



Curriculum Progression for Science

Curriculum Lead: Helen Griffiths Link Governor: Sarah Chatwin

INTENT

At Frodsham C of E Primary School, we encourage our children to develop an enthusiasm and enjoyment of scientific learning and discovery, to be inquisitive throughout their time at the school and beyond.

We plan a broad, balanced and adapted science curriculum; ensuring the progressive development of knowledge, skills and vocabulary and for the children to develop a love of science. Furthermore, we aim to inspire in pupils a curiosity and fascination about the natural and man-made world and a respect for the environment that will remain with them for the rest of their lives.

We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

We endeavour to ensure that the Science curriculum we provide will give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experiences.

IMPLEMENTATION

The acquisition of key scientific knowledge is an integral part of our science lessons. Linked knowledge organisers enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons.

At Frodsham C of E Primary, teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science.

Science is taught weekly and is planned in topic blocks by the class teacher. Our strategy is to enable all children to be catered for through adapted planning suited to their abilities. We plan for problem solving and real-life opportunities that enable children to find out for themselves. Children are encouraged to be curious, to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating practical, engaging lessons with opportunities for precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in learning.

Our curriculum is progressive. We build upon the learning and skill development of the previous years. Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career, and new vocabulary and challenging concepts are introduced through direct teaching. Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts. Through enrichment days, such as 'science week', we promote the profile of science and allow time for the children to engage in exciting, 'hands on' tasks.

NURSERY

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2 year old children can...

- Explore natural materials, indoors and outside.
- Explore and respond to different natural phenomena in their setting and on trips

3 and 4 year old children can...

- Use all their senses in hands-on exploration of natural materials.
- Explore collections of materials with similar and/or different properties.
- Talk about what they see, using a wide vocabulary
- Plant seeds and care for growing plants.
- Understand the key features of the life cycle of a plant and an animal.
- Begin to understand the need to respect and care for the natural environment and all living things.
- Explore how things work
- Explore and talk about different forces they can feel.
- Talk about the differences between materials and changes they notice.
- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

Key vocabulary:

healthy, unhealthy, germs, head, legs, arms, hands, feet, shoulders, face, eyes, ears, mouth, tongue, teeth heart, brain, bones, skin.
autumn, winter, spring, summer, weather, hot, cold, snowing, freezing, warm, wet, cloudy, harvest, farming, leaves, light, dark, desert, polar.
plants, grow, soil, sunlight, fruit, vegetable, tree, flower, bush, water.
life cycle, grow, change, tadpole, froglet, frog, larva, caterpillar, chrysalis, cocoon.
material, float, sink, plastic, fabric, wood, strong, waterproof, bendy, light, soft, hard
Pollution, recycle, rubbish, environment, community.
Minibeast, ant, spider, worm, snail, ladybird, habitat.

RECEPTION

Children can...

- 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.
- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
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Key vocabulary:

healthy, unhealthy, germs, head, legs, arms, hands, feet, shoulders, face, eyes, ears, mouth, tongue, teeth heart, brain, bones, skin.

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autumn, winter, spring, summer, weather, hot, cold, snowing, freezing, warm, wet, cloudy, harvest, farming, leaves, light, dark, desert, polar.
 plants, grow, soil, sunlight, fruit, vegetable, tree, flower, bush, water.
 life cycle, grow, change, tadpole, froglet, frog, larva, caterpillar, chrysalis, cocoon.
 material, float, sink, plastic, fabric, wood, strong, waterproof, bendy, light, soft, hard

YEAR 1

ANIMALS INCLUDING HUMANS	SEASONAL CHANGES	EVERYDAY MATERIALS	ANIMALS INCLUDING HUMANS	PLANTS	SRE
<p>Children can...</p> <ul style="list-style-type: none"> identify the human body parts and say which of the senses each part uses? ask simple questions about the human body Identify and understand how to care for pets 	<p>Children can...</p> <ul style="list-style-type: none"> identify the seasons and the associated weather use observations and gather recordings of the seasons across the year to identify key changes perform a simple test with equipment to find out what happens to the length of the day recognise features of day and night including temperature 	<p>Children can...</p> <ul style="list-style-type: none"> name a variety of everyday materials (wood, plastic, glass, metal, water and rock) identify, classify and group materials based on their physical features carry out a simple test to answer a question about materials a range of materials 	<p>Children can...</p> <ul style="list-style-type: none"> identify, label and classify animals including fish, amphibians, reptiles, birds and mammals explain what an omnivore, carnivore and herbivore is, with an example of each understand how to care for pets 	<p>Children can...</p> <ul style="list-style-type: none"> identify, label and name a variety of common wild and garden plants, including deciduous and evergreen trees label the structure of plants, including roots, stem, flower, etc. identify and describe the basic structure of a variety of common flowering plants, 	<p>Children can...</p> <ul style="list-style-type: none"> know that we can be friends with people who are different to us understand that babies need care and support know that older children can do more by themselves know there are different types of families know which people we can ask for help
<p>Key vocabulary: head, body, eyes, ears, mouth, teeth, leg,</p>	<p>Key vocabulary: season, autumn, winter, spring, summer, weather, seasons, sunrise, sunset</p>	<p>Key vocabulary: material, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks,</p>	<p>Key vocabulary: tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, hair, carnivores,</p>	<p>Key vocabulary: leaf, flower, petal, fruit, root, seed, trunk, branch, stem, bark</p>	<p>Key vocabulary: Friends, family, same, different, family, boy, girl, male, female, private parts, penis,</p>

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		tears, rough, smooth, shiny, dull, see through, not see through	herbivores, omnivores		vulva
YEAR 2					
USES OF EVERYDAY MATERIALS	PLANTS	ANIMALS INCLUDING HUMANS	LIVING THINGS AND THEIR HABITATS	SRE	
<p>Children can...</p> <ul style="list-style-type: none"> identify and compare different materials identify materials used to build landmarks around Frodsham recognise uses of different materials explore how materials can be changed by squashing, bending, twisting & stretching 	<p>Children can...</p> <ul style="list-style-type: none"> identify what plants and seeds need to grow and stay healthy observe and describe how seeds and bulbs grow into mature plants 	<p>Children can...</p> <ul style="list-style-type: none"> describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene find out about and describe the basic needs of animals, including humans, for survival (water, food and air) notice that animals, including humans, have offspring which grow into adults 	<p>Children can...</p> <ul style="list-style-type: none"> 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, and how they depend on each other explore and compare the differences between things that are living, dead, and things that have never been alive identify and name a variety of plants and animals in their habitats, including microhabitats describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name 	<p>Children can...</p> <ul style="list-style-type: none"> understand that some people have fixed ideas about what boys and girls can do describe the difference between male and female babies describe some differences between male and female animals understand that making a new life needs a male and a female 	

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			different sources of food.	
Key vocabulary: transparent, translucent, opaque, flexible, rigid, reflective, nonreflective, absorbant	Key vocabulary: seed, bulb, germinate, seedling, bud, flower, fruit, berry, root	Key vocabulary: offspring, reproduction, growth, exercise, breathing, hygiene, germs, disease	Key vocabulary: living, dead, never been alive, habitat, microhabitat, food chain	Key vocabulary: similar, different, sex, gender roles, stereotypes, girl, boy, male, female, private parts, penis, vulva

YEAR 3

PLANTS	FORCES AND MAGNETS	ANIMALS INCLUDING HUMANS	MATERIALS - ROCKS	LIGHT	SRE
Children can... <ul style="list-style-type: none"> 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 	Children can... <ul style="list-style-type: none"> 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 compare and group together a variety of everyday materials on the basis of whether 	Children can... <ul style="list-style-type: none"> 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 	Children can... <ul style="list-style-type: none"> 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. 	Children can... <ul style="list-style-type: none"> recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object 	Children can... <ul style="list-style-type: none"> Know and respect the body differences between ourselves and others name male and female body parts using agreed words understand that each person's body belongs to them understand personal space and unwanted touch understand that all families are different and have different family members identify who to go to for help and

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that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	<p>they are attracted to a magnet, and identify some magnetic materials</p> <ul style="list-style-type: none"> describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing 			<ul style="list-style-type: none"> find patterns in the way that the size of shadows change 	support
Key vocabulary: roots, stem/trunk, leaves, photosynthesis, pollen, pollination, seed formation, seed dispersal, germination	Key vocabulary: force, magnetic force, magnet, attract, repel, poles, contact force, non-contact force	Key vocabulary: nutrition, nutrients, carbohydrates, proteins, vitamins and minerals, fibre skeleton, bones, muscles, joints	Key vocabulary: rock, fossil, soil	Key vocabulary: light, dark, light source, transparent, translucent, opaque, shadow, reflect, mirror	Key vocabulary: Stereotypes, gender roles, similar, different, male, female, private parts, penis, testicles, vulva, vagina, uterus, family, fostering, adoption, relationship
YEAR 4					
ANIMALS INCLUDING HUMANS	ELECTRICITY	LIGHT AND SOUND	LIVING THINGS AND HABITATS	STATES OF MATTER	SRE
<p>Children can...</p> <ul style="list-style-type: none"> use scientific language to describe the digestive system identify teeth and explain the differences in their 	<p>Children can...</p> <ul style="list-style-type: none"> identify common appliances that run on electricity explain how a series electrical circuit works and create my own 	<p>Children can...</p> <ul style="list-style-type: none"> explain how sounds are travel and the role of vibrations enquire how sounds change with distance and present my findings 	<p>Children can...</p> <ul style="list-style-type: none"> ask questions about why environments change and use the answers to draw conclusions explore and use classification keys 	<p>Children can...</p> <ul style="list-style-type: none"> systematically observe and group materials by whether they are a solid, liquid or gas explain the part played by 	<p>Children can...</p> <ul style="list-style-type: none"> understand that puberty is an important stage in the human lifecycle know some changes that happen during

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<p>functions</p> <ul style="list-style-type: none"> construct and interpret a variety of food chains, identifying producers, predators and prey 	<ul style="list-style-type: none"> test the role of a switch in an electrical circuit and present my findings recognise similarities in some common conductors and insulators Identify alternative sources of energy 	<p>in different ways</p> <ul style="list-style-type: none"> through enquiry, predict and find patterns between the pitch of a sound and features of the object that produced it observe then explain how patterns between the volume of a sound and the strength of the vibrations that produced it 	<p>to help group, identify and name a variety of living things (plants and animals) in the local and wider environment</p> <ul style="list-style-type: none"> recognise that environments can change and can pose dangers 	<p>evaporation and condensation in the water cycle and associate the rate of evaporation with temperature after a practical enquiry</p> <ul style="list-style-type: none"> report what happens when materials change state through their own observations 	<p>puberty</p> <ul style="list-style-type: none"> know about the physical and emotional changes that happen in puberty understand that children change into adults to be able to reproduce if they choose to know that respect is important in all relationships including online explain how friendships can make people feel unhappy or uncomfortable
<p>Key vocabulary: digestive system, digestion, oesophagus, stomach, small intestine, large intestine, mouth, tongue, teeth, nutrients, absorb, canine, incisor, molar herbivore, carnivore, omnivore, producer, consumer, predator, prey, food chain</p>	<p>Key vocabulary: electricity, plug, positive, negative, electrical, mains, electrical circuit, electrical appliance, component, loose connection, short circuit, cell, battery, symbol, switch, conductor, insulator</p>	<p>Key vocabulary: sound, sound source, vibrations, pitch, volume, sound insulation</p>	<p>Key vocabulary: classification, classification key, environment, habitat, migrate, hibernate, vertebrates, invertebrates</p>	<p>Key vocabulary: change of state, melting, freezing, melting point, boiling point, evaporation, condensation, water cycle, temperature</p>	<p>Key vocabulary: lifecycle, reproduction, puberty, physical, emotional, sperm, egg, pubic hair, feelings</p>

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YEAR 5					
EARTH AND SPACE	FORCES	PROPERTIES AND CHANGES OF MATERIALS	LIVING THINGS AND THEIR HABITATS	ANIMALS INCLUDING HUMANS	SRE
<p>Children can...</p> <ul style="list-style-type: none"> 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 	<p>Children can...</p> <ul style="list-style-type: none"> 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 	<p>Children can...</p> <ul style="list-style-type: none"> compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through 	<p>Children can...</p> <ul style="list-style-type: none"> 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 	<p>Children can...</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age draw a timeline to indicate stages in the growth and development of humans. learn about the changes experienced in puberty. 	<p>Children can...</p> <ul style="list-style-type: none"> explain the main physical and emotional changes that happen during puberty ask questions about puberty with confidence understand how puberty affects the reproductive organs describe what happens during menstruation and sperm production explain how to keep clean during puberty explain how emotions/relations hips change during puberty know how to get help and support during puberty

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		<p>filtering, sieving and evaporating</p> <ul style="list-style-type: none"> • 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 			
<p>Key vocabulary: Earth, Sun, moon, planets, solar system, star, rotate, orbit</p>	<p>Key vocabulary: force, gravity, forcemeter, Newton (N), air resistance, water resistance, friction, mechanisms,</p>	<p>Key vocabulary: thermal insulator, thermal conductor, electrical insulator, electrical conductor, dissolve, solution,</p>	<p>Key vocabulary: life cycle, reproduction, sexual reproduction, asexual reproduction, fertilise, metamorphosis,</p>	<p>Key vocabulary: puberty, sexual reproduction, menstruation (period), sperm, egg, foetus, gestation, life</p>	<p>Key vocabulary: Puberty, physical changes, emotional changes, moods, menstruation, periods, tampons, sanitary</p>

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	simple machines	soluble, insoluble, sieve, filter, evaporation, reversible change, nonreversible change	runner, bulb, cutting, tuber	expectancy	towels, wet dreams, semen, erection, sweat, breasts, spots, pubic hair, facial hair, underarm hair, sexual feelings
YEAR 6					
LIGHT	ELECTRICITY	ANIMALS INCLUDING HUMANS	EVOLUTION AN INHERITANCE	LIVING THINGS AND THEIR HABITATS	SRE
Children can... <ul style="list-style-type: none"> recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to 	Children can... <ul style="list-style-type: none"> 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 and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram 	Children can... <ul style="list-style-type: none"> 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 	Children can... <ul style="list-style-type: none"> 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 	Children can... <ul style="list-style-type: none"> 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 give reasons for classifying plants and animals based on specific characteristics 	Children can... <ul style="list-style-type: none"> describe how and why the body changes during puberty in preparation for reproduction talk about puberty and reproduction with confidence explain differences between healthy and unhealthy relationships know that communication and permission seeking are important describe the decisions that have to be made before having children know some basic

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<p>explain why shadows have the same shape as the objects that cast them</p>			<p>in different ways and that adaptation may lead to evolution</p>		<p>facts about conception and pregnancy</p> <ul style="list-style-type: none"> • have considered when it is appropriate to share personal/private information in a relationship • know how and where to get support if an online relationship goes wrong
<p>Key vocabulary: light source, straight lines, light ray, reflect, shadow</p>	<p>Key vocabulary: circuit, circuit symbol, circuit diagram, cell, battery, switch, voltage</p>	<p>Key vocabulary: heart, pulse, blood, blood vessels, lungs, circulatory system, diet, exercise, drugs, lifestyle</p>	<p>Key vocabulary: evolution, offspring, inherited, characteristics, variation, environment, adapted, species, fossil</p>	<p>Key vocabulary: vertebrate, fish, amphibian, reptile, bird, mammal, invertebrate, plants</p>	<p>Key vocabulary: womb, sperm, egg, conception, fertilisation, pregnancy, sexual intercourse, twins, fostering, adoption, relationship, friendship, love, consent, intimacy, communication, personal/private information, internet safety</p>

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