Bolham Primary School Science Progression Map – Lower Key Stage Two

Scientific Knowledge and Conceptual Understanding		
Introduction: As stated in the National Curriculum, the objectives are separated into the separate year groups, however, there is no requirement for them to be taught in that specific year. This means that with our mixed year group classes, it is essential that the areas are covered through our rolling programme, but it does not matter if Year Three children are taught Year Four requirements and vice versa. Some areas in the programmes have separate areas of study e.g. Sound in Year 3, Light in Year 4. These have been grouped, where appropriate, to aid in the teaching of them.		
Programme of study	Year Three	Year Four
Plants/Living things and their habitat	• 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	• 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
Animals, including humans	• 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
Rocks	• Compare and group together different kinds of socks 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	

Light/Sound	• 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 • Find patterns in the way that the size of shadows change	• 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
Forces and magnets/States of matter	• 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	• 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
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

Working Scientifically			
Introduction: There are nine objectives for Working Scientifically across Lower Key Stage Two. The requirements should be covered by the end of Year Four, so there is no requirement for certain objectives to be covered in a specific year group. In Lower Key Stage Two at Bolham, we have grouped them into five categories. There are then suggestions for which subject areas these should be covered in. These objectives must be met through the content of the programmes of study.			
National Curriculum objectives	Detailed objectives	Year Three	Year Four
Asking questions and carrying out fair and comparative tests • Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests	• Start to raise their own relevant questions about the world around them in response to a range of scientific experiences • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions • Recognise when a fair test is necessary • Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be useful • Set up and carry out simple comparative and fair tests	<u>Plants/Living things in their habitat</u> - 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. <u>Rocks</u> - Compare and group together different kinds of socks on the basis of their appearance and simple physical properties. <u>Light/Sound</u> - Notice that light is reflected from surfaces. - Recognise that shadows are formed when the light from a light source is blocked by an opaque object. - Find patterns in the way that the size of shadows change. <u>Forces and magnets/States of matter</u> - Compare how things move on different surfaces.	<u>Light/Sound</u> - Identify how sounds are made, associating some of them with something vibrating. - 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. <u>Forces and magnets/States of matter</u> - 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). <u>Electricity</u> - 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.

		- 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. - Predict whether two magnets will attract or repel each other, depending on which poles are facing.	- 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.
Observing and measuring changes • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	• Make systematic and careful observations • Observe changes over time • Use a range of equipment, including thermometers and data loggers • Ask their own questions about what they observe • Where appropriate, take accurate measurements using standard units using a range of equipment	<u>Plants/Living things in their habitats</u> - 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. <u>Light/Sound</u> - Recognise that shadows are formed when the light from a light source is blocked by an opaque object. - Find patterns in the way that the size of shadows change. <u>Forces and magnets/States of matter</u>	<u>Light/Sound</u> - Identify how sounds are made, associating some of them with something vibrating. - 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. <u>Forces and magnets/States of matter</u> - Compare and group materials together, according to whether they are solids, liquids or gases. - Observe that some materials change state when they are

		- 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.	heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). <u>Electricity</u> - Recognise some common conductors and insulators, and associate metals with being good conductors.
Identifying, classifying, recording and presenting data • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	• Talk about criteria for grouping, sorting and classifying • Group and classify things • Collect data from their own observations and measurements • Present data in a variety of ways to help in answering questions • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables	<u>Plants/Living things in their habitats</u> - Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. <u>Animals, including humans</u> - Identify that humans and some other animals have skeletons and muscles for support, protection and movement. <u>Rocks</u> - Compare and group together different kinds of socks on the basis of their appearance and simple physical properties. <u>Light/Sound</u>	<u>Plants/Living things in their habitat</u> - 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. <u>Animals, including humans</u> - 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. <u>Forces and magnets/States of matter</u>

		- Recognise that shadows are formed when the light from a light source is blocked by an opaque object. <u>Forces and magnets/States of matter</u> - 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 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). <u>Electricity</u> - Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. - Recognise some common conductors and insulators, and associate metals with being good conductors.
Drawing conclusions, noticing patterns and presenting findings • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	• Draw simple conclusions from their results • Make predictions • Suggest improvements to investigations • Raise further questions which could be investigated • First talk about, and then go on to write about, what they have found out • Report and present their results and conclusions to others in written and oral forms with increasing confidence	<u>Plants/Living things in their habitat</u> - 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. <u>Rocks</u> - Compare and group together different kinds of socks on the basis of their appearance and simple physical properties. <u>Light/Sound</u>	<u>Plants/Living things in their habitats</u> - Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. <u>Light/Sound</u> - Identify how sounds are made, associating some of them with something vibrating. - Find patterns between the pitch of a sound and features of the object that produced it.

		- Notice that light is reflected from surfaces. - Recognise that shadows are formed when the light from a light source is blocked by an opaque object. - Find patterns in the way that the size of shadows change. <u>Magnets and forces/States of matter</u> - 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. - Predict whether two magnets will attract or repel each other, depending on which poles are facing.	- 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. <u>Magnets and forces/States of matter</u> - 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). <u>Electricity</u> - Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. - Recognise some common conductors and insulators, and associate metals with being good conductors.
Using scientific evidence and secondary sources of information • Identifying differences, similarities or changes	• Make links between their own science results and other scientific evidence • Use straightforward scientific evidence to answer questions or support their findings	<u>Plants/Living things in their habitats</u> - Identify and describe the functions of different parts of	<u>Plants/Living in their habitats</u> - Explore and use classification keys to help group, identify and name a variety of living things in

related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings	• Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	flowering plants: roots, stem/trunk, leaves and flowers. - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <u>Animals, including humans</u> - 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. <u>Light/Sound</u> - Recognise that they need light in order to see things and that dark is the absence of light. - 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. <u>Forces and magnets/States of matter</u> - Compare how things move on different surfaces.	their local and wider environment. - Recognise that environments can change and that this can sometimes pose dangers to living things. <u>Animals, including humans</u> - Describe the simple functions of the basic parts of the digestive system in humans. - Construct and interpret a variety of food chains, identifying producers, predators and prey. <u>Light/Sound</u> - 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. <u>Forces and magnets/States of matter</u> - Identify the part played by evaporation and condensation in the water cycle and associate the

		- 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. - Predict whether two magnets will attract or repel each other, depending on which poles are facing.	rate of evaporation with temperature.

Bolham Primary School Science Progression Map – Upper Key Stage Two

Scientific Knowledge and Conceptual Understanding		
Introduction: As stated in the National Curriculum, the objectives are separated into the separate year groups, however, there is no requirement for them to be taught in that specific year. This means that with our mixed year group classes, it is essential that the areas are covered through our rolling programme, but it does not matter if Year Five children are taught Year Six requirements and vice versa. Some areas in the programmes have separate areas of study e.g. Earth and Space in Year 5, Evolution and inheritance in Year 6. These have been grouped, where appropriate, to aid in the teaching of them.		
Programme of study	Year Five	Year Six
Living things and their habitat	• 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

Animals, including humans	• 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
Properties and changes of materials/Electricity	• 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 filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for 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	• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in their 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 diagram
Earth and space	• 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	

Forces	• 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, pullets and gears, allow a smaller force to have a greater effect	
Evolution and inheritance		• 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 king, 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
Light		• 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 to 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