

Fy nhaith ddysgu yn Ngwyddoniaeth/Thechnoleg/TGCh

My learning journey in **Science** and Technology/ICT



Uned ymholi/Enquiry unit: *Do you have what it takes to be a **Geologist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning: Previously you have discovered how changes in materials affect their properties and uses under different conditions. You have learnt how our planet provides natural materials and why they have been processed to make them useful. You have also found out how to identify questions that can be investigated scientifically and suggest suitable methods of inquiry, as well as evaluating methods to suggest improvements.

Yn ystod eich taith mi fyddwch yn …

During your journey you will …

- Explore different careers within STEM, including discovering the desirable skills and attributes of a Geologist
- Learn about the four main parts of the Earth
- Compare the percentage of different gases that make up our current atmosphere
- Explore how we can classify rocks, stating the three main groups, giving examples of each and explaining their properties
- Compare and contrast biological, chemical and physical weathering
- Outline the main stages in the rock cycle
- Explain how sedimentary rocks can change into metamorphic rocks
- Compare and contrast the processes of erosion, weathering and deposition
- Construct accurate word and symbol equations to show carbonate reactions
- Compare and contrast intrusive and extrusive igneous rocks, identifying the differences in how they are formed

Yr ydym ar y daith hon oherwydd …

We are on this journey because …

- There are amazing career pathways and future opportunities for all of us in STEM.
- Rocks and minerals are all around us! They help us to develop new technologies and are used in our everyday lives. It is interesting to study rocks because they contain clues about what the Earth was like in the past. We can then assemble a historical record of a planet and trace events that occurred long before humans roamed our planet.
- Slate has been quarried in north Wales for more than 1,800 years but during the Industrial Revolution demand surged as cities across the UK expanded with slate being widely used to roof workers' homes and factories.
- Young workers are needed to support growing demand for slate from Wales. Plans to extract 250,000 tonnes of Penrhyn purple slate were approved in late 2022, extending the life of the quarry to the end of 2035. The industry has had a considerable influence on the culture of the area and on that of Wales as a whole.

Eich tasgau/Your tasks:

Tasg/k 1: **Summative Assessment**: Pre and post topic quiz

Tasg/k 2: **Home Learning Task**: The 'Choc' Cycle

Tasg/k 3: **Practical Skills**: Chemical Weathering Experiment

Tasg/k 4: **Creative Assessment**: Careers Focused Task





Fy nhaith ddysgu yn Ngwyddoniaeth/Thechnoleg/TGCh

My learning journey in **Science** and Technology/ICT



Uned ymholi/Enquiry unit: *Do you have what it takes to be a **Microbiologist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously you have identified the threats to the development and health or organisms and recognised some natural defences, preventions and treatments. You have also engaged with scientific and technological evidence to form your own opinions and discovered how science and technology have impacted your everyday life.

Yn ystod eich taith mi fyddwch yn …

During your journey you will …

- Explore different careers within STEM, including discovering the desirable skills and attributes of a Microbiologist
- Identify the main groups of pathogens, giving examples of each
- Describe the different ways in which communicable diseases can be transmitted
- State the difference between a pandemic and an epidemic
- Outline some of the ways in which the body defends itself against disease
- Explain the importance of our immune system in defending us against disease
- Explore the term 'antibiotic resistance'
- Describe how vaccinations work
- Explain what antibiotics are and which type of illnesses they work on and why
- Evaluate the stages of pre-clinical and clinical drug trials, including the importance of the placebo condition
- Explore the past, present and future challenges in medicine and combating diseases

Yr ydym ar y daith hon oherwydd …

We are on this journey because …

- There are amazing career pathways and future opportunities for all of us in STEM.
- Bacteria are found in every habitat on Earth and there are approximately 10 times as many bacterial cells as human cells in the human body. We have all been affected by the Covid-19 pandemic and the problem of antimicrobial resistance is one of the most significant threats facing global health, wellbeing and food security.
- Infectious diseases have the capacity to wipe out entire populations, and microbiology is the key to keeping outbreaks under control. The study of microscopic organisms allows scientists to develop antibiotics and vaccines, with revelations such as Alexander Fleming's discovery of penicillin saving millions of lives.
- In just over 100 years antibiotics have drastically changed modern medicine and extended the average human lifespan by 23 years. As ethically informed citizens, it is important that we find, evaluate and use evidence in forming views; and engage with contemporary issues.

Eich tasgau/Your tasks:

Tasg/k 1: **Summative Assessment**: Pre and post topic quiz

Tasg/k 2: **Home Learning Task**: Creative Microorganisms

Tasg/k 3: **Practical Skills**: Growing Yeast

Tasg/k 4: **Creative Assessment**: Careers Focused Task





Fy nhaith ddysgu yn Ngwyddoniaeth/Thechnoleg/TGCh

My learning journey in **Science** and Technology/ICT



Uned ymholi/Enquiry unit: *Do you have what it takes to be an **Optometrist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously you have discovered how the properties of sound and light will affect how they are experienced and have manipulated the properties of sound and light to produce a desired effect. You have also described the impacts of science and technology, both past and present, in your everyday life.

Yn ystod eich taith mi fyddwch yn …

During your journey you will …

- Explore different careers within STEM, including discovering the desirable skills and attributes of an Optometrist
- Describe the difference between transparent, translucent and opaque objects
- Construct ray diagrams to show how light during reflection, refraction and dispersion
- Draw a labelled diagram of the human eye, identifying the main parts and functions
- Describe the similarities and differences between our human eye and a camera
- Explore phenomena such as rainbows, optical illusions and bioluminescent creatures
- Explain light as a transverse wave as part of the electromagnetic spectrum
- Investigate the 'Law of Reflection' through experiments
- Examine the interesting applications of light, such as using lasers in medicine & excitons for solar energy
- Compare long and short-sightedness and how different lens can help to correct a range of sight disorders
- Research how age-related diseases such as cataract and glaucoma are assessed and treated

Yr ydym ar y daith hon oherwydd …

We are on this journey because …

- There are amazing career pathways and future opportunities for all of us in STEM.
- Vision is one of our most valuable senses, and in a modern world filled with computer screens and mobile phone screens, it is increasingly necessary for everyone to have access to specialist eye care and attend regular eye check-ups
- Around 80% of the information from our surrounding environment that reaches our brains comes from our eyes. Composed of more than 2 million working parts, an eye cannot be transplanted as there are more than 1 million nerve fibres which connect each eye to the brain
- We are learning to be healthy, confident individuals who have the skills and knowledge to manage everyday life and can communicate effectively in different forms and settings, using both Welsh and English

Eich tasgau/Your tasks:

Tasg/k 1: **Summative Assessment**: Pre and post topic quiz

Tasg/k 2: **Home Learning Task**: Model Eyeball

Tasg/k 3: **Practical Skills**: Investigating Refraction

Tasg/k 4: **Creative Assessment**: Careers Focused Task





Fy nhaith ddysgu yn Ngwyddoniaeth/Thechnoleg/TGCh

My learning journey in **Science** and Technology/ICT



Uned ymholi/Enquiry unit: *Do you have what it takes to be a **Zoologist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously you have found out how your actions and the actions of others impact on the environment and living things; how living things compete for specific resources and depend on each other for survival and how the features of organisms help them to live, grow and reproduce for survival in the environment.

Yn ystod eich taith mi fyddwch yn …

During your journey you will …

- Explore different careers within STEM, including discovering the desirable skills and attributes of a Zoologist
- Identify biotic and abiotic factors that influence the population in an ecosystem
- Compare and contrast carnivores, omnivores and herbivores
- State reasons as to why a species may become extinct
- Classify vertebrates using MR FAB and identify unusual organisms which are hard to classify
- Construct food chains, food webs, pyramids of numbers and biomass
- Describe the difference between inherited and environmental variation
- Explain what is meant by 'bioaccumulation' and why it is a problem for humans
- Understand the difference between DNA, chromosomes and genes
- Evaluate the extent to which the Natural Selection theory proposed by Darwin, explains evolution and survival of the fittest

Yr ydym ar y daith hon oherwydd …

We are on this journey because …

- There are amazing career pathways and future opportunities for all of us in STEM.
- By studying animals we develop a better understanding of how we, ourselves, function and interact with the world around us. This helps us to develop better strategies to combat diseases, protect endangered species, and ensure sustainable food production.
- As ethical, informed citizens, we can respect the needs and rights of others and as a member of a diverse society we are able to empower better choices and develop solutions for a healthier, stronger world.
- The UK boasts more than 70,000 known species of animals, plants, fungi and microorganisms. But sadly, there has been a 13% decline in the average abundance of wildlife in the UK since the 1970s.
- According to a number of scientists, humans are the most dangerous species in global history! 26% of the UK's mammals are at a very real risk of becoming extinct, while 22% of seabird species studied have declined in the last five decades.

Eich tasgau/Your tasks:

Tasg/k 1: **Summative Assessment**: Pre and post topic quiz

Tasg/k 2: **Home Learning Task**: Habitat Diorama

Tasg/k 3: **Practical Skills**: Ecological Survey

Tasg/k 4: **Creative Assessment**: Careers Focused Task





Fy nhaith ddysgu yn Ngwyddoniaeth/Thechnoleg/TGCh

My learning journey in **Science** and Technology/ICT



Uned ymholi/Enquiry unit: *Do you have what it takes to be an **Aeronautical Engineer?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously, you will have explored how the motion of objects can be affected by applying specific forces and how you can use a variety of simple models to describe the forces acting on an object. You would have also learnt to explain and calculate how multiple forces acting on an object will affect its motion.

Yn ystod eich taith mi fyddwch yn …

During your journey you will …

- Explore different careers within STEM, including discovering the desirable skills and attributes of an Aeronautical Engineer
- Identify the different forces acting on an aeroplane at different parts of its journey
- Use and apply the Law of Conservation of Energy
- Construct Sankey diagrams to show different energy transfers that occur
- Explore what is meant by 'terminal velocity'
- Know how to calculate the resultant force
- Explain the reasons for constructing aeroplanes from materials such as titanium & aluminum
- Describe what is meant by the term 'g-force' and explain its effect on pilots
- Explain what causes air turbulence and what measures pilots may take to avoid this
- Investigate different aerofoil designs in relation to increased speed and lift
- Use the Bernoulli Principle to explain how aeroplanes fly
- Evaluate the extent to which biomimicry is used in aircraft design

Yr ydym ar y daith hon oherwydd …

We are on this journey because …

- There are amazing career pathways and future opportunities for all of us in STEM.
- With estimates of over 100,000 flights per day worldwide and 10,000 aeroplanes up in the sky at any given time, this is a really interesting topic to base our learning on. Many of us have been on a plane, and with improvements in technology, there are lots of exciting plans for the future including electric-powered and pilot-free planes.
- The UK aerospace sector has already generated exports worth £18.6 billion in 2023 bolstered by an increase in aircraft production and global orders. Both Airbus and Boeing have major manufacturing facilities in the UK such as the Airbus' wing manufacturing facility at Broughton, North Wales.

Eich tasgau/Your tasks:

Tasg/k 1: **Summative Assessment**: Pre and post topic quiz

Tasg/k 2: **Home Learning Task**: Bernoulli's Principle Challenge

Tasg/k 3: **Practical Skills**: Aerofoil Design Investigation

Tasg/k 4: **Creative Assessment**: Careers Focused Task





Fy nhaith ddysgu yn Ngwyddoniaeth/Thechnoleg/TGCh

My learning journey in **Science** and Technology/ICT



Uned ymholi/Enquiry unit: *Do you have what it takes to be an **Audiologist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously you have discovered how the properties of sound and light will affect how they are experienced and have manipulated the properties of sound and light to produce a desired effect. You have also described the impacts of science and technology, both past and present, in your everyday life.

Yn ystod eich taith mi fyddwch yn …

During your journey you will …

- Explore different careers within STEM, including discovering the desirable skills and attributes of an Audiologist
- Understand how sound travels as a longitudinal wave
- Describe how sounds can be changed in relation to their pitch (frequency) and amplitude
- Explore how sound is a form of energy that travels through different mediums, that sound can't travel in space and use a "slink-o-scope" to show sound wave traces on an oscilloscope
- Compare the processes and uses of infrasound and ultrasound
- Identify the main structures, positions and functions within the human ear, including ways in which damage can occur
- Summarise ways in which you can protect your ears from hearing loss and the function of ear wax
- Describe how our vestibular system helps to control our balance and explain what causes ear barotrauma
- Investigate different methods of soundproofing, how sounds are measured and how mosquito alarms can be used
- Research a range of ear conditions such as perforated eardrum, labyrinthitis and ear infections. Explain their causes and their suggestions treatments
- Explain how hearing aids and implants work for patients with hearing loss
- Explore phenomena such as echolocation and the Doppler effect

Yr ydym ar y daith hon oherwydd …

We are on this journey because …

- There are amazing career pathways and future opportunities for all of us in STEM.
- The idea of waves is useful because it is the key to explaining how energy can be transferred from one object to another object by radiation, even when the objects are not touching.
- Understanding waves helps us to communicate, explore the universe, and transfer energy to where we want it
- Sound is imperative for us to communicate with each other. But there are also lots of other amazing applications of sound including lithotripsy, removing plastic pollution from water, sonochemistry, sonar and high precision cutting. And not forgetting music!

Eich tasgau/Your tasks:

Tasg/k 1: **Summative Assessment**: Pre and post topic quiz

Tasg/k 2: **Home Learning Task**: Longitudinal Wave Model

Tasg/k 3: **Practical Skills**: Soundproofing Investigation

Tasg/k 4: **Creative Assessment**: Careers Focused Task





Fy nhaith ddysgu yn Ngwyddoniaeth/Thechnoleg/TGCh

My learning journey in **Science** and Technology/ICT



Uned ymholi/Enquiry unit: *Do you have what it takes to be a **Chemical Engineer?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning: Previously you have discovered how changes in materials affect their properties and uses under different conditions. You have learnt how our planet provides natural materials and why they have been processed to make them useful. You have also found out how to identify questions that can be investigated scientifically and suggest suitable methods of inquiry, as well as evaluating methods to suggest improvements.

Yn ystod eich taith mi fyddwch yn …

During your journey you will …

- Explore different careers within STEM, including discovering the desirable skills and attributes of a Chemical Engineer
- Learn about the Reactivity Series and how the relative position of elements can indicate what reaction may occur
- Explore physical and chemical changes
- Describe what combustion is and the three elements that make up the fire triangle
- Identify the different gas tests for hydrogen, oxygen and carbon dioxide
- Investigate rusting as an oxidation reaction
- Investigate displacement reactions, making predictions as to what products will be formed
- Explain the process for identifying the correct name of 'salt' when metals and acids react
- Practise writing word and balanced symbol equations for chemical reactions involving oxygen, water and acid
- Compare exothermic and endothermic reactions

Yr ydym ar y daith hon oherwydd …

We are on this journey because …

- There are amazing career pathways and future opportunities for all of us in STEM.
- Chemistry is the study of the building blocks of our world. Everything you touch, wear, eat or drink is the result of a chemical process. By studying chemistry, you learn how the world works and how items, such as medicines, get manufactured.
- You could help develop a life-saving vaccine. Or invent a new way to cut air pollution. Or create a new type of biodegradable plastic. Chemical scientists all over the world are working on climate change, human health, sustainable energy…issues that impact us all.
- Chemistry uses scientific evidence to shake up attitudes, influence changes in our behaviour and find solutions to make things better or more efficient, whether it's what you eat, how you travel or what you need to be well.

Eich tasgau/Your tasks:

Tasg/k 1: **Summative Assessment**: Pre and post topic quiz

Tasg/k 2: **Home Learning Task**: Reactivity Series Model

Tasg/k 3: **Practical Skills**: Displacement Reactions

Tasg/k 4: **Creative Assessment**: Careers Focused Task

