Woodham Burn Primary
Science

The progression grid outlines the specific knowledge and skills which pupils are expected to learn, along with the specific vocabulary which supports this understanding. Each unit of work is gathered under the appropriate scientific discipline, and where possible progression grids are organised to support the order of the learning journey across school. Also below is a progression map which highlights the teaching sequence.

Scientific Enquiry – The skills every pupil needs to ensure they can be a scientist

	At EYFS:	At Key Stage One:	At Lower Key Stage Two:	At Upper Key Stage Two:
Skills/Knowledge	• Children know about similarities and differences in relation to places, objects, materials and living things • Children talk about the features of their own immediate environment and how environments might vary from one another • Children describe shapes, spaces, and measures	• **E1**: ask simple questions and recognise that they can be answered in different ways • **E2:** observe closely, using simple equipment • **E3:** perform simple tests **E4:** dentify and classify • **E5:** use their observations and ideas to suggest answers to questions • **E6:** gather and record data to help in answering questions	• **E1:** ask relevant questions and use different types of scientific enquiries to answer them • **E2:** set up simple practical enquiries, comparative and fair tests • **E3:** make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • **E4:** gather, record, classify and present data in a variety of ways to help in answering questions • **E5:** record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • **E6:** report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • **E7:** use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • **E8:** identify differences, similarities or changes related to simple scientific ideas and processes • **E9:** use straightforward scientific evidence to answer questions or to support their findings.	• **E1:** plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • **E2:** take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • **E3:** record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • **E4:** using test results to make predictions to set up further comparative and fair tests • **E5:** 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 • **E6:** identify scientific evidence that has been used to support or refute ideas or arguments

Being a Scientist – Exemplifying scientific behaviours which ensure pupils know more and remember more

	At EYFS:	At Key Stage One:	At Lower Key Stage Two:	At Upper Key Stage Two:
Skills/Knowledge	• Children make observations of animals and plants and explain why some things occur, and talk about changes • Children use what they have learnt about media and materials in original ways, thinking about uses and purposes	• **B1:** Enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. • **B2:** They should be encouraged to be curious and ask questions about what they notice. • **B3:** They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions,	• **B1:** Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. • **B2:** They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about	• **B1:** Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up • comparative and fair tests and explain which variables need to be controlled and why.

		including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. • **B4:** They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.	criteria for grouping, sorting and classifying; and use simple keys. • **B3:** They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them • **B4:** They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. • **B5:** They should learn how to use new equipment, such as data loggers, appropriately. • **B6:** They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. • **B7:** With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. • **B8:** With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. • **B9:** They should also recognise when and how secondary sources • might help them to answer questions that cannot be answered through practical investigations. • **B10:** Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.	• **B2:** They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. • **B3:** They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. • **B4:** They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. • **B5:** They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. • **B6:** They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

Biology – Animals including humans						
	Key Stage One		Lower Key Stage Two		Upper Key Stage Two	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	• Perform a simple test related to senses. • To gather and record information.	• Setting up a practical test. Do children get faster as they grow older. • Recording of findings using simple scientific language by writing a result of a scientific investigation.	• Setting up simple practical enquiries of how muscles work in pairs. • Recording of findings using simple scientific language by writing a result of a scientific investigation.	• To carry out s practical investigation to show how the digestive system works. • To use straightforward scientific evidence to answer questions about the digestive system.	• Record data and results of increasing complexity using bar and line graphs, and models in the context of comparing gestation periods and life expectancies of animals. • I can record complex data using graphs and models	• To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurement with increasing accuracy and precision, taking repeat readings when appropriate by creating an enquiry that compares and categorises different forms of exercise and by taking accurate pulse measurements to gather data.
Key Outcomes	• I know the names of some common amphibians, fish, reptiles, birds and mammals. • I know the names of some common carnivores. herbivores and omnivores. • I know differences between some common fish, amphibians, reptiles, birds and mammals. • I know how to describe the parts of an animal. • I know what kind of animals are kept as pets. • I know how to label the human body and say which part of the body is connected to which sense.	• I know what happens to animals over time. • I know the names of different animals' young. • I know what animals and humans need to survive. • I know why exercise and a healthy diet is important. • I know why it is important to make sure you are clean and hygienic. • I know that animals, including humans have offspring which grow into adults.	• I can explain how animals obtain their food. • I know why animals including humans need the right types of nutrition. • I know about and can describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene. • I know how to compare and group animals by their diet. • I can identify and name bones. • I can identify and name the main functions of the skeleton. • I know why we need muscles to move.	• I know about the different parts of the human digestive system. • I know how to explain the different parts of the digestive system. • I know about the different types of teeth in humans and their simple functions. • I know how to draw and interpret a variety of food chains identifying producers, predators and pray.	• I know how to describe humans change as they age. • I know how babies how and develop. • I know how to describe and explain the main changes that occur during puberty. • I know how to identify the changes that take place in old age. • To know how to record complex data using graphs and models.	• I know how to identify and name the main parts of the human circulatory system. • I know how to describe the functions of the heart, blood vessels and blood. • I know about the impact of diet, exercise, drugs and lifestyle on the function of the human body. • I know how to describe the ways in which nutrients and water are transported within animals and humans. • I can describe how scientific evidence highlighted the dangers of smoking.

Topic Vocabulary	Reptiles, Mammals, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore,	Survival, Offspring, Calf, Exercise, Hygiene	Muscles, Contract, Relax, Joints, Nutrition, Nutrients, Carbohydrates, Protein,	Fats, Fibre, Vitamins, Minerals, invertebrates, vertebrates, Digestive system,	Small Intestine, Large Intestine, Colon, Saliva, Canine, Incisor, Molar Producers,	Foetus Embryo Womb Gestation Development Puberty Life Cycle Fertilisation	Reproduce Life Expectancy skeletal muscle digest	circulatory system blood vessels lifestyle nutrients substances	

Biology – Plants						
	Key Stage One		Lower Key Stage Two		Upper Key Stage Two	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	• To observe closely, using simple equipment in the context of observing the growth of bean plants. • To use their observations and ideas to suggest answers to questions by answering questions about what plants need to grow.	• To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy by comparing the growth of seedlings under different conditions. • To gather and record data to help in answering questions by measuring the results of a comparative test.	• To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) by investigating what plants need to grow well. • To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables by observing and recording plant growth. • To investigate the way in which water is transported within plants by observing the transport of food colouring through a flower stem.			
Key outcomes	• I know how to plant a bean. • I know the names of some deciduous and evergreen plants. • I know how to sort deciduous and evergreen leaves. • I know how to identify and describe the basic structure of a variety of common plants including trees. • I can talk about how my bean plant has grown. • I can say what plants need to grow well and give reasons for my answers.	• I know how seeds and bulbs grow into plants. • I know why plants need water, light and heat to grow and stay healthy. • I can explain the life cycle of plants. • I can explain the growth of different plants and record on a chart. (seeds vs bulbs) • I know how to record results of a comparative test.	• I know what the roots, stem or trunk, leaves, flowers of a plant do. • I know why plants need different amounts of water, light and heat to grow and stay healthy. • I know how water is transported inside plants. • I know about the lifecycle of a flowering plant. • I know how to name the different parts of a flower and explain their role in pollination and fertilisation.			
Topic Vocabulary	Garden, flower, Names of local and wild plants Seed, petal, deciduous, evergreen Plant, stem/stalk, branch, trunk, root, bulb,	Seedling, Shoot fully grown, growth, healthy, wither, soil, earth, water, light, cold/hot, nutrients.	Part, temperature, absorb, soil, well-drained, fertiliser, nutrients, plant lifecycle, transported, pollination, formation, seed dispersal			

Biology – Living things and their habitats						
	Key Stage One		Lower Key Stage Two		Upper Key Stage Two	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically		• To gather and record data to help in answering questions by investigating the preferred habitat of minibeasts.		• To recognise that environments can change and that this can sometimes pose dangers to living things by identifying changes and dangers in the local habitat. • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and table by recording observations on a map and in a table.		• To describe how things are classified into small groups, observing characteristics based on similarities and differences including micro-organisms, plants and animals.

Key outcomes		• I can observe and discuss the effects of seasonal change on plants and animals. • I can match and identify some leaves and fruit from common trees. • I know the differences between something that is living, things that are no longer alive and things that have never been alive. • I know how different habitats provide for animals and plants. • I know how different animals and plants depend on each other. • I know about different animals/plants in their habitats. • I know how a simple food chain works. • I know about and can name different food sources for different animals.		• I know how living things can be grouped together. • To know how to classify characteristics of living things, presenting in a table. • I know about how environmental changes can affect living things and pose dangers. • I know how to use a classification key to name a variety of living things in the wider and local environment.	• I know the differences between the lifecycles of a mammal, bird, insect and amphibian. • I know how to describe the reproductive cycle of a plant/animal. • I can compare the life cycles of plants, mammals, amphibians, insects and birds • I can compare the life cycles of amphibians and insects. (metamorphosis)	• I know how living things are classified into broad groups according to common observable characteristics. • I know how to classify plants and animals into groups and know why they have been classified into those groups • I can investigate different types of organisms.
Topic Vocabulary	Living Alive Dead Feed breath habitat Energy Food chain Predator shelter	Prey Woodland desert Source Adapt. Heat Habitats Micro habitats	Vertebrates, Invertebrates,	Environment, Human impact	Life Cycle, Mammal, Reproduction, Amphibian, Offspring Metamorphosis	classify classification domain kingdom phylum, class family genus species characteristics micro-organisms organism flowering non-flowering

Biology – Evolution and Inheritance						
	Key Stage One		Lower Key Stage Two		Upper Key Stage Two	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working [illegible]						
Key outcomes						• I know how fossils provide information about living things on the Earth millions of years ago. • I know why the offspring of living things are similar but not identical to their parents. • I know how animals and plants adapt to suit their environment. • I know how to explain that evolution is caused by the ability to adapt to environments • I can explain how adaptations can result in both advantages and disadvantages • I can explain how human intervention affects evolution
Topic Vocabulary					evolution adaption inherited traits adaptive traits	natural selection inheritance Charles Darwin Alfred Wallace DNA variation offspring fossil

Chemistry – Everyday Materials (Inc. Rocks)						
	Key Stage One		Lower Key Stage Two		Upper Key Stage Two	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically						
Key outcomes	• I know the difference between an object and what it is made from. • I know the names of some materials. • I know some of the properties of everyday materials. • I know how to group materials together by their features.	• I know what different materials are used for. • I know why some materials are more suitable for certain objects than others. • I know how the shape of everyday objects can be changed.	• I know how to compare and group different kinds of rocks according to their, appearance and physical properties. • I know how fossils are formed. • I know what soil is made from	• I know how to group materials by state- solid, liquid, gas. • I know that some materials change state when they are heated/cooled and observe/ research the temperature at which this happens in degrees Celsius. • I know part played by evaporation/ condensation in the water cycle, associate the rate of evaporation with temperature.	• I know how to classify materials by transparency, hardness, solubility, Electrical/ Thermal conductivity and response to magnets. • I know how some materials dissolve to form a solution. • I know how to separate materials in a solution. • I know how best to separate mixtures including filtering, sieving and evaporating. • I know how to give reasons based on evidence from comparative and fair testing for the uses of everyday materials. • I know how to demonstrate that dissolving, mixing and changes of state are reversible changes. • I know that some changes result in the formation of new materials and this change is not usually reversible.	
Topic Vocabulary	Rough, Smooth, Stretchy, Stiff, Bending, Twisting, Stretching, Elastic, Foil, Dull, Waterproof, Absorbent, Fabrics,		Fossils, Sandstone, Granite, Marble, Rock, Pumice, Crystals, Absorbent, Sedimentary, Organic matter, Grains, Solid, Liquid, Gas, Evaporation, Condensation, Particles,		Properties solubility transparency electrical -conductor thermal conductor magnets, dissolve solution, separate separating reversible changes dissolving evaporation filtering, sieving, melting irreversible new material quantitative measurements conductivity insulation chemical	

Physics – Magnets, Forces and Sound						
	Key Stage One		Lower Key Stage Two		Upper Key Stage Two	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Working Scientifically						
Key outcomes			• I know how things move on different surfaces. • I know that some forces need contact between objects, but magnetic forces can act at a distance. • I know how magnets attract and repel each other. • I know some materials that are magnetic/not magnetic and know how to group them. • I know about the poles of a magnet.	• I know how sounds are made. • I know how sound travels to your ear. • I know how the pitch of a sound depends on the object that produced it. • I know how to describe volume in terms of vibrations. • I know what happens to a sound when you get further away from it.	• I know why objects fall to Earth. • I know about the effects of air/water resistance and friction. • I know how mechanisms allow a smaller force to have a greater effect.	
Topic Vocabulary			Magnetic, Force, Attract, Repel, Friction, Poles, Magnetic Poles, gravity air resistance water resistance friction, surface force, effect accelerate decelerate		Magnetic, Force, Attract, Repel, Friction, Poles, Magnetic Poles, gravity air resistance water resistance friction, surface force, effect accelerate decelerate	

Physics – Light/electricity						
	Key Stage One		**Lower Key Stage Two**		**Upper Key Stage Two**	
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Working Scientifically						

Key outcomes			• I know why we need light to see things. • I know that dark is the absence of light. • I know why the sun is dangerous to the eyes. • I know shadows are formed and find patterns in the way the size of the shadows are formed. • I know about reflected light	• I know some appliances that run on electricity. • I know how to build a series electrical circuit and name each element. • I know how switches work in a circuit. • I know some common conductors/ Insulators. • I know why metal is a good conductor.		• I know and can talk about how light appears to travel. • I know how objects need to reflect light to be visible. • I know how we are able to see things because of light travelling. • I know why shadows are the same shape as the objects that cast them. • I know how the brightness of a lamp or volume of a buzzer is associated with the number and voltage of cells used in a circuit. • I know how to compare and give reasons for variations in how components function in circuits. • I know how to use recognised symbols to represent a simple circuit in a diagram.
Topic Vocabulary			Reflective, Reflection Natural light Artificial light.	Circuit, Series, Conductors, Insulators complete circuit Cells, Switches, Buzzers, Motor,	Refraction, Reflection, Spectrum, Rainbow travels straight reflect	light source object shadows mirrors periscope filters Amps, Volts, Voltage, Cell Circuit Diagram, Symbols

Physics – Earth and Space – Seasonal Change						
	Key Stage One		**Lower Key Stage Two**		**Upper Key Stage Two**	
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Working Scientifically	To observe and gather information about the seasons.				• Identifying scientific evidence that has been used to support or refute ideas or arguments in the context of how ideas changed from a flat earth view	

Key outcomes	• I know what the 4 seasons are/ • I know what is different about each season. • I know the kind of weather we get in each season. • I know how the length of the daylight hours changes in each season. • I can observe and discuss changes in the weather in each of the seasons.				• I know and can explain why we know the Sun, Earth and Moon are spherical. • I can name and describe features of the planets in our solar system. • I know how to order the planets in our solar system. • I know how planets move in our solar system. • I know how to explain day and night and the apparent movement of the sun across the sky. • I can investigate night and day in different parts of the Earth. • I can explain the movement of the Moon.	
Topic Vocabulary	Season, spring, summer, autumn, winter. Weather and names of common weather features. Days, hours, months. Light, dark, shadow, moon, movement.		Seed, petal, deciduous, evergreen		Sun, axis, orbit, moon, planet, star, celestial body, rotate, satellite, Neptune, Mercury, Venus, Mars, Uranus, Jupiter, Saturn, Earth, sphere, spherical bodies, geocentric model, heliocentric model, astronomer.	