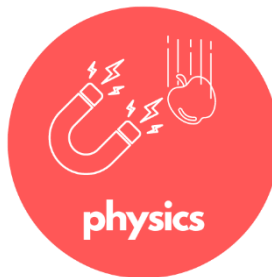


# Science Knowledge Categories

## Knowledge Categories

Science education in primary schools is a fundamental pillar of learning that fosters curiosity, critical thinking, and a deeper understanding of the natural world. To provide a structured and comprehensive approach to teaching science, we have identified four key knowledge categories that form the foundation of this subject. These categories are:



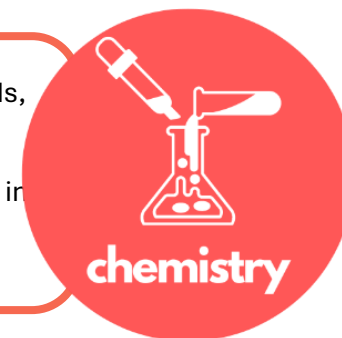


**Definition:** Biology is the study of living organisms, their structures, functions, behaviours, and interactions with their environments. It encompasses topics such as plants, animals, ecosystems, and human biology.

**Importance:** Teaching biology helps students develop an appreciation for the diversity of life on Earth and an understanding of their own biological processes. It fosters a sense of connection to the natural world.

**Definition:** Chemistry focuses on the properties, composition, and behaviour of matter, including elements, compounds, reactions, and chemical changes.

**Importance:** Understanding chemistry is essential for making sense of the physical and chemical processes that occur in our everyday lives. It promotes scientific literacy and informs students about the substances they encounter.





**Definition:** Physics explores the fundamental principles governing the behaviour of the physical world, including motion, forces, energy, electricity, magnetism, and the properties of matter.

**Importance:** Teaching physics helps students comprehend the fundamental laws that govern the universe. It encourages critical thinking and problem-solving skills and provides insights into technological advancements.

**Definition:** Working scientifically is the process of conducting scientific investigations and experiments, including asking questions, making predictions, collecting and analysing data, and drawing conclusions.

**Importance:** Emphasising working scientifically encourages students to think like scientists. It promotes inquiry-based learning, problem-solving, and the development of skills required to conduct meaningful scientific investigations.



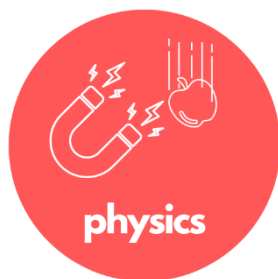


EYFS	KS1	LKS2	UKS2
Compare and group animals, identifying those that are nocturnal and diurnal	Describe how plants need water, light and a suitable temperature to grow and stay healthy.	Name and describe the functions of the different parts of flowering plants.	Label and draw the parts of a flower involved in sexual reproduction in plants.
Make healthy choices about food, drink, activity and toothbrushing.	Describe the stages of human development (baby, toddler, child, teenager and adult).	Know how water is transported within plants.	Describe how animals and plants can be bred to produce offspring with specific and desired characteristics.
	Describe what humans and animals need to survive and the importance of a healthy lifestyle.	Describe how humans need the skeleton and muscles for support, protection and movement.	Describe the process of human reproduction.
	Describe the main stages of an animal's life cycle.	Describe the purpose of the digestive system, its main parts and each of their functions.	Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood.
	Interpret and construct simple food chains to describe how living things depend on each other as a source of food.	Identify four different types of teeth in humans and other animals, and describe their functions.	Explain the impact of positive and negative lifestyle choices on their body.
		Describe what damages teeth and how to look after them.	Classify living things into groups according to common observable

		<p>Compare, sort and group living things in a variety of ways based on observable features and behaviour.</p> <p>Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time.</p>	<p>characteristics based on similarities and differences.</p> <p>Identify how animals and plants are adapted to suit their environment.</p> <p>Compare the life cycles of different animals and describe the differences they notice</p>
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EYFS	KS1	LKS2	UKS2
<p>Recognise and test materials that sink and float.</p> <p>Identify and compare materials that are recyclable and non-recyclable.</p>	<p>Compare the suitability of a range of everyday materials for particular uses.</p> <p>Compare and group materials in a variety of ways, such as based on their physical properties; being natural or man-made and being recyclable and non-recyclable.</p>	<p>Describe simply how fossils are formed, using words, pictures or a model.</p> <p>Group rocks by their properties and identify simple similarities and differences.</p> <p>Observe and explain that some materials change state when they are heated or cooled.</p> <p>Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation.</p> <p>Group and sort materials into solids, liquids or gases; reflective and non-reflective</p>	<p>Investigate and identify good thermal insulators, describing their common features.</p> <p>Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal).</p> <p>Separate mixtures by filtering, sieving and evaporating.</p> <p>Identify, demonstrate and compare reversible and irreversible changes.</p>



EYFS	KS1	LKS2	UKS2
<p>Begin to notice seasonal changes to weather and the environment.</p> <p>Begin to understand that shadows are formed when an opaque object blocks the light.</p> <p>Begin to explain that night and day is caused by the Earth's rotation.</p>	<p>Describe typical UK seasonal weather patterns.</p>	<p>Explain why light from the sun can be dangerous.</p> <p>Describe dark as being the absence of light and that we need light to be able to see.</p> <p>Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object.</p> <p>Explain that magnets have two poles and that opposite poles attract each other, while like poles repel each other.</p> <p>Explain that an object will not move unless a force is applied, describing whether the force requires direct contact or whether the force can act a distance (magnetic force).</p> <p>Explain how sounds are made and heard.</p>	<p>Compare and describe the effects of water resistance, air resistance and friction.</p> <p>Explain that objects fall to Earth due to the force of gravity.</p> <p>Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky.</p> <p>Describe or model the movement of the planets in our Solar System, including Earth, relative to the Sun and the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses.</p> <p>Describe, using diagrams, how light behaves when reflected off a mirror (plane,</p>



		<p>Compare how the volume of a sound changes at different distances from the source.</p> <p>Compare and find patterns in the pitch and the volume of a sound.</p> <p>Describe materials as electrical conductors and insulators.</p> <p>Compare common household equipment and appliances that are and are not powered by electricity.</p> <p>Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell.</p> <p>Construct operational simple series circuits using a range of components and switches for control.</p>	<p>convex or concave) and when passing through a lens (concave or convex).</p> <p>Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed.</p> <p>Identify that light travels in straight lines and explain that due to how light travels, we can see things because they give out or reflect light into the eye.</p> <p>Explain how the brightness of a lamp or volume of a buzzer is affected by the number and voltage of cells used in a circuit.</p> <p>Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components.</p>
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EYFS	KS1	LKS2	UKS2
<p>Ask questions about the world and make observations to find out more information.</p> <p>Make simple predictions on what they think will happen next.</p> <p>Summarise what they have found out from an investigation.</p>	<p>Ask and answer scientific questions about the world around them.</p> <p>Use simple equipment to measure and make observations.</p> <p>Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions.</p> <p>Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning.</p> <p>Begin to notice patterns and relationships in their data and explain what they have done</p>	<p>Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them.</p> <p>Take accurate measurements in standard units, using a range of equipment.</p> <p>Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately.</p> <p>Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.</p> <p>Use scientific vocabulary to report and answer questions</p>	<p>Ask and answer deeper and broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge.</p> <p>Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment.</p> <p>Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and making predictions based on prior knowledge and understanding.</p> <p>Independently, decide which observations to make, when and for how long and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect.</p>

	<p>and found out using simple scientific language.</p> <p>Use a range of methods (tables, charts, diagrams, and Venn diagrams) to gather and record simple data with some accuracy.</p>	<p>about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.</p> <p>Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).</p>	<p>Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe.</p> <p>Choose an appropriate approach to record accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge.</p>
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