

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 **Agricultural Scientist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously, you will have described how living things compete for specific resources, how the features of organisms allow them to live, grow and reproduce for survival as well as understanding how your actions and the actions of others impact on the environment and living things.

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 Agricultural Scientist and Farmer
- Compare and contrast organic and conventional farming methods
- Consider the advantages and disadvantages of intensive farming
- Identify some of the factors that affect the price of food in the UK
- Outline the factors affecting local and global future food security
- Explore where our food comes from and predict how farming may change in the next 100 years
- Explain the importance of finding sustainable ways to feed the population
- Research the idea of farming insects and the role they can play in the food system
- Identify key minerals and conditions that plants require to grow

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
- Welsh farmers manage over 80% of the land in Wales and contribute significantly to our economy, both directly as primary producers, forming the foundation of the £6 billion food and drink industry, and indirectly, safeguarding our key natural resources for the tourism sector in Wales, worth over £2.8bn.
- By learning about farming, we can learn valuable lessons about where our food comes from, the benefits of eating fresh and healthy produce and how to care for animals and the environment
- There are lots of opportunities for us to act as ethical, informed citizens and engage in contemporary debates and issues such as the environmental impact and challenges of feeding a growing population, the factors that affect the cost of food & sustainable farming

Eich tasgau/Your tasks:

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

Tasg/k 2: **Home Learning Task**: Design your own Farm!

Tasg/k 3: **Practical Skills**: Cress Seed Investigation

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





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



Uned ymholi/Enquiry unit: *Do you have what it takes to be a **Civil 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 how 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.

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 Civil Engineer
- Distinguish between contact and non-contact forces, giving examples of each
- Using examples, describe the difference between balanced and unbalanced forces
- Investigate factors affecting the period of a pendulum
- Explain what is meant by 'air resistance' and investigate factors that would affect this
- Measure the speed of different objects
- Explore the energy transfers that occur when objects are moving or at a height
- In the context of springs, explain how you would calculate the 'extension'
- Compare what is meant by high and low pressure using a labelled diagram
- Construct distance and velocity-time graphs to show objects that are stationary, moving at a constant speed and accelerating

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. A career in engineering can be exciting and extremely valuable, finding solutions to some of the newest and oldest challenges we as humans face. Today, UK engineering graduates are as high in demand as ever, thanks to our world-class universities and world-famous culture of innovation.
- We want to challenge cultural stereotypes in engineering. Currently, girls only make up 16% of the engineering workforce but engineering needs people with different experiences, ideas, and perspectives so that we can respond with the best and most innovative solutions to current& future problems
- Through hands-on experimentation, we will be developing key skills such as problem solving and deduction

Eich tasgau/Your tasks:

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

Tasg/k 2: **Home Learning Task**: Pendulum at Home Investigation

Tasg/k 3: **Practical Skills**: Air Resistance 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 an **Electrician?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously, you will have found out how 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. You would have also described the factors that affect electrical circuits and how these enable you to change variables and predict what will happen.

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 Electrician.
- Outline the dangers of using electricity and how you can stay safe
- Draw and label a range of circuit symbols
- Compare and contrast electrical conductors and insulators, giving examples of each
- Wire a plug, identifying the three wires and their colours, positions and functions
- Use models to explore the differences between series and parallel circuits
- Investigate how we can measure current, voltage and resistance within circuits
- Experiment how switches can be used to control different components in parallel
- Research about the current issues regarding the mining of and long-term disposal issues of lithium car batteries
- Explore some of the real-life examples of static electricity including lightning storms

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. Electrical engineering is at the forefront of developing new technologies for a number of industries including transport, healthcare, construction and robotics
- Modern innovations in electrical engineering have informed, enlightened, and connected the world.
- Everything from transportation to communication needs the help of moving electrons. Without electricity, you couldn't microwave your lunch, play your favourite video game, or use social media.
- There are over 700, 000 electric vehicles on the UK roads with 267,000 of them registered just last year alone. The need for an improved understanding of electronics is only going to increase as we move away from diesel & petrol engines.

Eich tasgau/Your tasks:

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

Tasg/k 2: **Home Learning Task**: The Future of Electric Cars

Tasg/k 3: **Practical Skills**: Resistance of a Wire Investigation

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





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



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

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously, you will have recognised that changes in materials affect their properties and uses under different conditions, that our planet provides us with natural resources and what the impact of science and technology is, both past and present, on 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 Materials Scientist
- Distinguish between an element, mixture and compound
- Explore uses, properties and benefits of using alloys
- Compare and contrast the properties of metals and non-metals
- Describe the properties and uses of the different forms of carbon
- Examine the key groups and properties of different elements on the Periodic Table
- Use chemical formula to represent numbers of elements in different compounds
- Explain the processes of evaporation, condensation, filtration and distillation
- Investigate dissolving using soluble and insoluble substances
- Explore some of the new materials that have recently been discovered

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, and in particular, Materials Science, helps us to understand the World around us.
- It is important for us to understand what things are made of and why they behave as they do. By understanding more about the elements and their properties, we can make informed decisions, such as identifying whether a chemical is toxic or dangerous.
- Every year, new materials are being created or discovered that could transform our lives in the future. Materials such as graphene or carbon nanotubes bring unlimited opportunities for the materials industry. What could the future hold?
- As ambitious, capable learners, we are learning to undertake research and evaluate critically what we have found.

Eich tasgau/Your tasks:

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

Tasg/k 2: **Home Learning Task**: Periodic Table Creative Challenge

Tasg/k 3: **Practical Skills**: Dissolving Enquiry

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 **Pharmacist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously, you will have identified questions that can be scientifically investigated and suggested suitable methods of inquiry, as well as suggesting conclusions and evaluating methods as a result of carrying out those inquiries. You would have also studied how changes in materials can affect their properties and uses under different conditions.

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 Pharmacist
- Recognise a range of hazard symbols
- Explore what the pH scale is, identifying the key numbers and colours used to distinguish between acid, alkali and neutral
- Outline what happens in a neutralisation reaction, predicting pH changes and giving real-life examples (i.e. indigestion)
- Form word and balanced symbol equations to show what happens when an acid and alkali mix, an acid and a metal react and for an acid and carbonate reaction
- Investigate how indicators can be used to identify whether a substance is acid, alkali or neutral
- Explore the effectiveness of different indigestion remedies
- Research the effects of acid rain on the environment

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
- Acids and alkalis are all around us, including a diverse array of food, drink and domestic products. These chemicals play an important role in our bodies, lives and the environment around us which provides us with many opportunities to explore real contexts and applications of chemistry
- Key issues such as the acidification of our oceans & acid rain are vital topics to discuss as ethical, informed citizens
- As healthy, confident individuals, we are learning how we can stay safe during our scientific experiments, by taking measured decisions and managing risk
- Through exploring different scenarios such as acid spills, bee stings and indigestion, we are thinking creatively to reframe and solve problems

Eich tasgau/Your tasks:

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

Tasg/k 2: **Home Learning Task**: pH scale and Hazcard label

Tasg/k 3: **Practical Skills**: Neutralisation 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 **Sports Scientist?***

Gwybodaeth a dysgu blaenorol/Prior knowledge and learning:

Previously, you will have studied the role of different organs and organ system that enable animals to live and grow as well as identifying some of the threats to the development and health or organisms. You would have also described the impacts of science and technology, 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 a Sports Scientist
- Identify the functions of the human skeleton
- Recognise key bones and muscle groups
- Outline benefits of exercising on both our physical and mental wellbeing, and distinguish between short and long term effects of exercise
- Describe the key organs within the circulatory, respiratory and digestive systems
- Compare aerobic and anaerobic respiration
- Explain how our respiratory system is adapted for gaseous exchange
- Compare and contrast how inspired air is different to expired air
- Evaluate the effect of smoking, vaping or drugs on an athlete's body

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 the average human body containing over 37.2 trillion cells, over 650 muscles and over 100,000 miles of blood vessels, it truly fascinating to find out everything that is going on inside ourselves!
- It is important for us to understand how our bodies work and use models to help us grasp abstract concepts that we are unable to physically touch or see.
- As healthy, confident individuals, it is important that we can apply knowledge about the impact of diet and exercise on physical and mental health in our daily lives.
- As ambitious, capable learners we are learning to use digital technologies to creatively communicate, find and analyse information.

Eich tasgau/Your tasks:

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

Tasg/k 2: **Home Learning Task**: Musculoskeletal Creative Challenge

Tasg/k 3: **Practical Skills**: Heart Rate & Exercise Investigation

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

