Llangyfelach Primary School

Science & Technology Progression Model

Science & Technology @LPS

The importance of science and technology in our modern world cannot be overstated. Developments in these areas have always been drivers of change in society, underpinning innovation and impacting on everyone's lives economically, culturally and environmentally. As such, the Science and Technology Area of Learning and Experience (Area) will be increasingly relevant in the opportunities young people encounter and the life choices that they make.

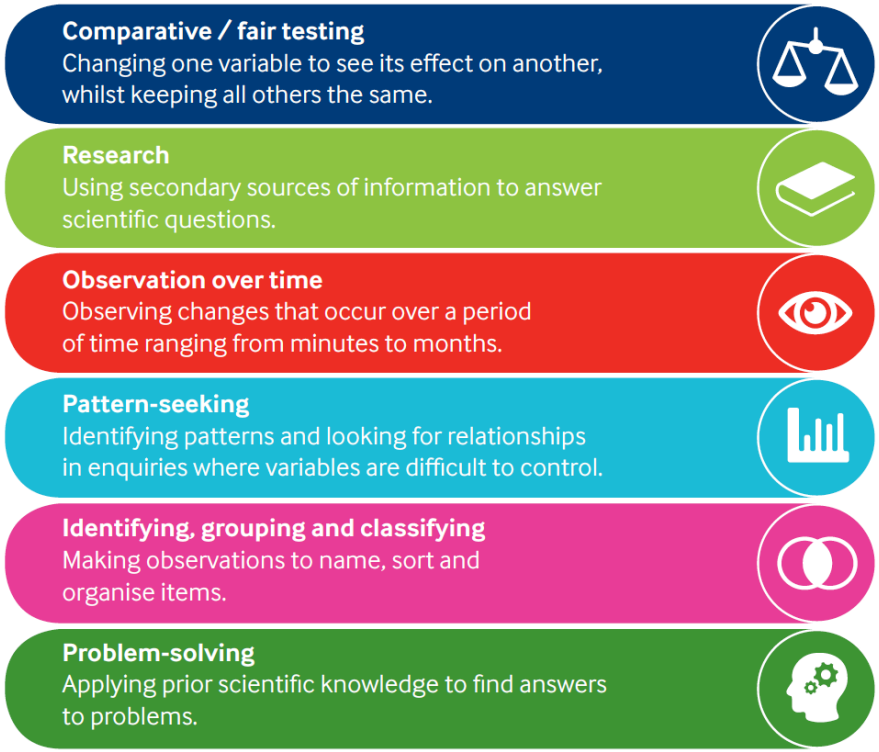
Ready access to vast amounts of data requires all learners to be able to assess inputs critically, understand the basis of information presented as fact, and make informed judgements that impact their own behaviours and values. They need to develop the ability to meaningfully ask the question, 'Just because we can, does that mean we should?'

What matters in this Area has been expressed in six statements which support and complement one another, and should not be viewed in isolation. Together they contribute to realising the four purposes of the curriculum.

Through robust and consistent evaluation of scientific and technological evidence, learners can become ethical, informed citizens of Wales and the world, who will be able to make informed decisions about future actions. Healthy, confident individuals, ready to lead fulfilling lives as valued members of society are informed by knowledge of their bodies and the ecosystems around them, and of how technological innovations can support improvements in health and lifestyle.

Ambitious, capable learners, ready to learn throughout their lives should engage with scientific and technological change. The knowledge and deep understanding gained through experiencing what matters in science and technology can help learners live independent and fulfilling lives that sees them contributing to society and culture in a variety of ways. Learners who are enterprising, creative contributors, ready to play a full part in life and work embrace such challenges, as they are encouraged to take risks, to innovate and evaluate, and learn to develop solutions. Thus, they can become more resilient and purposeful learners across all areas of learning and experience.

This Area draws on the disciplines of biology, chemistry, computer science, design and technology, and physics to enhance learners' knowledge and understanding of the world.



We believe that all learners should have a wide experience of enquiry and @LPS we concentrate on the following forms of enquiry based on approaches advised by the Primary Science Teaching Trust: https://pstt.org.uk

Science & Technology 6 Enquiry Types @LPS					
Comparative (Fair testing)	**Research**	**Observation**	**Pattern-seeking**	**Identifying, Grouping and Classifying**	**Problem-solving**
					
Changing one variable to see its effect on another, whilst keeping all others the same.	Using secondary sources of information to answer scientific questions.	Observing changes that occur over a period of time.	Identifying patterns and looking for relationships in enquiries where variables are difficult to control.	Making observations to name, sort and organise items.	Applying prior scientific knowledge to find answers to problems.

• Consider a car rolling down a ramp. Ask the children: What will affect how far the car travels?
• What can be changed (the **'variables'**) and whether this might make a difference to the outcome.
• **Possible variables**: the height of the ramp, the surface of the ramp, what the wheels of the car are made from, the shape of the car, the mass of the car, whether the car is pushed.
• **Comparative test**: If I change the car (the independent variable), what will happen to the distance the car travels (the dependent variable)?
• **Note:** it is unlikely that you will have cars of different mass that are the same shape, or cars of different shapes that are exactly the same mass, so this is a **comparative test**. You can compare different cars by keeping other variables the same. It is not a 'fair test' because at least two variables are being changed (e.g. mass and shape).
• **Fair test**: If we change the surface of the ramp (the independent variable), what will happen to the distance the car travels (the **dependent variable**)?
	• Pupils might use pictures, videos, books, websites or other information to help them to find out answers to questions about any area of science and technology.
	• They may visit a museum, undertake field trips, or talk to a visitor in school about science.
	• **Why is drinking salt water bad for humans?** Children could watch a film clip showing the effect of a salt solution on living cells.
	• **How do some animals manage to live in salty water?** Children could use a website to find out which animals are able to drink salt water and how they are able to do this.
	• **Can you find out about the differences between the planets in our solar system?** Children could watch film clips, interact with digital models, experience virtual reality environments, or read information from various sources to generate databases or charts to compare findings.
	• **How does skin change as you grow older?** Children could take pictures of family members and compare them.
		• All sorts of questions can be answered through observation over time. The period of time might be seconds, minutes, days or even months depending on the question asked.
		• **How do some materials change when they are heated?** Children may investigate what happens to chocolate when it is heated for a few minutes and then cooled.
		• **How do shadows change throughout the day?** Pupils might observe the shadow they cast at different times of the school day.
		• **Which drinks are bad for your teeth?** Pupils might observe eggshells in different liquids for a few days.
		• **What happens to frog spawn?** Children might observe tadpoles developing for a few weeks.
		• **What changes happen to a tree?** Pupils might visit the same tree every month for a complete year.
		• **What effects are altered when a particular code is changed?** Learners are asked to experiment with their coding algorithms in order to improve effects and outcomes.
			• Pattern seeking often starts with a question about a possible link between two events or phenomena (**variables**).
			• **Causal Relationships** exists when one variable in a data set has a direct influence on another variable. A causal relationship is also referred to as cause and effect (*e.g., the distance between the light and the object effecting the size of the shadow*).
			• Pattern-seeking enquiries provide excellent opportunities for children to learn about habitats, adaptation, growth, staying healthy (diet, exercise, disease), the weather, rocks and soils and the solar system.
			• **Where do daisies grow?** Count the number of daisies growing inside a hoop in different parts of a field.
			• **Do the biggest apples have the most seeds?** Measure the mass or circumference of an apple and record the number of seeds inside.
			• **How do musical instruments produce low notes?** Investigate the width of strings on a guitar, the number of holes covered on a recorder, or the volume of water in a glass bottle.
				• Learners use their knowledge and understanding to make comparisons, draw conclusions and organise information.
				• Early Years learners will undertake simple grouping tasks, sorting items by simple observable features.
				• Developmentally, they will begin to sort and classify using a variety of defined criteria.
				• Progressively, learners will use, apply and create charts in order to organise their findings and make conclusion.
				• Independently, learners will use, apply and create keys to sort, classify, identify and make comparisons within their learning in order to understand complex relationships.
				• **Can you sort these materials?** Explain how you have grouped them. (hard, soft, rough, smooth, shiny, dull, transparent, electrical or thermal conductivity or solubility).
				• **How can we sort animals into groups?** According to their appearance, their habitat, their diet, etc.
				• **How delicate is a Rainforest ecosystem?** Construct a complex Rainforest food web, experimenting with the cause and effect of removing certain factors.
					• Problem solving refers to an array of learner-centred processes that facilitate deep engagement with a question or problem, using strategies to develop solutions and explanations.
					• Learners explore their own ideas and deepen conceptual understanding.
					• Learners develop thinking and reasoning skills, resilience, determination and confidence.
					• Learners follow a cyclic series of phases, with the opportunity to revise solutions and explanations based on use, analysis and feedback.
					• These phases are not necessarily completed in a linear or lock-step manner.
					• They provide structure to address a question, issue, problem, or need.
					• The cyclical problem-solving steps are:
					  ○ **Ask questions or define problems.**
					  ○ **Explore solutions or explanations.**
					  ○ **Analyse or test solutions or explanations.**
					  ○ **Communicate or act on solutions or explanations using technical vocabulary.**
					  ○ **Review or evaluate solutions or explanations.**

Science & Technology 7 Enquiry Skills @LPS						
Asking Questions and Defining Problems	**Making Predictions and Explore Solutions**	**Analysing or Testing Solutions**	**Observing and Measuring**	**Recording**	**Communicating, Interpreting and Explaining**	**Reviewing and Evaluating**
						
• Asking relevant questions that can be answered using enquiry. (How? Why? What will happen if…?) • Decide how to find answers within a variety of ways and plan next steps. Examples: • **What features do animals living at the North Pole have?** Children might use books, websites or watch videos to find out (research). • **Do all flowers have five petals?** Children may suggest carrying out a survey of flowers in the school grounds (pattern seeking). • **Which shoes have most grip?** Children could investigate the forces needed to pull shoes across different surfaces (a comparative test). • **When is the bulb brightest?** Children could investigate the effect of changing the number of batteries or the thickness / length of the wire in their circuit (fair tests).	• Using prior knowledge to predict what will happen within an enquiry. • Make educated guesses (guestimates) to solutions to questions & problems. Examples: • **I think that the biggest egg will hatch first.** Using an egg hatching kit in the classroom for chicks (observation over time). • **I think that some objects can be hard and soft.** Children could identify classroom objects as hard and/or soft and place into labelled hoops (Identifying, grouping and classifying). Will the hoops need to overlap because some objects are hard and soft? • **I think this is the strongest magnet.** Children could measure the greatest distance that different types of magnet attract a paperclip (fair test). • **I think the puddle on the in the sun will evaporate sooner than the puddle in the shade.** Children may investigate by measuring the perimeter of the puddle or taking photographs during the day (observation over time and a comparative test).	• Set up practical enquiries to test and prove predictions or solutions. • Decide on the most appropriate enquiry type, the resources required, and the equipment needed. • Consider the safety measures that are required for your testing. Examples: • **What changes do you notice across the four seasons?** Children may decide to observe one tree across the year and ask to photograph it using a camera or tablet (observation over time). • **How do rocks vary?** Children may use hand lenses or microscopes to help them identify whether they have grains, crystals or fossils in them (identifying, grouping and classifying) • **How will you separate this mixture of sand, stones and salt?** You may provide a range of sieves, spoons, filter paper and funnels so that the children can explore how to do this most effectively (problem solving).	• Using senses and measuring equipment to make observations about enquiry and suggest answers to questions. • Using systematic and careful observations, taking measurements with increasing accuracy and precision, for example, taking repeat readings. Example: • **Using different senses** - you may use 'feely' bags or smelling pots to encourage young children to use their sense of touch and smell to identify different objects (identifying, grouping and classifying). • **Measuring with rulers** - children might investigate what happens to a seed or bulb as they grow into mature plants and measure the length of the stem (observation over time). • **Using a thermometer** - children might investigate the effect of temperature on the time it takes sugar to dissolve (fair test). • **Using data loggers** - children could record sound made by a ticking clock as the distance from the source increases (pattern seeking).	• Using tables, drawings and other means to note • observations and measurements. • Using drawings or annotated diagrams - children investigating the effect of light, water and temperature on plant growth might draw diagrams of the plants every few days (observation over time). • Using tables - children investigating materials that conduct electricity might record their findings in a table (comparative test). • Using graphs - children investigating whether people with the longest legs run fastest could plot a scatter graph and draw a 'line of best fit' to see whether there is a direct relationship (pattern seeking).	• Using information from the data to say what you found out. • Orally - young children could explain to the class which items sink and float after they have each tested some objects (identifying, grouping and classifying). • Drama - children describe pollination of flowers by insects after watching some film clips (research) • Power point - older children could present a power point to their peers after finding out about the life cycle of a chosen animal (research). • Diagrams - children could create a classification key to identify mini beasts or plants after carrying out a survey in their local environment (identifying, grouping and classifying) • Poster/leaflet - children could suggest which drinks would be best for your teeth after investigating the effect of different liquids on egg shells (observation over time & fair test). • Paragraph - children could write a short paragraph to explain how to make the best string telephone after testing various pots and threads (pattern seeking).	• Reflecting on the enquiry, the approach, identifying next steps and new questions. • Informal discussion between pupil and teacher - a pupil may explain that the rocket mouse did not travel far because the bottle was small (comparative test). • Class discussion - pupils may agree that they did not find many mini beasts when they went out to survey the school grounds because it was a cold/wet day (identifying, grouping and classifying). • Written - a child may explain an anomalous result on a graph. For example, when investigating the effect of different shapes on water resistance (fair test), 'We found it difficult to start the stop watch exactly at the time the shape touched the surface of the liquid so the times are not very accurate.'

Living Things & Environments							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
Living things **Learn about 5 life processes in plants and animals, focusing on senses:** A. Know that there are things that are living and non-living. B. Understand that living things move, feed, grow and reproduce. C. How to treat animals and plants with care and sensitivity. D. That humans and other animals need food and water to stay alive. **Environments** A. Relate life processes to animals and plants found in the local environment. B. Compare animal similarities and differences, focusing on minibeasts. C. Learn how animals are suited to their surroundings, focusing on local habitats. D. Identify things in our locality which maybe harmful to myself, other animals and plants.	**Living things** **Learn about 5 life processes in plants and animals, focusing on growth:** A. Understand the differences between things that are living and non-living. B. Notice that animals, including humans, have offspring which grow into adults. C. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). **Environments** A. Recognise similarities and differences between themselves and others, and to treat life with sensitivity. B. Compare animal similarities and differences, focusing on mammals, birds, fish and reptiles. C. Learn about herbivores and carnivores. D. Learn how animals are suited to their surroundings, focusing on hot and cold habitats. E. Identify threats to our oceans and what we can do to help living things and our environment.	**Living things** **Learn about 5 life processes in plants and animals, focusing on senses and nutrition:** A. Sort and classify things that are living and non-living, using their own criteria. B. Recognise the impact of diet, hygiene and exercise, on our bodies. C. Identify parts of the human body. D. Understand the role senses play in animals (including humans) and plants. **Environments** A. Compare animal similarities and differences, focusing on fish, amphibians, reptiles, birds and mammals. B. Use simple keys to classify animals. C. Identify common animals that are carnivores, herbivores and omnivores. D. Learn how animals and plants are suited to their surroundings, focusing on habitats such as the Brazilian Rainforest. E. Investigate threats to habitats studied and how we can help sustain them.	**Living things** **Learn about 7 life processes – focusing on growth, nutrition & reproduction in plants and animals:** A. Identify parts of the plant B. Understand the effects of light and water on plant growth. C. Learn about the functions of parts of a plant. D. Understand the life cycles of animals and plants. E. Explore stages of seed germination. F. Investigate things that are good and bad for our bodies (Natural or Synthetic). **Environments: Learn about 3 kingdoms: animals, plants and fungi.** A. Compare animal similarities and differences, focusing on fish, amphibians, crustaceans, echinoderms, reptiles, birds, insects and mammals. B. Compare similarities and differences between a variety of plants. C. Begin to use and construct keys to classify living things. D. Investigate a variety of habitats such as: coastal rockpools, woodland and oceans – learning about adaptation and dependence. E. Investigate simple food chains from habitats studied. F. Investigate threats to habitats studied and how we can help sustain them.	**Living things** **Learn about the 7 life processes – focusing on nutrition, growth & respiration in plants and animals:** A. Learn about teeth and their functions. B. Explore stages of growth in animals and plants. C. Compare respiration in plants and animals. D. Recognise the importance of a healthy balanced diet and exercise. E. Understand the effect of exercise and rest on pulse rate and breathing. **Environments: Learn about 3 kingdoms: animals, plants, and fungi.** A. Investigate how living things can be classified into broad kingdoms. B. Use and construct keys to classify living things into kingdoms and classes. C. Investigate a variety of habitats within Wales and other continents such as: rainforest, coral reef, woodland, desert, oceans and wetlands – learning about adaptation and dependence. D. Compare and contrast food chain within a variety of habitats. E. Investigate threats to habitats studied and how we can help sustain them (Llangyfelach endangered species) F. Learn how human actions have affected these habitats and environments both positively and negatively: Welsh Red Kites and Rainforest endangered species conservation.	**Living things** **Learn about the 7 life processes – focusing on movement, senses & excretion in plants and animals:** A. Compare & contrast circulation in plants and animals. B. Learn about vital organs and their functions. C. Investigate the 5 senses and their role within the human body. D. Investigate the role of skeletons and muscles in the human body. E. Compare and contrast how animal and plants excrete and the importance of removing waste. **Environments: Learn about 3 kingdoms: animals, plants and fungi.** A. Compare and contrast a variety of habitats: Oceans, Rivers, Mountains, Rainforests and Urban. B. Construct, compare and contrast different food chain structures within habitats studied - source, producer, consumer, predator and prey. C. Investigate survival relationships between all living things within habitats: competition, dependence and adaptation. D. Learn how human actions have affected habitats and environments both positively and negatively: Reintroduction of Salmon to Welsh rivers due to habitat fragmentation E. Investigate the impact human actions have on the environment and the actions required to repair damage: Ocean oil spills and plastic pollution.	**Living things** **Learn about the 7 life processes focusing on nutrition & reproduction in plants and animals:** A. Explore changes to the human body over time. B. Learn about positive and negative effects of substances on the body. C. Compare and contrast vital organs and their functions in plants and animals. D. Investigate life cycles of flowering plants and humans. E. Investigate factors effecting plant growth. F. Investigate the role of the leaf in producing new material for growth. G. Investigate the variety of seed dispersal. **Environments: Learn about 5 kingdoms: animals, plants, protists, monera and fungi.** A. Classify common organisms using keys and technical vocabulary. B. Investigate, compare and contrast the 3 biomes: Aquatic, Terrestrial and Lentic. C. Learn about the variety of ecosystems within each biome. D. Construct complex food webs, related to biomes and ecosystems studied. E. Investigate survival relationships between all living things within ecosystems: competition, dependence and adaptation. F. Learn about trophic levels: source, producer, primary, secondary, tertiary, consumer, predator, prey. G. Learn how human actions impact ecosystems both positively and negatively.	**Living things** **Compare and contrast 7 life processes between plants and animals:** A. Explore the double circulatory system and the components of blood. B. Investigate how diet can improve health and performance. C. Learn how natural defences, preventions and treatments reduce threats to life. D. Learn how advances in technology are improving quality of life and performance. E. Investigate the role living things play within the carbon cycle. F. Explore the benefits and hazards of micro-organisms. **Environments: Learn about 5 kingdoms: animals, plants, protists, monera and fungi.** A. Classify a variety of organisms using complex keys and technical vocabulary. B. Investigate the position, locations, and biodiversity of the rainforest belt and polar regions. C. Compare and construct complex food webs, related to biomes and ecosystems studied. D. Learn about trophic levels: source, producer, primary, secondary, tertiary, quaternary consumer, prey, predator, apex. E. Investigate how human actions impact ecosystems both positively and negatively. F. Investigate how adaptation and variation within species is linked to evolution. G. Discuss what evidence is available to support the theory of evolution.

Material Properties							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Explore and recognise the similarities and differences between familiar materials. B. Explore simple properties of familiar materials. C. Use specific vocabulary: hard, soft, shiny, smooth, rough.	A. Explore and recognise the similarities and differences between a variety of materials. B. Sort objects into groups using simple material properties. C. Begin to understand why certain materials are used for different purposes. D. Use specific vocabulary: metal, plastic, glass, wood, paper, rock, hard, soft, shiny, dull, smooth, rough, waterproof.	A. Investigate how the material properties of different objects are suited for their use: glass, wood, metal, stone, wool. B. Sort objects into groups using material properties: float, sink, soft, tough, brittle, weak, flexible, slimy, runny, opaque, waterproof, transparent, magnetic, non-magnetic. C. Investigate ways in which materials change: squash, bend, twist stretch, melt, freeze.	A. Compare properties of materials and their uses: hardness, strength, flexibility, absorbent, insulate heat, conduct heat, electricity and magnetism. B. Investigate the way some materials change when they are heated or cooled: water, chocolate, bread, clay. C. Explore how mixing and combining materials create different materials. D. Begin to explore reversable and non-reversable changes: melting, boiling, dissolving, freezing.	A. Compare and classify different kinds of rocks based on their appearance, physical properties and how they are used: Igneous, sedimentary, metamorphic, magma, molten, lava, sand, sediment, density. B. Learn how fossils are formed when things that have lived are trapped within rock. C. Recognise that soils are made from rocks and organic matter. D. Investigate different types of rocks/soils, considering their properties: permeable, impermeable, soluble, insoluble. E. Investigate separating different size solids using sieving techniques.	A. Compare and group materials together, according to whether they are solids, liquids or gases. B. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. C. Investigate the key aspects of the water cycle: evaporation, condensation, precipitation. D. Investigate how insoluble solids can be separated from water using filtering. E. Learn about the water treatment process including filtration and purification. F. Investigate human activity within the water cycle process to minimise the effects of climate change around the world: Dwr Cymru	A. Investigate the main properties of solids, liquids and gases using technical vocabulary: state, matter, molecule arrangement, freezing, melting, temperature, cooling, heating, boil, volume, density, fixed shapes, flow, free, compress, water vapour. B. Investigate what happens to different materials when they are heated or cooled and at what temperatures in degrees Celsius (°C). C. Compare and group together materials based on their properties: focusing on magnetism. conductivity and insulation (electrical and thermal). D. Investigate why engineers and designers carefully select materials for their products.	A. Overlearn the properties of solids, liquids and gases. B. Learn that dissolving, mixing and changes of state are reversible changes. C. Investigate different insoluble and soluble solids and the factors affecting the speed of dissolving. D. Investigate mixtures and solutions and their saturation points. E. Investigate different types of irreversible changes and their physical and chemical changes that usually result in the formation of new materials – cooking, burning, rusting, grinding, F. Investigate a variety of separation techniques and their uses, such as: Evaporation, Filtration, Distillation, Magnetic Separation, Sieving, Decanting.

Physical Properties							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Learn about and begin to describe the movement of familiar things: cars going faster, slowing down, changing direction, etc. B. Begin to understand that both pushes and pulls are examples of forces. C. Identify toys and familiar objects that use light and sound and how it benefits their use.	A. Learn about and begin to describe the movement of familiar things: cars going faster, slowing down, changing direction, etc. B. Begin to understand that both pushes and pulls are examples of forces. C. Learn that when things speed up, slow down or change direction, there is a cause (for example, a push or a pull). D. Identify things around the home and school that use electricity to operate. E. Understand the dangers and hazards of electricity.	A. Identify different light sources, including the Sun. B. Understand that darkness is the absence of light. C. Learn that light from the sun can be dangerous and that there are ways to protect our eyes and skin. D. Observe changes across the 4 seasons. E. Observe and describe weather associated with the seasons and how day length varies. F. Investigate different sounds and their sources. G. Learn about everyday appliances that use electricity, discussing health and safety.	A. Learn that sounds travel away from sources, getting fainter as they do so, and that they are heard when they enter the ear. B. Learn about health and safety measures regarding electricity in the home and wider world. C. Investigate different simple series circuits involving batteries, wires, bulbs and other components (buzzers, motors) D. Investigate how a switch can be used to break a circuit. E. Learn how to design, plan and draw simple series circuits using correct scientific symbols.	A. Learn how friction between two surfaces can slow moving objects or prevent them from moving. B. Investigate how different things move on different surfaces, according to their properties and friction. C. Learn that some forces need contact between 2 objects, but magnetic forces can act at a distance. D. Investigate magnetic and non-magnetic materials. E. Observe how magnets attract or repel each other, learning about the North and South Poles of a magnet. F. Explore how light reflects off different surfaces. G. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. H. Investigate patterns in the way that the size of shadows change. I. Learn how shadows change throughout the day in relation to the position of the sun. J. Investigate different series circuits involving several components. K. Investigate what happens when adding more components to a series circuit. L. Plan and draw scientific diagrams of series circuits using correct scientific symbols.	A. Investigate the parts and functions of the ears and eyes and how they help us see and hear. B. Learn that light travels in straight lines and objects are seen because they give out or reflect light into the eye. C. Learn that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. D. Investigate why shadows have the same shape as the objects that cast them. E. Investigate how sounds are made. F. Learn that vibrations from sounds (and their sources) travel through a medium to the ear. G. Investigate patterns between the pitch of a sound and features of the object that produced it. H. Investigate patterns between the volume of a sound and the strength of the vibrations that produced it. I. Learn that sounds get fainter as the distance from the sound source increases – investigating the difference between low and high pitch sounds. J. Investigate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit. K. Plan and draw scientific diagrams of more complex series circuits using correct scientific symbols.	A. Learn that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. B. Investigate the effects of air resistance, water resistance, upthrust and friction, that act between moving surfaces. C. Learn that energy transfers to different forms – investigating how friction turns to heat energy. D. Investigate how mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. E. Investigate the magnetic field of a bar magnet and how the field lines run from North to South Poles, and its relationship to the Earth's magnetic field. F. Investigate orbits, alignments and features of Earth and other planets relative to the sun in the solar system. G. Learn about the lunar cycle and relative size and distance to Earth. H. Investigate the position, rotation and angle of Earth and how this relates to length of day, night, year and seasons. I. Design, draw, label and construct series circuit, identifying and naming its basic parts (cells, wires, bulbs, switches and buzzers). J. Begin to investigate parallel circuits and decide which components will work within given diagrams.	A. Learn that forces act in pairs - Investigating balanced and unbalanced forces. B. Learn how to measure forces and investigate the difference between weight and mass. C. Investigate laws of motion and how they affect objects and the body. D. Learn how to make an electromagnet and investigate factors that make it stronger or weaker. E. Design, draw, label and construct series and parallel circuits, identifying and naming its parts (cells, wires, bulbs, switches and buzzers). F. Investigate how to control various sections of a parallel circuit using diagrams to plan and appropriate apparatus to test. G. Investigate the flow and measure of electricity: voltage, amps, resistance, electrons, volts (V), current. H. Experiment with variations for example: dimmer, brighter, louder, quieter. I. Learn about different forms of electricity: natural electricity, human-made electricity, solar panels, power station. J. Investigate how energy can be transferred from one place, or form, to another and how this can used to provide the energy we need in our modern lives.

Evaluating Scientific Enquiry							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Show curiosity about objects, events and people. B. Questions why things happen. C. Closely observes what animals, people and vehicles do. D. Use senses to explore the world around them. E. Answer how and why questions about their experiences.	A. Asks questions and enquire about the world around them. B. Make links and notice patterns in their experiences. C. Take a risk, engage in new experiences and learn by trial and error. D. Find ways to solve problems and test their ideas. E. Develop ideas through grouping and sequencing. F. Make observations and show an understanding of cause and effect. G. Suggest resources required for selected activities. H. Begin to connect ideas and events, communicating simple conclusions.	A. Use everyday language and simple scientific words to ask or answer a scientific question. B. Begin to say what might happen in an investigation – offering their predictions. C. Observe objects, materials and living things and describe what they see. D. Use simple, nonstandard equipment and measurements in a practical task. E. Sort and group objects, materials and living things, with help, according to simple observational features. F. Follow instructions to complete a simple test individually or in a group. G. Begin to record simple data. H. Talk about their findings and explain what they have found out. I. Use every day or simple scientific language to discuss given data.	A. Suggest ideas, ask simple questions and know that they can be answered or investigated in a variety of ways - including simple secondary sources, such as books and video clips. B. Make predictions drawing on their previous experiences and knowledge. C. Observe something closely and describe changes over time. D. Use simple equipment, such as hand lenses or egg timers to take measurements, make observations and carry out simple tests. E. Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns. F. Do things in the correct order when performing a simple test and begin to recognise when something is unfair. G. Gather data, record and talk about their findings, in a range of ways, using scientific vocabulary. H. Use scientific language to explain what they have found out. I. Identify simple patterns and relationships using simple comparative language.	A. Use ideas to pose questions, independently, about the world around them. B. Make predictions and offer logical reasons. C. Make decisions about what to observe during an investigation. D. Take accurate measurements using standard units. E. Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships. F. Discuss enquiry methods and describe a fair test. G. Record their findings using scientific language, diagrams, tables and charts. H. Draw a simple conclusion based on evidence from an enquiry or observation. I. Gather, record and use data in a variety of ways to answer a scientific question.	A. Suggest relevant questions and know that they could be answered in a variety of ways, including using secondary sources such as ICT. B. Answer questions using straight forward scientific evidence. C. Make predictions and give a reason using scientific knowledge and vocabulary. D. Make systematic and careful observations. E. Take accurate measurements using standard units and a range of equipment, including thermometers and data loggers. F. Identify similarities, differences and changes when talking about scientific processes. G. Identify and explain patterns seen in the natural environment. H. Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables. I. Choose appropriate ways to record and present information, findings and conclusions for different audiences (e.g., displays, oral or written explanations). J. Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries. K. Use scientific evidence to support their findings.	A. Raise different types of scientific questions, and hypotheses. B. Base predictions on findings from previous investigations C. Plan and carry out comparative and fair tests, making systematic and careful observations. D. Take measurements using a range of scientific equipment with increasing accuracy and precision. E. Plan a range of science enquiries, including comparative and fair tests. F. Record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, bar and line graphs and models. G. Use a simple mode of communication to justify their conclusions on a hypothesis. H. Begin to recognise how scientific ideas change over time. I. Identify changes, patterns, similarities and differences in data to help form conclusions. J. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	A. Pose and select the most appropriate line of enquiry to investigate scientific questions. B. Combine experience and knowledge of scientific phenomenon to make sound predictions. C. Make their own decisions about which observations to make, using test results and observations to make predictions or set up further comparative or fair tests. D. Choose the most appropriate equipment to take measurements, explaining how to use it accurately. E. Decide how long to take measurements for, checking results with additional readings. F. Select and plan the most suitable line of enquiry, explaining which variables need to be controlled and why, in a variety of comparative and fair tests. G. Choose the most effective approach to record and report results, linking to mathematical knowledge. H. Identify validity of conclusion and required improvement to methodology. I. Discuss how scientific ideas develop over time. J. Identify and explain causal relationships in data and identify evidence that supports or refutes their findings, selecting fact from opinion.

Designing & Evaluating Products							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Select available resources to construct through play. B. Communicate ideas practically using materials. C. Use specific vocabulary to explain their ideas. D. Share opinions on a given product. E. Explain what they like about what they have made through exploratory play.	A. Select appropriate resources. B. Communicate design ideas using materials and components. C. Follow a simple design brief. D. Use language of designing and making (join, build, shape, longer, shorter, heavier etc.). E. Talk about their work, linking it to the task. F. Talk about existing products and say what is and isn't good. G. Look at similarities and differences between existing objects, materials and tools.	A. Create and explain own ideas. B. Explain what the product is for, and how it will work. C. Use pictures and words to plan and begin to use models. D. Design a product following design criterion. E. Research similar existing products. F. Dismantle, examine, talk about existing objects and structures. G. Talk about things that other people have made and how they work. H. Talk about what could make a product better.	A. Create own ideas and plan what to do next. B. Explain intensions and how to do it. C. Explain purpose of product, how it will work and how it will be suitable for the user. D. Describe design using pictures, words, models, diagrams and using ICT. E. Design products for themselves and others, following design criteria. F. Select best tools and materials, explaining choices made. G. Use knowledge of existing products to produce ideas. H. Describe what went well, thinking about design criteria. I. Talk about existing products, expressing opinions on their use, materials used, how they work, audience, where they might be used. J. Discuss alterations to be made to improve the product.	A. Begin to research others' needs. B. Show design meets a range of requirements. C. Describe purpose of product. D. Follow given design criteria. E. Create a plan which shows order, equipment and tools. F. Describe design using an accurately labelled sketch and words. G. Make design decisions. H. Explain how product will work. I. Refer to design criteria while designing, making and evaluating. J. Discuss by whom, when and where products were designed. K. Evaluate how good existing products are.	A. Use research for design ideas. B. Show design meets a range of requirements and is fit for purpose. C. Begin to create own design criteria. D. Produce a plan and explain it to others. E. Create designs and plans that are realistic. F. Include an annotated sketch. G. Make and explain design decisions considering availability of resources. H. Make a prototype. I. Begin to use ICT to show or create designs. J. Use design criteria to make and evaluate a product, explaining how to improve the original design. K. Evaluate existing products, considering how well they've been made, materials used, whether they work effectively and are they fit for purpose. L. Research whether products can be recycled or reused.	A. Use internet and questionnaires for research and design ideas. B. Take a user's view into account when designing. C. Begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose. D. Create own design criteria. E. Produce a logical, realistic plan and explain it to others. F. Use cross-sectional planning and annotated sketches. G. Make design decisions considering time and resources. H. Clearly explain how parts of product will work. I. Model and refine design ideas by making prototypes. J. Use computer-aided designs. K. Evaluate the quality of design and product, justify choices of materials and techniques used. L. Evaluate ideas and finished product against specification, considering purpose and appearance. M. Test and evaluate final product; explaining improvements required and the effect different resources may have had. N. Research how sustainable materials are.	A. Draw on market research to inform design. B. Use research of user's individual needs, wants, requirements for design. C. Identify features of design that will appeal to the intended user. D. Create own design criteria and specification. E. Come up with innovative design ideas. F. Follow and refine a logical plan. G. Use annotated sketches, cross- sectional planning and exploded diagrams. H. Make design decisions, considering, resources and cost. I. Clearly explain how parts of design will work, and how they are fit for purpose. J. Independently model and refine design ideas by making prototypes and using pattern pieces. K. Use a variety computer-aided design software to fit the intended purpose and outcome. L. Evaluate ideas and finished product against specification, justifying if it's fit for purpose. M. Consider the impact of products beyond their intended purpose. N. Evaluate how much products cost to make and how innovative they are. O. Discuss some key inventors, designers, engineers, chefs and manufacturers of ground-breaking products.

Making Products							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Construct by stacking blocks vertically and horizontally. B. Construct on a larger scale by making enclosures and creating spaces. C. Join construction pieces together to build and balance. D. Realise that tools can be used for a purpose. E. Talk about what they eat at home. F. Discuss what healthy foods are and their healthy snack at school.	A. Construct with a purpose, using a variety of resources. B. Select tools & techniques to shape, assemble and join. C. Replicate structures with materials and components. D. Discuss how to make an activity safe and hygienic. E. Record experiences by drawing, writing, voice recording. F. Talk about what he/she eats at home and begin to discuss what healthy foods are, giving reasons why. G. Use simple tools with help to prepare food safely.	A. Explain the product being made, the steps involved and why. B. Select tools and equipment to cut, shape, join, finish and explain choices. C. Choose suitable materials and explain choices. D. Work in a safe and hygienic manner. E. Understand different media can be combined for a purpose. F. Suggest ways to make a material/product stronger. G. Use the basic principles of a healthy and varied diet to prepare dishes. H. Say where some food comes from and give examples of food that is grown. I. Understand that all food has to be farmed, grown or caught.	A. Explain the product being made and why it fits the purpose. B. Make suggestions for next steps. C. Join materials and components together in different ways. D. Measure materials required for the product design. E. Describe which tools to use and why. F. Choose suitable materials and explain choices depending on characteristics. G. Use joining, rolling or folding to make it stronger. H. Understand how to use levers, slides, wheels and axles. I. Understand that a 3D textile structure can be made from two identical fabric shapes. J. Develop food preparation techniques such as cut, peel and grate with increasing confidence. K. Understand the need for a variety of food in a diet.	A. Select suitable tools and equipment, explain choices; begin to use them accurately. B. Select appropriate materials, fit for purpose. C. Measure and mark out materials to cut to the correct size required for product designs. D. Learn techniques to assemble, join and combine materials. E. Learn the importance of finishing techniques. F. Work accurately to make cuts and holes. G. Alter product after checking, to make it better. H. Use simple lever and linkages to create movement. I. Use simple circuit in a product. J. Learn how to program a computer to control objects within and around a virtual environment. K. Talk about the different food groups and name food from each group L. Understand that food has to be grown, farmed or caught in Europe and the wider world M. Use a wider variety of ingredients and techniques to prepare and combine ingredients safely. N. Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.	A. Select suitable tools and equipment, explain choices in relation to required techniques and use accurately. B. Select appropriate materials, fit for purpose; explain choices. C. Work through plan in order. D. Realise if product is going to be good quality. E. Measure, mark out and cut materials or components with accuracy. F. Assemble and combine materials and components using a range of techniques. G. Begin to apply a range of finishing techniques with some accuracy. H. Use pneumatics to create movement. I. Use number of components in a circuit, within a product. J. Learn how to make structures stronger. K. Learn how to program a computer to control a product. L. Understand what makes a healthy and balanced diet, and that different foods and drinks provide different substances the body needs to be healthy and active. M. Understand the main food groups and the different nutrients that are important for health.	A. Use selected tools/ equipment with good level of precision. B. Select appropriate materials, fit for purpose; explain choices, considering functionality. C. Create and follow detailed step- by-step plan. D. Explain how product will appeal to an audience. E. Accurately measure, mark out, cut and shape materials and components. F. Accurately assemble, join and combine materials and components. G. Apply a range of finishing techniques to products. H. Ensure product is strong and fit for purpose. I. Refine product after testing. J. Begin to use cams, pulleys or gears to create movement. K. Learn how to incorporate a switch into a product. L. Learn how to program a computer to monitor changes in an environment and control product. M. Use range of food preparation techniques such as peeling, chopping, slicing, grating, mixing, spreading and kneading and baking. N. Read and follow recipes which involve several processes, skills and techniques. O. Understand how a variety of ingredients are grown, reared, caught and processed to make them safe and palatable/tasty to eat. P. Understand the advantages of eating seasonal and locally produced food.	A. Use selected tools and equipment precisely. B. Select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics. C. Create, follow, and adapt detailed step-by-step plans. D. Explain how product will appeal to audience; make changes to improve quality. E. Accurately measure and construct products using CAD software and 3D printing. F. Select the best finishing techniques to fit the purpose and function of the product/user. G. Be resourceful and resilient during practical problems. H. Use a variety of techniques to reinforce and strengthen a 3D frame. I. Explore hydraulics and pneumatics. J. Think about how a product might be sold and marketed. K. Consider ways in which adding a variety of circuits could improve a product. L. Monitor environment changes and log data over time, using computer programmes. M. Plan healthy meals based on the principles of a healthy and varied diet N. Use information on food labels to inform choices. O. Research, plan and prepare and cook a savoury dish applying knowledge of ingredients and technical skill.

Digital Citizenship							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Distinguish between someone they know and someone they have never met, e.g. 'Stranger Danger'. B. Use digital devices and media with care, e.g. name a variety of digital devices and handle appropriately. C. Add their name to digital work by using initial letter. D. Identify some work that belongs to others, e.g. find a photograph/picture created by a familiar peer/adult. E. Give reasons for likes/dislikes of on-screen activities. F. Use appropriate words and feelings, e.g. discuss words and feelings that could upset people.	A. Recognise that actions have consequences and identify simple rules to keep them safe (offline and online). B. Recognise that data can be shared online, e.g. with adult support, find images of themselves and others for example on the school website/school social media page, etc. C. Add their full name to digital work. D. Find the name of the author on digital work. E. Explain how people can connect with others online, e.g. identify forms of communication. F. Identify emotions of others on a range of digital software, e.g. talk about feelings and begin to recognise emotions; consider how actions and words can affect others; realise that behaviour has consequences; identify when they are angry worried or frightened and know who to ask for help.	A. Understand that some websites ask for information that is private and personal, e.g. identify private and personal information and discuss how to handle requests for private information – not disclosing full name, address, date of birth, school. B. Use digital devices within a controlled environment, time and context. C. Add their name and the date to work they have created. D. Understand that digital technology can be used to communicate and connect with others locally and globally e.g. LPS Website, Twitter Page, Instagram and Facebook. E. Begin to identify similarities and differences between online and offline communication, e.g. follow same rules when communicating face-to-face and online. F. Use appropriate words and feelings, e.g. discuss words, acts, behaviours.	A. Understand that information put online leaves a digital footprint or trail, e.g. explain the meaning of digital footprint and encourage them to think critically about the information they leave online. B. Identify the steps that can be taken to keep personal data and hardware secure, e.g. understand usernames and passwords, why we have them and how they are kept safe. C. Begin to identify and explain the advantages and disadvantages of digital media and devices on their lives, e.g. on their physical and mental well-being. D. Add their name and the date to work they have created and give reasons why this is important. E. Use digital technology to communicate and connect with others locally and globally, e.g. text, image, photographs, video, newsletters, e-mail, web services. F. Interact appropriately with others, e.g. follow the same rules when communicating face-to-face and online.	A. Be aware of simple rules for sharing images and data, e.g. understand that photographs cannot be taken of others or shared online without seeking permission first. B. Use strategies for creating and keeping strong, secure passwords, e.g. three to four random words joined together or using capitalisation, special characters and numbers. C. Acknowledge age restrictions and suitability of digital media and devices, e.g. locate and begin to understand PEGI ratings and age restriction guidelines. D. Identify physical and emotional effects of playing/watching inappropriate content/games. E. Explain how giving credit, is a sign of respect. F. Explain when and how it is acceptable to use the work of others. G. Explain the similarities and differences between offline and online communications, e.g. follow the same rules when communicating face-to-face and online; discuss how online communication can be misinterpreted. H. Compose clear and appropriate messages in online communities. I. Identify different forms of bullying, including cyberbullying, and suggest strategies for dealing with it, e.g. screenshot, block, report.	A. Understand how to protect themselves from online identity theft, e.g. security symbols such as a padlock, phishing, scam websites. B. Be aware that information put online leaves a digital footprint or trail, e.g. to aid identity theft. C. Identify risks and benefits of installing software, e.g. identify possible risks of installing free and paid for software. D. Identify the positive and negative influences of technology on the environment, e.g. consider the different ways free time is spent and begin to find a balance between active learning and digital activities. E. Understand that copying the work of others and presenting it as their own is called 'plagiarism', e.g. begin to consider consequences of plagiarism. F. Recognise watermarks on a variety of media, know the reasons for using watermarks and explore how watermarks can be added in different software. G. Identify actions to report and prevent cyberbullying, e.g. use strategies such as not replying, reporting and saving evidence. H. Identify appropriate behaviour when participating or contributing to collaborative online projects for learning, e.g. devise a set of rules.	A. Talk about the impact that the digital content created can have, e.g. think critically about the information shared online; be aware of appropriate and inappropriate text, photographs and videos and the impact of sharing these online. B. Explain why it is important to discuss their use of technology with an adult, e.g. discuss positive and negative reputation, maintain secure passwords on a regular basis and refrain from using the same password more than once. C. Identify secure sites by looking for privacy seals of approval, e.g. https, padlock icon. D. Explain the importance of balancing game and screen time with other parts of their lives. E. Learn the importance of citing all sites when researching e.g., create linked lists that references use of information or ideas. F. Understand that photographs can be edited digitally, exploring the advantages, disadvantages, reasons, rights and permissions associated with this. G. Demonstrate appropriate online behaviour and apply a range of strategies to protect self and others from possible online dangers, bullying and inappropriate behaviour, e.g. turn off comments on digital media, block users; know how to deal with and report inappropriate content and misuse.	A. Explain what metadata of a photograph can include, e.g. date, time and location. B. Identify benefits and risks of mobile devices broadcasting the location of the user/device, e.g. apps accessing location. C. Identify the benefits and risks of giving personal information and device access to different software. D. Understand how and why people use their information and online presence to create a virtual image of them as a user. E. Explore the reasons why they may be tempted to spend more time playing games or find it difficult to stop playing and the effect this has on their health. F. Cite all sources when researching and explain the importance of this, e.g. create linked lists for the referencing of digital and offline sources; discuss rights and permissions associated with this. G. Demonstrate appropriate online behaviour and apply a range of strategies to protect self and others from possible online dangers, bullying and inappropriate behaviour, e.g. turn off comments on digital media, block users; identify the risks and legal consequences of sending intimate images and content/sexting; recognise language that could be deemed to be offensive (including racist, sexist, homophobic, transphobic) in online activities.

Interacting and Collaborating							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Create a simple picture which they share digitally with another person or location, with support. B. Work together with a partner on a piece of digital work. C. Save work by clicking an icon.	A. Talk about different forms of online communication, e.g. e-mail, messaging, video call and their uses. B. Collaborate locally with a partner or group on a piece of digital work. C. Save work by clicking an icon and understand that the work can be retrieved.	A. Contribute to a whole-class or group online communication in one or more languages, e.g. e-mail or video call. B. Collaborate online with a partner, group or whole class on a piece of digital work. C. Save work using a familiar word as a filename, e.g. child's name/key word and understanding that this work can be retrieved.	A. Send simple online communication in one or more languages from a single user account, e.g. e-mail (ensuring address is typed accurately) or video call. B. Use online software to collaborate, create or edit a file in one or more languages, e.g. word processing, presenting tools, databases. C. Save work using an appropriate file name, e.g. child's name and simple title and understand the importance of this. D. Use an icon to open and share a saved file. E. Search for a specific file.	A. Learn to use and understand the benefits of emailing and video calling. B. Explain the advantages of communicating electronically, e.g. time saving (especially covering large distances almost instantly), resource saving, cost effectiveness, able to have multiple users from different countries communicating simultaneously, content is easily shared/ saved /stored/ tagged. C. Use an online collaborative platform, such as Teams, to communicate, share, create or edit a file in one or more languages, e.g. word processing, presenting tools, spreadsheets. D. Save files to a specific location using an appropriate file name, e.g. select a file name that would be searchable at a later date. E. Understand the importance of saving work periodically to avoid losing work. F. Develop strategies for finding information using different keywords and techniques, e.g. follow a step-by-step set of instructions on how to search effectively for information relevant to a task and select an appropriate website from skimming through a small number of sources.	A. Develop ability to send e-mails with attachments and changing the format for audience and purpose. B. Manage an online file, adding and responding to comments in one or more languages, e.g. create, share and edit an online file engaging in reflective discussion with teacher and/or peers. C. Use an online collaborative platform, such as Teams, to use as a discussion environment on class and home work. D. Be aware of different types of storage, e.g. local, network, online, removable. E. Manage files and folders locally or online, e.g. move files to a different folder. F. Find relevant information using different keywords and search techniques. G. Select an appropriate website from search results and begin to consider if the content is reliable.	A. Enhancing online communication skills when e-mailing, using search functions, managing contacts and embedding links to useful websites. B. Show an understanding of the advantages and disadvantages of different forms of communication and when it is appropriate to use each, e.g. explain when video conferencing may be more appropriate than e-mail, and visa versa. C. Use an online platform, such as Teams and OneNote to share, present, collaborate and extend topic project research in school and at home. D. Upload files from a local drive to online storage. E. Adjust keywords and search techniques to find relevant information. F. Begin to reference sources used in their work; consider if the content is reliable, e.g. find information using accurate terms, use a range of sources to check validity and understand the impact of incorrect information.	A. Exchange online communication in one or more languages, making use of a growing range of available features, such as managing folders within e-mail, including using reporting features to filter spam and make use of webcams to facilitate video calls. B. Discuss and explain the pros and cons of using instant messaging in social contexts; talk about purpose and audience. C. Work with others to create an online collaborative project or environment for a specific purpose in one or more languages, sharing and appropriately setting permissions for other group members, e.g. editing, commenting, viewing. D. Create and share hyperlinks to local, network and online files. E. Password-protect a file.

Producing Skills							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Navigate through a piece of software using internal menu to find desired item. B. Explore and use different multimedia components to capture and use text, image, sound, animation and video. C. Type a word (or simple sentence) and change the font, font colour and font size of the whole text. D. Use stamps to add images to an appropriate background and use a Paintbrush and Fill tools to create a simple image. E. Record audio to accompany a digital piece of work. F. Record and play back simple videos using a tablet/device or camera.	A. Find information with a variety of sources, e.g. suggest technology as a source of information and explore familiar image/ symbol-based websites or apps. B. Select appropriate software from a limited range to create multimedia components; create and explore the use of text, image, sound, animation and video. C. Build sentences, using words from a word bank. Insert and delete text. D. Use a camera to capture images. Use these images in a piece of digital work. E. Record audio to accompany a piece of digital work. F. Create a simple frame-by-frame animation by adding a series of stamps to a single background.	A. Use text when searching for information/media (image, video, sound) and use an internet browser independently, e.g. open web browser and type in one keyword for a search. B. Select appropriate software to complete given tasks to use text, image, sound, animation and video. C. Enter keywords into the JiT library search. D. Format individual words or sentences, by highlighting before formatting. Use Copy and Paste tools, using on-screen icons. E. Import a photograph as a background and enhance using simple graphic tools. Use a camera to capture a series of images. F. Record audio to accompany a digital piece of work. G. Record a sequence of videos to capture a story or role play of other learners.	A. Use keywords to search for specific information to solve a problem, e.g. type keywords into a search engine and explain how their choice of website helps to solve the problem. B. Add a new website to j2Launch dashboard using a URL. C. Combine text, image, sound, animation and video within a range of tasks. D. Build simple paragraphs. Justify the text to the left, right and centre. Move text boxes to appropriate places on the screen. Use keyboard shortcuts to access tools such as Copy and Paste. E. Import an image, resize, crop and rotate as appropriate, to enhance a document. F. Record multiple audio clips to accompany a piece of digital work. G. Record and edit videos, adding a title and ensure steady shots. H. Use editing tools to improve their work.	A. Create and edit multimedia components, organising a range of text, image, sound, animation and video for selected purposes. B. Format text using Bold, Italic, Underline. Use bullet points to create a list. C. Import an image. Add an effect, frame and shadow, as appropriate, to enhance a document. D. Add sound clips at appropriate points in a presentation. E. Create a simple stop-frame animation and add a title. F. Use a spellchecker, decide if the red line underneath words point to misspelt words; use suggested spellings where appropriate.	A. Using a range of software to create, modify and present multimedia components (text, image, sound, animation and video) for selected purposes. B. Manipulate text boxes on screen, by moving, resizing and duplicating. C. Use tables to structure information in a document or presentation. D. Digitise hand-drawn pictures and include in a presentation. E. Record and edit audio clips. F. Trim videos, which includes long shot, mid shot, close up. Use a greenscreen to edit different backdrops. G. Edit work for improvements and discuss the benefits and limitations of a spellchecker, especially with Welsh language documents.	A. Create, collect and combine a range of text, image, sound, animation, 3D virtual images and video for selected purposes. B. Manipulate text boxes by changing background colours, adding frames. C. Add more than one image to a document. Overlap the images and display the required part of each image by reordering the layer on which they sit. D. Remove original sound from a video and overlay a new narration. E. Combine more than one clip using extreme close up, extreme long shot and point of view shots. F. Explain reasons for layout and content of own work, e.g. evaluate the presentation for audience and appropriateness.	A. Extend strategies for finding information; store previous searches and results for future use, e.g. reference through hyperlinks and bookmark a website. B. Use a range of software to produce and refine multimedia components for specific purposes, including 3D virtual images, video and animation. C. Use superscript and subscript characters. Use both landscape and portrait page orientation, where appropriate; use spellcheckers. D. Resize an image, using a fixed and non-fixed aspect ratio. E. Record a multitrack audio clip. F. Combine clips, appropriate effects, transitions and titles, including reverse angle shot. G. Use comment functions within online software packages to allow others to review work, ask questions or add suggestions.

Data & Computational Thinking Skills							
P1.1	**P1.2**	**P2.1**	**P2.2**	**P2.3**	**P3.1**	**P3.2**	**P3.3**
A. Give single instruction to programmable toy, observe what has happened and then decide what instruction to give to move to the next given destination. B. Learners look for patterns, complete sequences and create their own patterns to develop their understanding of simple algorithms. C. Gather data using objects and sort using set criteria. D. Recognise that there are different types of data, e.g. sort and/or match objects/photographs/symbols.	A. Create short sequences of instructions to begin to control a floor robot using specific and accurate language, e.g. forward, back, left and right. B. Attempt alternative approaches to solve a problem or achieve a goal. C. Follow verbal instructions from others to recreate a constructed model. D. Create and record instructions for others to follow a trail. E. Interpret information and data by making direct comparisons, e.g. explain why one group or set is different to another set. F. Create a simple pictogram using suitable software. G. Sorting items into groups giving reasons for their groupings.	A. Understand and use simple programming language when investigating challenges using programmable toys, such as Bee-Bots. B. Programme a sprite to move in across a screen using directional language in JIT, e.g, Forward, Back, Home, Left, Right. C. Follow a sequence of steps to solve a problem, e.g. predict and explain what actions are needed to make something happen. D. Create and record written instructions that others understand and can follow. E. Change instructions to achieve a different outcome. F. Classify an object using more than one criterion, e.g. labelling group/set. G. Record data collected in a suitable format, e.g. use tally charts, pictograms and block graphs in simple computing package. H. Sort given pictures (e.g. insects) and words into groups, using one or more criteria, giving reasons for their grouping.	A. Programme a sprite to move in various directions across a screen using simple programming language in J2E, e.g, PU, PD, FD, BK, RT, LT, Repeat, End, CS. B. Explain to others how a designed solution works, e.g. explain a design for a simple playground game and test, correcting any issues that arise. C. Predict the outcome of simple sequences of instructions, e.g. predict what will happen if instructions are followed accurately. D. Create a simple solution that tests an idea, e.g. predict what would happen if it went wrong. E. Use logical reasoning to explain their predictions before programming and testing their commands to see if they are correct. F. Collect and organise data into groups, e.g. gather data by voting (Kahoot) or sorting and represent in pictures, objects or drawings. G. Extract information from simple tables and graphs, e.g. answer questions on table graph. H. Record data collected in a variety of suitable formats, e.g. lists, tables, block graphs, tally charts and pictograms, and input into software packages (JiT) I. Create branching databases to classify and sort information and data.	A. Programme a sprite to move in directions, patterns or shapes across a screen using programming and mathematical tools and language. B. Detect and correct mistakes in sequences of instructions, e.g. identify mistakes in a solution that would cause it to fail (debug). C. Identify repetitions or loops in a sequence, e.g. identify where to shorten a set of instructions by repeating steps, for instance when learning a new song. D. Explore simple algorithms and compare the similarities and differences between them. E. Collect data, enter and analyse in given formats e.g. table, charts, databases and spreadsheets. F. Search and sort a given and online database following a simple line of enquiry, e.g. deciding which data needs collecting and giving reasons for sorting. G. Use a spreadsheet to store and interrogate information, e.g. add information to a spreadsheet, discuss the information and begin to answer specific questions. H. Create a graph using a spreadsheet. I. Extract data charts from software packages and drop into presentations or project work to support content and purpose.	A. Investigate repetition (loops) in programming language by creating algorithms to draw patterns made of complex shapes (using scratch or logo). B. Demonstrate how part of a solution might need repetition. C. Represent a simple solution in a flowchart that contains a looping element, e.g. identify where a repeat or loop may work in a flowchart, for instance traffic lights, and select variables. D. Create data sets and extract information from them with tables, charts, spreadsheets and databases. E. Create a simple database, e.g. identifying records, fields, etc., using prepared software. F. Perform simple searches and extract information on branching databases, e.g. simple search on branching database to answer questions and check statements. G. Add and amend records in databases, e.g. fields. H. Extract information from spreadsheets to answer specific questions. **I.** Add information to a given spreadsheet.	A. Design simple sequences of instructions (algorithms) including the use of Boolean values (i.e. yes/no/true/false), e.g. within the algorithm, demonstrate the correct use of Boolean values giving an either/or response. B. Create, explore and analyse data sets, highlighting relationship within them e.g. using spreadsheets, databases, tables and charts C. Interrogate a database using search and sort filters, e.g. sorting on a particular field or record. D. Create a database collect, prepare and create a database ensuring accuracy of entry and editing mistakes. E. Perform simple manipulations of a database, e.g. adding field. F. Perform searches on larger databases and online databases. G. Create a spreadsheet with a variety of data and use simple formulas, e.g. sum, +, -, *, /. H. Explore patterns and relationships and make simple predictions about changing variables in data.	A. Demonstrate how programs or processes run by following a sequence of instructions exactly and in order. B. Demonstrate how an algorithm is useful for representing a solution to a problem through testing. C. Understand that changing instructions can affect or even terminate a process, e.g. moving instructions around in a program could produce unexpected outcomes or cause the program to fail altogether. D. Construct, refine and interrogate data sets to test or support an investigation. E. Create and organise a database with a variety of fields to record results, F. Search using two or more criteria for a specific purpose. G. Add and remove data fields to improve quality. H. Use the results from searches and represent the information appropriately, e.g. carry out relevant searches using =, >, <, >=, <=, <> and represent searched information in relation to task. **I.** Create spreadsheets with increasing complexities and test hypotheses, e.g. create spreadsheets with simple formulae (+ - * / , sum, max, min, average). J. 'What if' – predict outcome of change of single data items, perform changes and record actual outcome.