properties. (Will It Squash, Bend, Twist or Stretch?)
Assessment – Children choose a photo from the ‘unusual uses for materials’ power point and describe why is the material is or isn’t suitable for the object it has been used for.

Black - Learning objective    Red – Suggested Activities or useful information.    Purple – Core investigations

## Year 2– Science Knowledge Builder– *Small Steps and Suggested Lesson-Level Overview*

### Small Steps Overview – Animals inc. Humans (Y2)

(1)	Notice that animals, including humans, have offspring which grow into adults.
(2)	Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
(3)	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
(4)	<b>Providing further depth and breadth of understanding</b>

**NOTE – SOME STEPS WILL TAKE MORE THAN 60 MINUTES**

#### Pupils will know...

		Key Vocab (MUST be introduced) *
<b>All knowledge (inc. key vocab) linked to prior learning (see page 3 for linked objectives)</b>		
that animals (inc. humans) have offspring. (1)	<b>Step 1</b>	baby, offspring, new-born, parent
that the offspring of animals inc. humans can be matched to their parents. (1)		
that an animal's (inc. human's) offspring grows over time into an adult. (1)	<b>Step 2</b>	grow, growth, toddler, child, teenager, adult, elderly
that an animal's (inc. human's) offspring needs to be looked after as it grows. (2)	<b>Step 3</b>	care
that the characteristics of all animals inc. humans change as they grow. (3)	<b>Step 4</b>	characteristics
that as they grow, animals inc. humans need water, food and air to stay alive. (2)	<b>Step 5</b>	basic needs, survive, water, food, air, dehydrated, malnourished, nutrients, food, balanced diet
that if an animal does not consume sufficient water, they will become dehydrated. (3)		
that if an animal does not consume sufficient food (nutrients), they will become malnourished. (3)		
that animals inc. humans consume different types of food. (3)	<b>Step 6</b>	healthy
that sometimes animals inc. humans eat a lot of some foods and little of others. (3)		
that to stay healthy, humans need an adequate and varied diet of different foods. (3)	<b>Step 7</b>	fit, unfit, fitness, exercise, heart rate, pulse, tired, sweat, thirst
that animals inc. humans need exercise in order to stay healthy. (3)		
that doing no exercise is very unhealthy for animals inc. humans. (3)		
that when animals inc. humans exercise, their heart rate increases, breathing gets faster and they feel warmer. (4)	<b>Step 8</b>	<b>Consolidate vocabulary introduced at Step 7</b>
that when animals inc. humans exercise, they might feel tired, thirsty start to sweat. (4)		
that when humans exercise their heart rate (pulse) changes. (4)	<b>Step 9</b>	hygiene, illness, germs, bacteria, disease
that pulse rate can be measured in the wrist or neck. (4)		
that humans need to maintain good hygiene in order to stay healthy. (3)		
that poor hygiene can be dangerous as germs may spread. (3)		
that germs can cause illness and make people feel unwell. (3)		

← Core Investigation 1  
← Core Investigations 2 & 3

← Core Investigation 3

**\*Vocabulary may already have been introduced but must be covered in the given context**

## Year 2 – Science Lesson Objectives

### Animals inc. Humans (Y2)

To group young animals and their adults.
To compare the stages of the human life cycle.
To describe what animals, including humans, need to survive.
Describe the importance of healthy eating, exercise and hygiene.
1. Measure and record results to find a pattern. (TAPS- Hands Span)
2. To understand the basic needs of a baby. (Invite a baby in to school and ask questions about its care).
3. Find out how animals change as they grow into adults. (How Does a Tadpole Change over Time?) Could also choose a different animal.
4. Evaluate our comparative test (Do Bananas Make Us Run Faster?)
Assessment – Make a poster to share the ways to stay healthy and the importance of exercise, food and hygiene.

Black - Learning objective    Red – Suggested Activities or useful information.    Purple – Core investigations

## Year 2– Science Knowledge Builder– *Small Steps and Suggested Lesson-Level Overview*

### Small Steps Overview – Plants (Y2)

(1)	Observe and describe how seeds and bulbs grow into mature plants.
(2)	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
(3)	<b>Providing further depth and breadth of understanding</b>

**NOTE – SOME STEPS WILL TAKE MORE THAN 60 MINUTES**

#### **Pupils will know...**

#### **Key Vocab (MUST be introduced) \***

<b>All knowledge (inc. key vocab) linked to prior learning (see page 3 for linked objectives)</b>			
<i>that seeds and bulbs eventually grow into mature plants. (1)</i>	<b>Step 1</b>	seed, bulb, plant,	← <b>Core Investigation 1</b>
<i>that different plants grow in different soil conditions. (3)</i>	<b>Step 2</b>	soil, conditions, growth, chalky, clay, loamy, peaty, sandy, silty	
<i>that every part of a plant has a job to do. (1)</i>	<b>Step 3</b>	roots, anchor, nutrients	
<i>that plants need healthy roots in order to grow well. (1)</i>			
<i>that roots anchor the plant into the soil. (1)</i>			
<i>that plants need nutrients from the soil to grow well. (2)</i>			
<i>that water and nutrients are taken in through the roots. (1)</i>	<b>Step 4</b>	water, healthy, transport, stem, trunk	
<i>that plants need water, but not unlimited water, for healthy growth. (2)</i>			
<i>that water is transported through the stem (or trunk) to other parts of the plant. (2)</i>			
<i>that plants need a healthy stem (or trunk) in order to grow well. (1)</i>	<b>Step 5</b>	leaves, food	
<i>that plants need leaves in order to grow well. (1)</i>			
<i>that a plant's leaves help it to make its own food. (3)</i>	<b>Step 6</b>	green plant, light, space, temperature, sunlight	← <b>Core Investigation 2</b>
<i>that green plants need light in order for them to grow well. (2)</i>			
<i>that plant growth is affected by the availability of light. (2)</i>			
<i>that plants need sufficient space in order to grow well. (1)</i>			
<i>that plant growth is affected by temperature. (2)</i>	<b>Step 7</b>	pollination, pollinator, flower, insect	
<i>that flowers attract insects to a plant. (1)</i>			
<i>that insects pollinate some flowers. (1)</i>	<b>Step 8</b>	life cycle, pollination, fertilisation, seed production, seed dispersal, germination, sprout, shoot,	← <b>Core Investigation 3</b>
<i>that plants have a life cycle. (1)</i>			
<i>that a plant's life cycle includes pollination, fertilisation, seed production, seed dispersal and germination. (1)</i>			
<i>that seeds can be dispersed in a variety of ways. (1)</i>	<b>Step 9</b>	farming, garden, greenhouse, allotment, fruit	
<i>that many plants can provide food for us and some plants are grown for this. (3)</i>			

**\*Vocabulary may already have been introduced but must be covered in the given context**

Year 2 – Science **Lesson Objectives**

**Plants (Y2)**

To observe the growth of bulbs over time. (Daffodils planted in October.)
To describe the life cycle of a plant.
To explain what plants need to grow and stay healthy.
To describe what happens if plants don't get all the things they need.
To explain how plants are suited to their habitats.
1.Measure and record results to find a pattern (Do Bigger Sees Grow into Bigger Plants?)
2. Make predictions about the grow of plants under different conditions. (TAPS- Plant Growth)
3.Observe the growth of a bean over time. (What happens to a bean when it is planted?)
Assessment – Children draw and describe the lifecycle of a plant.

Black - Learning objective    Red – Suggested Activities or useful information.    Purple – Core investigations

## Year 2– Science Knowledge Builder– *Small Steps and Suggested Lesson-Level Overview*

### Small Steps Overview – Living Things and their Habitats (Y2)

**NOTE – SOME STEPS WILL TAKE MORE THAN 60 MINUTES**

(1)	Identify & name a variety of plants and animals in their habitats, including micro-habitats.
(2)	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.
(3)	Explore and compare the differences between things that are living, dead, and things that have never been alive.
(4)	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.
(5)	<b>Providing further depth and breadth of understanding</b>

#### Pupils will know...

#### Key Vocab (MUST be introduced) \*

All knowledge (inc. key vocab) linked to prior learning (see page 3 for linked objectives)				
that animals inc. humans and plants are living things (1)	<b>Step 1</b>	living things, habitat, micro-habitat, environment		
that there are different types of habitats, inc. microhabitats (1)				
that a 'habitat' is the environment in which a living thing lives (1)				
that in many habitats, there are things that are living, things that are dead, and things that have never been alive (3)	<b>Step 2</b>	living, dead, never been alive, extinct	← Core Investigation 1	
that in many habitats there are things that were once alive but are now extinct (no longer any of them alive) (5)				
that there are differences between things that are living, things that are dead and things that have never been alive (3)	<b>Step 3</b>	similarity, difference		
that if something is alive then it will (have all of the life processes): (3)	<b>Step 4</b>	life processes, movement, respiration, sensitivity, growth, reproduction, excretion, nutrition		
<ul style="list-style-type: none"> <li>Be able to <b>MOVE</b></li> <li>Be able <b>RESPIRE</b></li> <li>Be <b>SENSITIVE</b> to the environment</li> <li>Be able to <b>GROW</b></li> <li>Be able to <b>REPRODUCE</b></li> <li>Be able to <b>EXCRETE</b> waste</li> <li>Be able to take in <b>NUTRIENTS</b></li> </ul>				
that if something is dead then it was once living, but no longer has all of the life processes (3)				
that if something was never living then it has never had all of the life processes (3)				
that different animals are found in different habitats (1 and 4)	<b>Step 5</b>	<b>Consolidate vocabulary</b>	← Core Investigation 2	
that different plants are found in different habitats (1 and 4)	<b>Step 6</b>			
that a habitat provides for the basic needs of a plant or animal (4)	<b>Step 7</b>	basic needs, air, water, food, survival, food source		
that there are different food sources in different habitats (4)				
that a food source is where a living thing's food comes from (4)				
that animals are suited to the habitat in which they are mostly found (4)	<b>Step 8</b>	suited, adaptation	← Core Investigation 3	
that plants are suited to the habitat in which they are mostly found (4)	<b>Step 9</b>	Interdependent, producers, consumers, predators, prey		
that plants and animals in local habitats are interdependent (4)				
that in natural habitats there are producers, consumers and predators and prey (2)				
that a food chain can be used to show producers and consumers in a habitat (2)	<b>Step 10</b>	food chain	← Core Investigation 4	
that a food chain shows how each animal gets its food (2)				
that the arrows in a food chain mean 'is eaten by' (2)				

**\*Vocabulary may already have been introduced but must be covered in the given context**

## Year 2 – Science Lesson Objectives

### Living Things and their Habitats (Y2)

Describe a habitat and identify animals live in it.
Identify how an animal is suited to its habitat.
Describe how different habitats provide for the basic needs of different kinds of animals and plants.
Explain how living things in a habitat depend on each other
Compare the differences between things that are living, dead and have never been alive.
1. Identify and group things that are living, dead and have never been alive. (How Would You Group Things?)
2. Record our observations (TAPS - Nature Spotters)
3. Make predictions about where woodlice may live. (TAPS- Where the Woodlice Are?)
4. Conduct research using secondary sources. (Research what animals eat).
Assessment - Food chain paper chains or 'Find it and Eat it' (From A Creative approach to teaching Science page 47).

Black - Learning objective    Red – Suggested Activities or useful information.    Purple – Core investigations

## Year 2 - Possible Misconceptions

<b>Year 2</b>	<b>Use of Everyday Materials</b>	<b>Plants</b>
	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• only fabrics are materials</li> <li>• only building materials are materials</li> <li>• only writing materials are materials</li> <li>• the word rock describes an object rather than a material</li> <li>• solid is another word for hard.</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• plants are not alive as they cannot be seen to move</li> <li>• seeds are not alive</li> <li>• all plants start out as seeds</li> <li>• seeds and bulbs need sunlight to germinate.</li> </ul>
	<b>Animals inc. Humans</b>	<b>Living Things and their Habitats</b>
	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• an animal's habitat is like its 'home'</li> <li>• all animals that live in the sea are fish</li> <li>• respiration is breathing</li> <li>• breathing is respiration.</li> </ul>	<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• an animal's habitat is like its 'home'</li> <li>• plants and seeds are not alive as they cannot be seen to move</li> <li>• fire is living</li> <li>• arrows in a food chain mean 'eats'.</li> </ul>

### ***Useful Resources and Websites***

Name	Link / Location
<ul style="list-style-type: none"> <li>• Primary Science Teaching Trust (website)</li> </ul>	<a href="https://pstt.org.uk">https://pstt.org.uk</a>
<ul style="list-style-type: none"> <li>• Teacher Assessment in Primary Science (TAPS)</li> </ul>	<a href="https://pstt.org.uk/resources/curriculum-materials/assessment">https://pstt.org.uk/resources/curriculum-materials/assessment</a> Also on Teams / Shared area
<ul style="list-style-type: none"> <li>• STEM</li> </ul>	<a href="https://www.stem.org.uk/primary-science">https://www.stem.org.uk/primary-science</a>
<ul style="list-style-type: none"> <li>• Explorify</li> </ul>	<a href="https://explorify.uk">https://explorify.uk</a>
<ul style="list-style-type: none"> <li>• ReachOut CPD</li> </ul>	<a href="https://www.reachoutcpd.com">https://www.reachoutcpd.com</a>