



Knowledge and Concepts Map for Science

Year B Autumn	Rocks (Yr 3) 	Properties and Changes of Materials (Yr 5) 
Key Concepts	Fossilisation, erosion, rock formation	Melting, freezing, evaporating, condensing, dissolving
Key Vocabulary	Igneous rock, sedimentary rock, metamorphic rock, magma, lava, sediment, permeable, impermeable, fossilisation, erosion	Materials, solids, liquids, gases, melting, freezing, evaporating, condensing, insulator, transparency, dissolving
Sticky Knowledge	<ul style="list-style-type: none"> ● There are three types of naturally occurring rock; igneous, sedimentary, metamorphic ● Caves are formed when water permeates through the bedrock and erodes some of the rock away. ● Soil is the uppermost layer of the Earth. It is a mixture of different things: minerals, air, water and organic matter ● A fossil is the preserved remains or traces of a dead organism. ● The process by which a fossil is formed is called fossilisation. 	<ul style="list-style-type: none"> ● Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency. ● Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by: sieving, filtering, evaporating ● Irreversible changes often result in a new product being made from the old materials EG burning wood produces ash ● Melting is when a solid changes to a liquid ● Freezing is when a liquid turns into a solid ● Evaporation is when a liquid turns into a gas ● Condensing is when a gas turns into a liquid ● Materials that will dissolve are known as soluble. ● Materials that won't dissolve are known as insoluble



	<p>oral forms with increasing confidence</p> <p>Using Scientific Evidence and Secondary Sources of Information</p> <p>make links between their own science results and other scientific evidence</p> <p>identify similarities, differences, patterns and changes relating to simple scientific ideas and processes;</p> <p>recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p>	<p>Drawing Conclusions, Noticing Patterns and Presenting Findings</p> <p>notice patterns;</p> <p>draw conclusions based in their data and observations;</p> <p>use their scientific knowledge and understanding to explain their findings;</p> <p>read, spell and pronounce scientific vocabulary correctly;</p> <p>look for different causal relationships in their data;</p> <p>independently report and present their conclusions to others in oral and written forms.</p> <p>Using Scientific Evidence and Secondary Sources of Information</p> <p>use primary and secondary sources evidence to justify ideas</p> <p>use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;</p>



Year B Spring	Sound (Yr 4) 	Earth and Space (Yr 5) 
Key Concepts	How sound travels, vibrations	
Key Vocabulary	Ear, particles, vibration, sound wave, volume, amplitude, pitch	Sun, star, moon, planet, satellite, orbit, rotate, axis
Sticky Knowledge	<ul style="list-style-type: none"> ● Sounds are created by vibrations. ● The louder the sound, the bigger the vibration ● Pitch is a measure of how high or low a sound is: Faster vibrations = higher pitch; Slower vibrations = lower pitch ● The size of the vibration is called the amplitude. Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude. ● Sound can travel through solids, liquids and gases. ● Sound travels as a wave, vibrating the particles in the medium it is travelling in. ● Sound cannot travel through a vacuum. 	<ul style="list-style-type: none"> ● Our solar system is made up of the following planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune. ● The moon orbits Earth every 27 days ● Earth rotates on its axis. It does a full rotation once every 24 hours. ● The Earth is also orbiting the Sun. It takes 365 ¼ days to orbit the Sun ● Daytime occurs when the side of Earth is facing the Sun ● Night occurs when the side of Earth is facing away from the Sun ● Seasons occur because of the tilt of the Earth's axis



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	<p>identify similarities, differences, patterns and changes relating to simple scientific ideas and processes;</p>	<p>use primary and secondary sources evidence to justify ideas;</p> <p>identify evidence that refutes or supports their ideas;</p> <p>recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact;</p> <p>use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;</p> <p>talk about how scientific ideas have developed over time.</p>



Year B Summer	Animals including humans (Yr 5)	Animals including humans (Yr 4)
		
Key Concepts	Fertilisation, puberty, adulthood	Food chain, Digestive system, function of teeth
Key Vocabulary	Fertilisation, gestation, reproduce, sexual reproduction, asexual reproduction, life cycle, adolescence, puberty, menstruation, adulthood	Digest, oesophagus, stomach, small intestine, large intestine, rectum, herbivore, carnivore, omnivore, producer, predator, prey
Sticky Knowledge	<ul style="list-style-type: none"> • How the body changes during puberty • The stages of the human lifecycle: • Fertilisation – when the male and female sex cells fuse together • Infancy – rapid growth and development, walk and talk • Childhood – children learn new skills • Adolescence – Puberty, the body changes to enable reproduction • Adulthood – The human body is at its peak of fitness and strength • Late adulthood – decline in health and fitness 	<ul style="list-style-type: none"> • The teeth of an animal are designed to eat different foods depending on the diet of the animal • Teeth have different functions: incisor – bites and cuts; canine – rips and tears; molar – grinds • The stomach breaks down food with stomach acid • Nutrients are absorbed into the body in the small intestine • Water is absorbed by the large intestine • The arrows in a food chain show the flow of energy (food for)



Scientific Skills
LKS2

UKS2

Asking Questions and Carrying Out Fair and Comparative Tests

with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences;

with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;

explore and talk about their ideas, raising different kinds of scientific questions;

ask their own questions about scientific phenomena;

Observing and Measuring Changes

Identifying, Classifying, Recording and Presenting Data

independently group, classify and describe living things and materials;

use and develop keys and other information records to identify, classify and describe living things and materials;

decide how to record data from a choice of familiar approaches;

record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs

Drawing Conclusions, Noticing Patterns and Presenting Findings

notice patterns;

draw conclusions based in their data and observations;

use their scientific knowledge and understanding to explain their findings;

read, spell and pronounce scientific vocabulary correctly;

identify patterns that might be found in the natural environment;

look for different causal relationships in their data;

Asking Questions and Carrying Out Fair and Comparative Tests

start to raise their own relevant questions about the world around them in response to a range of scientific experiences;

start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;

recognise when a fair test is necessary;

help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used;

set up and carry out simple comparative and fair tests

Observing and Measuring Changes

make systematic and careful observations;

observe changes over time;

use a range of equipment, including thermometers and data loggers;

Identifying, Classifying, Recording and Presenting Data

collect data from their own observations and measurements;

present data in a variety of ways to help in answering questions;

use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge;

record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.

Drawing Conclusions, Noticing Patterns and Presenting Findings

draw simple conclusions from their results;

make predictions;



	<p>independently report and present their conclusions to others in oral and written forms.</p> <p>Using Scientific Evidence and Secondary Sources of Information</p> <p>use primary and secondary sources evidence to justify ideas;</p> <p>identify evidence that refutes or supports their ideas;</p> <p>recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact;</p> <p>use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;</p>	<p>suggest improvements to investigations;</p> <p>raise further questions which could be investigated;</p> <p>first talk about, and then go on to write about, what they have found out;</p> <p>report and present their results and conclusions to others in written and oral forms with increasing confidence.</p> <p>Using Scientific Evidence and Secondary Sources of Information</p> <p>use straightforward scientific evidence to answer questions or support their findings;</p> <p>identify similarities, differences, patterns and changes relating to simple scientific ideas and processes;</p> <p>recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p>