South View Community Primary School

Our Science Curriculum

Science Leads

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1. THE BASIC PRINCIPLES OF OUR CURRICULUM

Learning is a change to long term memory.

Our aims are to ensure that our children experience a wide breadth of study and have, by the end of each Key Stage, long - term memory of an ambitious body of procedural and semantic knowledge.

2. OUR CURRICULUM INTENT

Curriculum Drivers shape our curriculum breadth. They are derived from an exploration of the backgrounds of our children, our beliefs about high quality education and our values. They are used to ensure we give our children appropriate and ambitious curriculum opportunities. Our curriculum drivers, enabling us to ensure OUR children get what THEY need from us are that:

- Our children will develop vocabulary so that they are able to speak and understand spoken language, access more complex texts and write with eloquence.
- Our children will leave South View as successful readers. They will 'learn to read' and consequently 'read to learn'.
- Our children will explore their own cultures, surroundings and emotions and those of others, to gain a wider understanding of the world and their place within it.

3. SCIENCE INTENT

Science inspires children. It excites them and develops their innate curiosity. At South View, we recognise the power of this as a starting point, and it is our intention to harness these values and provide a high-quality Science curriculum which delivers opportunities to grow these positive beginnings into a life-long passion to explore the world around them.

At South View, in conjunction with the National Curriculum, our Science teaching offers cross-curricular opportunities for pupils to develop their scientific knowledge and conceptual understanding, and develop and use a range of skills for working scientifically, including questioning, researching and making first-hand observations.

The teaching and acquisition of new vocabulary is very important in our school and this is no different in the Science curriculum. Scientific language is taught and built on as topics and subject areas are revisited in different year groups and across key stages. In addition, we see Science as a way of not only exploring concepts, but also as a way of developing our school Core Values through collaborating, showing resilience, articulating ideas and explanations, reflecting on our learning, demonstrating creativity in our thinking and being all-round excellent learners in Science.

Finally, it is our intention that our Science curriculum will enable pupils to recognise the importance of Science in daily life, to make pupils aware that many jobs of the future are likely to relate to a secure scientific understanding, and also to give them strong foundations upon which future science teaching may build.

4. SCIENCE LONG TERM PLAN

Crowland South View Primary School Science Curriculum						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Foundation Stage	*-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*					
Term 1	**Animals, including humans**	**Use of Everyday Materials**	**Animals, including humans**	**Eating and Digestion**	**Properties Of Materials**	**Electricity**
Term 2	**Seasonal changes**	**Living Things and their Habitats**	**Rocks, Fossils and Soils**	**States of Matter**	**Changes Of Materials**	**Animals including Humans**
Term 3	**Everyday materials**	**Habitats from around the World**	**Plants**	**Sound**	**Forces**	**Evolution and Inheritance**
Term 4	**Sustainability**	**Sustainability** **Animals, including humans - Growth**	**Sustainability**	**Living Things and their habitats - Conservation**	**Sustainability** **Earth And Space**	**Sustainability**
Term 5	**Plants**	**Animals, including humans - Life Cycles**	**Light**	**All Living Things and their habitats**	**Living Things And Their Habitats**	**Living things and their habitats**
Term 6	**Animals**	**Plants**	**Forces and Magnets**	**Electricity**	**Animals Including Humans**	**Light**

5. SCIENCE KNOWLEDGE PROGRESSION for EYFS, Key Stage 1 and Key Stage 2

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals, including Humans						
Understanding the world The Natural World Explore the natural world around them, making observations and drawing pictures of animals.	• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • Identify and name a variety of common animals that are carnivores, herbivores and omnivores • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	• Notice that animals, including humans, have offspring which grow into adults • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	• Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	• Describe the simple functions of the basic parts of the digestive system in humans • Identify the different types of teeth in humans and their simple functions • Construct and interpret a variety of food chains, identifying producers, predators and prey.	• Describe the changes as humans develop to old age.	• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Describe the ways in which nutrients and water are transported within animals, including humans.
Living Things						
Understanding the world The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.		• Explore and compare the differences between things that are living, dead, and things that have never been alive • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants,		• Recognise that living things can be grouped in a variety of ways • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • Recognise that environments can change and	• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • Describe the life process of reproduction in some plants and animals.	• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics.

		and how they depend on each other • Identify and name a variety of plants and animals in their habitats, including micro-habitats • Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.		that this can sometimes pose dangers to living things.		
Plants						
<u>Understanding the world</u> <u>The Natural World</u> Explore the natural world around them, making observations and drawing pictures of plants	• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants, including trees.	• Observe and describe how seeds and bulbs grow into mature plants • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • Investigate the way in which water is transported within plants • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.		• Describe the process of sexual reproduction in plants. • Describe the process of asexual reproduction in flowering plants.	
Electricity						
				• Identify common appliances that run on electricity • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • Identify whether or not a lamp will light in a simple series circuit, based on		• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers

				whether or not the lamp is part of a complete loop with a battery • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • Recognise some common conductors and insulators, and associate metals with being good conductors.		and the on/off position of switches • Use recognised symbols when representing a simple circuit in a diagram.
Forces						
		(Link to materials – some materials can be changed by force)	• Compare how things move on different surfaces •Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.		• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
Materials/Properties and changing materials						
	• Distinguish between an object and the material from which it is made • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses		• Compare and group materials together, according to whether they are solids, liquids or gases • Observe that some materials change state when they are heated or cooled, and	• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity	

	• Describe the simple physical properties of a variety of everyday materials • Compare and group together a variety of everyday materials on the basis of their simple physical properties.	• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		measure or research the temperature at which this happens in degrees Celsius (°C) • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	(electrical and thermal), and response to magnets • Some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • Demonstrate that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	
Light						
	(Link to seasonal changes – sun safety – Introduce shadows and the sun being a source of light)		• Recognise that they need light in order to see things and that dark is the absence of light • Notice that light is reflected from surfaces • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes • Recognise that shadows are formed when the light from a light source is blocked by a solid object			• Recognise that light travels in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • Use the idea that light travels in straight lines to explain why shadows have the

			• Find patterns in the way that the size of shadows change.			same shape as the objects that cast them.
Sound						
	(Link to music – pitch/long and short sounds/dynamics and tempo)	(Link to music – pitch/long and short sounds/dynamics and tempo)		• Identify how sounds are made, associating some of them with something vibrating • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produced it • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Recognise that sounds get fainter as the distance from the sound source increases.		
Rocks						
	(Link to Year 1 – dinosaur topic, introduction of fossils)		• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • Describe in simple terms how fossils are formed when things that have lived are trapped within rock •Recognise that soils are made from rocks and organic matter.			
Earth and Space						
<u>Understanding the world</u> <u>The Natural World</u> *Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter*	(Linked to Year 1 – Geography – Earth-oceans and United Kingdom)	(Link to Year 2 – Geography – 7 continents/north and south poles, 5 oceans)	(Link to Year 3 – Geography – Earth -Climate zones/ topographical features)		• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system • Describe the movement of the Moon relative to the Earth • Describe the Sun, Earth and Moon as approximately spherical bodies	

					• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Evolution and Inheritance						
		(Linked to Year 2 -Animals and Living things – offspring,, habitats)	(Linked to Year 3 -rocks – fossils)		(Linked to year 5 – Living things – reproduction)	• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

6. SCIENTIFIC SKILLS PROGRESSION

(5 Types of enquiry skills - Observation over time, Pattern seeking, Identifying, classifying and grouping, Comparative and fair testing, Research using secondary sources)

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Planning						
Having their own ideas– thinking of ideas; finding ways to solve problems; finding new ways to do things Making predictions Planning making decisions about how to solve a problem and reach a goal	Ask simple questions when prompted Suggest ways of answering a question	Ask simple questions Recognise that questions can be answered in different ways	Ask relevant questions when prompted Set up simple and practical enquiries, comparative and fair tests Set up comparative tests	Ask relevant questions Plan different types of scientific enquiries to answer questions Set up simple and practical enquiries, comparative and fair tests	With prompting, plan different types of scientific enquiries to answer questions With prompting, recognise and control variables where necessary	Plan different types of scientific enquiries to answer questions Recognise and control variables where necessary
Conducting Experiments						
Testing their ideas. Children use everyday language as they explore to talk about size, weight, capacity. They explore characteristics of everyday objects and shapes Children safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	Make relevant observations Conduct simple tests, with support	Observe closely, using simple equipment Perform simple tests	Make systematic observations, using simple equipment Use standard units when taking measurements	Make systematic and careful observations using a range of equipment, including thermometers and data loggers Take accurate measurements using standard units, where appropriate	Select, with prompting, and use appropriate equipment to take readings Take precise measurements using standard units	Take measurements using a range of scientific equipment Take measurements with increasing accuracy and precision Take repeat readings when appropriate
Recording Evidence						
Developing ideas of grouping , sequencing, cause and effect Children represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.	With prompting, suggest how findings could be recorded	Record and communicate their findings in a range of ways and begin to use simple scientific language	Record findings in various ways With prompting, suggest how findings may be tabulated With prompting, use various ways of recording, grouping and displaying evidence	Record findings using simple scientific language, drawings and labelled diagrams Record findings using keys, bar charts, and tables Gather, record, classify and present data in a variety of ways to help to answer questions	Take and process repeat readings	Record data and results of increasing complexity using scientific diagrams and labels
Reporting Findings						
Making links and noticing patterns <u>Speaking:</u> Uses talk to organise, sequence and clarify	Recognise findings	Identify and classify	With prompting, suggest conclusions from enquiries Suggest how findings could be reported	Report on findings from enquiries, including oral and written explanations, of results and conclusions	Record data and results Record data using labelled diagrams, keys, tables and charts	Report and present findings from enquiries, including conclusions and causal relationships

thinking and ideas Gives meaning to marks they make as the draw, write and paint Children can make observations about plants and animals and explain why some things occur and talk about changes.				Report on findings from enquiries using displays or presentations	Use line graphs to record data	Report and presents findings from enquiries in oral and written forms such as displays and other presentation Report and present findings from enquiries, including explanations of, and degree of, trust in results
Predictions and Conclusions						
Checking how well their activities are going Changing strategy as needed Reviewing how well the approach worked <u>Understanding:</u> Listens and responds to ideas expressed by others Children can discuss similarities and differences between living things, objects and materials.	Gather and record data Use observations to suggest answers to questions	Gather and record data to help answer questions Use their observations and ideas to suggest answers to questions	Suggest possible improvements or further questions to investigate	Identify differences, similarities or changes related to simple scientific ideas and processes Use straightforward scientific evidence to answer questions or to support their findings Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships With support, present findings from enquiries orally and in writing Suggest further comparative or fair tests	Identify scientific evidence that has been used to support or refute ideas or arguments Use test results to make predictions to set up further comparative and fair tests

7.KEY VOCABULARY

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals, including Humans						
I wonder if…. I think that….	common animals fish amphibians reptiles birds mammals pets Carnivores meat, cat, dog, lion, fox, shark, killer whale, eagle, hawk, snake, tyrannosaurus rex Herbivores plants, cow, hamster, guinea pig, tortoise, triceratops Omnivores Meat and plants, badger, human, bear, chickens head neck arms elbows legs knees face ears eyes hair mouth teeth	offspring grow adults nutrition reproduce Survival water, food air, exercise, hygiene egg – chick – chicken egg – caterpillar – pupa – butterfly spawn – tadpole – frog lamb – sheep baby – toddler – child – teenager - adult	nutrition vitamins minerals fat protein carbohydrates fibre water skeletons – support – protection skull – brain ribs – heart, lungs movement joint muscles – movement, pull, contract, relax diet	human digestive system mouth tongue – mixes, moistens, saliva teeth – incisors – cutting, slicing canines – ripping, tearing molars – chewing, grinding oesophagus transports stomach acids enzymes small intestine – absorbs water, vitamins large intestine – compacts carnivore herbivore brush floss not too many sweets food chain Sun producers prey predators	human development baby – toddler – child – teenager – adult puberty gestation length mass grows grow growing	human internal organs – heart, lungs, liver, kidney, brain skeletal skeleton muscle muscular digest digestion digestive human circulatory system - heart, blood, vessels impact – diet, exercise, drugs, lifestyle nutrients water damage – drugs, alcohol substance

Living Things						
I wonder if…. I think that….		living dead never alive habitats micro-habitats food food chain sun- grass – cow – human alive healthy logs leaf litter stony path under bushes shelter seashore woodland ocean rainforest conditions - hot/warm/cold dry/dark/damp bright/shade/dark		environment flowering non-flowering plants animals vertebrate dangers vertebrate – fish, amphibians, reptiles, birds, mammals invertebrate – snails, slugs, worms, spiders, insects plants – flowering plants (including grasses, non-flowering (including mosses and ferns) human impact – positive – nature reserves, ecologically planned parks, garden ponds negative – population, development, litter, deforestation	life cycles – Mammal, amphibian, insect, bird life process of reproduction – plants, animals, vegetable garden, flower border animal behaviourist – Jane Goodall reproduction – plants – sexual, asexual animals – sexual lifecycles around the world – rainforest, oceans, desert, prehistoric similarities differences	micro-organisms plants animal classification classify animals invertebrates- insects, spiders, snails, worms vertebrates – fish, amphibians, reptiles, birds, mammals scientists – Carl Linnaeus
Plants						
I wonder if…. I think that….	common wild plants garden plants deciduous evergreen tree – deciduous evergreen, trunk, branches, leaf, root plant – leaf, root, leaves, bud, flowers blossom, petals, root stem fruit vegetables bulb seed	water light suitable temperature grow healthy germination reproduction	structure – flowering plants, roots, stem/trunk, leaves, flowers function – nutrients, support, reproduction, makes its own food requirements for life and growth – air, light, water, nutrients from soil, room to grow needs vary, fertiliser life cycle - flowers, pollination, seed formation, seed dispersal			

Electricity						
I wonder if…. I think that….				appliances electricity electrical circuit cell wire bulb buzzer danger electrical safety sign insulators - wood, rubber, plastic, glass conductors – metal, water, switch open closed		voltage brightness volume switches – on/off, open/closed danger series circuit working safely with electricity circuit diagram switch bulb buzzer motor recognised symbols electrical safety sign
Forces						
I wonder if…. I think that….			force push pull open surface magnet magnetic attract repel magnetic poles North South		gravity air resistance water resistance friction surface force effect move accelerate decelerate stop change direction brake mechanism pulley gear spring theory of gravitation Galileo Galilei Isaac Newton	
Materials/Properties and changing materials						
I wonder if…. I think that….	material – wood, plastic, glass, metal, water, rock	wood, metal, plastic, glass, brick, rock, paper, cardboard	appearance physical properties properties –	solid – iron, ice melt	properties – hardness, solubility, transparency, conductive	

	properties – hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent brick paper fabrics elastic foil	squashy, bending, twisting, stretching metal – coins, cans, cars, table legs wood – matches, floors, telegraph poles spoons – plastic, wood, metal, but not glass John Dunlop – rubber Charles Macintosh - waterproof	hard/soft, shiny/dull, rough/smooth, smooth/not smooth fossils- sedimentary rock	freeze liquid evaporate condense gas container changing state- chocolate, butter, cream heated cooled cool degrees Celsius thermometer water cycle – evaporate, evaporation, condense, condensation temperature – melting, melt ice – warm/cool water – warm/cool water vapour	(electrical and thermal), response to magnets dissolve – liquid solution separate separating solids, liquids, gases – filtering, sieving, evaporating reversible changes – dissolving, mixing, evaporation, filtering, sieving, melting irreversible – new material, burning, rusting magnetism electricity Chemists – Spencer Silver, Ruth Benerito quantitative measurements – conductivity, insulation chemical	
Light						
I wonder if…. I think that….			light see dark reflect surface natural - star, Sun, Moon artificial – torch, candle, lamp shadow blocked solid sunlight dangerous protect eyes			light travels straight reflect reflection light source object shadows mirrors periscope rainbow filters
Sound						
I wonder if…. I think that….				vibrate vibration		

				vibrating air medium ear hear sound volume pitch faint fainter loud louder string percussion woodwind brass insulate		
Rocks						
I wonder if.... I think that....			appearance physical properties - hard/soft, rough/smooth, absorbent/not absorbent fossils sedimentary rock soils organic matter buildings gravestones grains crystals			
Earth and Space						
I wonder if.... I think that....					Planets - Earth Sun Moon Mercury Venus Mars Jupiter Saturn Uranus	

					Neptune Pluto moon star solar system dwarf planet movement- rotate, orbit, axis celestial body sphere spherical day night light heat eclipse satellite universe solar astronomer – Ptolemy Alhazen Copernicus Shadow clock sundial	
Evolution and Inheritance						
I wonder if…. I think that….						living things change fossils offspring vary not identical characteristics variation evolution adaption inherit inheritance adapt environment extreme conditions advantageous v disadvantageous

						Charles Darwin Alfred Wallace Palaeontologist – Mary Anning

8. SCIENTIFIC ENQUIRY VOCABULARY

(5 Types of enquiry skills - Observation over time, Pattern seeking, Identifying, classifying and grouping, Comparative and fair testing, Research using secondary sources)

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	question answer observe observing equipment identify classify sort group record diagram chart map data compare contrast describe biology chemistry physics		**research -** relevant questions, scientific enquiry, comparative and fair test, systematic, careful observation, accurate measurements **equipment -** thermometer, data logger **data -** gather, record, classify, present **record –** drawings, labelled diagrams, keys, bar charts, tables, oral and written explanations, conclusion, predictions differences, similarities, changes **evidence –** improve secondary sources guides, keys construct interpret		**plan –** variables, measurements, accuracy, precision, repeat findings **report data –** scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph, line graph predictions further comparative and fair test **report and present –** conclusions, causal relationship, explanations, degree of trust, oral and written display and presentation **evidence-** support, refute ideas or arguments identify, classify and describe patterns systematic quantitative measurements	