

Science Knowledge Organiser

	Year 4	Term: Autumn 1	Topic: Potions	Area of Science: States of Matter
Prior substantive knowledge		Substantive knowledge taught		Disciplinary knowledge*
Year 1 – Moon Zoom - Properties of materials Year 2 – Coastlines – Floating and sinking Year 3 – Mighty metals – Magnetism.		There are 3 states of matter. These are <u>solids, liquids and gasses</u> . The <u>molecules</u> in solids are close together which means solids are hard and not <u>malleable</u> . An example of a solid is rock, ice or glass. The molecules in liquids are slightly further apart which means liquids can change shape. An example of a liquid is water. The <u>molecules</u> in gases are far apart and loose which means that gases move around and spread quickly. An example of a gas is smoke. <u>Solids</u> can be <u>heated</u> to turn into liquids. This process is called melting. <u>Liquids</u> can be turned into solids by cooling. This process is called <u>freezing</u> .		Working Scientifically • Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables • Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers • Use appropriate ways to record and present information, findings and conclusions for different audiences (e.g. displays, oral or written explanations)
National curriculum objective for substantive knowledge				
States of Matter • Describe, compare and group the properties of solids, liquids and gases, giving examples of each (e.g. solids retain their shape) • Measure or research the temperature, in degrees Celsius (°C), at which materials change state and compare to the temperatures at which water changes state • Explain the effect of heating and cooling on a range of substances, including water		Solid Liquid Gas		
Vocabulary				Suggested experiments covered and questions
Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating				Compare, Ice, butter and Chocolate and the temperatures in which they go from a solid to a liquid.
malleable				Give data linked to topic where by the children need to make predictions and pose questions.

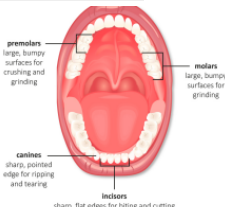
*For previous and post disciplinary knowledge see Disciplinary knowledge progression document. Please note this is also a national curriculum objective.

Science Knowledge Organiser

	Year 4	Term: Autumn 2	Topic: Blue Abyss	Area of Science: Living things and their habitats																	
Prior substantive knowledge		Substantive knowledge taught		Disciplinary knowledge*																	
Year 3 – Predator – Food chains		Corals are marine invertebrates that live in large groups called colonies. Some species produce a hard exoskeleton that forms into a coral reef. The Great Barrier Reef on the north eastern coast of Australia, is the longest and largest coral reef in the world with over 600 types of coral. Corals are at risk of being destroyed by climate change, pollution and consumers. Understand that coral bleaching is a natural process but has been sped up and can have an adverse/irreversible affect on wildlife. Name a range of aquatic animals including but not limited to Sharks (Great white, reef, hammerhead) fish (Tuna, clown, barracuda) sea urchins, sea horses, starfish and plankton. When a part of the food chain becomes unavailable (because of pollution, over fishing, hunting, natural disaster) the rest of the food chain is affected. This can be both positively and negatively. <table><tr><th>Key word</th><th>Definition</th></tr><tr><td>Consumer</td><td>Eats another organism</td></tr><tr><td>Omnivore</td><td>Eats animals and plants</td></tr><tr><td>Carnivore</td><td>Only eats other animals</td></tr><tr><td>Herbivore</td><td>Only eats plants</td></tr><tr><td>Prey</td><td>Gets eaten by the predator</td></tr><tr><td>Predator</td><td>Feeds on the prey</td></tr><tr><td>Producer</td><td>Makes its own food by photosynthesis</td></tr></table>		Key word	Definition	Consumer	Eats another organism	Omnivore	Eats animals and plants	Carnivore	Only eats other animals	Herbivore	Only eats plants	Prey	Gets eaten by the predator	Predator	Feeds on the prey	Producer	Makes its own food by photosynthesis	Working Scientifically	
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Producer	Makes its own food by photosynthesis																				
National curriculum objective for substantive knowledge		• Suggest relevant questions and know that they could be answered in a variety of ways, including using secondary sources such as ICT • Use appropriate ways to record and present information, findings and conclusions for different audiences (e.g. displays, oral or written explanations) • Take accurate measurements using standard units and a range of equipment, including thermometers and data loggers																			
Living things and their habitats • Recognise that environments can change and that this can sometimes pose changes in living things • Develop own classification keys and assign living things to groups, using their keys Animals • Construct a variety of food chains and explain what would happen if one of the parts of the chain became ‘unavailable’ • Identify producers, predators and prey in a given food chain and define the terms																					
Vocabulary		Suggested experiments covered and questions																			
Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats marine invertebrates colonies. exoskeleton Great Barrier Reef Corals Coral reef climate change, pollution consumers. Sound Volume, Vibration, Wave, Pitch, Tone, Speaker		• Sc S 1 Y4 Love to investigates: How can we change a sound? Identify how sounds are made, associating some of them with something vibrating. Find patterns between the pitch of a sound and features of the object that produced it • Sc S 2 Y4 Recognise that vibrations from sounds travel through a medium to the ear. Love to investigates: Can we block sound? • Sc S 4 Y4 Love to investigates: How far can sound travel? Find patterns between the volume of a sound and strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the source increases																			

*For previous and post disciplinary knowledge see Disciplinary knowledge progression document. Please note this is also a national curriculum objective.

Science Knowledge Organiser

	Year 4	Term: Spring 1	Topic: Burps, Bottoms & Bile	Area of Science: Animals
Prior substantive knowledge		Substantive knowledge taught		Disciplinary knowledge*
Year 1 Paws, Claws and Whiskers – Teeth types in relation to herbivore, carnivore and omnivore		Humans need to absorb proteins, carbohydrates, fats, vitamins and minerals from their food to keep healthy and have enough energy to live and work. An example of a protein is: meat and fish. An example of a carbohydrate is: bread, pasta and rice. An example of a fat is: avocado, eggs and nuts.		Working Scientifically • Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables • Identify similarities/ differences/ changes when talking about scientific processes • Use appropriate ways to record and present information, findings and conclusions for different audiences (e.g. displays, oral or written explanations) • Identify, with help, changes, patterns, similarities and differences in data to help form conclusions • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Gather, record, classify and present data in a variety of ways to help in answering questions using a key
National curriculum objective for substantive knowledge		There are six stages to the digestive system . These are the mouth, oesophagus, stomach, small intestine, large intestine and rectum . There are 4 main types of teeth. These are the incisors, molars, pre molars and canines . We need to keep teeth clean with fluoride products so acid does not erode our teeth.		
Animals • Identify the different types of teeth and their functions, including how these vary from animal to animal and animal to human • Identify body parts associated with the digestive system, such as mouth, tongue, teeth, oesophagus, stomach and intestine and describe their special functions and describe their functions		Animals have different types of teeth. For example, if an animal is a carnivore , their teeth will be sharp in order to rip and tear food. Herbivores such as rabbits have flat teeth in order to crunch and grind food such as grass. Omnivores have a mixture of both sharp and flat teeth in order to rip meat and grind things such as grass.		
Vocabulary				
Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine rectum, Herbivore, Carnivore, Canine, Incisor, Molar proteins, carbohydrates, fats, vitamins and minerals healthy energy digestive system fluoride erode.				Suggested experiments covered and questions How does toothpaste help protect teeth? Experiment with egg shells, tooth paste and vinegar to establish its positive affects on stopping tooth decay. Measure the time (Standard unit of measure) that it takes for the egg shell to fall away. Measure the temperature at which a food substance in acid break sown quickest. Mimic body temperature.

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Science Knowledge Organiser

	Year 4	Term: Spring 2	Topic: I am Warrior! (Romans)	Area of Science:
Prior substantive knowledge	Substantive knowledge taught		Disciplinary knowledge*	
	No Science			
National curriculum objective for substantive knowledge				
Vocabulary			Suggested experiments covered and questions	

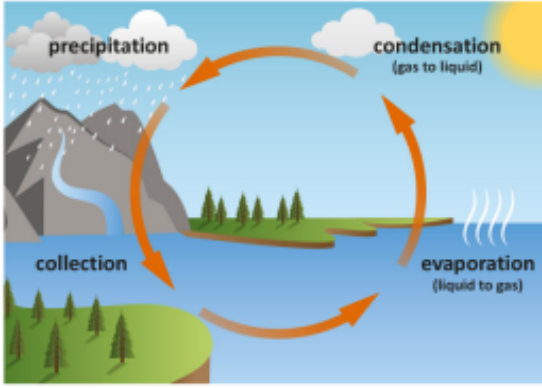
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Science Knowledge Organiser

	Year 4	Term: Summer 1	Topic: Invasion Traders & Raiders	Area of Science:
Prior substantive knowledge	Substantive knowledge taught		Disciplinary knowledge*	
	No Science			
National curriculum objective for substantive knowledge				
Vocabulary			Suggested experiments covered and questions	

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Science Knowledge Organiser

	Year 4	Term: Summer 2	Topic: Misty Mountain Sierra	Area of Science: States of Matter
Prior substantive knowledge		Substantive knowledge taught		Disciplinary knowledge*
Year 4 – Potions - States of matter		Mountains are large, rocky raised surfaces that are much higher than a hill. Water cannot be made- it is constantly recycled through a process called the water cycle. The water in seas, oceans, rivers and lakes is heated by the sun and evaporates to form water vapour that rises into the air. Water vapour condenses as it cools and changes back into water droplets, forming clouds. The water then falls down as rain, snow sleet or hail. This is called precipitation. The rainwater runs off land into rivers and travels back to the sea. The cycle then starts again 		Working Scientifically • Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables • Use appropriate ways to record and present information, findings and conclusions for different audiences (e.g. displays, oral or written explanations)
National curriculum objective for substantive knowledge				
States of Matter • Identify how water changes state, using the correct terminology and relate these key processes to the water cycle • Explain the effect of heating and cooling on a range of substances, including water Electricity • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • 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 • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors				
Vocabulary		Some examples of appliances that run on electricity are: hairdryers, microwaves, phone chargers and lights . In a simple electric circuit there are: cells, wires, bulbs, switches and loops with batteries . Metal is a common conductor of electricity and wood is an insulator of electricity.		Suggested experiments covered and questions
recycled water cycle. seas, oceans, rivers lakes evaporates water vapour rain, snow sleet or hail . This is called precipitation. Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators electric circuit				Using a simple series circuit, what materials are insulators and conductors?

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