St. Katharine's Science Knowledge Overview

EY	ELG: The Natural World		The Natural World		The Natural World		Creating with Materials
	Explore the natural world around them, making observations and drawing pictures of animals and plants		Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.		Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.		Explore a variety of materials

1	Plants	Animals, including humans	Animals, including humans		Everyday materials		Seasonal changes
	identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; identify and describe the basic structure of a variety of common flowering plants, including trees.	identify, name, draw and label the basic parts of the human body say which part of the body is associated with each sense.	identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; identify and name a variety of common animals that are carnivores, herbivores and omnivores; describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).		distinguish between an object and the material from which it is made; identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; describe the simple physical properties of a variety of everyday materials; compare and group together a variety of everyday materials on the basis of their simple physical properties.		observe changes across the four seasons; observe and describe weather associated with the seasons and how day length varies.

2	Living things & their habitats		Plants	Animals incuding humans		Uses of everyday materials
	explore and compare the differences between things that are living, dead, and things that have never been alive; identify that most living things live in habitats to which they are suited, describe how different habitats provide for the basic needs of different animals and plants, and how they depend on each other; identify and name a variety of plants and animals in their habitats, including micro-habitats; describe how animals obtain their food from plants and other animals, using a simple food chain, and identify and name different sources of food.		observe and describe how seeds and bulbs grow into mature plants; find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	notice that animals, including humans, have offspring which grow into adults; find out about and describe the basic needs of animals, including humans, for survival (water, food and air); describe the importance for humans of eating the right amounts of different types of food. describe the importance for humans of exercise and hygiene.		identify and compare the suitability of a variety of everyday materials (wood, metal, plastic, glass, brick, rock, paper and cardboard) for particular uses. find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

3	Plants	Animals incl humans	Rocks	Materials	Magnets		Light
	identify and describe the functions of different parts of flowering plants: roots, stem / trunk, leaves and flowers; explore the requirements of plants for life & growth (air, light, water, soil nutrients, 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.	identify that animals and humans need the right types & amount of nutrition; they can't make their own food; they get nutrition from what they eat; identify the different types of teeth in humans and their simple functions.	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.	compare and group together everyday materials on the basis of their properties, including hardness. give reasons, based on comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.	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 a variety of 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.		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; compare and group together everyday materials on the basis of their transparency.

4	**Living things & habitats**	**Animals, Humans**	**States of Matter**	**Electricity**	**Forces**	**Space**
	recognise that living things can be grouped in a variety of ways; explore &use classification keys to help group, identify & name a variety of living things in their local and wider environment; recognise that environments can change & that this can sometimes pose dangers to living things;	identify that humans & some animals have skeletons & muscles for support, protection and movement; construct and interpret a variety of food chains, identifying producers, predators & prey.	compare and group materials together, according to whether they are solids, liquids); observe that some materials melt or freeze / solidify when heated or cooled and measure / research the temperature in °C at which this happens.	identify common appliances that run on electricity; construct simple series electrical circuits, identifying & naming basic parts: cells, wires, bulbs, switches & buzzers; identify whether or not a lamp will light in a simple series circuit, based on whether 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; compare and group together everyday materials on the basis of their electrical conductivity.	compare how things move on different surfaces; explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth & the falling object; identify the effects of air resistance, water resistance &friction, that act between moving surfaces.	describe the movement of the Earth, & 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 & night & the apparent movement of the Sun across the sky.
5	**Living things & habitats**	**Humans**	**States of matter**	**Electricity**	**Light**	**Sound**
	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. **Plants** explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	describe the functions of the basic parts of the digestive system in humans; describe the changes as humans develop to old age.	compare and group materials, according to whether they are solids, liquids or gases; identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature; demonstrate that changes of state are reversible changes.	associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit; compare & give reasons for variations in how components function (brightness of bulbs, loudness of buzzers, on/off position of switches); use recognised symbols when representing a simple circuit in a diagram.	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; find patterns in the way that the size of shadows change.	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.
6	**Living things & habitats**	**Humans**		**Evolution & Inheritance**	**Properties & changes of materials**	**Forces**
	describe how living things are classified into broad groups according to common observable characteristics & based on similarities & differences, including micro-organisms, plants & animals; give reasons for classifying plants and animals based on specific characteristics.	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.		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 and that adaptation may lead to evolution.	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; demonstrate that dissolving and mixing 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.	recognise that some mechanisms, including levers, pulleys & gears, allow a smaller force to have a greater effect.

	Ask Questions	Answer questions	Observe data using equipment	Measure data using equipment	Analyse and present data in				Communicate conclusions orally and in writing
					Labelled Diagrams	Classification keys	Tables	Graphs	
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1	Ask simple scientific questions	Carry out different types of scientific enquiry: 1. observing changes over time; 2. grouping, identifying and classifying; 3. comparative and fair testing; 4. noticing patterns; 5. researching using secondary sources;	Magnifiers Microscopes binoculars	Rulers 1cm Counting leaves Counting vertebrates	Human body Animals Plant		3 columns for herbivore, omnivore and carnivore 5 columns for vertebrates 2 columns for plant height		Say / write what they found out, pronouncing and spelling scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge.
2	Ask simple scientific questions	Carry out different types of scientific enquiry: 1. observing changes over time; 2. grouping, identifying and classifying; 3. comparative and fair testing; 4. noticing patterns; 5. researching using secondary sources;	microscopes magnifiers binoculars	Rulers 0.5 cm Counting pipette drops	Food chains Life cycles	Use classification keys	3 columns for Living, dead, never alive 2 columns for absorbency		Write what they found out, spelling scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge.
3	Write relevant questions	Set up and carry out different types of scientific enquiry: 1. observing changes over time; 2. grouping, identifying and classifying; 3. comparative and fair testing; 4. noticing patterns; 5. researching using secondary sources;	microscopes magnifiers	Digital scales – 1g Beakers & measuring cylinders– 10 ml Rulers – 0.5 cm Data loggers – light lux	Plant with functions teeth	Draw a classification key for 2 birds	2 columns for data	Bar charts – scale of 1	Write simple conclusions identifying similarities and differences and suggesting improvements using correctly spelled, simple scientific vocabulary.

	Ask Questions	Answer questions	Observe data using equipment	Measure data using equipment	Analyse and present data in				Communicate conclusions orally and in writing
					Labelled Diagrams	Classification keys	Tables	Graphs	
4	Write relevant questions	Set up and carry out different types of scientific enquiry: 1. observing changes over time; 2. grouping, identifying and classifying; 3. comparative and fair testing; 4. noticing patterns; 5. researching using secondary sources;	microscopes magnifiers	Length: rulers 1mm Metre sticks 0.01m Time: Stopwatch 0.01s Temperature data loggers & thermometers 0.1°C	Detailed labelled diagram of skeleton Food chains	Draw a classification key for 3 or 4 animals	Begin to repeat results, calculating the median average and recording in 4 columns	Bar charts and scatter graphs – scale not in ones	Identify differences, similarities or changes; use scientific evidence to support their findings; suggest improvements; make predictions for new values; raise further questions; using correctly spelled, simple scientific vocabulary.
5	Write relevant questions	Plan and carry out different types of scientific enquiry: 1. observing changes over time; 2. grouping, identifying and classifying; 3. fair tests - identify and control at least 4 variables 4. noticing patterns; 5. researching using a range of secondary sources;	microscopes magnifiers	Length: rulers 1mm Metre sticks 0.01m Volume: measuring cylinders 0.1ml Data loggers – light lux Sound dB	Detailed labelled diagram of: human and flower organs with functions, water cycle, Light diagrams Circuit diagrams Life cycles	Draw a classification key for 4 or more animals	Precise, repeated results with median average in 5 columns	Bar charts and line graphs – scale to fit page Excel	Identify relationships, explain results, explain the degree of trust, use test results to make predictions about how to set up further tests; using correctly spelled, scientific vocabulary.
6	Write relevant questions	Plan and carry out different types of scientific enquiry: 1. observing changes over time; 2. grouping, identifying and classifying; 3. fair tests - identify and control at least 6 variables 4. noticing patterns; 5. researching using a range of secondary sources;	Fair tests identify and control at least 6 variables	Newton meters 0.1 N Pulse meters Length: Rulers 1mm Metre sticks 0.01m Tape measures	Detailed labelled diagram of pats of the heart	Draw a classification key for 6 or more animals or plants	Precise, repeated results with mean or median average in 5 columns	Choose appropriate graph: bar, line, scatter graphs Equally space the scale to fit the page Excel	Identify relationships, explain results, explain the degree of trust, use test results to make predictions about how to set up further tests, identify scientific evidence that has been used to support or refute ideas or arguments; using correctly spelled, scientific vocabulary.