SCIENCE

Science Knowledge - Biology, Chemistry, Physics

Progression in Skills at Fawkham CEP School

(see table at end of document for detailed EYFS science knowledge coverage)

Biology – Animals including humans

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Term 3: Frozen Kingdom-**Animals including humans**	Term 4: Looking after our world- - **Animals including humans**	Term 5: Dragons -**Animals including skeletons**	Term 3: Scrumdiddlyumptious! – **Animals including humans**	Term 4: Classics -**Animals including humans**	Term 6: What a performance – **Animals including humans**
-know about similarities and differences in relation to living things -make observations of animals and explain why some things occur, and talk about changes	-Identify and name a variety of common animals that are birds, fish, amphibians, reptiles 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 (birds, fish, amphibians, reptiles and mammals, and including pets). -Identify, name draw and label the basic parts of the human body and say which parts 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 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 from birth to old age.	-Identify and name the main parts of the human circulatory system, and explain 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.

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Biology – Plants

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Term 5: African Safari -**Plants**	Term 3: Looking after our world- **Plants**	Term 2: Rainforest - **Plants**			
-Know about similarities and differences in relation to living things -They make observations of plants…and talk about changes	-Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen -Identify and describe the basic structure of a variety of common plants including roots, stem/trunk, leaves and flowers.	-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 plants; roots, stem, 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 ways in which water is transported within plants. Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal			

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Biology – Living Things and their habitats

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Big city - **Living things and their habitats**		<u>Term 2:</u> Frozen Kingdom -**Living things and their habitats**	<u>Term 3:</u> Raging Rivers – **Living things and their habitats**	<u>Term 4:</u> Classics -**Living things and their habitats**
-Know about similarities and differences in relation to living things -Talk about the features of their own immediate environment and how environments might vary from one another. -Make observations 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, 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.		-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 that this can sometimes pose dangers to living things.	-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.

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Biology – Evolution and Inheritance

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Term 3: Pre-historic World – **Rocks including fossil formation**		Term 6: What a performance! - **Evolution and Inheritance**	
			-Describe in simple terms how fossils are formed when things that have lived are trapped within rock		-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.	

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Chemistry – States of Matter/Materials

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Term 2: Once upon a time -**Everyday Materials**	Term 1: Space - **Uses of everyday materials**		Term 5: Extreme Earth -**States of matter**	Term 2: Fawkham Child – **Properties of Materials** **(Properties and Changes of Materials – focus on properties)**	Term 2: Shakespeare -**Changes of Materials** **(Properties and Changes of Materials – focus on changes)**
-Know about similarities and differences in relation to materials	-Distinguish between and object and the material from which it is made. -Identify and name a variety of everyday materials, including wood, plastic, glass, water and rock. -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 physical properties.	-Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses -Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		-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 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.	-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 -Understand 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 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.	

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Chemistry – Rocks

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Term 3: Pre-historic World – **Rocks including fossils**		Term 6: What a performance! - **Evolution and Inheritance**	
			-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.		-Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Physics – Light

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Term 1: Where I live - **Light**		Term 4: Classics -**Light**			Term 3: WW2 - **Light**
	Additional unit – no NC skills See exploratory unit plan below*		-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 Find patterns in the way that the sizes of shadows change.			-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 explain why shadows have the same shape as the objects that cast them.

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Physics – Sound

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Term 2: Space - **Sound**	Term 1: Make a Splash! - **Sound**			
		Additional unit – no NC skills See exploratory unit plan below **	-Identify how sounds are made, associating some of them with something vibrating -Recognise that vibrations from a sound 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.			

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Physics – Electricity

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				Term 1: Trash or treasure - **Electricity**		Term 1: All about me – **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 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.		-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.

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Physics – Forces and Magnets

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Term 4: Super heroes-**Forces**			Term 4: Classics -**Forces and magnets**	Term 5: Ancient Greece -**Forces 1-** gravity, friction, air resistance, water resistance	Term 5: Egyptians -**Forces 2-** levers, pulleys and gears,
	Additional unit – no NC skills See exploratory unit plan below***			-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 they are attracted to a magnet, and identify some magnetic materials -Describe magnets as having two poles -Predict whether two magnets will attract or repel each other, depending on which poles are facing.	-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.

SCIENCE

Science Knowledge

Progression in Skills at Fawkham CEP School

Physics – Earth and Space

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<u>All Terms</u> **Seasonal Changes**				<u>Term 1:</u> Space – **Earth and Space**	
-they make observations of animals and plants and explain why some things occur, and talk about changes.	-Observe changes across the four seasons -Observe and describe weather associated with the seasons and how day length varies.				-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	

***KS1 Exploratory Unit Plan** **Light**

Observe / measure over time	What happens to glow in the dark materials in a dark box? What happens to glow sticks or glow balloons?
Comparative / fair-test	How can we make the biggest/smallest/longest/shortest shadow? How can we make the darkest shadow? Which colour shows up the best in dim light?
Pattern seeking	Can everyone see all colours
Grouping and classifying	Group materials into transparent, translucent, opaque materials. Group materials into those that let light through and those that don't. Group materials into reflective or not etc.
Research	How do animals hunt at night in the dark?
Technology (design and make)	Design and make a shadow puppet. Design and make a dark den/cave

****KS1 Exploratory Unit Plan** **Sound**

Explore	Making sounds using the instruments. Blocking out sounds in various ways including hands over ears and covering ears with materials. Making sounds using everyday objects e.g. sound balloons / canisters. Make sounds using body parts e.g. clap hands, click fingers, whistle
Comparative / fair-test	Do sounds get fainter as we get further away? How can we block out the sound? Can we hear through the wall/water? Does increasing the stretch on the rubber band change its sound?
Pattern seeking	Do young people have better hearing than old people? Is one ear as good as two? Is your left ear as good as your right for hearing things? Do you need both ears to know where a sound is coming from?
Grouping and classifying	Sort instruments by how they are played. Sort instruments by material constructed from. Sort by volume or pitch Play guess which instrument using yes/no questions
Research	What can other animals hear that we can't e.g. talk about dog whistles
Technology (design and make)	Design and make a musical instrument (to use for a sound effect in a story or play) Design and make a pair of ear defenders

***KS1 Exploratory Unit Plan **Forces**

Observe / measure over time	What happens to the putty tower? What happens to the hole in the dough?
Comparative / fair-test	Which water squirter / pistol squirts water the furthest? How can we get the water squirter to squirt water further? How can we make the car/boat travel further/go faster? Do push toys bounce higher with a bigger push? Which is the bounciest ball?
Pattern seeking	Do bigger people have bigger pushes? Are both hands as strong/good at pushing?
Grouping and classifying	Sort toys into push and pull toys Sort materials into & doughs in to those that return to their original shape and those that don't once pressure is released
Technology (design and make)	Design and make a pop up toy. Design and make a sailing boat.

EYFS science opportunities (2 year EYFS planning cycle) – links to different areas of science

Science area of Knowledge	EYFS Science opportunities	Science area of Knowledge	EYFS Science opportunities
Biology **Chemistry** **Physics**	Cycle 1 Cycle 2 Ongoing – both cycles	**Biology** **Chemistry** **Physics**	Cycle 1 Cycle 2 Ongoing – both cycles
Ourselves	Y1 cycle-T3-Labelling body parts Y1 cycle-T3--Exploring senses Y1 cycle-T3--How do we keep healthy? - healthy practices including tooth brushing etc	**Plants**	Y1 cycle-T4-Unicorn/ rainbow- colour experiments e.g. skittles experiment/ dying carnations Y1 cycle-T5-Growing plants- naming parts of a plant/ observing growth and talking about conditions for growth Y2 cycle-T2-Forest school focus- -identifying different trees Y2 cycle-T3-Growing Beanstalks -labelling a plant Y2 cycle-T3-Discussing conditions for growing plants Y2 cycle-T4-Comparing different countries (Africa/England) Y2 cycle-T5--Learning about Bees- growing flowers to encourage the bees.
Animals	Butterfly boxes, hatching chicks etc. Y1 cycle-T1-Which animals come out of eggs? Y1 cycle-T1-Spiders- making water channels Y1 cycle-T2-Nocturnal animals- identifying Investigating light and dark Y1 cycle-T6-Whale blubber experiment Y2 cycle-T1-Where do bears live? Y2 cycle-T2-Which animals live in our woodland? Y2 cycle-T4-Comparing different countries (Africa/England) Y2 cycle-T5-Identifying different farm animals Y2 cycle-T5--Matching animals to their home Y2 cycle-T5--Naming animals and their young Y2 cycle-T5--Learning about Bees- growing flowers to encourage the bees.	**Properties of materials**	Dough, water, sand play Y1 cycle--T1-Spiders- making water channels Y1 cycle--T1-Which materials will protect Humpty Dumpty? Y1 cycle-T6-Floating and sinking Y1 cycle-T6-Making boats- waterproof/ not waterproof Y1 cycle-T6-Whale blubber experiment Y2 cycle-T1-Sorting materials- hard/soft Y2 cycle-T1-Making porridge Y2 cycle-T1-Bear hunt- exploring textures Y2 cycle-T3-Building houses for the Three Little Pigs- choosing materials Y2 cycle-T3-What would happen to the Gingerbread man if he swam across the river? Y2 cycle-T6-Which material makes the best boat?

Science area of Knowledge **Biology** **Chemistry** **Physics**	**EYFS Science opportunities** Cycle 1 Cycle 2 Ongoing – both cycles	**Science area of Knowledge** **Biology** **Chemistry** **Physics**	**EYFS Science opportunities** Cycle 1 Cycle 2 Ongoing – both cycles
Light	Y1-T2--Nocturnal animals- identifying Investigating light and dark Y1-T2--Learning about different light sources Y1 cycle-T2--What is in the sky at night? Y2 cycle-T2-Seasonal changes	**Materials changing**	Cooking Modelling materials Y1 cycle-T4--Making potions and observing reactions Y1 cycle-T4-Unicorn/ rainbow- colour experiments e.g. skittles experiment/ dying carnations Y2 cycle-T1-Making porridge Y2 cycle-T3-What would happen to the Gingerbread man if he swam across the river? Y2 cycle-T4-Bread experiment- which condition causes the bread to go mouldy? Y2 cycle-T4-Observing decay on different foods
Sound	Percussion instruments Junk model instrument making/playing	**Forces and motion**	Cars and other wheeled vehicles & sit on wheeled vehicles Construction toys that need bits pushing together/ pulling apart Y2 cycle-T6-Making flying machines and testing them Y2 cycle-T6-Building bridges Y2 cycle-T6-Ramps science experiment Y2 cycle-T6-Which material makes the best boat?
Space	Y1 cycle-T2--What is in the sky at night?		