TAFF BARGOED LEARNING PARTNERSHIP

School Curriculum – Whole School Progression

Curriculum for Wales		
	AoLE Focus	SCIENCE AND TECHNOLOGY
	Our School Curriculum Vision	Within the Taff Bargoed Learning Partnership, our learners will be provided with experiences that will allow them to; Recognise their importance as a global citizen and take responsibility for their environment and wider world; developing their understanding of organic and inorganic science. They will apply experience, skills and knowledge to develop ideas independently. Authentic contexts will fuel their curiosity and provide opportunities to question, observe, challenge and create solutions to problems. As individuals, our learners will foster a respect for emerging technologies; relating it to their everyday lives. Through the various areas explored, learners will combine their skills and understanding to achieve their potential
	Progression Step	3

Knowledge – *'Learn ABOUT'*

Within our Curriculum, a focus is given to Pupil interest in contributing to the learning that is taking place, in order to develop a child-centred approach. However there is a range of expected knowledge that we aim to develop Pupils Skills through.

In Year 5, Pupils will learn about…

- Impacts on the environment and the wider effect of human activity causing environmental issues
- Exploring habitats of animals and living things, exploring features such as food chains, classification and adaption to environment
- Natural resources including fossil and green energy and how this can support our future use of the planet
- Magnetic fields and electricity and the use of these in everyday life
- Forces around us including gravity
- Space and the features that affect us in our everyday lives.
- How technology (including engineering) and its developments, impact on everyday life
- The world of coding and how this can be used for various purposes including using monitors and sensors
- The importance of e-safety in the online world
- The use of technology for processing information, including gaming and 3D modelling
- Mechanisms control movement and that an input is needed to start a mechanism and the output that is caused as a result.
- How to strengthen structures, finding out about bridges and their associated features
- Designing a product which incorporates a simple circuit.

In Year 6, Pupils will learn about…

- The features of their bodies including the functions and systems relating to vital organs and tissues
- The effects of unhealthy lifestyles and preventions and cures of illness
- Exploring the properties associated with changes of state and changes to materials and their properties
- Electricity and energy transfer in use of everyday life including features of batteries.
- Investigating the sources and systems associated with light and sound.
- How technology (including engineering) and its developments, impact on everyday life
- The importance of e-safety in the online world of communication, including the use of blogging
- The world of coding and how this can be used for various purposes, including an initial understanding of binary code and networking
- The use of technology for processing information in various ways.
- The features of CAMS and followers and how these can be used in a product to create a desired effect.
- Man-made and natural structures and how structures can be strengthened by manipulating materials and shapes
- Create a toy/game that incorporates a simple circuit
- Design a product that uses simple coding as part of its features.

Experience – *'Learn FROM'*

Pupils will be provided with an opportunity to experience:-

- Experience and investigate real life science, making their own observations and findings
- Exploring the world of technology and technological developments, including the world of engineering
- Take part in regular opportunities to apply their STEM skills
- Identify for themselves how the world of Science and Technology can open up areas of employment and study
- Apply their findings to their own lives and the everyday world that they live in.
- Visitors and visits to places of scientific discovery and development of technology.
- How technology (including engineering) and its developments, impact on everyday life
- Engaging with resources of a digital nature
- Opportunities to engage in design and construction activities

SKILLS – *'Learn TO'*

*Through our Curriculum for **Expressive Arts,** our pupils will develop as **Ambitious, Capable Learners**, **Healthy confident Individuals**, **Ethical, informed Citizens** & **Enterprising, Creative contributors.***
Enrichment and Experiences within this AoLE, at our School, will include opportunities for Pupils to;

What Matters Statement	Through opportunities to;	Descriptions of Learning	What this looks like in **YEAR 5**:	What this looks like in **YEAR 6**:	On to **YEAR 7**:
Being curious and searching for answers is essential to understanding and predicting phenomena		3.1 I can identify questions that can be investigated scientifically and suggest suitable methods of inquiry	▪ Recognise that scientific enquiry can test and answer a range of questions. ▪ Suggest ideas independently. ▪ Carry out a 'fair test' varying one factor to investigate. ▪ Use a range of apparatus safely	▪ Identify different kinds of enquiry to use to answer a question e.g. survey, pattern seeking, fair test, technology, identification and classification, exploration ▪ Select and use apparatus with care and precision and use it safely.	
		3.2 I can suggest conclusions as a result of carrying out my inquiries	▪ Use graphs to identify patterns and trends in data ▪ State what has been found using relevant language ▪ Link conclusions to scientific knowledge and understanding.	▪ Make a series of observations and measurements with appropriate precision, repeating where necessary. ▪ Use evidence to draw a conclusion ▪ Information gathered from inquiries provides conclusions which are consistent.	

3.3 I can evaluate methods to suggest improvements.	▪ Begin to state whether their method was effective or not, and identify strategies to improve next time	▪ Evaluate investigations carried out, highlighting strengths in method used, and highlighting ways forwards for improving.	
3.4 I can engage with scientific and technological evidence to inform my own opinions.	▪ Know that information can come from a variety of sources including texts, IT and own investigations ▪ Use various sources to form an opinion/view	▪ Use a range of relevant information sources in order to establish an opinion regarding a concept.	
3.5 I can understand how my actions and the actions of others impact on the environment and living things.	▪ Understand how the decisions we make individually and collectively affect the environment ▪ Understand how local actions have global effects because of connections between places and people.	▪ Understand how the decisions we make individually and collectively affect the environment ▪ Understand how local actions have global effects because of connections between places and people.	
3.6 I can describe the impacts of science and technology, past and present, in my everyday life.	▪ Begin to give examples of how science and technology have improved and impacted on our daily lives ▪ Explore how technology and science has evolved over time.	▪ Provide 'pros' and 'cons' for using technology and science within daily lives, considering the impact on mental health and the environment. ▪ Consider issues related to 'screen time'. ▪ Compare and contrast science and technology over a given period of time.	

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What Matters Statement		Descriptions of Learning	What this looks like in **YEAR 5**:	What this looks like in **YEAR 6**:	On to **YEAR 7**:
Design thinking and engineering offer technical and creative ways to meet society's needs and wants.	**Through opportunities to;**	3.7 I can draw inspiration to design from historical, cultural and other sources.	• Adapting a traditional method to design a variation/own version of a product. • Look at exiting examples of various products/items as a source of inspiration for new designs/thinking. • Take inspiration from a range of sources including historical items, cultural items and other sources.	• Use familiar experiences as a design source (e.g. designing a playground featuring a variety of different structures, considering effective and ineffective designs). • Look at exiting examples of various products/items as a source of inspiration for new designs/thinking. • Take inspiration from a range of sources including historical items, cultural items and other sources.	
		3.8 I can creatively respond to the needs and wants of the user, based on the context and on the information collected.	• Follow a design brief to design and create a product, with a focus on accuracy and needs of the user. • Consider the differences necessary between a range of users e.g. the features of a child's toy will differ between a baby and a toddler.	• Follow a design brief to design and create a product, with a focus on accuracy and needs of the user. • Consider the differences necessary between a range of users e.g. the features of a child's toy will differ between a baby and a toddler.	
		3.9 I can identify and consider factors when developing deign proposals.	▪ Design products considering the main component shapes required and creating appropriate templates as a result. ▪ Considering proportions of individual components when designing a product made of a number of parts.	▪ Design products considering the main component shapes required and creating appropriate templates as a result. ▪ Considering proportions of individual components when designing a product made of a number of parts.	
		3.10 I can use design thinking to test and refine my design decisions without fear of failure.	▪ Make and test a protoype with accuracy and in keeping with the design criteria, identifying any adaptions that need to be made as a result of a failed design.	▪ Make and test a protoype with accuracy and in keeping with the design criteria, identifying any adaptions that need to be made as a result of a failed design. ▪ Apply points of improvement	
		3.11 I can apply my knowledge and skills when making design decisions in order to produce specific outcomes.	▪ Design a product which uses a mixture of structures and mechanisms - naming each mechanism, input and output accurately. ▪ Consider strategies to strengthen structures/products in order to achieve intended outcomes. ▪ Know that mechanisms in a product control the movement.	▪ After experimenting with various mechanisms (e.g. exploring the functions of cams), create a design for an item/product based on knowledge gained from the findings of the experiments. ▪ Design products that contain moving parts ▪ Include facts and drawings as part of the design, gained from research undertaken	
		3.12 I can consider how my design proposals will solve problems and how this may affect the environment.	▪ Consider effective and ineffective design ideas, taking into consideration the wider environmental impact that the product may have e.g. waste of material ▪ Explore issues around real world examples of productions and the environmental impacts this is having e.g. the use of materials required in batteries for mobiles destroying sea beds and coral reef.	▪ Consider effective and ineffective design ideas, taking into consideration the wider environmental impact that the product may have e.g. waste of material ▪ Explore issues around real world examples of productions and the environmental impacts this is having e.g. the use of materials required in batteries for mobiles destroying sea beds and coral reef.	

3.13 I can use design communication methods to develop and present ideas, and respond to feedback.	▪ Communicate design ideas through a range of forms including prototypes and storyboarding ▪ Adapting and improving own products/designs identifying elements that need to be improved during final production. ▪ Suggest areas of improvement for others designs.	▪ Draw a design for a product from 3 different perspectives to gain a better understanding of how a final product may look ▪ Generate ideas through sketching and discussion, selecting an appropriate method to communicate ideas collated. ▪ Annotate designs to provide further detail	
3.14 I can combine component parts, materials and processes to achieve functionality and improve the effectiveness of my outcomes.	▪ Create a product which uses a mixture of structures and mechanisms - naming each mechanism, input and output accurately. ▪ Creating products which combine with a simple electrical control circuit (mapping out where different components of a circuit will go) ▪ Make mechanisms/structures using various techniques to produce movement.	▪ Assemble components accurately to make a product stable/strong. ▪ Incorporate various control mechanisms/circuits into a design in order to improve functionality	
3.15 I can select and safely use appropriate tools, materials and equipment to construct purposeful outcomes.	▪ Select appropriate tools and equipment for particular tasks ▪ Use correct techniques safely when using a range of tools – e.g. using correct techniques to saw safely. ▪ Measure, mark and cut various materials (including fabric) to achieve design outcomes.	▪ Select appropriate materials for the task based on the materials properties ▪ Use various equipment and tools safely ▪ Measure, mark and check the accuracy of components and various pieces required for the product/item. ▪ Use materials to achieve an intended purpose e.g. to strengthen, to decorate etc.	
3.16 I can use prototyping as a link between my designing and making.	▪ Communicate design ideas through a range of forms including prototypes ▪ Make and test a protoype with accuracy and in keeping with the design criteria	▪ Model ideas through prototypes ▪ Evaluate the effectiveness of a design from exploring the features included within a protoype.	
3.17 I can take into account the impact my making may on the environment.	▪ Consider the sustainability of their designs, taking into consideration the wider environmental impact that the product may have e.g. waste of material	▪ Consider the sustainability of their designs, taking into consideration the wider environmental impact that the product may have e.g. waste of material	

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What Matters Statement		Descriptions of Learning	What this looks like in **YEAR 5**:	What this looks like in **YEAR 6**:	On to **YEAR 7**:
The world around us is full of living things which depend on each other for survival.	**Through opportunities to;**	3.18 I can describe how living things compete for specific resources and depend on each other for survival.	▪ Represent and explain that food chains begin with a green plant, which 'produces' food for other organisms. ▪ Explore food chains of a range of different animals		
		3.19 I can describe the features of organisms and recognise how they allow them to live, grow and reproduce for survival in their environment.	▪ Describe how animals in two habitats are suited to the conditions of their habitat ▪ Describe the processes of pollination, fertilisation, seeds dispersal and germination	▪ Explain that living things need to reproduce if the species is to survive and recognise stages in growth and development of humans.	
		3.20 I can explain the role of different organs and systems that enable plants and animals to live and grow.	▪ Recognise the main functions of their skeleton and that their skeleton grows as they grow ▪ Describe independently the main functions of the skeleton ▪ Identify some foods needed for a healthy and varied diet and some harmful effects of drugs ▪ Name and explain the some parts of a flower ▪ Describe the processes of pollination, fertilisation, seeds dispersal and germination	▪ Recognise that during exercise the heart beats faster to take blood more rapidly to the muscles ▪ Recognise the main functions of the main organs within the body and understand that their skeleton grows as they grow ▪ State that movement depends on both skeleton and muscles ▪ Describe independently the main functions of the skeleton state that when one muscles contracts and the other relaxes	
		3.21 I can describe some changes in growth and development caused by hormones.	▪ Understand that Personal Hygiene is how we look after our bodies and that keeping ourselves clean and tidy makes us feel better about ourselves and also keeps us, and those around us, healthier ▪ Identify some of the changes that happen to the body during puberty in both boys and girls	▪ Understand that during puberty (*with the change of hormones*) emotions may become stronger and more intense. Moods might change more frequently, quickly and randomly, and may have strong emotions that you have never experienced before. ▪ Periods (menstruation) happen due to the hormones changing in a girl's body.	
		3.22 I can identify the threats to the development and health of organisms and recognise some natural defences, preventions and treatments.		▪ Begin to develop an awareness of the phrase 'immunity' and understand (in basic terms) how the body helps to protect against disease. ▪ Understand that there are natural and man-made treatments that the body can use in defence of threats. ▪ Explore a range of diseases and illness, identifying treatments used.	

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What Matters Statement		Descriptions of Learning	What this looks like in **YEAR 5**:	What this looks like in **YEAR 6**:	On to **YEAR 7**:
Matter and the way it behaves defines our universe and shapes our lives	**Through opportunities to;**	3.23 I can recognise that changes in materials affect their properties and uses under different conditions.	▪ Explore various reversible and irreversible materials, and that they can be classified as solid, liquid and gas. ▪ Describe melting and dissolving and give everyday examples of each ▪ Investigate an aspect of dissolving ▪ Recognise that although it is not possible to see a dissolved solid it remains in the solution and that solids can be recovered from a solution by evaporation ▪ Identify several factors that affect the rate at which a solid dissolves ▪ State that some materials e.g. metals have to be heated to a very high temperature before they melt ▪ Explain that when solids dissolve they break up so small they pass through the holes in the filter paper. ▪ State that air is a gas	▪ Make clear distinctions between the properties of solids, liquids and gases. ▪ Measure volumes of liquids and explain why observations and measurements need to be repeated ▪ Recognise that although it is not possible to see a dissolved solid it remains in the solution and that solids can be recovered from a solution by evaporation ▪ Identify several factors that affect the rate at which a solid dissolves ▪ Identify a range of contexts in which evaporation or filtration can be used to separate mixtures ▪ Classify some changes, e.g. dissolving as reversible and others e.g. burning as irreversible ▪ Recognise that irreversible changes often make new and useful materials ▪ Recognise the hazards of burning materials	
		3.24 I can recognise that our planet provides natural materials and can explain why they may have been processed to make them useful.	▪ Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ▪ Understand the difference between man-made and natural	▪ Identify the origins of various materials, understanding that all materials start from natural products. ▪ Explain that some changes in natural materials result in the formation of new materials, and that this kind of change is not usually reversible.	

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Forces and energy provide a foundation for understanding our universe.		3.25 I can explore how the motion of objects can be affected by applying specific forces.	▪ Identify friction as a force ▪ Describe some ways in which friction between solid surfaces can be increased ▪ Describe how to measure forces and how to investigate friction, explaining what their results show and relating what they found out to their everyday experience. ▪ Recognise situations in which frictional forces are helpful as well as those which frictional forces resist motion	▪ Measure forces using a force meter and present measurements in tables, identifying that weight is a force and is measured in Newton ▪ Recognise that weight is a force and more than one force can act on an object	
		3.26 I can use a variety of simple models to describe the forces acting on an object.	▪ Recognise that forces acts in a particular direction ▪ Describe some of the factors that increase friction between solid surfaces and increase air and water resistance	▪ Describe some situations in which there is more than one force acting on an object ▪ Draw diagrams to illustrate forces acting on an object ▪ Describe and explain the motion of some familiar objects in terms of several factors acting on them	
		3.27 I can explain that energy can be transferred from one place to another and how this can be used to provide the energy we need in our modern lives.	▪ Understand that there are different types of energy stores and energy transfers ▪ Explore different energy sources and how these energy sources can be converted. ▪ Give various examples of how energy is used practically in everyday life.	▪ Understand that energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed. ▪ Explain that when energy is transferred from one store to another then work is done. ▪ Identify various examples of renewable and non-renewable energy sources in everyday life.	
		3.28 I can describe the factors that affect electrical circuits and this will enable me to change variables and predict what will happen.	▪ Construct simple circuits and use them to test whether materials are electrical conductors or insulators and how switches work ▪ Relate knowledge about metals and non – metals to their use in electrical appliances and systematically investigate the effect of changing components in a circuit on the brightness of bulbs ▪ Explain why some circuits work and others do not	▪ Set up a circuit which can be used to investigate an idea and use knowledge about electrical conductors and insulators to answers about circuits ▪ Interpret more complex circuit diagrams and describe the difference between wires usually used for circuits and fuse wires	
		3.29 I can explain how the properties of sound and light will affect how they are experienced.	▪ Suggest sources of producing sound/light ▪ Generalise that sounds are produced when objects vibrate ▪ Recognise that sounds travel through solids, water and air		
		3.30 By manipulating the properties of sound and lights, I can produce a desired effect.	▪ Distinguish and suggest how to change the pitch and loudness of sounds ▪ Use the properties of light to create a desired effect.		

		3.31 I can describe how magnetic fields behave and explore a range of practical uses for them.		▪ Begin to develop an awareness of what is meant by a 'magnetic field' and explore this within practical contexts. ▪ Identify every day, practical uses for magnets.	

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What Matters Statement		Descriptions of Learning	What this looks like in **YEAR 5**:	What this looks like in **YEAR 6**:	On to **YEAR 7**:
Computation is the Foundation for our digital world.	**Through opportunities to;**	3.32 I can use conditional statements to add control and decision-making to algorithms.	▪ Design simple sequences of instructions (algorithms) including the use of Boolean values (yes/no/true/false) ▪ Design and write programs that solve problems, including controlling or simulating physical systems.	▪ Demonstrate how programs or processes run by following a sequence of instructions exactly and in order. ▪ Design and write programs that solve problems, including controlling or simulating physical systems.	
		3.33 I can identify repeating patterns and use loops to make my algorithms more concise.	▪ Use sequence, selection and repetition in programs/algorithms ▪ Solve problems by decomposing them into smaller parts.	▪ Use sequence, selection and repetition in programs ▪ Organise code into functions and Call Functions to eliminate surplus code in a program	
		3.34 I can explain and debug algorithms.	▪ Design, write and debug programs that accomplish goals, including controlling physical systems. ▪ Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	▪ Debug a program, using flow charts, and organise code into tabs. ▪ Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	
		3.35 I can use sensors and actuators in systems that gather and process data about the systems' environment.	▪ Work with variables and various forms of input and output.	▪ Work with variables and various forms of input and output.	
		3.36 I can identify positive and negative design elements that affect user interactions.	▪ Select, use and combine a variety of software on a range of digital devices and design and create a range of programs/systems and content that accomplish given goals.	▪ Design programs using their choice of objects, attributing specific actions to each using their new programming knowledge.	
		3.37 I can explain how digital devices can be interconnected globally and locally.	▪ Understand computer networks, including the internet, and how they can provide multiple services such as the World Wide Web and the opportunities they offer for communication and collaboration.	▪ Understand computer networks, including the internet, and how they can provide multiple services such as the World Wide Web and the opportunities they offer for communication and collaboration.	
		3.38 I can explain the importance of securing the technology I use and protecting the integrity of my data.	▪ Use technology safely, respectfully and responsibly, identifying a range of ways to report concerns about content and contact. ▪ Understand how to maintain secure passwords	▪ Use technology safely, respectfully and responsibly, identifying a range of ways to report concerns about content and contact. ▪ Identify secure sites by looking for privacy seals of approval.	

		3.39 I can explain how my data is used by services, which can help me make more informed decisions when using technology.	▪ Understand what is meant by 'personal information' and can provide ways of keeping this safe.	▪ Identify benefits and risks of mobile devices broadcasting the location of the user/device, e.g. apps accessing location ▪ Identify the benefits and risks of giving personal information and device access to different software.	
		3.40 I can explain how data is stored and processed.	▪ Begin to recognise some simple ways of keeping their personal data safe. ▪ Recognise different ways that data/information can be stored e.g. cloud, USB etc.	▪ Begin to recognise some simple ways of keeping their personal data safe. ▪ Recognise different ways that data/information can be stored e.g. cloud, USB etc.	
		3.41 I can effectively store and manipulate data to produce and give a visual form to useful information.	▪ Select, use and combine a variety of software on a range of digital devices and design and create a range of programs/systems and content that accomplish given goals.	▪ Select, use and combine a variety of software on a range of digital devices and design and create a range of programs/systems and content that accomplish given goals.	