Stelling Minnis CEP School

Science Progression Document



EYFS: How we provide for a foundation of scientific skills and knowledge

Main link: Understanding the World

The following are potential learning opportunities where our children may develop skills and knowledge of science in readiness for the KS 1 curriculum. Other opportunities may arise as we follow the children's interests.

	The state of the s								
	Healthy eating – where does our food come from?	Investigating and exploring natural materials in their environment	Making comparisons between different materials and their properties	Asking questions and beginning to give explanations Exploration	Recognising environments that are different from their own.				
Ī	Daily weather discussions	Make observations.	Understand the key	Explain how we care	Explore the natural world using				
	and comparisons with countries around the world	Use new vocabulary to predict, discuss ideas and	features of the life cycle of a plant/ animal	for our environment and all living things	the 5 senses with hands-on experiences				
	Discuss and compare	their findings							
	seasons								
	Talk about how animals behave differently in different seasons (hibernations/adaptation)	Explore food chains and introduce herbivores, omnivores, carnivores when looking at dinosaurs and other animals they are familar with	Explore and talk about forces they experience/ feel when exploring (push, pull, magnets, attract, repel, gravity)	Explore floating and sinking. Investigate which materials sink and float and why.	Sing songs and rhymes about the world around is				
	Understand the effect of changing seasons on the natural world around them	Oral hygiene	Keeping healthy – diets, exercise, well-being (links to PSHE, PD)	Explore changing states in materials e.g. sand, cooking, water	Talk about our bodies				

ELG: **The Natural World** • 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.

People, Cultures and Communities • Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. • Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and (when appropriate) maps.

EYFS: What this might look like in provision

Main link: Understanding the World

The following are possible opportunities within all provision areas that children may develop scientific skills and knowledge. They may be further developed or adapted to follow the children's interests.

Daily weather observations	Floating and sinking of objects in the water tray	Exploring different gradients and speeds when racing cars down ramps. Using materials to change speeds and discuss friction	Discussions about dinosaurs. Make links to animals and the food chain. Link to healthy eating, balanced diet and what we eat	Planting and caring for our garden and wider school environment – inc. polytunnel, Forest School woodland
Exploring change in materials e.g. water – ice, melting chocolate	Shadow drawing on playground, making shadow puppets	Drawing with ice, painting snow	Looking at life cycles of tadpoles in Forest School pond, other animals – farm visit	Painting with water on playground/fences, watching it dry more quickly in warm weather
Talk about our bodies – Doctor's surgery role play area	Drawing maps and talking about man-made and natural features	Autumn senses walk	Investigating hibernation in our local environment	Animals and habitats – discussion, investigations, explorations in our local environment
Comparing animals that live in different parts of the world	Exploring the changing properties of mud in the mud kitchen or sand in the sand pit	Using magnets to explore different magnetic and non-magnetic objects	Exploring different objects using senses that relate to different environments/seasons	Making healthy food in our cooking sessions

	Year 1						
	Biology			Physics			
Animals, including Humans	Animals, including Humans	Plants	Everyday Materials	Seasonal Change			
Name common animalsCarnivores, etc	Human body and senses	Common plants Plant structure	Properties of materialsGrouping materials	The four seasonsSeasonal weather			
 Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds Know and classify animals by what they eat (carnivore, herbivore and omnivore) Know how to sort by living and non living things 	Know the name of parts of the human body that can be seen	 Know and name a variety of common wild and garden plants Know and name the petals, stem, leaves and root of a plant Know and name the roots, trunk, branches and leaves of a tree 	Know the name of the materials an object is made from Know about the properties of everyday materials	Name the seasons and know about the type of weather in each season			

Year 1 **Working Scientifically** ■ Ask questions such as: • Why are flowers different colours? Why do some animals eat meat and others do not? ☐ Set up a test to see which materials keeps things warmest, know if the test has been successful and can say what has been learned Explain to someone what has been learned from an investigation they have been involved with and draw conclusions from the answers to the questions asked Measures (within Year 1 mathematical limits) to help find out more about the investigations undertaken

	Year 2					
	Biology		Chei	mistry		
All living things and their habitats	Animals, including Humans	Plants	Everyday Materials			
Alive or deadHabitatsAdaptationsFood chains	 Animal reproduction Healthy living Basic needs 	 Plant and seed growth Plant reproduction Keeping plants healthy 	 Identify different materials Name everyday materials Properties of materials 	 Compare the use of different materials Compare movement on different surfaces 		
 Classify things by living, dead or never lived Know how a specific habitat provides for the basic needs of things living there (plants and animals) Match living things to their habitat Name some different sources of food for animals Know about and explain a simple food chain 	Know the basic stages in a life cycle for animals, (including humans) Know why exercise, a balanced diet and good hygiene are important for humans	Know and explain how seeds and bulbs grow into plants Know what plants need in order to grow and stay healthy (water, light & suitable temperature)	Know how materials can be changed by squashing, bending, twisting and stretching	Know why a material might or might not be used for a specific job		

Working Scientifically

- Ask questions such as:
 - Why do some trees lose their leaves in Autumn and others do not?
 - How long are roots of tall trees?
 - Why do some animals have underground habitats?
- Use equipment such as thermometers and rain gauges to help observe changes to local environment as the year progresses
- Use microscopes to find out more about small creatures and plants
- ☐ Know how to set up a fair test and do so when finding out about how seeds grow best
- □ Classify or group things according to a given criteria, e.g. deciduous and coniferous trees
- Draw conclusions from fair tests and explain what has been found out
- Use measures (within Year 2 mathematical limits) to help find out more about the investigations they are engaged with

	Year 3						
	Biology			Phy	rsics		
Animals, including humans	Plants	Plants	Rocks	Forces	Light		
 Skeleton and muscles Nutrition Exercise and health 	Plant lifeBasic structure and functions	Life cycle Water transportation	Fossil formationCompare and group rocksSoil	Different ForcesMagnets	ReflectionsShadows		
Know about the importance of a nutritious, balanced diet Know how nutrients, water and oxygen are transported within animals and humans Know about the skeletal and muscular system of a human	Know the function of different parts of flowing plants and trees	Know how water is transported within plants Know the plant life cycle, especially the importance of flowers	 Compare and group rocks based on their appearance and physical properties, giving reasons Know how soil is made and how fossils are formed Know about and explain the difference between sedimentary, metamorphic and igneous rock 	 Know about and describe how objects move on different surfaces Know how a simple pulley works and use to on to lift an object Know how some forces require contact and some do not, giving examples Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason 	Know that dark is the absence of light Know that light is needed in order to see and is reflected from a surface Know and demonstrate how a shadow is formed and explain how a shadow changes shape Know about the danger of direct sunlight and describe how to keep protected		

Year 3							
Working Scientifically							
Ask questions such as: • Why does the moon appear as different shapes in the night sky?		Use a thermometer to measure temperature and know there are two main scales used to measure temperature					
Why do shadows change during the day?Where does a fossil come from?		Gather and record information using a chart, matrix or tally hart, depending on what is most sensible					
Observe at what time of day a shadow is likely to be at its longest and shortest		Group information according to common factors e.g. plants that grow in woodlands or plants that grow in gardens					
Observe which type of plants grow in different places e.g. bluebells in woodland, roses in domestic gardens, etc.		Use bar charts and other statistical tables (in line with Year 3 mathematics statistics) to record findings					
Use research to find out how reflection can help us see things that are around the corner		Know how to use a key to help understand information presented on a chart					
Use research to find out what the main differences are between sedimentary and igneous rocks		Be confident to stand in front of others and explain what has been found out, for example about how the moon changes shape					
Test to see which type of soil is most suitable when growing two similar plants		Present findings using written explanations and include diagrams when needed					
Test to see if their right hand is as efficient as their left hand		Make sense of findings and draw conclusions which help them to understand more about scientific information					
Set up a fair test with different variables e.g. the best conditions for a plant to grow		Amend predictions according to findings					
Explain to a partner why a test is a fair one e.g. lifting weights with right and left hand, etc.		Be prepared to change ideas as a result of what has been found out during a scientific enquiry					
Measure carefully (taking account of mathematical knowledge up to Year 3) and add to scientific learning							

Biol	ogy	Chemistry	Phy	rsics
Animals, including humans	All living things and their habitats	States of Matter	Electricity	Sound
Digestive systemTeethFood chains	Grouping living thingsClassification keysAdaptation of living things	 Compare and group materials Solids, liquids and gases Changing state Water cycle 	 Uses of electricity Simple circuits and switches Conductors and insulators 	 How sounds are made Sound vibrations Pitch and Volume
 Identify and name the parts of the human digestive system Know the functions of the organs in the human digestive system Identify and know the different types of human teeth Know the functions of different human teeth Use and construct food chains to identify producers, predators and prey 	 Use classification keys to group, identify and name living things Know how changes to an environment could endanger living things Group materials based on their state of matter (solid, liquid, gas 	Know the temperature at which materials change state Know about and explore how some materials can change state Know the part played by evaporation and condensation in the water cycle	 Identify and name appliances that require electricity to function Construct a series circuit Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers) Predict and test whether a lamp will light within a circuit Know the function of a switch Know the difference between a conductor and an insulator; giving examples of each 	 Know how sound is made, associating some of them with vibrating Know how sound travels from a source to our ears Know the correlation between pitch and the object producing a sound Know the correlation between the volume of a sound and the strength of the vibrations that produced it Know what happens to a sound as it travels away from its source

Year 4							
Working Scientifically							
Ask questions such as: • Why are steam and ice the same thing? • Why is the liver important in the digestive systems?		Gather and record information using a chart, matrix or tally chart, depending on what is most sensible					
 What do we mean by 'pitch' when it comes to sound? 		Group information according to common factors e.g. materials that make good conductors or insulators					
Use research to find out how much time it takes to digest most of our food		Use bar charts and other statistical tables (in line with Year 4 mathematics statistics) to record findings					
Use research to find out which materials make effective conductors and insulators of electricity		Present findings using written explanations and include diagrams, when needed					
Carry out tests to see, for example, which of two instruments make the highest or lowest sounds and to see if a glass of ice weighs the same as a glass of water		Write up findings using a planning, doing and evaluating process					
Set up a fair test with more than one variable e.g. using different materials to cut out sound		Make sense of findings and draw conclusions which helps them understand more about the scientific information that has been learned					
Explain to others why a test that has been set up is a fair one e.g. discover how fast ice melts in different temperatures		When making predictions there are plausible reasons as to why they have done so					
Measure carefully (taking account of mathematical knowledge up to Year 4) and add to scientific learning		Able to amend predictions according to findings					
Use a data logger to check on the time it takes ice to melt to water in different temperatures		Prepared to change ideas as a result of what has been found out during a scientific enquiry					
Use a thermometer to measure temperature and know there are two main scales used to measure temperature							

Bio	logy	Chemistry	Phy	sics
All living things and their habitats	Animals, including humans	Properties and changes in materials	Forces	Earth and Space
 Life cycles – plants and animals Reproductive processes Famous naturalists 	Changes as humans develop from birth to old age	 Compare properties of everyday materials Soluble/ dissolving Reversible and irreversible substances 	 Gravity Friction Forces and motion of mechanical devices	 Movement of the Earth and the planets Movement of the Moon Night and day
 Know the life cycle of different living things e.g. mammal, amphibian, insect and bird Know the differences between different life cycles Know the process of reproduction in plants Know the process of reproduction in animals 	Create a timeline to indicate stages of growth in humans	 Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets Know and explain how a material dissolves to form a solution Know and show how to recover a substance from a solution Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating) Know and demonstrate that some changes are reversible and some are not Know how some changes result in the formation of a new material and that this is usually irreversible 	 Know what gravity is and its impact on our lives Identify and know the effect of air and water resistance Identify and know the effect of friction Explain how levers, pulleys and gears allow a smaller force to have a greater effect 	 Know about and explain the movement of the Earth and other planets relative to the Sun Know about and explain the movement of the Moon relative to the Earth Know and demonstrate how night and day are created Describe the Sun, Earth and Moon (using the term spherical)

Year 5							
Working Scientifically							
Set up an investigation when it is appropriate e.g. finding out which materials dissolve or not		Able to present information related to scientific enquiries in a range of ways including using IT such as power-point and iMovie					
Set up a fair test when needed e.g. which surfaces create most friction?		Use diagrams, as and when necessary, to support writing					
Set up an enquiry based investigation e.g. find out what adults / children can do now that they couldn't when a baby		Is evaluative when explaining findings from scientific enquiry					
Know what the variables are in a given enquiry and can isolate each one when investigating e.g. finding out how effective parachutes are when made with different materials		Clear about what has been found out from recent enquiry and can relate this to other enquiries, where appropriate					
Use all measurements as set out in Year 5 mathematics (measurement), including capacity and mass		Their explanations set out clearly why something has happened and its possible impact on other things					
Use other scientific instruments as needed e.g. thermometer, rain gauge, spring scales (for measuring Newtons)		Able to give an example of something focused on when supporting a scientific theory e.g. how much easier it is to lift a heavy object using pulleys					
Able to record data and present them in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs		Keep an on-going record of new scientific words that they have come across for the first time					
Make predictions based on information gleaned from investigations		Able to relate causal relationships when, for example, studying life cycles					
Create new investigations which take account of what has been learned previously		Frequently carry out research when investigating a scientific principle or theory					

	Biology	Physics		
Animals, including humans	All living things and their habitats	Evolution and Inheritance	Electricity	Light
The circulatory systemWater transportationImpact of exercise on body	Classification of living things and the reasons for it	 Identical and non identical off-spring Fossil evidence and evolution Adaptation and evolution 	Electrical componentsSimple circuitsFuses and voltage	How light travelsReflectionRay models of light
 Identify and name the main parts of the human circulatory system Know the function of the heart, blood vessels and blood Know the impact of diet, exercise, drugs and lifestyle on health Know the ways in which nutrients and water are transported in animals, including humans 	 Classify living things into broad groups according to observable characteristics and based on similarities and differences Know how living things have been classified Give reasons for classifying plants and animals in a specific way 	 Know how the Earth and living things have changed over time Know how fossils can be used to find out about the past Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents) Know how animals and plants are adapted to suit their environment Link adaptation over time to evolution Know about evolution and can explain what it is 	 Compare and give reasons for why components work and do not work in a circuit Draw circuit diagrams using correct symbols Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer 	 Know how light travels Know and demonstrate how we see objects Know why shadows have the same shape as the object that casts them Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Year 6 **Working Scientifically** Know which type of investigation is needed to suit Use a range of written methods to report findings, particular scientific enquiry e.g. looking at the including focusing on the planning, doing and relationship between pulse and exercise evaluating phases Set up a fair test when needed e.g. does light travel in Clear about what has been found out from their straight lines? enquiry and can relate this to others in class Know how to set up an enquiry based investigation Explanations set out clearly why something has e.g. what is the relationship between oxygen and happened and its possible impact on other things plood_{\$} Know what the variables are in a given enquiry and Aware of the need to support conclusions with can isolate each one when investigating evidence Justify which variable has been isolated in scientific Keep an on-going record of new scientific words that investigation they have come across for the first time and use these regularly in future scientific write ups Use all measurements as set out in Year 6 mathematics Use diagrams, as and when necessary, to support (measurement), including capacity, mass, ratio and writing and be confident enough to present findings proportion orally in front of the class Able to record data and present them in a range of Able to give an example of something they have ways including diagrams, labels, classification keys, focused on when supporting a scientific theory e.g. tables, scatter graphs and bar and line graphs classifying vertebrate and invertebrate creatures or why certain creatures choose their unique habitats Make accurate predictions based on information Frequently carry out research when investigating a gleaned from their investigations and create new scientific principle or theory investigations as a result Able to present information related to scientific enquiries in a range of ways including using IT such as power-point, animoto and iMovie