



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Yr Athrofa
Centre for Education
Addysg i Gymru | Education for Wales

**Trawsnewid Addysg,
Trawsnewid Bywydau**

**Transforming Education,
Transforming Lives**

*Trawsnewid Addysg, Trawsnewid Bywydau
Transforming Education, Transforming Lives*

www.uwtsd.ac.uk

ECAD5012

Gwyddoniaeth a Thechnoleg
3

Science and Technology
3

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Datganiadau o'r hyn sy'n bwysig

- Mae bod yn chwilfrydig a chwilio am atebion yn hanfodol i ddeall a rhagfynegi ffenomenau.
- Mae meddylfryd dylunio a pheirianeg yn cynnig ffyrdd technegol a chreadigol i ddiwallu anghenion a dymuniadau cymdeithas.
- Mae'r byd o'n cwmpas yn llawn pethau byw sy'n dibynnu ar ei gilydd i oroesi.
- Mae mater, a'r ffordd y mae'n ymddwyn, yn diffinio ein bydysawd ac yn ffurfio ein bywydau.
- Mae grymoedd ac egni yn gosod sail i ddeall ein bydysawd.
- Mae cyfrifiaduraeth yn gosod sail i'n byd digidol.

<https://hwb.gov.wales/cwricwlwm-i-gymru/gwyddoniaeth-a-thechnoleg/disgrifiadau-dysgu/>

Statements of what matters

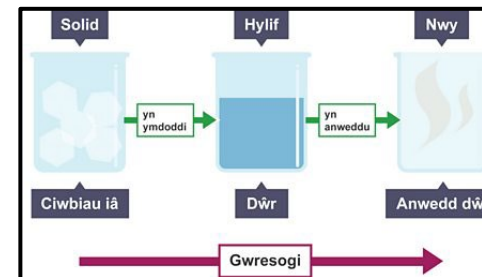
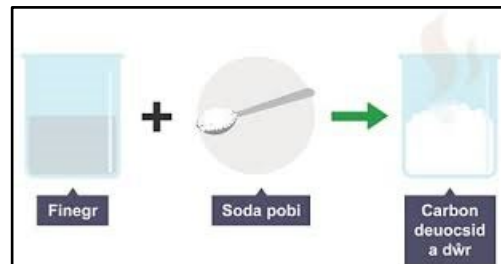
- Being curious and searching for answers is essential to understanding and predicting phenomena.
- Design thinking and engineering offer technical and creative ways to meet society's needs and wants.
- The world around us is full of living things which depend on each other for survival.
- Matter and the way it behaves defines our universe and shapes our lives.
- Forces and energy provide a foundation for understanding our universe.
- Computation is the foundation for our digital world.

<https://hwb.gov.wales/curriculum-for-wales/science-and-technology/descriptions-of-learning/>

Yr hyn sy'n bwysig :

Mae mater, a'r ffordd y mae'n ymddwyn yn diffinio ein bydysawd ac yn ffurfio ein bywydau.

- Mae'r bydysawd a phob peth byw wedi ei wneud o fater
- Mae sut y mae mater yn ymddwyn yn pennu priodweddau defnyddiau ac yn ein galluogi i ddefnyddio adnoddau naturiol a chreu sylweddau newydd.
- Gall deall natur mater fod o gymorth i ddysgwyr werthfawrogi y dylanwad y caiff Cemeg ar ein byd.
- Mae adweithiau cemegol yn digwydd yn gyson yn ein hamgylchedd ac oddi mewn i bethau byw,



Statement of what matters :

Matter and the way it behaves defines our universe and shapes our lives

- The universe and all living things are made up of *matter*.
- The behaviour of matter determines the properties of materials and allows us to use natural resources, as well as to create new substances.
- Understanding the nature of matter can help learners to appreciate the impact that chemistry has on the world around them
- Chemical reactions happen continuously in our environment as well as in living things



Yr hyn sy'n bwysig :

Mae mater, a'r ffordd y mae'n ymddwyn yn diffinio ein bydysawd ac yn ffurfio ein bywydau.

Cam cynnydd 1

Rwy'n gallu archwilio priodweddau defnyddiau, a dewis gwahanol ddefnyddiau at ddefnydd penodol.

Rwy'n gallu nodi, dilyn a dechrau creu dilyniannau a phatrymau mewn gweithgareddau pob-dydd.

Cam cynnydd 2

Rwy'n gallu adnabod patrymau ar sail fy arsylwadau a'm hymchwiliadau, ac rwy'n gallu mynegi fy nghanfyddiadau.

Rwy'n gallu defnyddio fy [ngwybodaeth](#) a'm dealltwriaeth i ragfynegi effeithiau fel rhan o'm hymchwiliadau gwyddonol.

Rwy'n gallu gwneud penderfyniadau dylunio, gan ddefnyddio fy [ngwybodaeth](#) am ddefnyddiau a chynnyrch sy'n bodoli eisoes, ac awgrymu gwelliannau dylunio.

Rwy'n gallu archwilio a disgrifio priodweddau defnyddiau, a chyfiawnhau'r defnydd a wneir ohonyn nhw.

Rwy'n gallu arsylwi ar a disgrifio'r ffyrdd y mae defnyddiau yn newid wrth eu cymysgu gyda'i gilydd.

Cam cynnydd 3

Rwy'n gallu adnabod bod newidiadau mewn defnyddiau, o dan wahanol amodau, yn effeithio ar eu priodweddau a'r defnydd a wneir ohonyn nhw.

Rwy'n gallu adnabod bod ein planed yn darparu defnyddiau naturiol, a gallu esbonio pam y gellir eu bod wedi cael eu prosesu i'w gwneud yn ddefnyddiol.



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Partneriaeth Dysgu Proffesiynol Yr Athrofa
Yr Athrofa Professional Learning Partnership

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Statement of what matters:

Matter and the way it behaves defines our universe and shapes our lives

Descriptions of learning- arranged in progression steps

Progression step 1

I can explore the properties of materials and choose different materials for a particular use.

I can identify, follow and begin to create sequences and patterns in everyday activities.

Progression step 2

I can recognise patterns from my observations and investigations and can communicate my findings.

I can use my knowledge and understanding to predict effects as part of my scientific exploration.

I can make design decisions, using my knowledge of materials and existing products, and suggest design improvements.

I can explore and describe the properties of materials and justify their uses.

I can observe and describe ways in which materials change when they are mixed together.

Progression step 3

I can recognise that changes in materials affect their properties and uses under different conditions.

I can recognise that our planet provides natural materials and can explain why they may have been processed to make them useful.

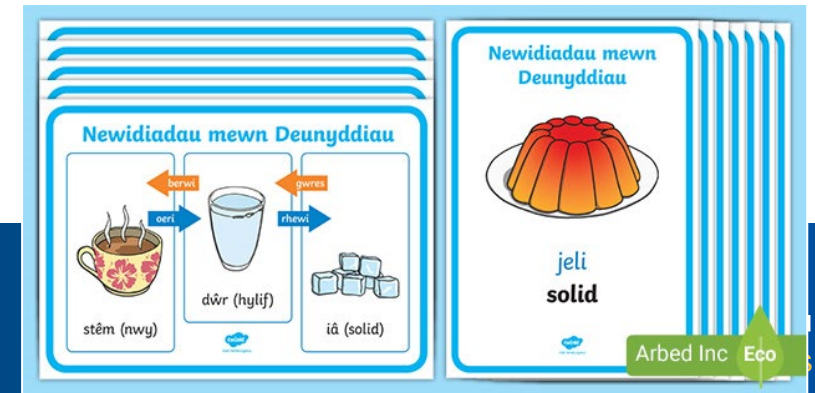
Egwyddorion Cynnydd :Cynllunio ar gyfer cynnydd:

“Caiff cynnydd ym Maes Dysgu a Phrofiad Gwyddoniaeth a Thechnoleg ei ddangos wrth i ddysgwyr archwilio a phrofi syniadau a chysyniadau cynyddol gymhleth sy'n rhan o'r datganiadau o'r hyn sy'n bwysig”

[Gwyddoniaeth a Thechnoleg: Egwyddorion cynnydd - Hwb \(gov.wales\)](http://gov.wales)

Enghraifft: dysgu sut y gellir trin deunyddiau:

- ar gamau cynharach trwy chwarae, cymysgu deunyddiau a gwybod y gall deunyddiau newid, ac o dan rai amodau byddant yn ymateb i ffurfio rhywbeth newydd, yn ogystal â chael eu cyfuno i greu cynhyrchion newydd
- yn nes ymlaen, gellir archwilio gwahanol fathau o adweithiau cemegol



Principles of progression : Planning for progression

“Progression in the Science and Technology Area of Learning and Experience is demonstrated by learners exploring and experiencing increasingly complex ideas and concepts that sit within the statements of what matters.”

<https://hwb.gov.wales/curriculum-for-wales/science-and-technology/principles-of-progression/>

Example: learning how materials can be manipulated:

- at earlier steps through play, mixing materials and knowing that materials can change, and under certain conditions will react to form something new, as well as be combined to create new products
- at later steps, different types of chemical *reactions* can be explored



Cam Cynnydd 2 & 3

Esiamplau:

Tyrrau Papur:

<https://www.youtube.com/watch?v=GfVdtAe8JL0>

Blodau Papur

<https://www.youtube.com/watch?v=Tit7hYw1Meo>

Rhew yn Ymdoddi

<https://www.youtube.com/watch?v=TVHUNl9uJk8>

Cromatograffeg

<https://www.youtube.com/watch?v=xPvH-Eev8sA>

<https://pstt.org.uk/resources/curriculum-materials/resources-overview>

TASGAU SY'N TANIO

- * Clipiau ffilm i sbarduno tasgau ymholi ymarferol
- * I'w defnyddio yn yr ysgol neu yn y cartref
- * Does dim llawer o gyfarpar

Progression steps 2 & 3

Examples:

Paper Towers:

https://www.youtube.com/watch?v=X_e_7bWetGI

Paper Flowers

<https://www.youtube.com/watch?v=9khE5wHTgjU>

Melting Ice

<https://www.youtube.com/watch?v=CTsygsa-v5c>

Colourful Ink

<https://www.youtube.com/watch?v=OBWiuHkRF4s>

<https://pstt.org.uk/resources/curriculum-materials/resources-overview>

STARTERS FOR SCIENCE

- * Short videos to get started with practical science enquiry
- * Can be used in school or at home
- * Minimal resources needed

Crewch sbardun: Un gair bach o'i le.

- Ar ddechrau thema er mwyn asesu beth mae'r dysgwyr yn gwybod yn barod.
- Ar ddiwedd thema i asesu beth a ddysgwyd.
- Defnyddiwch luniau yn lle geiriau gyda dysgwyr ifanc.
- Asesu'r rhesymu oddeutu eu dewisiadau.
- Meddwl yn feirniadol.

Newidiadau

Pa un o'r geiriau sydd allan o le a paham?

Ymestyn. Rhydu. Plygu	1	Pam?
Malu. Hydoddi. Distyllu.	2	Pam?
Llosgi. Ymdoddi. Anweddu.	3	Pam?
Hydoddi. Niwtraleiddio. Hidlo.	4	Pam?
Crafu. Cyrydu. Peintio.	5	Pam?
Pobi. Cymysgu. Curo.	6	Pam?



Create a Starter for Science: Odd one Out

- At the start of a topic to assess what learners already know.
- At the end of a topic to apply ideas
- Use pictures instead of words with younger learners
- Assess the reasoning behind the choices
- Involves critical thinking

Changes

WHICH IS THE ODD ONE OUT
IN THE FOLLOWING AND WHY?

Stretching. Bending. Rusting.	1	WHY?
----------------------------------	----------	------

Grinding. Dissolving. Distilling.	2	WHY?
--------------------------------------	----------	------

Burning. Melting. Evaporating.	3	WHY?
-----------------------------------	----------	------

Dissolving. Neutralising. Filtering.	4	WHY?
---	----------	------

Corroding. Scraping. Painting.	5	WHY?
-----------------------------------	----------	------

Mixing. Beating. Baking.	6	WHY?
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Fermenting. Condensing. Freezing.	7	WHY?
--------------------------------------	----------	------

© S Naylor, B Keogh, A Goldsworthy (2004)

Ymchwilio, Arbrofi, Creu, Darganfod

Cam Cynnydd 2&3

<https://primarylibrary.crestawards.org/all-superstar-challenges-in-welsh/64363180>



Investigate, Experiment, Create, Discover

Progression Steps 2&3

<https://primarylibrary.crestawards.org/all-superstar-challenges/61747644>



YHSB/SOWM 1-6

ECAD5017

The following CREST SuperStar challenges map onto the six science content areas in the Curriculum for Wales for ages 7-11:

Curiosity



- A hole in my bucket
- A sticky problem
- Bumblebee mystery
- Camouflaged creatures
- Colorado brown stain
- Over to you

Living things

- Making toothpaste
- Buy them and try them
- Colorado brown stain
- Outdoor gym
- Playground games

Design thinking and engineering

- Bridge blunder
- Band rollers
- Bowled over
- Crafty rafts
- Discus dilemma
- Kite calamity
- Outdoor gym
- Spinning solutions



Matter and its behaviours

- A hole in my bucket
- A sticky problem
- Cheesy challenge
- Get set jellies
- Investigating ink
- Just my cup of tea
- Polymer problem
- Protecting polymers
- Surprising stains
- Testing and comparing tea
- Tomato sauce
- Yummy yogurt



Forces and energy

- Band rollers
- Bowled over
- Bridge blunder
- Super spinners
- Racing rockets



Computation and the digital world *

- Bumblebee mystery
- Drifting dandelions
- Super spinners

* You can use digital tools such as cameras to record and analyse results in these challenges



You can read about the curriculum for Wales in full here:

<https://hwb.gov.wales/curriculum-for-wales/>

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15

YHSB 2



Tai a chartrefi

<https://hwb.gov.wales/repository/resource/3e344fb7-0d42-4c80-8faa-2d2b27e6cd7d>

SOWM 2



Houses and homes

<https://hwb.gov.wales/repository/resource/3e344fb7-0d42-4c80-8faa-2d2b27e6cd7d>



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YHSB 3



Adnoddau Dysgu yn yr Awyr Agored -
Lleihau Gwastraff

<https://hwb.gov.wales/repository/resource/2b591435-5fd1-40d1-8d8c-8cf3ad370d77>

SOWM 3



Eco-Schools Outdoor Learning
Resources - Waste Minimisation

<https://hwb.gov.wales/repository/resource/2b591435-5fd1-40d1-8d8c-8cf3ad370d77>

YHSB/SOWM 4 & 5 :



Cardiff Metropolitan University | Prifysgol Metropolitan Caerdydd

why&how?
PRIMARY SCIENCE TEACHING TRUST

BATH SPA UNIVERSITY

TAPS Cymru cynllunio ar gyfer Asesiad Ffocws



<https://hwb.gov.wales/repository/resource/5a9010f1-aadc-4d1b-8f96-d98d4d3adbd3>



Cardiff Metropolitan University | Prifysgol Metropolitan Caerdydd

why&how?
PRIMARY SCIENCE TEACHING TRUST

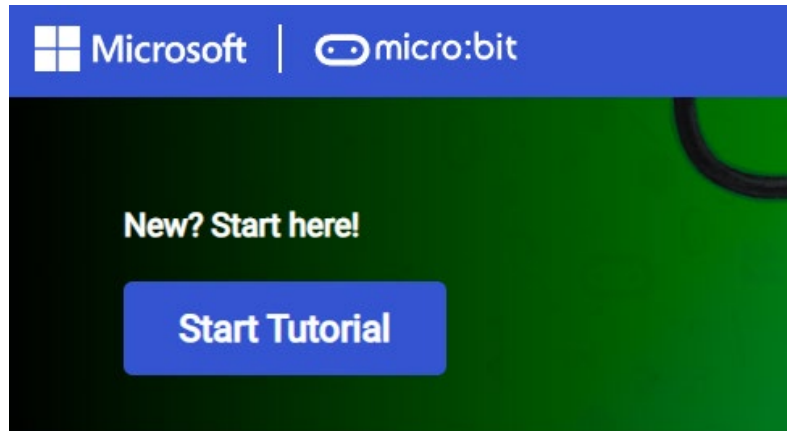
BATH SPA UNIVERSITY

TAPS Cymru plans for Focused Assessment

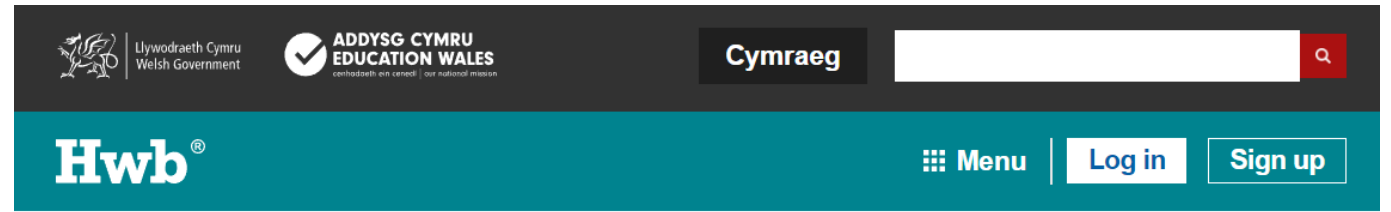


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YHSB 6 :

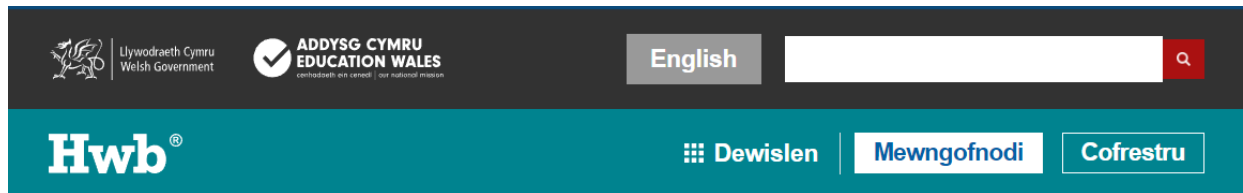


SOWM 6:



[Home](#) > [Resources](#)

Resources



[Hafan](#) > [Adnoddau](#)

Adnoddau

[Projects | Computer coding for kids and teens | Raspberry Pi](#)
[Free coding clubs for kids | Code Club](#)

Own CPD: [RaspberryPiFoundation: Teaching Programming to 5- to 11-year-olds | edX](#)

Syniadau ac Adnoddau?



<https://hwb.gov.wales/parthau/rhwydwaith-cenedlaethol-ar-gyfer-rhagoriaeth-mewn-gwyddoniaeth-a-thechnoleg/repository/discovery?catalogs=05a98ef2-994a-4512-a4f6-742834626b09&kiosk=1&sort=recent&strict=1>

Resources and Ideas?



[Repository - National Network For Excellence in Science and Technology - Hwb \(gov.wales\)](https://hwb.gov.wales/parthau/rhwydwaith-cenedlaethol-ar-gyfer-rhagoriaeth-mewn-gwyddoniaeth-a-thechnoleg/repository/discovery?catalogs=05a98ef2-994a-4512-a4f6-742834626b09&kiosk=1&sort=recent&strict=1)

Cysylltiadau defnyddiol

Useful links

- <https://www.stem.org.uk/resources/collection/3485/teaching-primary-science>
- <https://www.ase.org.uk/resources/primary-science>
- <https://wowscience.co.uk/>
- <https://www.tes.com/teaching-resources>
- <https://explorify.wellcome.ac.uk/>
- <https://blockly.games/>
- [About iDEA](#)