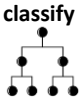
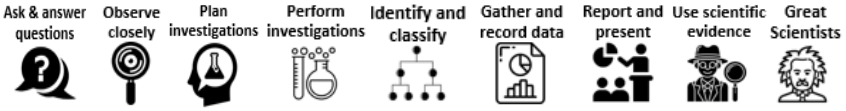
Concept Map – Science

Concept	EYFS ELG	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ask & answer questions 	Wild animals Seasons Patterns in nature. Floating and sinking.	-Seasonal changes -Everyday materials -Plants	-Plants -Living things and habitats -Uses of everyday materials -Basic needs, diet, healthy living	-Forces and magnets -Rocks -Animals inc humans -Plants -Light	-Sound -Electricity -States of Matter -The water cycle -Digestion -Animals food Chains and habitats	-All units	-All units
Observe closely 	– observing changes in the weather and seasons. -Similarities and differences between ourselves and others – noticing what is the same and different basic knowledge of body parts. -Animals, woodland, jungle, minibeasts. -changing states (ice)	-Seasonal changes -Animals inc humans -Plants -Everyday materials	-Plants -Living things and habitats -Uses of everyday materials -Basic needs, diet, healthy living	-Forces and magnets -Rocks -Plants -Light	-Sound -Electricity -States of Matter -The water cycle -Digestion -Animals food chains and habitats	-All units.	-All units.
Plan investigations 	-Continuous provision – exploring materials. Floating and sinking.				-Electricity -States of Matter -The water cycle -Digestion	-Properties of materials -Forces -Living things and habitats -Earth and space	-Evolution and inheritance -Electricity -Animals inc humans -Light -Living things and habitats **-STEM DAY**
Perform investigations 	-Materials – Three little pigs. Materials – Gingerbread man. -Plants – daffodils -Plants – poppies. - changing states.	-Seasonal changes -Plants -Everyday materials	-Living things and habitats -Uses of everyday materials -Plants -Basic needs, diet, healthy living	-Forces and magnets -Rocks -Animals inc humans -Plants -Light	-Sound	-Forces -Living things and habitats -Earth and space	-Electricity -Animals inc humans -Light -Living things and habitats **-STEM DAY**
Identify and classify 	Continuous provision – exploring materials. - Leaf identification -Animals – woodland, jungle,	-Seasonal changes -Animals inc. humans -Plants -Everyday materials	-Plants -Living things and habitats -Uses of everyday materials		-Sound -States of Matter -Digestion -Animals food chains and habitats	-All units.	-All units
Gather and record data 	-Daily calendar and weather chart Floating and sinking.	-Seasonal changes -Animals inc humans -Plants -Everyday materials	-Plants -Living things and habitats -Uses of everyday materials	-Magnets and forces -Rocks -Animals inc humans -Plants	-Sound -Electricity -States of Matter -Digestion -Animals food chains and habitats	-Properties of materials -Forces -Living things and habitats -Animals inc humans -Earth and space	-Evolution and inheritance -Electricity -Animals inc humans -Light -Living things and habitats



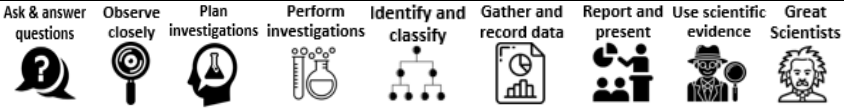
Report and present 	-woodland animals (clay model) Patterns in nature – (leaves)			-Magnets and forces -Rocks -Animals inc humans -Plants -Light	-Sound -Electricity -States of Matter -The water cycle -Digestion -Animals food chains and habitats	-Properties of materials -Forces -Animals inc humans -Earth and space	-Evolution and inheritance -Electricity -Animals inc humans -Light -Living things and habitats
Use scientific evidence 	Patterns in nature. Weather and seasons.					-Properties of materials -Forces -Living things and habitats -Animals inc humans -Earth and space	-Evolution and inheritance -Electricity -Animals inc humans -Light -Living things and habitats **-STEM DAY**
Great Scientists 		-Animals inc humans.	-Plants -Living things and habitats -Food chains	-All units	-All units	-All units	-All units

Concept Curriculum Skills – Science

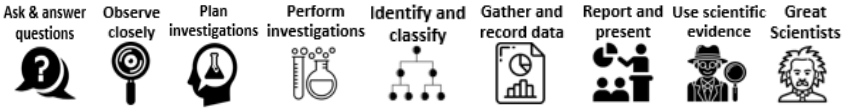
Please note: These relate to the AT1 skills – please refer to the national curriculum for science for the knowledge statements for each year group:

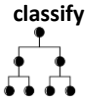
https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study

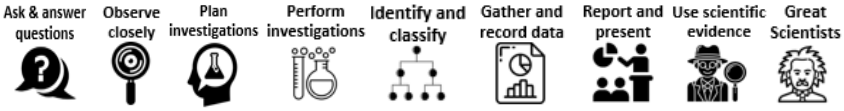
Concept	EYFS ELG	KS1 Curriculum Skills	LKS2 Curriculum Skills	UKS2 Curriculum Skills
Ask & answer questions 	**ELG: The Natural World** - To generate and answer questions about the natural world around them. - To generate and answer questions about processes and changes in the natural world around them. - To ask and answer questions about changing seasons and changing states of matter. **ELG: Listening, attention and understanding** - To listen and respond to questions. **ELG: Speaking** - To use knowledge gained to give explanations to answer questions. - To ask questions to clarify understanding.	-To generate and answer questions about how things are either similar or different, how things change or how they happen, using experiences and observations gained exploring the world around them. -To be actively involved in the planning of an enquiry, deciding how to use the resources provided to answer a scientific question. -To, through experience, begin to recognise that there can be different ways to answer a question. -To ask questions about how things are either similar or different, how things change or how they happen, that have been developed with their teacher, often through a set up scenario. -To suggest appropriate answers to scientific questions using own	-To use observations or measurements taken during scientific enquires to answer their own or others' questions. -To use secondary sources to support own evidence or ideas to answer a scientific question and question sources that may refute own findings. -To explore and answer questions posed by the teacher. -To decide how to gather evidence to their own questions using a range of question stems for support. -To identify and justify the type of enquiry used, using prior knowledge to support own choice. -To decide how to gather evidence to their own questions when given a range of resources. -To explore and answer questions using secondary	Securing KS1 and LKS2



		evidence gathered through observation, measurements taken during practical enquiry and information gained through research using secondary sources. -To recognise and compare size, texture, property of material, key features of animals. –To use results from own practical enquiry to identify the strongest and weakest/ the 'biggest and smallest', 'most healthy and least healthy' etc. from their data.	sources with the understanding that the question cannot be answered through practical investigation in the school environment. -To use prior knowledge to pose scientific questions, using a range of question stems to support. -To explore ways to answer the questions posed, identifying the type of enquiry needed. -To identify and justify the type of enquiry used. -To recognise when and how to use reliable secondary sources to answer questions that may not be possible to answer through practical work in the school environment.	
Observe closely 	**ELG: The Natural World** To explore the natural world around them, making observations and drawing pictures of animals and plants. - To know some similarities and differences between the natural world around them and contrasting environments, - To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	-To use the appropriate senses and observation equipment, such as magnify glasses and tablets to record and make careful observations. -To identify, compare and notice changes in their natural environment. -To take measurements to make comparisons using non-standard units. -To take and record measurements using comparisons and some standard units.	-To use a range of equipment including stop watches, force meters, filters, and thermometers to measure and to make systematic and accurate observations. -To use a range of equipment, including data loggers, to measure pitch and sound volume/to measure voltage to make systematic observations. -To use standard units of measure, to make systematic observations.	Securing KS1 and LKS2
Plan investigations 	**ELG: The natural world.** To explore the world around them. **ELG: Listening, attention and understanding.** To respond to questions and problems. To explore questions to clarify understanding.		-To gather evidence to answer questions generated by the teacher and themselves using a selection of practical resources. –To plan and carry out comparative and fair tests, using pattern seeking skills to identify a pattern or a lack of a pattern.	-To decide how to gather evidence to answer scientific question using a wide range of resources. -To choose and justify their choice of type of enquiry. -To ask scientific questions in response to a stimulation by a scientific experience or based on their developed understanding following an enquiry. -To gather evidence using a range of self-selected resources to answer their questions. -To carry out and justify own fair tests, showing a clear understanding of recognising and controlling variables.

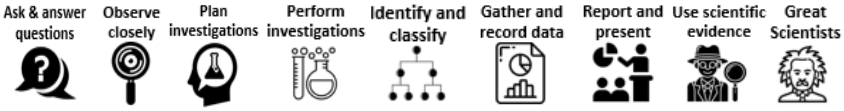


				-To choose and justify their choice of type of enquiry with the understanding that a question can be answered in different ways. -To use observations and data collected to identify patterns and relationships within a suitable sample. -To understand and use secondary sources to support own investigations and to answer questions that cannot be answered through practical work in the school environment.
Perform investigations 	**ELG: The natural world.** - To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	-To gather evidence using observations over time to answer scientific questions posed by the teacher and themselves with teacher support. –To gather evidence using practical resources to answer scientific questions posed by the teacher or generated by themselves. -To perform pattern seeking enquires and take observations over a short period of time. -To perform comparative tests and record the results gathered.	-To gather evidence to answer questions generated by the teacher and themselves using a selection of practical resources. -To follow their plan to carry out observations, comparative and fair tests. -To use tests to identify patterns, classify and rank objects. -To use enquiry to identify a lack in patterns.	-To gather evidence using a range of self-selected resources to answer their questions. -To carry out and justify own fair tests, showing a clear understanding of recognising and controlling variables. -To choose what observations or measurements will be taken during the enquiry. -To select the measuring equipment needed to give the most accurate results. – -To decide how the enquiry could be adapted if needed, e.g. by repeating readings for a fair test, recognising and controlling variables. -To identify patterns or a lack of a pattern, or to check own findings with secondary sources.
Identify and classify 	**ELG: The Natural World.** - To know some similarities and differences between the natural world around them and contrasting environments,	-To name, describe and compare the characteristics used to identify materials, habitats, living beings, weather patterns and plants using careful observations and testing. -To use observations to identify own criteria for grouping and sorting. -To use secondary sources to name, identify and describe the characteristics used to identify living beings. -To begin to identify own criteria for grouping and sorting. -To use secondary sources to extend subject knowledge to name and identify characteristics of living things.	-To use and interpret own data to generate combative statements based on their evidence. -To identify causal relationships and natural occurring patterns or that lack of pattern identified.	Securing KS1 and LKS2



Gather and record data 	**ELG: The Natural World.** - To explore the natural world around them, making observations and drawing pictures of animals and plants; - To understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. (Note: This can be recorded verbally through play. E.G role presenting their data as a scientist, it does not need to be in written form.)	-To use photographs, drawings, labelled diagrams and writing to record own observations and subject knowledge. -To use prepared tables to record measurements or classify. -To recognise biggest and smallest, difference in eye/hair colour, length of limbs/hair etc. from own data. -To classify using sorting rings, Venn diagrams and tree diagrams. -To interpret data onto block graphs. -To take and record measurements, using comparisons and then non-standard units. -To take measurements using thermometers and calendars.	-To use scientific language, labelled diagrams, keys and tables to record and present findings. -To use tables, bar charts and graphs to record their measurements and use tables, Venn diagrams and Carroll diagram to record their classifications. -To understand and show that data can be presented in different ways.	-To record and present scientific knowledge and evidence using the most appropriate method of recording. -To carefully consider how to present data for an audience – e.g. using labelled diagrams or images, videos or writing. -To record classifications using an appropriate method e.g. a table, classification key, Carroll diagram or Venn diagram. -To choose to record data gathered using an appropriate recording method such as a table, scatter, line or bar graph. -To offer a depth of understanding present the data gathered in at least two ways to answer a scientific question.
Report and present 			-To use their own current subject knowledge and evidence gathered through enquires to generate accurate conclusions. -To identify the need for adapting methods and adapt during an enquiry or suggest how an enquiry could be adapted if repeated. -To generate further questions that could be answered by extending the same enquiry. -To use and interpret own data to generate combative statements based on their evidence. -To identify causal relationships and natural occurring patterns or that lack of pattern identified. -To use scientific vocabulary to communicate their findings to an audience using a range of media.	-To identify relationships and patterns, or lack of relationships and patterns, found using own evidence gathered. -To explain own findings using own subject knowledge. -To evaluate the control of variables and the accuracy and precision of measurements taken to gather own results. -To identify any limitations in own data that may reduce trust in results. -To communicate own findings to an audience using a range of media, including the use of relevant scientific language and scientific diagrams with labels. -To evaluate the credibility of evidence gathered through secondary sources.
Use scientific evidence 	**ELG: The Natural World.** -To 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;			-To make predictions using own scientific knowledge gained through scientific enquiry. -To use comparative and fair tests to investigate their predictions. -To use information gathered from own observations, or gathered

				from secondary sources, to answer their own and others' scientific questions. -To discuss how their evidence supports or disproves theirs or others answers. -To discuss how their ideas may have changed due to evidence gathered and talk about how their new findings have changed their scientific understanding.
Great Scientists 		**Carl Linnaeus (1707- 1778)** Swedish botanist who collected and named plants and animals. Created today's method of classifying. **Mary Anning (1799-1847) -** English fossil hunter, discovered new fossils and named dinosaurs found. **The Eden project (1995 -),** Plant collection and preservation project. **Kew gardens** – Collection and preservation of plants and fungi. **Charles Darwin (1809 – 1882)** naturalist who studied animal evolution. **Sir David Attenborough (1926 -)**, British naturalist and presenter. **Rachel Carson (1907 – 1964)** studied the effects of pesticides on crops. As a result from 1964 pesticides need to be tested to ensure they are not harmful. **Gregor Mendel (1822-1884**) used experiments on plants to make the connections between how the children inherit features/traits from both parents.	**Alexander Graham Bell (1847-1922)** – Studied the importance of vibration. Invented the telephone using vibrations from the voice. **Ernst Mach (1838-1916)** - Physicist discovered and explored velocity of sound. **Guglielmo Marconi (1874-1937)** - Italian physicist and inventor. He invented the telegraph to send messages, was this developed to allow the travel of sound. **Benjamin Franklin (1706-1790) –** Created the lightning rod to stop buildings catching alight from lightning. **Thomas Edison (1847-1931)** – Inventor of the electric light bulb, phonograph (sound recording device) and kinetoscope (moving image projector). First electric light company 1878. **Michael Faraday (1791-1867) -** Invented the electric motor. **Democritus (460-370 BCE**) – Theory of invisible particles, pathing the way for the future discovery of atoms. **James Hutton (1726-1797) –** Scottish scientist, created the theory of rain. **William Beaumont (1785-1853**) – Surgeon, first person to observe and explain the digestive system. **Edward Angle (1855 – 1930) –** Created the Angle classification system to identify position of four types of teeth in the human mouth.	**Mary Anning (1799-1847) -** English fossil hunter, discovered new fossils and named dinosaurs from discoveries. **Charlies Darwin (1809-1882)** – Developed the theory of evolution. **Gregor Mendel (1822-1884)** – Theory of inheritance by experimenting on pea plants. **Francis Crick (1916 – 2004) and James Watson (1928 -),** discovered the structure of DNA as a twisted ladder 1953. **Rosalind Franklin (1920-1958)** – Took an x-ray of a DNA strand. **Jane Goodall (1934 -),** English scientist – Study of chimpanzees to compare link to humans in 1960. **Benjamin Franklin (1706-1790) –** Created the lightning rod to stop buildings catching alight from lightning. **Thomas Edison (1847-1931)** – Inventor of the electric light bulb, phonograph (sound recording device) and kinetoscope (moving image projector). First electric light company 1878. **Michael Faraday (1791-1867) -** Invented the electric motor. **William Harvey (1578-1657)** – First to accurately describe and publish an explanation of the circulatory system. **Alexander Fleming (1881 – 1955)** – Scottish physician-scientist who discovered penicillin.



			Rachel Carson (1907-1964) – Studied the polluting effects of pesticides resulting in changes in law, with pesticides to be tested before use from 1964. **Carl Linnaeus (1707 – 1778)**, Swedish botanist – creator of the taxonomic system used to classify, still used today. **Charles Darwin (1809 – 1882),** British naturalist focused in animal evolution. **Sir David Attenborough (1926 -)**, British naturalist and presenter. **Albert Einstein (1879-1955)** – Developed a detailed explanation of the force of gravity in 1915. **Isaac Newton (1642-1727)** - Discovered and created an explanation of how gravity works. In Lincolnshire. **Mary Anning (1799-1847) -** English fossil hunter from Dorset, discovered dinosaur fossils and named new species found. **James Hutton (1726-1797**) - Scottish scientist discovered that the Earth is being continuously formed. **The Eden project (1995 -),** Plant collection and preservation project. **Kew gardens** – Collection and preservation of plants and fungi. **Ibn al Haythan / Alhazen (965-1040) –** Astronomer, Theory of light reflecting into eyes not omitting from eyes. Proved light travels in straight lines. **Thomas Edison (1847-1931**) – Inventor of the electric light bulb and in 1878 Edison electric light company. **Nicolaus Copernicus** (1473-1543) Introduce Polish astronomer – Discovered that the Earth travels around the sun.	**Louis Paster (1822- 1895) -** Developed the first vaccines using micro-organisms. **Edward Jenner (1749-1823)** – English surgeon. Introduced the small pox vaccine, trialling on milkmaids in 1796. **Ibn al Haythan / Alhazen (965-1040) –** Astronomer, Theory of light reflecting into eyes not omitting from eyes. Proved light travels in straight lines. **Robert Hooke (1635-1703)** – Inventor of the 2 lens microscope. **Carl Linnaeus (1707 – 1778)**, Swedish botanist – creator of the taxonomic system used to classify, still used today. **Joseph Banks (1743-1820),** English naturalist, with his team of scientists he visited South America collecting and drawing botanical specimens. (Posters available STEM website) **Alfred Russel Wallace (1823 – 1913),** British naturalist – predated Charles Darwin's theory of evolution. **Joseph D Hooker (1817 – 1911),** English botanist – Botanical collector. **Leonardo de Vinci (1452-1519),** Inventor, used an understanding of the properties of materials to design plans for submarine, armoured tanks, winged crafts – not built but designed ahead of time. **Isaac Newton (1642-1727),** English mathematician – Created an explanation of how gravity works. **Albert Einstein (1879-1955),** Developed Isaac Newton's theory on gravity – explaining in more detail. **The Eden project (1995 -),** Plant collection and preservation project. **Kew gardens** – Collection and preservation of plants and fungi. **Sir David Attenborough (1926 -),** British naturalist and presenter.

				Zhang Heng (78- 139CE) Chinese astronomer – mapped the stars and planets. **Nicolaus Copernicus (1473-1543)** Polish astronomer – heliocentric universe; the sun is at the centre of the universe not the Earth as previously believed. **Galileo Galilei (1563- 1642)** Invented the telescope to study the surface of the moon. Discovered Jupiter has four moons. **Neil Armstrong (1930-2012**) –American Astronaut – First man to set foot on the moon 1969. **Stephen Hawking (1942 – 2018)** Professor of Mathematics – Expert on black holes, formed by matter collapsed on itself with strong gravity pull. **Tim Peake (1972 -)** British Astronaut - First British ESA astronaut to visit the International Space Station 2015.