Science Progression Document : 7-11 year olds (Wildcats) Version Jan 2024

Part 1 : Knowledge and Understanding

Progression consideration : green, blue, red, purple

Knowledge and Understanding		Intended Year	Theme / challenge question	Dates covered Record when planned into yearly overview
To be taught about:	**This might include:**			
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	2018-19 2019-20	**Off Piste :** transport of water **How good is change?** Parts of plants and flowers. Pollination **Remote learning** Hydroponics. Growing plants on mars **What makes a Journey so fascinating?** requirements of plants for life and growth. Plants in the rainforest **Shall we go up above or down under?** photosynthesis	 Oct / Nov 19 May 2020 May-July 2021 Oct / Nov 2022

Animals (including humans) Animals (including humans) Animals including humans Animals including humans	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. describe the changes as humans develop to old age. 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.	2019-20	**Shark Guardian visit and follow up work.** Sharks body and features Food chains, predators and prey **Wind in the willows picnic:** making poo. Digestive system Making a model digestive system. **Shall we go up above or down under?** Revisited **What makes a journey so fascinating?** What is an animal? Understand and identify food chains (rainforest) **Are myths merely misconceptions** Circulatory system, blood, heart Could mermaids exist? **The 2nd Elizabethan Age: a good review?** Health and diet: a comparison over the decades. Teeth	Dec 19 / Jan 2020 Jan 2020 Nov 2022 May-July 2021 Spring 2022 Summer 2022

			Shall we go up above or down under? Food chain (as energy chain)	Autumn 2022
Rocks (and minerals)	compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ; describe in simple terms how fossils are formed when things that have lived are trapped within rock ; recognise that soils are made from rocks and organic matter.	2018-19 2021-22 2022-23	**What would it be like to live on our Island?** Different types of rocks, fossils, what soil is made of. **Are myths merely misconceptions** Comparison of bottled and tap water (minerals) **Shall we go up above or down under?** Structure of the Earth (KS3)	Jan / Feb 19 March / April 2022 Oct 2022
Light	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.	2020-21	**Is Plotting and Planning always marvellous?** Light travels in straight lines, objects are seen as they reflect light. Different types of light rays. UV / blacklight. Luminescence (creating a luminous object using photo and chemiluminescence.) Creating and explaining shadows.	October / November 2020

Forces and magnets 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. 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. Newtons Laws. Density	2018-19 2018-2019 2019-20 2020-21 2021-22	**What would it be like to live on our Island?** Magnets have 2 poles. 2 magnets attract or repel depending on poles. Magnetic fields. **Ancient Egypt week** Off piste (Egyptian week) egg investigation Potato launchers : WW2 theme / remote learning investigation What affects the depth of a moon crater? Remote learning investigation (meteorites) **Are Great Leaders born to fly?** Gravity, G forces, forces including air resistance, water resistance. What is flight including falling, gliding and powered flight. Sir Isaac Newton and the laws of motion. **International Space week** How rockets work – revisit Newtons Laws **What's our power?**	Jan / Feb 19 May 2019 May 2020 May 2020 Jan / Feb 2021 (remote learning) Autumn 2021

			How is a tornado created? Unbalanced forces	Autumn 2021
		2022-23	**Shall we go up above or down under** Forces linked to STEM work on submersibles. Volume and density	Spring 2023
		2023-24	**Is it all Elementary?** Using density = mass ÷ volume to work out the density of an object (a stick) (Displacement of water)	Autumn 2024
Energy	Differences between power and energy Sources of energy Different types of energy Renewable and non renewable energy The Sun as our ultimate source of energy Energy Chain and key vocabulary (Producer, consumer, decomposer, prey, predator etc.)		**What's our power?** Differences between power and energy Sources of energy Different types of energy Wind and solar Investigations (solar cooker, measuring wind) **Shall we go up above or down under?** Energy chain (sun – producer – consumer)	Autumn 2021 Autumn 2022
Living things and their habitats Living things and their habitats Living things and their habitats	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	2018-19 2018-19	**Can you persuade me?** Grouping living things. Classification. Microorganisams.	April 19

	environments can change and that this can sometimes pose dangers to living things. 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. 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	2019-20 2022-23 2023-24	**What would it be like to live on our Island?** Recognise change in environment **How good is change?** How sharks reproduce **What makes a journey so fascinating?** Identify and group animals and plants in the rainforest Give reasons based on characteristics **Shall we go up above or down under?** Microorganisms Thermofiles Classification of mammals: marsupials Life Cycle of different marsupials and comparison with other mammals (incl. humans) Identify and classify different sea animals Study of oceans and compare the sea creatures which live in various depths **How Beastly?**	Jan / Feb 19 Dec 19 May-July 2021 Oct 22 – Feb 23 Feb- April 2024

			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 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	
States of matter Properties and changes of materials	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. 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,	2019-20 2019-20	**How good is change?** Properties of solids, liquids, gases. How a steam engine works. Hydraulics. Steam engine. **Bamboo and panda week** Various investigations on bamboo kitchen roll (absorbency) **Shall we play walls and warriors?** Water cycle **Shopping theme week**	Oct 19 Jan 2020 January 2020

Elements and the periodic table Acids and Alkalis The PH scale	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. Elements, mixtures and compounds. The discovery of the elements and the atom (KS3 science)	2020-21	Life cycle assessment of shopping bags. Consider materials/ resources and manufacturing and disposal and impact. **Shall we play walls and warriors?** Building a dam: properties such as impervious, rigid, malleable. Soap boat investigation : which substance might make the boat go the quickest? **Is Plotting and Planning Always Marvellous?** Properties of liquids and gases. Solubility (immiscible, soluble, more / less dense, dissolve) (chromatography) which colour inks are more soluble? Investigation : frobscottle – can bubbles go down? Changes resulting in formation of new substance (CO2)	January 2020 March 2020 March / April 2020 September / October 2020

		2021-22 2022-23 2023-24	Investigations using popping candy **International Space week** Modelling rockets using chemical reactions **Viking project (linked to Chris' book)** Properties of materials Testing properties (bamboo kitchen roll, making oil lamps) Reversible and irreversible reactions Physical and chemical reactions **Shall we go up above or down under** Properties of materials- STEM work on submersibles. Includes a focus on density (work on KS3 area of science) **Is it all elementary?** Solids, liquids, gases. Changes in states. Evaporation, condensation. Mixtures and compounds. Separating mixtures. Reversible and irreversible	Autumn 2021 Autumn 22 Spring 2023 October / November 2023

			Elements, mixtures and compounds. The discovery of the elements and the atom (KS3 science) Acids and Alkalis. The PH scle. Using universal indicator. Investigating the PH of different waters.	December 2023 October 2023
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.	2021-22	**Are Myths Merely Misconceptions** African Instruments and how they work. Focus on kalimbas **The 2nd Elizabethan Age: a good review?** As left	Spring 2022 Summer 2022
Electricity 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. associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the	2018-19	**What was life like in the post-war era of the 1920s?** Focus on electric circuits. Lamps, switches, conductors and insulators. Dimmers, symbols **WWII remote learning theme**	Nov/Dec 2018 June 2020

	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.		Create a coding machine using a circuit **What are Europe's Awes and Abominations** electric circuits. Lamps, switches, conductors and insulators. Components, making switches, alarms. All content left and also parallel circuits (extended learning to KS3 content.) Making and wiring a cardboard house. **Is it all elementary?** How hydroelectric dams work	Summer 2023
Earth and Space	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.	2019-20	**Remote learning summer 2020 (no question)** All elements Including meteorites, satellites and probes, the history of space exploration, how to survive on mars, how we see the universe.	June 2020 Autumn 2021

			Autumn Moon Festival and International Space week Phases of the Moon How rockets are powered to reach space	
Evolution and inheritance	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.	18-19 2020-21 2023-24	**What was life like on our island?** How animals adapt to suit their environment. **Are leaders born to fly?** Could dragons have existed? Examples of evolution (eg. reptiles and dinosaurs to birds) **What makes a journey so fascinating?** Evolution and natural selection **How Beastly?** What survived the meteor which wiped out dinosaurs? Why? What evolved?	Feb – April 2019 February 2021 May-July 2021 February 2024
Forensic Science	DNA, genetics, fingerprinting, blood types	2023-24	**Is it all Elementary?** DNA, fingerprinting, blood types	Oct – Dec 2023

Part 2 : Types of investigation (working scientifically)

Ensure the following are built into the long and medium-term planning documents. Include these in the short / medium term objective grids (to go into books.) Audit at least once a term

	Audit point Date: Jan 20	Audit point Date : Oct 20 (since last audit)	Audit point: Oct 21 Since last audit	Audit point: July 22 Since last audit	Audit point: Jan 23 Since last audit	Audit point Jan 24
Fair Test	X	X	X	X	X	X
Exploring	X	X	X	X	X	X
Pattern seeking		X	X	X	X	X
Sorting, classifying, identifying			X	X	X	X
Research	X	X	X	X	X	X
Modelling	X	X	X	X	X	X

Part 3 : Science skills

Ensure the following are built into the long and medium-term planning documents. Include these in the short / medium term objective grids (to go into books.) Audit at least once a term

	Audit point Date: Jan 20	Audit point Date : Oct 20	Audit point : Oct 21 Since last audit	Audit point July 22 Since last audit	Audit point Jan 23 Since last audit	Audit point Jan 24 Since last audit
Planning	X	X	X	X	X	X
Obtaining	X	X	X	X	X	X
Reporting	X	X	X	X	X	X
Analysis	X	X	X	X	X	X
Evaluating	X	X	X	X	X	X