

## Year Two

**During Year 2 children develop the skills of working scientifically through 3 units:**

Year	Questioning & Enquiry	Observing and Measuring	Investigating	Recording & Reporting Findings	Identifying & classifying	Conclusions	Key Vocab
2	Ask questions of a scientific nature about the world around us	Observe closely using simple equipment (rulers, egg timers, stop watches) including observing over time  Use observations and ideas to suggest answers to questions	Perform simple tests independently To be able to describe what happened in the investigation	Record findings in different ways (e.g. provided table, tally chart, pictograms)	Use simple features to compare objects, materials and living things, and decide how to sort and group them	Talk about what they found out, how they found it out, if anything surprised them and changes they might make if they did the investigation again	<b>Identify</b> <b>Classify</b> <b>Describe</b> <b>Compare</b> <b>Contrast</b> <b>Diagram</b> <b>Chart</b> <b>Data</b>
<b>Connections to Mathematics Units</b>		<p><b>Measuring Week 10</b> I choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit, using rulers (divisions of ones, twos, fives, tens)</p> <p><b>Measuring Week 11</b> I can read scales to measure mass (g/kg) to the nearest appropriate unit using scales (divisions of ones, twos, fives, tens) – including missing values I choose and use appropriate standard units to estimate and measure</p>		<p><b>Measuring Week 12</b> I can interpret and construct simple pictograms, tally charts, block diagrams and simple tables I can ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity I can ask and answer questions about totalling and comparing categorical data</p>			

		temperature (°C) to the nearest appropriate unit using thermometers (divisions of ones, twos, fives, tens)					
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### Unit 1 (Autumn Term): Living things and their habitats

<b>Connections to other science units:</b>				
This is the second unit children encounter which is in Year 1. Learning undertaken in this unit will be built on in Year 5 (Living things & their habitats)				
<b>Living things and their habitats</b> <b>Year Two</b>	<p><b>Basic needs (water, food and air)</b> &gt;find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p><b>Food chains</b> &gt;describe how animals obtain their food from plants and other animals, using the idea of a food chain, identifying producers, predators and prey</p> <p>&gt;identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p><b>Effects of habitat on food chains</b></p>	<p><b>I can use and explain the key vocabulary linked to food chains and habitats</b></p> <p><b>I know the basic needs of living things</b></p> <p><b>I can draw a food chain identifying producers, predators and prey</b></p> <p><b>I can identify and describe different habitats</b></p> <p><b>I can describe the effects of habitat on food chains and how living things are adapted to their surroundings</b></p>	<p><b>Food chain</b> <b>Food source</b></p> <p><b>Habitat</b> <b>Woodland</b> <b>Polar</b> <b>Coast</b> <b>Pond</b></p> <p><b>Depend</b> <b>Dependent</b></p> <p><b>Survival</b> <b>Water</b> <b>Food</b> <b>Air</b></p> <p><b>Carnivore</b> <b>Herbivore</b> <b>Omnivore</b></p> <p><b>Producer</b> <b>Predator</b> <b>Prey</b></p>	<p>Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.</p> <p><b>Pupils might work scientifically by:</b></p> <p>Sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.</p>

	<p>&gt;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>&gt;identify and name a variety of plants and animals in their habitats, including microhabitats</p>			<p><b>Examples of activities:</b></p> <p>&gt;Children read about what adaptations are. They match four animals to their habitats and discuss two adaptations that each animal has that enable them to survive in their habitat.</p> <p>&gt; Children name a variety of familiar animals and plants. They think about ways to group them.</p> <p>&gt; Children carry out a field investigation into three local micro-habitats. They predict what they might see, draw what they can see, and after the investigation compare and contrast the three micro-habitats.</p> <p>&gt; Children learn how to read and explain a food chain. They create four of their own food chains, each containing three organisms.</p> <p>&gt; Children read about food chains which start with a producer and end with a human being. They use pictures to create 3 food chains, with 2, 3 and 4 elements.</p> <p><b>Links to websites:</b></p> <p><a href="https://www.hamilton-trust.org.uk/science/year-2-science/living-things-and-their-habitats-habitats/?gclid=EAIaIQobChMIguGXi-iZ6QIVh63tCh2mYgG3EAAYAAEgL6-vD_BwE">https://www.hamilton-trust.org.uk/science/year-2-science/living-things-and-their-habitats-habitats/?gclid=EAIaIQobChMIguGXi-iZ6QIVh63tCh2mYgG3EAAYAAEgL6-vD_BwE</a></p> <p><a href="https://www.stem.org.uk/resources/community/collection/12723/year-2-living-things-and-their-habitats">https://www.stem.org.uk/resources/community/collection/12723/year-2-living-things-and-their-habitats</a></p>
<p><b>Common misconceptions:</b></p>				<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> </ul> <p>arrows in a food chain mean ‘eats’.</p>

**Unit 2 (Spring Term): Plants**

<p><b>Connections to other science units:</b></p> <p>This is the second unit children encounter which is in Year 1. Learning undertaken in this unit will be built on in Year 4 (Plants)</p>
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<p><b>Plants</b> <b>Year</b> <b>Two</b></p>	<p><b>Observe and describe how seeds/bulbs grow</b> &gt;observe and describe how seeds and bulbs grow into mature plants</p> <p><b>Conditions needed for growth</b> &gt;find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p><b>I know and can use key vocabulary to talk about plants</b></p> <p><b>I can label different parts of plants</b></p> <p><b>I can explain how seeds and bulbs grow into plants</b></p> <p><b>I know the conditions that are needed for plants to grow</b></p> <p><b>I know what will happen if plants do not get the conditions they need for growth</b></p>	<p><b>Light</b> <b>Dark</b> <b>Food</b> <b>Water</b></p> <p><b>Bulb</b> <b>Growth/Grow</b> <b>Germination</b> <b>Stage</b> <b>Survival</b></p> <p><b>Temperature</b></p>	<p>Pupils should use the local environment throughout the year to observe how different plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants.</p> <p><b>Note:</b> Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.</p> <p><b>Pupils might work scientifically by:</b></p> <p>Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.</p> <p><b>Examples of activities:</b></p> <p>&gt;Children learn about the pollination of flowering plants by flying insects. They complete a diagram showing the main stages in the insect pollination process.</p> <p>&gt;Children learn about the four main parts of a plant - leaves, flower, stem and roots. They colour and label a diagram of a plant, describing the functions of its four main parts.</p> <p>&gt;Children learn about the life cycle of a simple flowering plant - germination, growth, flowering and seed production. They complete and label a diagram of a plant's life cycle and explain the four stages.</p> <p>&gt;Children plant hyacinth bulbs and help them to grow by giving them soil, water and sunlight. Over a six-week period, children measure the height of the plant, sketch it and describe it (this activity could be started before Science Week).</p> <p>&gt; Children learn about germination. They carry out an investigation into what seeds need to germinate. They set up 6 pots, 5 of which have one ingredient missing. They make predictions, and after 1 week, sketch and describe what has happened.</p> <p>&gt;Children learn about the function of bulbs. They carry out an investigation into what bulbs need to start growing again.</p> <p>&gt;Children think about the 3 most important things needed for healthy plant growth. They use this to plan and carry out an investigation.</p>
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<b>Common misconceptions:</b>				Some children may think: <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>

### Unit 3 (Summer Term): Light

<b>Connections to other Science Units:</b> This is the first unit children encounter light Learning undertaken in this unit will be built on in Year 5 (Earth & Space) and Year 6 (light)				
Concept	Content (from NC)	Key Knowledge – Assessment	Key Vocab	Contextual Application
<b>Light</b> <b>Year</b> <b>Two</b>	<b>From Y3</b>  <b>Light and dark</b> >recognise that they need light in order to see things and that dark is the absence of light  >identify that light comes from a source which	<b>I know and understand the key vocabulary related to light</b>  <b>I can explain the difference between light and dark</b>  <b>I can identify different light sources (manmade/natural)</b>	<b>Light</b> <b>Dark</b>  <b>Light source</b> <b>Object</b> <b>Sun</b>  <b>Reflection</b> <b>Mirror</b> <b>Reflective</b>  <b>Protect</b>  <b>Shadow</b>	Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.  <b>Note:</b> Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.  <b>Pupils might work scientifically by:</b>  Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.  <b>Examples of activities:</b>

	<p>can be natural or manmade</p> <p><b>Reflection</b> &gt;notice that light is reflected from surfaces</p> <p><b>Shadows</b> &gt;recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p><b>Patterns of shadows</b> &gt;find patterns in the way that the size of shadows change.</p>	<p><b>I know that light reflects from surfaces</b></p> <p><b>I know how shadows are formed</b></p> <p><b>I can experiment and explain how shadows can be changed.</b></p>		<p>&gt;Children investigate how a moving light source affects the size of an object’s shadow. They predict and measure the width of the shadow cast when the light source is at a range of distance. They can attempt to explain the relationship between light source distance and shadow size.</p> <p>&gt;Children learn that we see things because they are either light sources that make light, and that we see them because light travels directly into our eyes, or they are non-light sources that we can see because light reflects off them into our eyes. They cut out different images and place them into 2 groups – light sources and non-light sources.</p> <p>&gt;Children investigate the number of light sources in different rooms in their school (starting with the classroom). They record findings in a tally chart which they then turn into a frequency table. Finally, the children can present results in a bar chart, selecting a suitable scale to use.</p> <p>&gt;Children learn that shadows are formed when an opaque object blocks the path of light, which travels in straight lines. They use a light source to cast an object’s shadow onto a piece of paper and draw around the outline. They can investigate and explain how the shape of the object affects its shadow.</p> <p>&gt;Children learn that shadows cast by the Sun change in length and direction during the day. Using a gnomon (such as a cricket wicket) and chalk children create their own sundial on the playground. They calibrate their sundial and explain how it works.</p> <p><b>Links to websites for additional activities:</b></p> <p><a href="https://www.stem.org.uk/resources/community/collection/12719/year-3-light">https://www.stem.org.uk/resources/community/collection/12719/year-3-light</a></p> <p><a href="https://www.hamilton-trust.org.uk/science/year-3-science/light-light-and-shadows/">https://www.hamilton-trust.org.uk/science/year-3-science/light-light-and-shadows/</a></p>
<p><b>Common misconceptions:</b></p>				<p>Some children may think:</p> <ul style="list-style-type: none"> <li>• We can still see even where there is an absence of any light.</li> </ul>

- Our eyes 'get used to' the dark • the moon and reflective surfaces are light sources.
- A transparent object is a light source.
- Shadows contain details of the object, such as facial features on their own shadow.

Shadows result from objects giving off darkness.