Science Progression and Assessment Grids

Whittingham
C of E PRIMARY SCHOOL

KS1	LKS2	UKS2
Intent: At Whittingham C of E Primary School, it is our intention to recognise the importance of Science in every aspect of daily life. We give the teaching and learning of Science the prominence it requires. The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence. We intend to build a Science curriculum which develops learning and results in the acquisition of knowledge and build a Science curriculum which enables children to become enquiry based learners. We will ensure they are covering skills and concepts from the National Curriculum. We aim to develop their scientific skills and concepts which are transferrable to different areas within science. We have chosen these topics for their local relevance and how they have impacted the wider world. It allows children to embed scientific knowledge and start to develop their scientific questioning and use of key vocabulary.		
Implementation: We will structure the lessons so that prior knowledge, revision of facts and scientific knowledge are built upon. We will ensure that revision and introduction of key vocabulary is built into each lesson. We will ensure that children have the opportunity to apply these skills and language during the lesson.		
Impact: We want the children to develop a love of science and exploring scientific concepts which they can relate to. As the children develop their vocabulary these will be displayed throughout the school/classroom for children to refer to during the lesson. We will measure the impact of their learning through key questioning, child led assessment and summative assessment.		

KPI's- Working Scientifically

Year 1	Year 2
• Ask simple questions and recognise that they can be answered in different ways (Year 1 focus) • Use simple equipment to observe closely (Year 1 focus) • Perform simple tests (Year 1 focus) • Identify and classify (Year 1 focus) • Use his/her observations and ideas to suggest answers to questions (Year 1 focus) • Gather and record data to help in answering questions (Year 1 focus)	• Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum (Year 2 focus) • Use simple equipment to observe closely including changes over time (Year 2 focus) • Perform simple comparative tests (Year 2 focus) • Identify, group and classify (Year 2 focus) • Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns (Year 2 focus) • Gather and record data to help in answering questions including from secondary sources of information (Year 2 focus)
Year 3	**Year 4**
• Ask relevant questions and use different types of scientific enquiries to answer them (Year 3 focus) • Set up simple practical enquiries, comparative and fair tests (Year 3 focus) • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (Year 3 focus) • Gather, record, classify and present data in a variety of ways to help in answering questions (Year 3 focus) • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (Year 3 focus) • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (Year 3 focus) • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (Year 3 focus) • Identify differences, similarities or changes related to simple scientific ideas and processes (Year 3 focus) • Use straightforward scientific evidence to answer questions or to support his/her findings (Year 3 focus)	• Ask relevant questions and use different types of scientific enquiries to answer them (Year 4 focus) • Set up simple practical enquiries, comparative and fair tests (Year 4 focus) • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (Year 4 focus) • Gather, record, classify and present data in a variety of ways to help in answering questions (Year 4 focus) • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (Year 4 focus) • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (Year 4 focus) • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (Year 4 focus) • Identify differences, similarities or changes related to simple scientific ideas and processes (Year 4 focus) • Use straightforward scientific evidence to answer questions or to support his/her findings (Year 4 focus)

	Year 5	**Year 6**
	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (Year 5 focus) • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (Year 5 focus) • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 5 focus) • Use test results to make predictions to set up further comparative and fair tests (Year 5 focus) • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (Year 5 focus) • Identify scientific evidence that has been used to support or refute ideas or arguments (Year 5 focus)	• Plan different types of scientific enquiries to answer their own or others' questions, including recognising and controlling variables where necessary (Year 6 focus) • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (Year 6 focus) • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 6 focus) • Use test results to make predictions to set up further comparative and fair tests (Year 6 focus) • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (Year 6 focus) • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations (Year 6 focus) • Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources • Group and classify things and recognise patterns
Animals including humans	**Year 1**	**Year 2**
	• 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	• Understand that animals, including humans, have offspring which grow into adults • 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

	Year 3	**Year 4**
	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
	Year 5	**Year 6**
	• 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 and their habitats	**Year 1**	**Year 2**
		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
	Year 3	**Year 4**
		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 and have an impact on living things
	Year 5	**Year 6**
	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
Materials	**Year 1**	**Year 2**
	• 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 • 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	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • Describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
	Year 3	**Year 4**
	Year 5	**Year 6**
	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 • Recognise 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	
Plants	**Year 1**	**Year 2**
	• 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
	Year 3	**Year 4**
	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	
	Year 5	**Year 6**
Seasonal Changes	**Year 1**	**Year 2**
	• Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies	
	Year 3	**Year 4**
	Year 5	**Year 6**

Electricity	**Year 1**	**Year 2**
	Year 3	**Year 4**
		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
	Year 5	**Year 6**
		• 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
Forces and Magnets	**Year 1**	**Year 2**
	Year 3	**Year 4**
	Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance	

	• 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	
	Year 5	**Year 6**
	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 • 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	
S Light O	**Year 1**	**Year 2**
	Year 3	**Year 4**
	Recognise that he/she needs 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 eyes • Recognise that light from the sun can be dangerous and that there are ways to protect eyes • Find patterns in the way that the size of shadows change	
	Year 5	**Year 6**
		• 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
	Year 1	**Year 2**

	Year 3	**Year 4**
		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
	Year 5	**Year 6**
Rocks	**Year 1**	**Year 2**
	Year 3	**Year 4**
	• 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	
	Year 5	**Year 6**
S t	**Year 1**	**Year 2**

	Year 3	**Year 4**
		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
	Year 5	**Year 6**
Earth and Space	**Year 1**	**Year 2**
	Year 3	**Year 4**
	Year 5	**Year 6**
	• 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	**Year 1**	**Year 2**
	Year 3	**Year 4**
	Year 5	**Year 6**
		• 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

Key Vocabulary		
KS1	**LKS2**	**UKS2**
<u>General Scientific Vocab</u> **Investigate Measure Changes Prove Observe Predict Simple Tests Identify Classify Groups Gathering/Recording Data Equipment Questioning Experiment**	<u>General Scientific Vocab</u> **Investigate Measure Changes Prove Observe Predict Simple Tests Identify Classify Groups Gathering/Recording Data Equipment Questioning Experiment**	<u>General Scientific Vocab</u>
<u>A - Animals including humans</u> **Fish Amphibian Reptile Bird Mammals Insects Carnivore Herbivore Omnivore**	<u>A – Light and Sound</u> **Light shadows dark transparent Opaque translucent echo pitch Convex concave vibration air sound**	<u>A – Evolution and Inheritance: survival of the fittest</u> **Fossils inhabited offspring adaptation Evolution variation survive**

Human Body (neck, head, arm etc.) Survival Oxygen Food Water Shelter Sleep Offspring Adults Living/Dead/Never been alive Habitats Microhabitats Food Chain Food Sources	**Medium ear faint decibel Amplify frequency loud low quiet High rhythm**	**Natural selection sibling genes Environment chromosome extinct Endangered inheritance organism Palaeontologist**
A - Materials and their uses **Materials Plastic Wood Paper Glass Metal Rock Hard Soft Transparent Translucent Opaque Squashing Bending Twisting Stretching**	A – Forces and Magnets **Magnets springs metal iron weight Push pull gravity force downwards Upwards friction air resistance Water resistance force meter momentum Up thrust acceleration velocity attract Repel magnetic poles north south Exert apply buoyancy newton Drag displacement equal/unequal Unbalanced force extend mean**	A – Forces and Properties of Materials **Resistance faster/slower friction Levers pulleys gears force Water resistance air resistance friction Gravity gas solid liquid dissolve Reversible changes filtering sieving Evaporating substance solution fair test**
A - Plants/Seasonal Changes **Wild/Garden Plants Deciduous Evergreen Trees Bulbs Mature Plants Water Light Temperature 4 Seasons Weather**	A – Plants and living things **Roots stem trunk leaves flowers Petal air light water nutrients Lifecycle pollination seed formation Seed dispersal reproduction fertilizer Water transportation warmth temperature Non-flowering plants ferns mosses**	A – All living things **Life cycle amphibian mammal insect Reptile bird reproduction sexual a-sexual micro-organisms subdivided invertebrates vertebrates habitat**
B - Weather **Oxygen Fire Fuel Dry Wind Season**	B –Electricity **Cells wires bulbs switches buzzers Complete loop open and closed circuits Simple series circuit conductor insulator Motor battery appliance Electrical circuit**	B – Animals including humans **Develop old age growth puberty Gestation period circulatory system Nutrients internal organs**
B - Living things and their habitats	B – Rocks and states of matter	B – Light and Electricity

Fish Amphibian Reptile Bird Mammals Insects Carnivore Herbivore Omnivore Human Body (neck, head, arm etc.) Survival Oxygen Food Water Shelter Sleep Offspring Adults Living/Dead/Never been alive Habitats Microhabitats Food Chain Food Sources	**Solids liquids gas heated cooled Evaporation condensation water cycle Fossils grains crystals organic matter**	**Straight lines reflect shadows Reflection light source brightness Components buzzers bulbs switches Simple circuit voltage cells**
<u>B – Plants and Trees</u> **Wild/Garden Plants Deciduous Evergreen Trees Bulbs Mature Plants Water Light Temperature 4 Seasons Weather**	<u>B –Living things and their habitats</u> **Nutrition skeleton muscles digestive system food chains producers predators prey mouth tongue teeth oesophagus stomach small/large intestine carnivores/herbivores/omnivores teeth molars canine incisors enamel**	<u>B – Earth and Space</u> **Planets solar system sun earth Mercury Venus mars Jupiter Saturn Uranus spherical bodies day and night Sun dials orbits celestial body axis**