2019

Curriculum Skills and Progression Map
Science

Nebula
where stars are born

The Nebula Federation

White Woman Lane Junior School

SCIENCE - WORKING SCIENTIFICALLY: STATUTORY REQUIREMENTS			
	KEY STAGE ONE	LOWER KEY STAGE TWO	UPPER KEY STAGE TWO
QUESTIONING	Asking simple questions, recognising they can be answered in different ways	Asking relevant questions, using range of scientific enquiries to answer them. Using straightforward scientific evidence to answer questions or support findings.	Planning range of scientific enquiries to answer questions, recognising and controlling variables where necessary.
OBSERVING	Observing closely using simple equipment	Making systematic, careful observations, taking accurate measurements. Using a range of equipment, including thermometers and data loggers	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
EXPERIMENTING	Performing simple tests	Setting up simple practical enquiries, comparative and fair tests	Using test results to make predictions to set up further comparative and fair tests.
CLASSIFYING	Identifying and classifying	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
APPLYING	Using observations and ideas to suggest answers to questions	Using results to draw simple conclusions, make prediction, suggest improvements raise further questions. Identifying differences, similarities or changes related to scientific ideas processes	Identifying scientific evidence that has been used to support or refute ideas or arguments.
RECORDING	Gathering and recording data to help in answering questions	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, oral and written explanations, displays or presentations of results and conclusions	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

WWL

Skills Map - Science	
Year 3 – Plants and Animals, including Humans	
Animals, including Humans	**Plants**
• Can they explain the importance of a nutritionally balanced diet? • Can they describe how nutrients, water and oxygen are transported within animals and humans? • Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat? • Can they describe and explain the skeletal system of a human? • Can they describe and explain the muscular system of a human? • Can they describe what they have found using scientific language? • Can they describe what they have found out using secondary sources?	• Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? Range of plants. • Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)? • Can they investigate the way in which water is transported within plants? • Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal? • Can they record their observations in different ways? (Labelled diagrams, charts etc.) Use secondary sources • Can they plan and set up a fair test and explain why it was fair? • Can they explain what they have found out and use their measurements to say whether it helps to answer their question? • Can they set up a simple test to make comparisons?
Year 3 Greater Depth	
• Can they explain how the muscular and skeletal systems work together to create movement? • Can they classify living things and non-living things by a number of characteristics that they have thought of? • Can they explain how people, weather and the environment can affect living things? • Can they explain how certain living things depend on one another to survive?	• Can they classify a range of common plants according to many criteria (environment found, size, climate required, etc.)?

Plants and animals including humans (yr 3)

Vocabulary	Roots, stem, nutrients, pollination, seed dispersal, fertiliser, seed formation, stigma, anther, soil. Nutrition, skeleton, muscles, diet, joint pelvis, cartilage, rib cage, tendon, spine.
Deeper thinking questions	Is your pizza healthy? How do you know? Which is better for you protein or carbohydrates? Explain your answer. Why does a tiger need lots of protein in its diet? What is the most important bone in our body? Why? What is the most important part of a flower? Why? What is most important for a plant: • Light • Heat • Water? Explain your answer.
Links to other subjects	Maths, Art (careful observational drawings) PE
Key skills covered/learned	Making links between science and PE and our bodies and how they need certain things to be healthy.
Trips/days	N/A
Enquiry links – ideas for where links could be made.	Look at a person who has unwell, children to be doctors and make suggestions as to how to improve their health. They could carry out certain tasks/ suggestions to improve the health and it could be set up to show whether these things are successful (the right thing to improve health) or not.

Skills Map - Science		
Year 3 – Rocks, Forces and Magnets, Light		
Rocks	**Forces and Magnets**	**Light**
• Can they compare and group together different rocks on the basis of their appearance and simple physical properties? • Can they describe and explain how different rocks can be useful to us? • Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock? • Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed? • Can they recognise that soils are made from rocks and organic matter? • Can they describe what they have found using scientific language? • Can they classify objects in different ways? • Can they describe what they have found using scientific language? • Can they use different ideas and suggest how to find something out?	• Can they compare how things move on different surfaces? • Can they observe that magnetic forces can be transmitted without direct contact? • Can they observe how some magnets attract or repel each other? • Can they identify and classify which everyday materials are attracted to magnets and which are not? • Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance? • Can they describe magnets have having two poles (N & S) and predict whether two magnets will attract or repel each other depending on which poles are facing? • Can they make and record a prediction before testing? • Can they take accurate measurements using different equipment and units of measure? • Can they set up a simple fair test to make comparisons? • Can they explain what they have found out and use their measurements to say whether it helps to answer their question?	• Can they recognise that they need light in order to see things? • Can they recognise that dark is the absence of light? • Can they notice that light is reflected from surfaces? • Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes? • Can they recognise that shadows are formed when the light from a light source is blocked by a solid object? • Can they find patterns in the way that the size of shadows change? • Can they explain the difference between transparent, translucent and opaque? • Can they set up a simple fair test to make comparisons? • Can they describe what they have found using scientific language? • Can they record their observations in different ways? - labelled diagrams, charts etc.

	• Can they record their observations in different ways? - labelled diagrams, charts etc.?	
Year 3 Greater Depth		
• Can they classify igneous and sedimentary rocks? • Can they begin to relate the properties of rocks with their uses?	• Can they investigate the strengths of different magnets and find fair ways to compare them?	• Can they explain why lights need to be bright or dimmer according to need? • Can they say what happens to the electricity when more batteries are added? • Can they explain why their shadow changes when the light source is moved closer or further from the object?

Rocks, Forces and Magnets, Light (yr 3)

Vocabulary	Reflection, shadows, light source, opaque, refraction, periscope, nocturnal, orbits, concave, convex. Fossil, soil, crystals, sedimentary, metamorphic, igneous, magnetic pole, organic matter, attract and repel.
Deeper thinking questions	Is a larger magnet always stronger? How do you know? If a magnet is in a box can it attract a magnet outside the box? Explain your answer. HAP – If you could build a house out of any rock, which would you use? Why? LAP – If you could have a house made of chalk or a house made of marble, which would you choose? Why? Why does the sun cause longer shadows in the morning and evening? What material is better for making shadow puppets, paper or plastic? Why?
Links to other subjects	RE, maths, literacy, art
Key skills covered/learned	Measuring, accurate drawings, discussion and verbal reasoning skills,
Trips/days	Visitor comes in to talk about fossils and rocks, children get to see a range of different specimens with a specialist talking about them. Visit to the Norwich Cathedral to look at light linking it with RE.

Enquiry links	Archaeologists on a dig.

Skills Map - Science			
Year 3 – Working Scientifically			
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**	**Types of investigations**
• Can they use different ideas and suggest how to find something out? • Can they make and record a prediction before testing? • Can they plan a fair test and explain why it was fair? • Can they set up a simple fair test to make comparisons? • Can they explain why they need to collect information to answer a question?	• Can they take accurate measurements using different equipment and units of measure? • Can they record their observations in different ways? - labelled diagrams, charts etc. • Can they describe what they have found using scientific language?	• Can they explain what they have found out and use their measurements to say whether it helps to answer their question?	• Children should have the opportunity to investigate • Observing changes over different periods of time • Noticing patterns • Grouping and classifying • Carrying out comparative and fair tests • Finding things out using secondary resources
Year 3 Greater Depth			
• Can they record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?	• Can they explain their findings in different ways (display, presentation, and writing)? • Can they use their findings to draw a simple conclusion? • Can they suggest improvements and predictions for further tests?	• Can they suggest how to improve their work if they did it again?	

Skills Map - Science		
Year 4 – Living Things and their Habitats, Animals including Humans and States of Matter		
Animals including Humans	**Living Things and their Habitats**	**States of Matter**
• Can they identify, name and describe the functions of the basic parts of the digestive system in humans? • Can they identify the simple function of different types of teeth in humans? • Can they compare the teeth of herbivores and carnivores? • Can they identify, construct and interpret a variety of food chains, identifying producers, predators and prey? • Can they identify differences, similarities or changes related to simple scientific ideas or processes?	• Can they recognise that living things can be grouped in a variety of ways? • Can they classify and identify into broad groups? • Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates) • Do they recognise that environments can change and this can sometimes pose a danger to living things? • Can they explain how environmental changes have an impact on living things? • Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs? • Can they explain their findings in different ways (display, presentation, writing)?	• Can they compare and group materials together, according to whether they are solids, liquids or gases? • Can they explain what happens to materials when they are heated or cooled? • Can they measure or research the temperature at which different materials change state in degrees Celsius? • Can they describe how materials change state at different temperatures? • Can they use measurements to explain changes to the state of water? • Can they explain everyday phenomena including the water cycle? • Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs? • Can they evaluate and communicate their methods and findings? • Can they use a range scientific equipment to take accurate measurements or readings?

Year 4 Greater Depth		
• Can they classify living things and non-living things by a number of characteristics that they have thought of? • Can they explain how people, weather and the environment can affect living things? • Can they explain how certain living things depend on one another to survive?	• Can they give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment? • Can they explore the work of pioneers in classification? (e.g. Carl Linnaeus) • Can they name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore).	• Can they group and classify a variety of materials according to the impact of temperature on them? • Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line?

Living Things and their Habitats, Animals including Humans and States of Matter (yr4)

Vocabulary	Pancreas, oesophagus, intestine, organ, molar, canine, food chain, predators, prey, salivary gland. Water vapour, condensation, precipitation, evaporation, substance, matter, lava, solid, liquid, gas.
Deeper thinking questions	• What is a habitat (pre) • Do you think it is vital to leave habitats alone and why? • How might life be different for humans if they were invertebrates? • Why should scientists classify animals into different categories? • Why do we not find a lion on a bug hunt? • Do you think it is still important to protect our tress and forests? Why? • What other ways can we care for our environment? • Why is it important to keep our teeth healthy? • Why do we have these different teeth? • What might happen if we used apple juice? (egg experiment) Why? • How would your diet be different if you didn't have teeth? • Why don't babies have teeth?

	• Can you name a matter that can exist in all three states? • What might happen if evaporation stopped? • Why should we care about global warming? • How could we survive without water?
Links to other subjects	Geography, History.
Key skills covered/learned	Observations, questioning skills being developed – guiding their own learning to look at how to solve questions and things that they want to know- planning an experiment (with support) to find these things out. Measuring and drawing accurate representations.
Trips/days	Trip to the zoo to look at habitats when in captivity compared to their natural habitats.
Enquiry links	Detective day/morning discovering who did it from their teeth indentations.

Sound and electricity (yr4)

Vocabulary	Vibrating, pitch, volume, insulation, outer, middle and inner ear, cochlea, auditory, frequency, hammer. Circuit, buzzers, conductor, batteries, cells, socket, appliance, series circuit.
Deeper thinking questions	• How might life be different if you could not hear? • Why do astronauts need a suit to communicate in space? • Why do we enjoy certain types of music? • Do you think mains or battery power is better? • Why is it important to invest in renewable energy? • How could we cope without electricity?
Links to other subjects	DT, maths
Key skills covered/learned	Measuring, accurate drawings, discussion and verbal reasoning skills,
Trips/days	Trip to the Ecocity wind turbine in Swaffham – this has now closed so an alternative is being sought.
Enquiry links	

Skills Map - Science	
Year 4 – Sound and Electricity	
Sound	**Electricity**
• Can they describe a range of sounds and explain how they are made? • Can they associate some sounds with something vibrating? • Can they compare sources of sound and explain how the sounds differ? • Can they explain how to change a sound (louder/softer)? • Can they recognise how vibrations from sound travel through a medium to an ear? • Can they describe the relationship between the pitch of the sound and the features of its source/object that produces it? • Can they find patterns between the volume of the sound and the strength of the vibrations that produced it, and the distance of the source? • Can they investigate how different materials can affect the pitch and volume of sounds? • Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated? • Can they decide which information needs to be collected and decide the best way for collecting it? • Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?	• Can they identify common appliances that run on electricity? • Can they construct a simple series electric circuit? • Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers? • Can they recogniser symbols to represent simple series circuit diagrams? • Can they 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? • Can they recognise that a switch opens and closes a circuit? • Can they associate a switch opening with whether or not a lamp lights in a simple series circuit? • Can they recognise some common conductors and insulators? • Can they associate metals with being good conductors? • Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated? • Can they suggest improvements and predictions? • Can they ask their own questions? • Can they explain their findings in different ways (display, presentation, writing)?
Year 4 Greater Depth	
• Can they explain why sound gets fainter or louder according to the distance? • Can they explain how pitch and volume can be changed in a variety of ways? • Can they work out which materials give the best insulation for sound?	• Can they explain how a bulb might get lighter? • Can they recognise if all metals are conductors of electricity? • Can they work out which metals can be used to connect across a gap in a circuit? • Can they explain why cautions are necessary for working safely with electricity?

Skills Map - Science			
Year 4 – Working Scientifically			
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**	**Types of investigations**
• Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated? • Can they suggest improvements and predictions? • Can they ask their own questions? • Can they decide which information needs to be collected and decide what the best way to collect it is? • Can they use their findings to draw a simple conclusion?	• Can they take measurements using different equipment and units of measure and record what they have found in a range of ways? • Can they use a range scientific equipment's to take accurate measurements or readings? • Can they explain their findings in different ways (display, presentation, writing)? • Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs?	• Can they find any patterns in their evidence or measurements? • Can they evaluate and communicate their methods and findings? • Can they make a prediction based on something they have found out? • Can they ask further questions based on their data and observations? • Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables? • Can they identify differences, similarities or changes related to simple scientific ideas or processes?	Children should have the opportunity to investigate: • Observing changes over different periods of time • Noticing patterns • Grouping and classifying • Carrying out comparative and fair tests • Finding things out using secondary resources.

Year 4 Greater Depth			
• Can they plan and carry out an investigation by controlling variables fairly and accurately? • Can they use test results to make further predictions and set up further comparative tests?	Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?	• Can they report findings from investigations through written explanations and conclusions? • Can they use a graph or diagram to answer scientific questions?	• Can they use a range of variables to investigate?

Skills Map - Science		
Year 5 – Living Things and their Habitats, Properties and changes to materials		
Animals including Humans	**Living Things and their Habitats**	**Properties and changes to materials**
• Can they describe the changes as humans develop to old age? • Can they use basic ideas of inheritance, variation and adaptation to describe how living things have changed over time? • Can they use a graph to answer scientific questions? • Can they present a report of their findings through writing, display and presentation?	• Can they describe the differences in the life cycles of a mammal, amphibians, an insects and a bird? • Can they identify the reproductive processes of some animals? • Can they describe the life cycles of common plants? • Can they explore the work of well know naturalists and animal behaviourists? (David Attenborough and Jane Goodall)	• Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets? • Can they explain how some materials dissolve in liquid to form a solution? • Can they explain what happens when dissolving occurs? • Can they use their knowledge of solids, liquids and gases to decide and describe how mixtures might be separated, including through filtering, sieving, evaporating? • Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic? • Can they describe changes using scientific words? (evaporation, condensation)

	• Can they present a report of their findings through writing, display and presentation?	• Can they demonstrate that dissolving, mixing and changes of state are reversible changes? Can they explain that some changes result in the formation of new materials, and that this kid of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda? • Can they use the terms 'reversible' and 'irreversible'? • Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary? • Can they make a prediction with reasons? • Can they use test results to make predictions to set up comparative and fair tests? • Can they take repeat readings when appropriate? • Can they record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs?
Year 5 Greater Depth		
• Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies? • Can they describe the changes experienced in puberty? • Can they draw a timeline to indicate stages in the growth and development of humans?	• Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border? • Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?	• Can they describe methods for separating mixtures? (filtration, distillation) • Can they work out which materials are most effective for keeping us warm or for keeping something cold? • Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases) • Can they explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda? • Can they explore the work of chemists who created new materials, e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)?

– Living Things and their Habitats, Properties and changes to materials (yr5)

Vocabulary	Solubility, conductivity, transparency, thermal evaporation, dissolve, bicarbonate of soda, thermal, filtering, melting, separate. Puberty, gestation, classification, reproduction, teenager, obese, toddler, embryo.
Deeper thinking questions	• What are the adv/disadv of humans if they were not mammals? • What vertebrate/invertebrate would you want to be and why? • What are the adv/disadv of this plant reproducing this way? • [Pic of an obscure animal] Where is its habitat and why have you chosen it? • Develop a creature for a chosen habitat • Design something to keep an ice-cube cold and explain your choices • [Give chn an object with a specific purpose] What materials would you use to make it and why did you choose those properties?
Links to other subjects	Geography, maths, DT/stem – Which materials would be best to build with?
Key skills covered/learned	Reading graphs, drawing graphs, making real life connections, close observations, presentation.
Trips/days	Norwich cathedral day looking at materials and forces.
Enquiry links	

Skills Map - Science	
Year 5 – Earth, Space and Forces	
Earth and Space	**Forces**
• Can they identify and explain the movement of the Earth and other plants relative to the sun in the solar system? • Can they explain how seasons and the associated weather is created? • Can they describe and explain the movement of the Moon relative to the Earth? • Can they describe the sun, earth and moon as approximately spherical bodies? • Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky? • Can they present a report of their findings through writing, display and presentation using appropriate scientific vocabulary? • Can they use evidence from secondary sources to explore their own and other people's ideas?	• Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object? • Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces? • Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect? • Can they present a report of their findings through writing, display and presentation using appropriate scientific vocabulary? • Can they use a graph to answer scientific questions? • Can they use test results to make predictions to set up comparative and fair tests?
Year 5 Greater Depth	
• Can they compare the time of day at different places on the earth? • Can they create shadow clocks? • Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge? • Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)	• Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction) • Can they design very effective parachutes? • Can they work out how water can cause resistance to floating objects? • Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation?

Earth, Space and Forces (yr5)

Vocabulary	Orbit, solar system, astronomical, planet, rotation, spherical, crescent moon, gibbous moon, eclipse and lunar. Friction, gravity, air resistance, water resistance, levers, pulleys, gears, parachute, Galileo, Newton.
Deeper thinking questions	• If you had a chance to live on any other planet, which and why? • What are the differences about living nearer/further away from the equator? • Using your knowledge of hemispheres and the Earth's seasons, what would Father Christmas be doing in the Summer, then? • [After the investigations] What if we changed . . . ? How might it go? • What would happen if we did not have friction?
Links to other subjects	DT, maths, geography, literacy
Key skills covered/learned	Measuring, accurate drawings, discussion and verbal reasoning skills, presentation and research skills.
Trips/days	Norwich cathedral day looking at materials and forces.
Enquiry links	

Skills Map - Science		
Year 5 – Working Scientifically		
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**
• Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary? • Can they make a prediction with reasons? • Can they use test results to make predictions to set up comparative and fair tests?	• Can they take measurements using a range of scientific equipment with increasing accuracy and precision? • Can they take repeat readings when appropriate? • Can they record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs?	• Can they use a graph to answer scientific questions? • Can they present a report of their findings through writing, display and presentation?

Year 5 Greater Depth		
• Can they explore different ways to test an idea, choose the best way and give reasons? • Can they vary one factor whilst keeping the others the same in an experiment? • Can they use information to help make a prediction? • Can they explain, in simple terms, a scientific idea and what evidence supports it?	• Can they decide which units of measurement they need to use? • Can they explain why a measurement needs to be repeated?	• Can they find a pattern from their data and explain what it shows? • Can they link what they have found out to other science? • Can they suggest how to improve their work and say why they think this?

Skills Map - Science		
Year 6 – Living Things		
Evolution and Inheritance	**Living things and their Habitats**	**Animals, including Humans**
• Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago? • Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents? • Can they give reasons why offspring are not identical to each other or to their parents? • Can they explain the process of evolution and describe the evidence for this? • Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution? • Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? Can they explain, in simple terms, a scientific idea and what evidence supports it?	• Can they 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? • Can they give reasons for classifying plants and animals based on specific characteristics? • Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?	• Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? • Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? • Can they describe the ways in which nutrients and water are transported within animals and plants, including humans? • Can they explain, in simple terms, a scientific idea and the evidence which supports it?

Year 6 Greater Depth		
• Can they research and discuss the work of famous scientists, such as Charles Darwin, Mary Anning and Alfred Wallace? • Can they explain how some living things adapt to survive in extreme conditions? • Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet?	• Can they explain why classification is important? • Can they readily group animals into reptiles, fish, amphibians, birds and mammals? • Can they sub divide their original groupings and explain their divisions, such as vertebrates and invertebrates? • Can they find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification?	• Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies? • Can they compare the organ systems of humans to other animals? • Can they make a diagram of the human body and explain how different parts work and depend on one another? • Can they name and locate the major organs in the human body?

Living Things (Yr6)

Vocabulary	Off spring, adaptation, evolution, inheritance, palaeontologist, Charles Darwin, genes, chromosomes, syndrome, genotype. Micro-organisms, vertebrates, invertebrates, species, fungi, bacteria, algae, Carl Linnaeus.
Deeper thinking questions	• Modern examples : Zebra finches – they have changed from eating seeds to pecking the skin of animals to drink their blood which has resulted in a change in their beaks • Is there evidence of human evolution today? • How do humans influence animal evolution? - Crows (in Japan?) use pedestrian crossings and people walking across them to get nut shells cracked

	- Some Sperm whales in Alaska have learnt/evolved to follow the fishing boats and take the fish one by one off their long line fishing hooks • Can you discuss the work of Charles Darwin, Mary Anning and Alfred Wallace? • How do some living things adapt to survive in extreme conditions? • What are the advantages and disadvantages of specific adaptations, such as being on two rather than four feet? • How is the human skeleton suited to our lifestyle? • Can you be healthy and not fit? Fit and not healthy? • Comparison/research opportunity: heart rate/size/lifespan – whales are large with a long lifespan, compared to a mouse. However with dogs the larger species e.g. great dane has a shorter lifespan than a small dog. Why is this? • Can you compare the organ systems of humans to other animals? • Why could we describe blood as the body's river system? • Can you compare the organ systems of humans to other animals? • Why is classification important? • What is the significance of Carl Linnaeus – a pioneer of classification? • Could Spiderman really exist? • What are micro-organisms and how would you classify them?
Links to other subjects	PSHE, RSE, English,
Key skills covered/learned	Measuring, accurate drawings, discussion and verbal reasoning skills, accurate observations, presentation, research skills,
Trips/days	
Enquiry links	

Skills Map - Science	
Year 6 – Electricity and Light	
Electricity	**Light**
• Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers) • Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches? • Can they use recognised symbols when representing a simple circuit in a diagram? • Can they explore different ways to test an idea, choose the best way, and give reasons? • Can they identify the key factors when planning a fair test? • Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this? • Can they use information to make a prediction and give reasons for it? • Can they use test results to make further predictions and set up further comparative tests? • Can they find a pattern from their data and explain what it shows? • Can they use a graph to answer scientific questions? • Can they link what they have found out to other science? • Can they suggest how to improve their work and say why they think this?	• Can they recognise that light appears to travel in straight lines? • Can they 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? • Can they 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? • Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them? • Can they find a pattern from their data and explain what it shows? • Can they use a graph to answer scientific questions? • Can they link what they have found out to other science? • Can they suggest how to improve their work and say why they think this? • Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? • Can they draw conclusions from their work? • Can they report findings from investigations through written explanations and conclusions using appropriate scientific language?
Year 6 Greater Depth	
• Can they make their own traffic light system or something similar? • Can they explain the danger of short circuits? • Can they explain what a fuse is? • Can they explain how to make changes in a circuit? • Can they explain the impact of changes in a circuit? • Can they explain the effect of changing the voltage of a battery?	• Can they explain how different colours of light can be created? • Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope) • Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters?

Electricity and light (yr 6)

Vocabulary	Conductor, insulator, socket, series circuit, cells, volts, generator, turbine, fuses, Thomas Edison, power source. Light wave, light source, concave, convex, filters, lens, retina, cornea, iris, pupil, reflection, refraction.
Deeper thinking questions	• What different ways could we conserve electricity? • Can you explain the impact of changes in a circuit? • Designing an electric circuit game/torch/traffic lights • Could you ever have more than one shadow? • Could you ever lose your shadow? • How are different colours of light created? • Explore a range of phenomena – rainbows, colours on soap bubbles, objects looking bent in water and coloured filters
Links to other subjects	ICT, DT, English and maths
Key skills covered/learned	Measuring, accurate drawings, discussion and verbal reasoning skills, accurate observations, presentation, research skills,
Trips/days	Visit from an optician to talk about how we see light.
Enquiry links	Using inquiry story to hook kids in for a reason to make torches, testing their understanding of electrical circuits and design.

Skills Map - Science			
Year 6 – Working Scientifically			
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**	**Types of investigations**
• Can they explore different ways to test an idea, choose the best way, and give reasons? • Can they identify the key factors when planning a fair test? • Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this? • Can they use information to make a prediction and give reasons for it? • Can they use test results to make further predictions and set up further comparative tests? • Can they explain, in simple terms, a scientific idea and what evidence supports it?	• Can they explain why they have chosen specific equipment? (including ICT based equipment) • Can they decide which units of measurement they need to use? • Can they make precise measurements? • Can they explain why a measurement needs to be repeated? • Can they record their measurements in different ways? (including bar charts, tables and line graphs) • Can they read and record measurements systematically using a range of scientific equipment with increasing accuracy and precision? • Can they present a report of their findings through writing, display and presentation?	• Can they find a pattern from their data and explain what it shows? • Can they use a graph to answer scientific questions? • Can they link what they have found out to other science? • Can they suggest how to improve their work and say why they think this? • Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? • Can they draw conclusions from their work? • Can they report findings from investigations through written explanations and conclusions using appropriate scientific language?	Children should have the opportunity to investigate through: • Recognising and controlling variables accurately and fairly, including changes over different periods of time • Noticing patterns, groupings and classifying • Carrying out comparative and fair tests • Finding things out using a wide range of secondary sources.
Year 6 Greater Depth			

• Can they choose the best way to answer a question and use information from different sources to plan an investigation? • Can they make a prediction which links with other scientific knowledge?	Can they plan which equipment they will need and use it effectively? Can they explain qualitative and quantitative data?	• Can they identify scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it? • Can they explain how they could improve their way of working? • Can they report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations?

Deeper thinking: General investigation planning

- How can you choose the best way to test your idea and give reasons why?
- Can you vary just one factor and explain why we do this?
- Can you make a prediction which links with other scientific knowledge?
- Can you link your conclusions to other scientific knowledge?
- Can you explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough?

Deeper thinking questions are fluid and having had conversations with colleagues they often develop according to the type of children and the topics that are being taught, (as I am sure you know) the ones in this table are used but are not fixed as the only ones.

	3G	3S	3L
Autumn 1	Food & Bodies 3	Forces & Magnets 2	Food & Bodies 3
Autumn 2	Rocks & Fossils 1	Food & Bodies 3	Forces & Magnets 2
Spring 1	Forces & Magnets 2	Rocks & Fossils 1	Rocks & Fossils 1
Spring 2	Plants 4	Plants 4	Plants 4
Summer 1	Light & reflections 5	Light & Reflection 5	Light & Reflection 5
Summer 2 (if time)	Space 6	Space 6	Space 6

Long term plans for each year group (order subject to change)

Year 3 Science Long term plan

Year 4

	4C Miss Coe	4R (Mrs Butler)	4P (EP)
AUTUMN 1st	Living Things	Power it Up	Teeth & Eating
2nd	Teeth & Eating	Living Things	Power it Up
SPRING 1st	Looking at States	Sound	Living Things
2nd	Sound	Teeth & Eating	Looking at States
SUMMER 1st	Power it Up	Looking at States	Sound
2nd	Bubbles	Bubbles	Bubbles

Year 5

		5D (SD)	5B (LB)	5S (Mrs Butler)
AUTUMN	**1st**	Earth & Space	Earth & Space	Animals incl. Humans
	2nd	Animals incl. Humans	Properties & Changes of Materials	Earth & Space
SPRING	**1st**	Properties & Changes of Materials Living Things & their Habitats	Forces	Living Things & their Habitats
	2nd		Animals incl. Humans	Forces
SUMMER	**1st**	Forces	Living Things & their Habitats	Properties & Changes of Materials
	2nd	Super Scientists (SoS)	Super Scientists (SoS)	Super Scientists (SoS)

Year 6

Date	Mrs Semmens-Byrne 6S	Miss Delijani 6Q	Mrs Butler 6H
Autumn	We are dinosaur hunters	We are dinosaur hunters	We are dinosaur hunters
Autumn	Electricity	Light	Evolution and inheritance
Autumn/Spring	Light	Evolution and inheritance	Electricity
Spring	Evolution and inheritance	Electricity	Light
Spring/Summer	Living things and their habitats	Animals including humans	Living things and their habitats
Summer	Animals including humans	Living things and their habitats	Animals including humans

Inquiry projects are being developed for some lessons, we are working on ways to include this. Including 'hooks' for the focus of the lesson to help give the objectives that 'reason' for them being done.