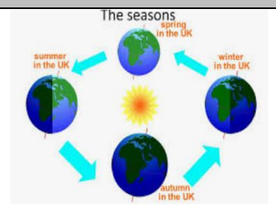
Squirrel Class - 2 Year Rolling Science Curriculum

A spiral approach to the geography curriculum revisits places, concepts and processes to support progression and secure learning for pupils, and help teachers with sequencing.
It is frequently acknowledged that science benefits from a spiral approach to the curriculum, revisiting places, concepts and capabilities to build up pupils' depth of knowledge, understanding and skills, so enabling them to make progress. Our topic units are carefully planned, providing opportunities to develop pupils' learning guided by the aspects and dimensions of history, and revisiting and building on previous learning in an engaging curriculum.

KS1 (Years 1 & 2) rolling programme

Aspects of achievement in Science	Autumn Year A/B		Spring Year A/B		Summer Year A/B	
Topic	 **British Birds (Magnificent Monarchy)**	 **The Earth, The Sun and the seasons (The moon landings)**	 **Under the Ocean (Titanic)**	 **Animals who help us (ww2)**	 **Growing our own**	 **Treasure Islands**
Disciplines of Biology, Chemistry, and Physics	**Biology** **Animals** • Identifying and naming fish, amphibians, reptiles, birds and mammals; recognising carnivores, herbivores and omnivores		**Biology** **Needs of animals** • Animals need water, food and air to survive and to have offspring **Living things & their habitats** • Basic introduction to habitats and micro-habitats, and simple food chains **Chemistry** **Everyday materials** • Distinguishing objects from the material it's made from, and describing simple properties		**Biology** **Plants** • Identifying and naming common plants and describing basic structures • Plants grow from seeds, and require water, light and a suitable temperature **Chemistry** **Uses of everyday materials** • Comparisons of an object's material with its use; impact of bending, twisting etc. on solid objects	
	• Observe and describe changes across four seasons. • Observe and describe the weather and how it varies. • Observe and describe how the length of the day changes at different times of the year. **Biology / Physics - Seasonal changes - Observing changes across four seasons and describing associated weather**					
Substantive knowledge Year 1, Year 2,	**Biology – Animals**		**Chemisty – Everyday Materials**		**Biology Plants**	
	• Identify and name a variety of common animals that they have seen. • Compare first-hand the similarities and differences of different animals. • Group familiar animals according to what they eat. • Describe and compare features of a variety of common animals (fin, wing, claw, scales, feather etc.) • Name and locate simple parts of the human body, including those related to the senses.	• Describe the main changes that occur as young animals, including humans, grow into adults. • Describe the basic needs of animals, including humans, for survival. • Describe the importance of exercise, a balanced diet and hygiene for humans.	• Identify a variety of common materials and objects made from them. • Identify and name a variety of everyday materials (e.g. wood, metal, glass, paper, water, rock). • Use simple language to describe the physical properties of materials (e.g. hard, soft, rough, smooth, shiny, dull). • Use the physical properties of materials to compare and group them.	• Identify and compare the properties of everyday materials, to assess their suitability for particular purposes. • Investigate how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees, e.g. five examples of each from Tilstock school grounds. • Identify and describe the basic structure of a variety of common flowering plants, including trees, and name parts, e.g. leaves, flowers, roots, stem/trunk.	• **Observe and describe how seeds and bulbs grow into mature plants. Recognise that water, light and a suitable temperature are needed for survival and growth**
Scientific Enquiry (Disciplinary knowledge)	1. Asking simple questions and recognising that they can be answered in different ways	2. Observing closely, using simple equipment	3. Performing simple tests	4. Using their observations and ideas to suggest answers to questions	5. Gathering and recording data to help in answering questions	6. Identifying and classifying
	Scientific Enquiry					

Otter Class - 2 Year Rolling Science Curriculum

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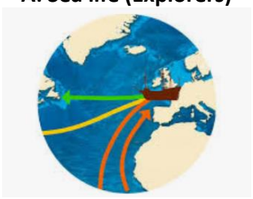
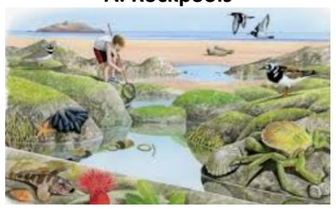
LKS2 (Years 3 & 4) rolling programme

Aspects of achievement in Science	Autumn Year A/B		Spring Year A/B		Summer Year A/B	
Topic	**A: Fire! Fire!** 	**B: The industrial Revolution** 	**A: Sea life (Explorers)** 	**B: Oceans (Vikings)** 	**A: Rockpools** 	**B: Rainforests** 
Disciplines of Biology, Chemistry, and Physics	Physics Light • Relationship between light and how we see; the formation of shadows Forces & magnets • Magnets have poles which attract or repel Electricity • Simple series circuits Chemistry States of matter • Solids, liquids and gases and the role of temperature in changing states		Biology Living organisms • The role of muscles and skeletons; • the importance of nutrients Living things & their environment • Introduction to classifying animals and their environment Digestion • The human digestive system and simple food chains Physics Sounds • Relationship between strength of vibrations and volume of sound		Chemistry Rocks • Comparisons of types of rocks and how fossils are formed Biology Plants • The key features of flowering plants and what they need to survive Living things & their environment • Introduction to classifying animals and their environment	
Substantive knowledge Year 3, Year 4, and the Key Stage	**Physics – Light, forces, magnets, electricity, sound**		**Chemisty – Rocks, states of matter**		**Biology – Animals, Plants**	
	LIGHT • Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. • Find patterns in the way that the size of shadows change. **FORCES** • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.	**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. SOUND • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.	**Rocks** • Compare and group rocks in different ways according to their properties. • Describe how fossils are formed. • Explain, in simple terms, that soils are made when rocks are weathered and breakdown into small particles that combine with organic matter to make soil	**States of Matter** Compare and group together different kinds of rocks based on their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**Animals** 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. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can sometimes pose dangers to living things.	**Plants** • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • 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. • Investigate the way in which water is transported within plants. • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Scientific Enquiry (Disciplinary knowledge)	Asking relevant questions and using different types of scientific enquiries to answer them	Setting up simple practical enquiries, comparative, and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Gathering, recording, classifying, and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings.

Scientific Enquiry

Badger Class - 2 Year Rolling Science Curriculum

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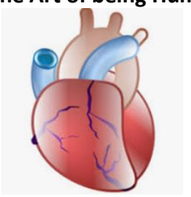
UKS2 (Years 5 & 6) rolling programme

Aspects of achievement in Science	Autumn Year A/B		Spring Year A/B		Summer Year A/B	
Topic	**A: Puzzling Pyramids** 	**B: The Greeks** 	**A: America!** 	**B: The Romans** 	**A: What a wonderful Word** 	**B: The Art of being Human** 
Disciplines of Biology, Chemistry, and Physics	**Chemistry** Properties of materials • Relationship between materials and their uses; difference between reversible and non-reversible changes **Physics** Forces • Gravity, air and water resistance and friction; introduction to pulleys Earth and space • Movements of planets and the Moon, and relationship to day and night		**Physics** **Electricity** • Investigating variations in series circuits **Light** • How light travels and is reflected, and how this allows us to see **Biology** **Classifying living things** • Further classification of living organisms based on characteristics		**Biology** Life cycle • Life cycles of a mammal, amphibian, insect and bird, and some reproduction processes Human development • Human development to old age Evolution and inheritance • Fossils; introduction to the idea that adaptation may lead to evolution Functions of the human body • Human circulatory system; • transport of nutrients within the body	
Substantive knowledge Year 5, Year 6,	**Physics – Earth & Space, Light, forces, electricity**		**Chemistry – Properties of materials, chemical reactions**		**Biology – life cycles, humans, evolution & inheritance**	
	Forces Year 5 • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Earth & Space Year 5** • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	**Light Year 6** • Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Electricity Year 6** • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram.	**Properties of materials Year 5** • 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. • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	**Chemical reactions Year 6** Identify, with reasons, whether changes in materials are reversible or not. Recognise when a chemical reaction has taken place (change of colour, production of odour, change in temperature, release of gas or formation of solid).	**Life Cycles Year 5** • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Describe the life process of reproduction in some plants and animals. **Classification Year 6** • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. • Give reasons for classifying plants and animals based on specific characteristics.	**Humans** **Year 5 • Describe the changes as humans develop to old age.** **Year 6 • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.** **• Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.** **• Describe the ways in which nutrients and water are transported within animals, including humans.** **Evolution & Inheritance Year 6** **• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.** **• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.** **• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.**
Scientific Enquiry (Disciplinary knowledge)	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Using test results to make predictions to set up further comparative and fair tests	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations	Identifying scientific evidence that has been used to support or refute ideas or arguments

Scientific Enquiry