

**Bryn Offa CE Primary
School
Science
Medium Term Plan**

Science Vision Statement

Our vision for science is to develop curious and inquisitive learners, who use their scientific skills and knowledge to understand the world around them.

Science Intent Statement

It is the intent of Bryn Offa CE Primary School for science to be taught in all classes and year groups through at least 2 hours of lessons a week. As one of the core subjects within the National Curriculum for KS1 and KS2, it should be given the prominence it deserves. Within Reception, science is mainly taught through play and links to 'Understanding the world'. Science lessons will be differentiated so all children can access them, whilst also building on their knowledge from previous years. Wherever possible, educational visits should be linked to the current topic being taught in that class. The cost of these visits will be covered by Bryn Offa for Pupil Premium and Pupil Premium + children so all pupils can share these experiences together. Bryn Offa has a beautiful setting, this should be used extensively. Each year, the children should visit the Llanymynech Heritage Area as this can reinforce their learning in a wide range of areas, including seasonal changes, habitats, animals, plants and rocks. Children should be taught to respect and admire living organisms and the natural world around them.

The Medium Term Plan and Skill Progression Table should allow teachers to ensure that children's knowledge and skills are developed progressively, building on what they have already learnt and practised. Teachers should also use the Medium Term Plan to link scientific skills (using the Skills Progression Table for guidance) into each topic and allow children to learn about influential scientists and key scientific discoveries. Throughout each academic year, children must have had access to a variety of enquiry types: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. At Bryn Offa, pupils should spend time researching scientists and how scientific ideas have developed over time. This allows the children to see the real world application of scientific knowledge, whilst also encouraging them to view science as a potential career path. Pupils should be encouraged to present their findings in a systematic, scientific manner, including diagrams, graphs, charts and the use of technology. Developing the children's scientific skills should be considered central to each science lesson, as this gives children the building blocks they need to be successful in science at secondary school and it is also where they can let their natural curiosity and inquisitiveness flourish.

The science subject coordinator should regularly check and audit science equipment and resources so the children at Bryn Offa can develop their understanding of scientific ideas and theories practically, as well as their scientific skills. The children should be taught to respect the materials and resources they have access to, to ensure their own and others' safety. Children must be taught the key vocabulary for their topic and they should be encouraged to apply this terminology in oral discussions and in their written work. Each class must have a working wall, which allows the children to see this vocabulary, as well as the scientific skills they are developing. The children's opinions and thoughts should be collated each year, allowing the teachers and science subject coordinator to produce lessons and a curriculum which puts pupils enthusiasm and enjoyment at its heart. Ultimately, science at Bryn Offa should prepare pupils to understand the use and implications of science, today and for the future.

Bryn Offa CE Primary School Science Medium Term Plan

Due to our mixed year classes, each class is taught on a rolling 2-year cycle. This allows for the breadth and depth of the science curriculum to be covered.

Class 5	Autumn	Spring	Summer
<p>Cycle A</p> <p>Even academic years e.g.2018, 2020</p> <p>Year 3 objectives; Year 4 objectives; Year 5 objectives; Year 6 objectives</p>	<p>Electricity - Can we vary the effects of electricity?</p> <ul style="list-style-type: none"> ○ 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 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ How would you group these electrical devices based on where the electricity comes from? (Identifying and classifying) ○ Working safely with electricity ○ How does a light bulb work? How has electricity changed the way we live? (Research) ○ Explore electrical conductors and insulators ○ Which metal is the best conductor of electricity? (Comparative testing) ○ Make their own switches ○ Does the temperature of a light bulb go up the longer it is on? (Pattern seeking and observing over time) ○ Can you make your bulb brighter? ○ How does the voltage of the batteries in a circuit affect the brightness of a lamp or the volume of a buzzer? (Fair test) ○ Which type of fruit makes the best fruity battery? (Comparative testing) ○ Garrett Morgan & Thomas Edison <p>Possible Links to Computing</p> <ul style="list-style-type: none"> - Light sensors to measure the brightness of bulbs in the circuits - Sound sensors to measure the volume of buzzers <p>States of Matter- Is water always wet?</p> <ul style="list-style-type: none"> ○ 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 	<p>States of Matter continued - Is water always wet?</p> <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ Can you group these materials and objects into solids, liquids, and gases? (Identifying and classifying) ○ How does the mass of an ice cube change over time? (Observing over time) ○ How does the mass of a block of ice affect how long it takes to melt? (Fair test) ○ Which material is best for keeping our hot chocolate warm? (Observing over time) ○ Create a mini water cycle <p>Properties and Changes of Materials - Can we change materials reversibly and irreversibly?</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 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ How does a sugar cube change as it is put in a glass of water? (Observing over time) ○ How does the temperature of tea affect how long it takes for a sugar cube to dissolve? (Fair test) ○ Which type of sugar dissolves the fastest? (Comparative testing) ○ What did Stephanie Kwolek discover and why was it important? (Ideas over time) ○ What are microplastics and why are they harming the planet? (Research) ○ Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains? ○ Explore reversible changes ○ Explore changes that are difficult to reverse <p>Possible Links to Computing</p> <ul style="list-style-type: none"> - Light sensors used to measure transparency. 	<p>Living Things and their Habitats - How do living things change over time and place?</p> <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 that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal ○ Describe reproduction in some plants (sexual and asexual) and animals ○ Describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird ○ Describe how living things are classified into groups based on observable characteristics and similarities and differences, including micro-organisms, plants and animals ○ Give reasons for classifying plants and animals based on specific characteristics <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ What happens to celery when it is left in a glass of coloured water? (Observing over time) ○ How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? (Fair test) ○ What are all the different ways that seeds disperse? (Research) ○ How does a tadpole/caterpillar change over time? (Observing over time) ○ What are the differences between the life cycle of an insect and a mammal? (Research) ○ Is there a relationship between a mammal's size and its gestation period? (Pattern seeking) ○ Compare a collection of animals based on similarities and differences in their lifecycle. (Identifying and classifying) ○ Which is the most common invertebrate on our school playing field? (Comparative testing) ○ What happens to a piece of bread if you leave it on the windowsill for two weeks? (Observing over time) ○ What ideas did Edward Jenner have about small pox and how did he test them? (Ideas over time) ○ How would you make a classification key for vertebrates/invertebrates or microorganisms? (Identifying and classifying) ○ David Attenborough, Eva Crane and Carl Linnaeus ○ Survey local area for living things – compare with another environment e.g. Heritage Area <p>Possible Links to Computing</p> <ul style="list-style-type: none"> - Digital photography or possibly video for time lapse

Class 5	Autumn	Spring	Summer
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> Cycle B Odd academic years e.g.2019, 2021 Year 3 objectives; Year 4 objectives; Year 5 objectives; Year 6 objectives </p>	<p>Earth and Space - Sun, Earth and Moon: What is moving and how do we know?</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>Scientific Skills Links:</p> <ul style="list-style-type: none"> How could you organise all the objects in the solar system into groups? (Identifying and classifying) How have our ideas about the solar system changed over time? (Ideas over time) How do astronomers know what stars are made of? (Research) Can you observe and identify all the phases in the cycle of the Moon? (Identifying and classifying) Is there a pattern between the size of a planet and the time it takes to travel around the Sun? (Pattern seeking) Identify scientific evidence that has been used to support or refute ideas or arguments Compare the time of day at different places on Earth Neil Armstrong, Tim Peake and Stephen Hawking Eggonaut – return your eggonaut safely back to Earth (link to forces) <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Use of technology to access things like mars rover, Hubble etc <p>Light - How do we see?</p> <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 Find patterns in the way that the size 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> How does the Sun make light? (Research) How would you organise these light sources into natural and artificial sources? (Identifying and classifying) Are you more likely to have bad eye sight and to wear glasses if you are older? (Pattern seeking) How have our ideas about eclipses changed over time? (Ideas over time) 	<p>Light continued - How do we see?</p> <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Which material is the most reflective? (Comparative testing) Why do some people need to wear glasses to see clearly? (Research) Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? (identifying and classifying) How does my shadow change over the day? (Observing over time) Refraction experiments Designing and making a periscope and kaleidoscope <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Time lapse video can be used to show the movement of shadow etc Light sensors can be used to measure the light reflected off different surfaces <p>Forces - How and why do objects move?</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>Scientific Skills Links:</p> <ul style="list-style-type: none"> Can you label and name all the forces acting on the objects in each of these situations? (Identifying and classifying) How does the surface area of a parachute affect the time it takes to fall to the ground? (Fair test) Which shape parachute takes the longest to fall? (Comparative testing) How have our ideas about gravity changed over time? (Ideas over time) How do submarines sink if they are full of air? (Research) Do all objects fall through water in the same way? (Pattern seeking) Density – syrup, water, oil in cup and add objects Friction ramp experiments Parachute experiments Design and make products that use levers, pulleys, gears and/or springs and explore their effects Galileo Galilei and Isaac Newton <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Filming falling objects with iPads and observing in slow motion 	<p>Evolution and Inheritance - What is evolution? How does it happen? How do scientists know?</p> <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 in different ways and that adaptation may lead to evolution <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize? (Ideas over time) What happened when Charles Darwin visited the Galapagos islands? (Research) Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? (Identifying and classifying) Can you classify these observations into evidence for the idea of evolution, and evidence against? (Identifying and classifying) Is there a pattern between the size and shape of a bird's beak and the food it will eat? (Pattern seeking) How are animals and plants adapted to survive in extreme environments? (Research) Explore different dog breeds and cross breeds <p>Animals including Humans - Why does my heart beat? How do our choices affect how our bodies work?</p> <ul style="list-style-type: none"> 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Are the oldest children in our school the tallest? (Pattern seeking) Why do people get grey/white hair when they get older? (Research) Can you identify all the stages in the human life cycle? (Identifying and classifying) Create a timeline showing key stages of how humans grow and develop How does my heart rate change over the day? (Observing over time) How does the length of time we exercise for affect our heart rate? (Fair test) Which type of exercise has the greatest effect on our heart rate? (Comparative testing) <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Database of animal characteristics

Class 4	Autumn	Spring	Summer
<p style="text-align: center;">Cycle A</p> <p style="text-align: center;">Even academic years e.g.2018, 2020</p> <p style="text-align: center;">Year 3 objectives; Year 4 objectives; Year 5 objectives; Year 6 objectives</p>	<p>Rocks - Are all rocks the same?</p> <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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Can you use the identification key to find out the name of each of the rocks in your collection? (Identifying and classifying) What were James Hutton's ideas about how rocks were made and what was his evidence? (Ideas over time) Make their own fossils Who was Mary Anning and what did she discover? (Research) Filter soil to find out what is it made of How does adding different amounts of sand to soil affect how quickly water drains through it? (Fair test) Which soil absorbs the most water? (Comparative testing) Explore local environment – Llanymynech Rock visit <p>Electricity - Can we vary the effects of electricity?</p> <ul style="list-style-type: none"> 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 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> How would you group these electrical devices based on where the electricity comes from? (Identifying and classifying) Working safely with electricity How does a light bulb work? How has electricity changed the way we live? (Research) Which metal is the best conductor of electricity? (Comparative testing) How does the thickness of a conducting material affect how bright the lamp is? (Fair test) Make their own switches Does the temperature of a light bulb go up the longer it is on? (Pattern seeking and observing over time) How does the voltage of the batteries in a circuit affect the brightness of a lamp or the volume of a buzzer? (Fair test) Garrett Morgan and Thomas Edison 	<p>States of Matter- Is water always wet?</p> <ul style="list-style-type: none"> 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Can you group these materials and objects into solids, liquids, and gases? (Identifying and classifying) How does the level of water in a glass change when left on the windowsill? (Observing over time) Create a mini water cycle How does the mass of an ice cube change over time? (Observing over time) How does the mass of a block of ice affect how long it takes to melt? (Fair test) <p>Properties and Changes of Materials - Can we change materials reversibly and irreversibly?</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 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> How does a sugar cube change as it is put in a glass of water? (Observing over time) How does the temperature of tea affect how long it takes for a sugar cube to dissolve? (Fair test) Which type of sugar dissolves the fastest? (Comparative testing) What did Stephanie Kwolek discover and why was it important? (Ideas over time) What are microplastics and why are they harming the planet? (Research) Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains? Explore reversible changes Explore changes that are difficult to reverse <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Light sensors used to measure transparency. 	<p>Living Things and their Habitats - Are living things in danger? Do all lifecycles look the same?</p> <ul style="list-style-type: none"> Recognise living things can be grouped in a variety of ways Explore classification keys to help group, identify and name a variety of living things in their local and wider environment Recognise environments can change and this can sometimes pose dangers to living things Describe reproduction in some plants (sexual and asexual) and animals Describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird Describe how living things are classified into groups based on observable characteristics and similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Can we use the classification keys to identify all the animals that we caught pond dipping? (Identifying and classifying) How did Jane Goodall learn about the habits and behaviours of chimpanzees and why does she still need to work to protect their habitat? (Ideas over time) Madagascar in Danger Why are people cutting down the rainforests and what effect does that have? (Research) How does a tadpole/caterpillar change over time? (Observing over time) What are the differences between the life cycle of an insect and a mammal? (Research) Is there a relationship between a mammal's size and its gestation period? (Pattern seeking) Compare this collection of animals based on similarities and differences in their lifecycle. (Identifying and classifying) Which is the most common invertebrate on our school playing field? (Comparative testing) What happens to a piece of bread if you leave it on the windowsill for two weeks? (Observing over time) How would you make a classification key for vertebrates/invertebrates or microorganisms? (Identifying and classifying) Survey local area for living things – compare with another environment e.g. Heritage Area or rainforest David Attenborough, Eva Crane and Carl Linnaeus <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Digital photography can be used to photograph insects etc so they can be identified and noted on photograph. Easier to cross reference with online identification charts.

Class 4	Autumn	Spring	Summer
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> Cycle B Odd academic years e.g.2019, 2021 Year 3 objectives; Year 4 objectives; Year 5 objectives; Year 6 objectives </p>	<p>Earth and Space - Sun, Earth and Moon: What is moving and how do we know?</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>Scientific Skills Links:</p> <ul style="list-style-type: none"> How could you organise all the objects in the solar system into groups? (Identifying and classifying) How have our ideas about the solar system changed over time? (Ideas over time) How do astronomers know what stars are made of? (Research) Can you observe and identify all the phases in the cycle of the Moon? (Identifying and classifying) Is there a pattern between the size of a planet and the time it takes to travel around the Sun? (Pattern seeking) Compare the time of day at different places on Earth Neil Armstrong, Tim Peake and Stephen Hawking Eggnaut – return your eggnaut safely back to Earth (link to forces) <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Use of technology to access things like mars rover, Hubble etc <p>Sound - How do we hear sounds?</p> <ul style="list-style-type: none"> 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> When is our classroom the quietest? (Observing over time) How does the length of a guitar string/tuning fork affect the pitch of the sound? (Fair test) Which material is best to use for muffling sound in ear defenders? (Comparative testing) Since the 1800s, how has science helped people who are deaf? (Ideas over time) Do all animals have the same hearing range? (Research) Is there a link between how loud it is in school and the time of day? If there is a pattern, is it the same in every area of the school? (Pattern seeking) Make their own musical instruments Alexander Graham Bell <p>Possible Links to Computing</p> <ul style="list-style-type: none"> The use of slow-motion video can be really useful in filming vibration Sound sensors to give numerical results for sound experiments Audacity is good for recording sounds and allowing the children to see the sound wave 	<p>Forces - How and why do objects move?</p> <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 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Which materials are magnetic? (Identifying and classifying) Does the size and shape of a magnet affect how strong it is? (Pattern seeking) Can you label and name all the forces acting on the objects in each situation? (Identifying and classifying) How does the surface area of a parachute affect the time it takes to fall to the ground? (Fair test) Which shape parachute takes the longest to fall? (Comparative testing) How have our ideas about gravity changed over time? (Ideas over time) Density – syrup, water, oil in cup and add objects Friction ramp and parachute experiments Design and make products that use levers, pulleys, gears and/or springs and explore their effects Galileo Galilei and Isaac Newton <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Filming falling objects with iPads and observing in slow motion <p>Evolution and Inheritance - What is evolution? How does it happen? How do scientists know?</p> <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 in different ways and that adaptation may lead to evolution <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> What happened when Charles Darwin visited the Galapagos islands? (Research) Can you classify these observations into evidence for the idea of evolution, and evidence against? (Identifying and classifying) Is there a pattern between the size and shape of a bird's beak and the food it will eat? (Pattern seeking) 	<p>Animals including Humans - What do our bodies do with the food we eat? How do our bodies change as we get older?</p> <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 Describe the basic function of the simple parts of the digestive system in humans (mushy crackers demo, making poo) Identify the different types of teeth in humans and describe their function Construct and interpret a variety of food chains, identifying producers, predators and prey 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> How do the skeletons of different animals compare? (Identifying and classifying) How can we group the food that we eat? (Identifying and classifying) How does an egg shell change when it is left in cola? (Observing over time) Compare carnivores and herbivores teeth, suggest reasons for the differences How has a visit to the dentist changed since ancient times? (Ideas over time) What are the names for all the organs involved in the digestive system? (Identifying and classifying) Are foods that are high in energy always high in sugar? (Pattern seeking) Who grows the fastest, girls or boys? (Comparative testing) Are the oldest children in our school the tallest? (Pattern seeking) Why do people get grey/white hair when they get older? (Research) Can you identify all the stages in the human life cycle? (Identifying and classifying) How does my heart rate change over the day? (Observing over time) How does the length of time we exercise for affect our heart rate? (Fair test) Which type of exercise has the greatest effect on our heart rate? (Comparative testing) <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Make use of the pulse monitors to show effect of exercise on the human body.

Class 3	Autumn	Spring	Summer
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> Cycle A Even academic years e.g. 2018, 2020 Year 2 objectives; Year 3 objectives; Year 4 objectives; Year 6 objectives </p>	<p>Uses of Everyday Materials - How do we choose the best material?</p> <ul style="list-style-type: none"> 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Which shapes make the strongest paper bridges? (Comparative testing) Which material makes the car go furthest? (Comparative testing) How are plastics made? Which types of plastic can be recycled? (Research) Which materials are shiny and which are dull? (Identifying and classifying) Would a paper boat float forever? (Observing over time) What is the best material for ...? Charles Macintosh Staying warm in winter – melting snowman experiment <p>Possible Links to Computing</p> <p>- Different sensors may be used in the testing of different materials e.g. the temperature sensors can help determine the best material to make a warm coat (thermal insulator)</p> <p>Rocks - Are all rocks the same?</p> <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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Can you use the identification key to find out the name of each of the rocks in your collection? (Identifying and classifying) What were James Hutton's ideas about how rocks were made and what was his evidence? (Ideas over time) Make their own fossils Who was Mary Anning and what did she discover? (Research) Filter soil to find out what is it made of How does adding different amounts of sand to soil affect how quickly water drains through it? (Fair test) Which soil absorbs the most water? (Comparative testing) Explore local environment – Llanymynech Rock visit 	<p>Plants - What should I do to grow a healthy plant? Why do plants have flowers?</p> <ul style="list-style-type: none"> 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 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> How can we identify the trees that we observed on our tree hunt? (Identifying and classifying) Do seeds and/or bulbs need soil to grow? (Comparative testing) What happens to my bean after I have planted it? (Observing over time) Do cress seeds grow quicker inside or outside? (Comparative testing) Do bigger seeds grow into bigger plants? (Pattern seeking) How does a cactus survive in a desert with no water? (Research) What happens to celery when it is left in a glass of coloured water? (Observing over time) How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? (Fair test) What are all the different ways that seeds disperse? (Research) How many different ways can you group our seed collection? (Identifying and classifying) How do flowers in a vase change over time? (Observing over time) <p>Possible Links to Computing</p> <p>- Digital photographs can be taken of the stages of plant growth, notated and included in their science books.</p> <p>- Sensors can be used to determine which is the best place for the plants to grow for light and temperature.</p>	<p>Living Things and their Habitats - Why do different animals live in different habitats?</p> <ul style="list-style-type: none"> 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 living things can be grouped in a variety of ways Explore classification keys to help group, identify and name a variety of living things in their local and wider environment Recognise environments can change and this can sometimes pose dangers to living things <p>Scientific Skills</p> <ul style="list-style-type: none"> How would you group things to show which are living, dead, or have never been alive? (Identifying and classifying) How does the habitat of the Arctic compare with the habitat of the rainforest? (Research) How would you group these plants and animals based on what habitat you would find them in? (Identifying and classifying) What conditions do woodlice prefer to live in? (Pattern seeking) Which habitat do worms prefer – where can we find the most worms? (Pattern seeking) How does a tadpole/caterpillar change over time? (Observing over time) Can we use the classification keys to identify all the animals that we caught pond dipping? (Identifying and classifying) How did Jane Goodall learn about the habits and behaviours of chimpanzees and why does she still need to work to protect their habitat? (Ideas over time) Survey local area for living things – compare with another environment e.g. Heritage Area & rainforest David Attenborough and Maria Investigate frog and butterfly lifecycles if they are in school <p>Possible Links to Computing</p> <p>- Branching databases for identifying minibeasts</p>

Class 3	Autumn	Spring	Summer
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> Cycle B Odd academic years e.g.2019, 2021 Year 2 objectives; Year 3 objectives; Year 4 objectives; Year 6 objectives </p>	<p>Light – What is the dark? What is a shadow?</p> <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 Find patterns in the way that the size 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Is the Sun the same brightness all day? When is our classroom darkest? (Observing over time) Where are shadows found? (Pattern seeking) How does the distance between the shadow puppet and the screen affect the size of the shadow? (Fair test) How have our ideas about eclipses changed over time? (Ideas over time) How does the Sun make light? (Research) How would you organise these light sources into natural and artificial sources? (Identifying and classifying) Are you more likely to have bad eye sight and to wear glasses if you are older? (Pattern seeking) Mirror games Making shadows – shadow puppets Making a periscope Which material is the most reflective? (Comparative testing) Why do some people need to wear glasses to see clearly? (Research) How does my shadow change over the day? (Observing over time) Explore rainbows and colour filters <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Light sensors for any work involving light. Light sensors could be used to measure how much light is blocked (the density of the shadow) made by different objects. 	<p>Sound - How are sounds made?</p> <ul style="list-style-type: none"> 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> When is our classroom the quietest? (Observing over time) How does the volume (intensity of sound) of a drum change as you move further away from it? (Fair test) Which material is best to use for muffling sound in ear defenders? (Comparative testing) Since the 1800s, how has science helped people who are deaf? (Ideas over time) Do all animals have the same hearing range? (Research) Is there a link between how loud it is in school and the time of day? If there is a pattern, is it the same in every area of the school? (Pattern seeking) Make their own musical instruments Alexander Graham Bell <p>Possible Links to Computing</p> <ul style="list-style-type: none"> The use of slow-motion video can be really useful in filming vibration Sound sensors to give numerical results for sound experiments Audacity is good for recording sounds and allowing the children to see the sound wave <p>Forces and Magnets - What can magnets do?</p> <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 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Which materials are magnetic? (Identifying and classifying) Which magnet is strongest? (comparative testing) Does the size and shape of a magnet affect how strong it is? (Pattern seeking) Which surface is best to stop you slipping? (Comparative testing) How does a compass work? (Research) Identify that magnets work without direct contact Explore the behaviour and use of everyday magnets 	<p>Animals including Humans - What do living things need to survive? What is a healthy diet and why is it important?</p> <ul style="list-style-type: none"> 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 other animals have skeletons and muscles for support, protection and movement Describe the basic function of the simple parts of the digestive system in humans (mushy crackers demo, making poo) Identify the different types of teeth in humans and describe their function Construct and interpret a variety of food chains, identifying producers, predators and prey <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Which offspring belongs to which animal? (Identifying and classifying) What do you need to do to look after a pet dog/cat/lizard and keep it healthy? (Research) When the first fizzy drink machine was invented in 1775, scientist Joseph Priestley said it was the cure to many health problems. What ideas do scientists have about fizzy drinks today? (Ideas over time) How can we group the food that we eat? (Identifying and classifying) How do the skeletons of different animals compare? (Identifying and classifying) What would happen if humans did not have a skeleton? Marie Curie – X rays How does the skull circumference of a girl compare with that of a boy? (comparative testing & pattern seeking) What are the names for all the organs involved in the digestive system? (Identifying and classifying) How does an egg shell change when it is left in cola? (Observing over time) How has a visit to the dentist changed since ancient times? (Ideas over time) Compare carnivores and herbivores teeth, suggest reasons for the differences Toothpaste Are foods that are high in energy always high in sugar? (Pattern seeking) <p>Possible Links to Computing</p> <ul style="list-style-type: none"> Time lapse can be used to show decay. Pivot (simple animation software) can be used to show the difference between the way different animals move (templates are provided)

Class 2	Autumn	Spring	Summer
<p style="text-align: center;">Cycle A</p> <p style="text-align: center;">Even academic years e.g.2018, 2020</p> <p style="text-align: center;">Year 1 objectives; Year 2 objectives</p>	<p>Living Things and Animals, including Humans - What is alive, dead or was never alive? What do living things need to survive?</p> <ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead and never living Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) 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. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> How would you group things to show which are living, dead, or have never been alive? (Identifying and classifying) When the first fizzy drink machine was invented in 1775, scientist Joseph Priestley said it was the cure to many health problems. What ideas do scientists have about fizzy drinks today? (Ideas over time) <p>Possible Links to Computing</p> <p>- Use pulse monitors to see the effect of exercise, graph can be created by teacher for whole class</p>	<p>Everyday Materials - What are things I use made from? Can we change materials?</p> <ul style="list-style-type: none"> 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 simple physical properties of everyday materials Compare and group everyday materials based on 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Is there a pattern in the types of materials that are used to make objects in a school? (Pattern seeking) Which materials are the most flexible or the most absorbent? (Comparative testing) How are building materials different now to when Queen Elizabeth I was on the throne? (Ideas over time) How are bricks made? (Research) We need to choose a material to make an umbrella. Which materials are waterproof? (Identifying and classifying) What happens to shaving foam over time? (Observing over time) Which materials are shiny and which are dull? (Identifying and classifying) Which material would be the best for the roof of the little pig's house? (Comparative testing) How are plastics made? Which types of plastic can be recycled? (Research) Would a paper boat float forever? (Observing over time) Which material makes the car go furthest? (Comparative testing) What is the best material for ...? Ole Kirk Christiansen and Charles Macintosh Compare how things move on different surfaces (preparation for forces in Class 3) 	<p>Plants - How many types of plant are there?</p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants and trees, including deciduous and evergreen trees Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> Which type of compost grows the tallest sunflower? (Comparative testing) How does my sunflower change each week? (Observing over time) How does a cactus survive in a desert with no water? (Research) <p>Habitats - Why do animals live in different places?</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 Identify and name a variety of plants and animals in their habitats, including micro-habitats <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> How does the habitat of the Arctic compare with the habitat of the rainforest? (Research) How would you group these plants and animals based on what habitat you would find them in? (Identifying and classifying) What conditions do woodlice prefer to live in? (Pattern seeking) Which habitat do worms prefer –where can we find the most worms? (Pattern seeking) How does a tadpole/caterpillar change over time? (Observing over time) Identify and group living things locally – Llanymynech Heritage Area Minibeast village
	<p style="text-align: center;">Seasonal changes - What is it like in winter, spring, summer and autumn?</p> <p style="text-align: center;">Seasonal changes are covered across the whole academic year</p> <ul style="list-style-type: none"> Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies <p style="text-align: center;">Scientific Skills Links:</p> <ul style="list-style-type: none"> In which season does it rain the most? (Comparative testing) Are there plants that are in flower in every season? What are they? (Research) How would you group these things based on which season you are most likely to see them in? (Identifying and classifying) Do trees with bigger leaves lose their leaves first in autumn? (Pattern seeking) <ul style="list-style-type: none"> Does the wind always blow the same way? (Pattern seeking) How does the oak tree change over the year? (Observing over time) <p style="text-align: center;">Possible Links to Computing</p> <p>- Sensors can be used on the simple setting to measure the temperature and light levels to compare between seasons.</p> <p style="text-align: center;">- Use of the weather station</p>		

Class 2	Autumn	Spring	Summer
<p style="text-align: center;">Cycle B</p> <p style="text-align: center;">Odd academic years e.g.2019, 2021</p> <p style="text-align: center;">Year 1 objectives; Year 2 objectives; Year 3 objectives</p>	<p>Animals including Humans - What are carnivores, herbivores and omnivores?</p> <ul style="list-style-type: none"> ○ Identify, name, describe and compare 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 ○ Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ● What strange ideas did Italian scientist Luigi Galvani have about animals in 1780? Why did he think that? (Ideas over time) ● How are the animals in Australia different to the ones that we find in Britain? (Research) ● What do you need to do to look after a pet dog/cat/lizard and keep it healthy? (Research) ○ Llanymynech Heritage Area & forest school – Identify animals locally 	<p>Animals including Humans - What can our bodies do? Do living things change or stay the same?</p> <ul style="list-style-type: none"> ○ Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense ○ Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ○ Animals have offspring, which grow into adults ○ Lifecycles of frogs and butterflies can be covered, if tadpoles or caterpillars are in school <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ How does my height change over the year? (Observing over time) ○ Is our sense of smell better when we can't see? (Comparative testing) ○ Do you get better at smelling as you get older? (Pattern seeking) ○ Do all animals have the same senses as humans? (Research) ○ How can we organise all the zoo animals? (Identifying and classifying) ○ Which offspring belongs to which animal? (Identifying and classifying) <p>Light - Where does light come from? What is a shadow?</p> <ul style="list-style-type: none"> ○ Observe and name a variety of light sources ○ Recognise that we need light in order to see things ○ Recognise that dark is the absence of light ○ Shadows are created by blocking light ○ Recognise that light from the sun can be dangerous and that there are ways to protect their eyes <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ How would you organise these light sources into natural and artificial sources? (Identifying and classifying) ○ Is the Sun the same brightness all day? When is our classroom darkest? (Observing over time) ○ Exploring the similarities of places where shadows are found (Pattern seeking) ○ Observing shiny objects - do they shine in the dark? ○ Making shadows – shadow puppets 	<p>Plants - What are the different parts of a plant called? What do plants need to grow?</p> <ul style="list-style-type: none"> ○ Identify and describe the basic structure of a variety of flowering plants, including trees ○ Observe and describe how seeds and bulbs grow into mature plants <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ Which tree has the biggest leaves? (Comparative testing) ○ How can we sort the leaves that we collected on our walk? (Identifying and classifying) ○ Flowering plant dissection on different plants to see similarities and differences ○ How can we identify the trees that we observed on our tree hunt? (Identifying and classifying) ○ What happens to my bean after I have planted it? (Observing over time) ○ Do seeds and/or bulbs need soil to grow? (Comparative testing) ○ Do cress seeds grow quicker inside or outside? (Comparative testing) ○ Do bigger seeds grow into bigger plants? (Pattern seeking)
	<p style="text-align: center;">Seasonal changes - What is it like in winter, spring, summer and autumn?</p> <p style="text-align: center;">Seasonal changes are covered across the whole academic year</p> <ul style="list-style-type: none"> ○ Observe changes across the four seasons ○ Observe and describe weather associated with the seasons and how day length varies <p style="text-align: center;">Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ In which season does it rain the most? (Comparative testing) ○ Are there plants that are in flower in every season? What are they? (Research) ○ How would you group these things based on which season you are most likely to see them in? (Identifying and classifying) ○ Do trees with bigger leaves lose their leaves first in autumn? (Pattern seeking) <ul style="list-style-type: none"> ○ Does the wind always blow the same way? (Pattern seeking) ○ How does the oak tree change over the year? (Observing over time) <p style="text-align: center;">Possible Links to Computing</p> <ul style="list-style-type: none"> - Sensors can be used on the simple setting to measure the temperature and light levels to compare between seasons. - Use of the weather station 		

Class 1	Autumn	Spring	Summer
<p style="text-align: center;">Cycle A</p> <p style="text-align: center;">Even academic years e.g.2018, 2020</p> <p style="text-align: center;">Year 1 objectives</p>	<p>Everyday Materials - What are things I use made from? Distinguish between an object and the material from which it is made</p> <ul style="list-style-type: none"> ○ Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock ○ Describe simple physical properties of everyday materials ○ Compare and group everyday materials based on their physical properties <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ Is there a pattern in the types of materials that are used to make objects in a school? (Pattern seeking) ○ Which materials are the most flexible or the most absorbent? (Comparative testing) 	<p>Everyday Materials continued - What are things I use made from?</p> <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ How are building materials different now to when Queen Elizabeth I was on the throne? (Ideas over time) ○ How are bricks made? (Research) ○ Which materials can be recycled? (Research) ○ We need to choose a material to make an umbrella. Which materials are waterproof? (Identifying and classifying) ○ Which materials will float and which will sink? (Identifying and classifying) ○ What happens to shaving foam over time? (Observing over time) 	<p>Plants - How many types of plant are there?</p> <ul style="list-style-type: none"> ○ Identify and name a variety of common wild and garden plants and trees, including deciduous and evergreen trees <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ Which type of compost grows the tallest sunflower? (Comparative testing) ○ How does my sunflower change each week? (Observing over time)
	<p style="text-align: center;">Seasonal changes - What is it like in winter, spring, summer and autumn? Seasonal changes are covered across the whole academic year</p> <ul style="list-style-type: none"> ○ Observe changes across the four seasons ○ Observe and describe weather associated with the seasons and how day length varies <p style="text-align: center;">Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ In which season does it rain the most? (Comparative testing) ○ Are there plants that are in flower in every season? What are they? (Research) ○ How would you group these things based on which season you are most likely to see them in? (Identifying and classifying) ○ Do trees with bigger leaves lose their leaves first in autumn? (Pattern seeking) <ul style="list-style-type: none"> ○ Does the wind always blow the same way? (Pattern seeking) ○ How does the oak tree change over the year? (Observing over time) <p style="text-align: center;">Possible Links to Computing</p> <ul style="list-style-type: none"> - Sensors can be used on the simple setting to measure the temperature and light levels to compare between seasons. - Use of the weather station 		

Class 1	Autumn	Spring	Summer
<p style="text-align: center;">Cycle B</p> <p style="text-align: center;">Odd academic years e.g.2019, 2021</p> <p style="text-align: center;">Year 1 objectives</p>	<p>Animals including Humans - What are carnivores, herbivores and omnivores?</p> <ul style="list-style-type: none"> ○ Identify, name, describe and compare 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 <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> • What strange ideas did Italian scientist Luigi Galvani have about animals in 1780? Why did he think that? (Ideas over time) • How are the animals in Australia different to the ones that we find in Britain? (Research) ○ Llanymynech Heritage Area & forest school – Identify animals locally 	<p>Animals including Humans - What can our bodies do?</p> <ul style="list-style-type: none"> ○ Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense ○ Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ How does my height change over the year? (Observing over time) ○ Is our sense of smell better when we can't see? (Comparative testing) ○ Do you get better at smelling as you get older? (Pattern seeking) ○ Do all animals have the same senses as humans? (Research) ○ How can we organise all the zoo animals? (Identifying and classifying) 	<p>Plants - What are the different parts of a plant called?</p> <ul style="list-style-type: none"> ○ Identify and describe the basic structure of a variety of flowering plants, including trees <p>Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ Which tree has the biggest leaves? (Comparative testing) ○ How can we sort the leaves that we collected on our walk? (Identifying and classifying)
	<p style="text-align: center;">Seasonal changes - What is it like in winter, spring, summer and autumn?</p> <p style="text-align: center;">Seasonal changes are covered across the whole academic year</p> <ul style="list-style-type: none"> ○ Observe changes across the four seasons ○ Observe and describe weather associated with the seasons and how day length varies <p style="text-align: center;">Scientific Skills Links:</p> <ul style="list-style-type: none"> ○ In which season does it rain the most? (Comparative testing) ○ Are there plants that are in flower in every season? What are they? (Research) ○ How would you group these things based on which season you are most likely to see them in? (Identifying and classifying) ○ Do trees with bigger leaves lose their leaves first in autumn? (Pattern seeking) <ul style="list-style-type: none"> ○ Does the wind always blow the same way? (Pattern seeking) ○ How does the oak tree change over the year? (Observing over time) <p style="text-align: center;"><u>Possible Links to Computing</u></p> <ul style="list-style-type: none"> - Sensors can be used on the simple setting to measure the temperature and light levels to compare between seasons. - Use of the weather station 		

Bryn Offa CE Primary School Scientific Skills Progression Table

	Early Years Foundation Stage	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking Questions and Planning	<ul style="list-style-type: none"> - Show curiosity about objects, events and people (Playing and Exploring) - Questions why things happen (Speaking: 30-50 months) - Engage in open-ended activity (Playing and Exploring) - Choose the resources they need for their chosen activities (ELG: Self Confidence & Self Awareness) 	<ul style="list-style-type: none"> - Explore the world around them and raise their own simple questions - Experience different types of science enquiries, including practical activities - Begin to recognise different ways in which they might answer scientific questions 	<ul style="list-style-type: none"> - Raise their own relevant questions about the world around them - Should be given a range of scientific experiences including different types of science enquiries to answer questions - Start making their own decisions about the most appropriate type of scientific enquiry they might use to answer questions - Set up simple practical enquiries, comparative and fair tests - Recognise when a simple fair test is necessary and help decide how to set it up - 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 	<ul style="list-style-type: none"> - Use their science experiences to explore ideas and raise different kinds of questions - Talk about how scientific ideas have developed over time - 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 - Make their own decisions about what observations to make, what measurements to use and how long to make them for 			
Identifying and Classifying	<ul style="list-style-type: none"> - Develop ideas of grouping, sequences, cause and effect (Creating and Thinking Critically) - Know about similarities and differences in relation to places, objects, materials and living things (ELG: The World) 	<ul style="list-style-type: none"> - Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them 	<ul style="list-style-type: none"> - Talk about criteria for grouping, sorting and classifying; and use simple keys 	<ul style="list-style-type: none"> - 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 			
Using Secondary Sources	<ul style="list-style-type: none"> - Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world (The World: 30-50 months) 	<ul style="list-style-type: none"> - Ask people questions and use simple secondary sources to find answers 	<ul style="list-style-type: none"> - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations 	<ul style="list-style-type: none"> - Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact 			

	Early Years Foundation Stage	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observing, Measuring and Recording	<ul style="list-style-type: none"> - Find ways to solve problems/ find new ways to do things/ test their ideas (Creating & Thinking Critically) - Take a risk, engage in new experiences and learn by trial and error (Playing and Exploring) - Closely observes what animals, people and vehicles do (The World: 8-20 months) - Use senses to explore the world around them (Playing and Exploring) - Handle equipment and tools effectively (ELG: Moving & Handling) - Create simple representations of events, people and objects (Being Imaginative: 40-60+ months) - Builds up vocabulary that reflects the breadth of their experience (Understanding: 30-50 months) 	<ul style="list-style-type: none"> - Carry out simple tests - Observe closely using simple equipment with help, observe changes over time - Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data - Record simple data - Begin to draw simple labelled diagrams 	<ul style="list-style-type: none"> - Make systematic and careful observations - Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them - Take accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers/thermometers appropriately - Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data 	<ul style="list-style-type: none"> - Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. - Take repeat measurements where appropriate. - Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 			
Measuring and Recording (Maths Progression)	<ul style="list-style-type: none"> - Begin measuring by counting - Begin to use frequency charts 	Continue with all previously taught methods and: <ul style="list-style-type: none"> - Use Venn diagrams - Begin to use simple tables 	Continue with all previously taught methods and: <ul style="list-style-type: none"> - Use tally charts - Use pictograms - Begin to use Carroll diagrams 	Continue with all previously taught methods and: <ul style="list-style-type: none"> - Use bar graphs 	Continue with all previously taught methods and: <ul style="list-style-type: none"> - Use time graphs - Use classification keys - Use line graphs 	Continue with all previously taught methods and: <ul style="list-style-type: none"> - Begin to choose their own recording method and explain their choice - Introduce use of decimals to increase accuracy of results - Use scatter graphs - Introduce mean average and discuss when appropriate to use 	Continue with all previously taught methods and: <ul style="list-style-type: none"> - Choose their own recording method and explain their use - Use mean average independently and children can explain how it improves accuracy - Introduce finding percentages - Use pie charts - Introduce use of ratios

	Early Years Foundation Stage	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
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Concluding and Evaluating	<ul style="list-style-type: none"> - Make links and notice patterns in their experience (Creating & Thinking Critically) - Answer how and why questions about their experiences (ELG: Understanding) - Make observations of animals and plants and explain why some things occur, and talk about changes (ELG: The World) - Develop their own narratives and explanations by connecting ideas or events (ELG: Speaking) 	<ul style="list-style-type: none"> - With guidance, they should begin to notice patterns and relationships - Use their observations and ideas to suggest answers to questions - Talk about what they have found out and how they found it out - With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language 	<ul style="list-style-type: none"> - With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions - Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions - 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. 	<ul style="list-style-type: none"> - Look for different casual relationships in their data and identify evidence that refutes or supports their ideas - Identify scientific evidence that has been used to support or refute ideas or arguments - Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas - Use oral and written forms such as displays and other presentations to report conclusions, casual relationships and explanations of degree of trust in results - Use their results to make predictions and identify when further observations, comparative and fair tests might be needed 			