



Grymuso Addysgwyr | Empowering Educators



Dros ddysgwyr, dros Gymru
For learners, for Wales

**Datgloi potensial: Mewnwelediadau i wella
addysgu ac arweinyddiaeth mewn addysg
fathemateg**

**Unlocking potential:
Insights into improving teaching and
leadership in mathematics education**



Mae Doug Lemov yn dweud:

"Nid yw hyd yn oed y gweithdy gorau yn y byd (ac nid ydym yn honni bod y gweithdy hwn yn mynd i fod yn un o'r rheini) yn ddigon i newid ymddygiad oni bai bod rhyw fath o ddilyniant cadarnhaol"

Ni fydd sesiwn o ddilyniant ar ôl heddiw (er y byddwn yn ymweld gyda'ch ysgol rhywbryd yn y chwe mlynedd nesaf! Felly, yn ystod y sesiwn:

- ceisiwch adnabod o leiaf ddau beth rydyn ni'n eu rhannu gyda chi heddiw a allai wneud gwahaniaeth i'ch adran (trwy fabwysiadu'r syniad neu wella ymarfer sy'n digwydd yn barod.
- ystyriwch sut rydych yn mynd i weithredu i ymgorffori'r syniadau / wella'r hyn rydych yn ei wneud.

Doug Lemov says:

"Even the best workshop in the world (and we're not claiming that this will be one of those) isn't sufficient to change behaviour unless there is some kind of positive follow-up"

There will not be any follow-up from us to today's session, although we will visit your school sometime in the next six years. Therefore, during the session:

- try and identify at least two things that we share today which could make a difference to your department (by implementing or refining practice that already happens).
- consider what action you will need to take to implement these ideas / drive improvements.

Prif negeseuon sydd yn yr adroddiad

Main findings from the report

Negeseuon o'r adroddiad

Ar y cyfan, roedd ansawdd addysgu mathemateg yn rhy amrywiol

Ar y cyfan, roedd safonau disgyblion mewn mathemateg yn rhy isel.

Lle roedd addysgu yn effeithiol, gwnaeth disgyblion gynnydd da oherwydd bod gan athrawon ddisgwyliadau uchel o'r hyn y gallai disgyblion ei gyflawni. Roedd yr athrawon hyn yn defnyddio ystod o ddulliau addysgu effeithiol a oedd yn herio pob disgybl yn effeithiol

Yn rhy aml, roedd gan athrawon ddealltwriaeth gyfyngedig o'r ffyrdd gorau o gefnogi dysgu disgyblion. Roedd hyn naill ai oherwydd nad oedd eu gwybodaeth pwnc yn ddigon cryf neu nad oeddent wedi datblygu eu addysgeg pwnc yn ddigon da.

Findings from the report

Overall, the quality of teaching of mathematics was too variable

Overall, pupils' standards in mathematics were too low.

Where teaching was effective, pupils made good progress because teachers had **high expectations** of what pupils could achieve. These teachers used a **range** of effective teaching methods that **challenged all** pupils well

Too often, teachers had a limited understanding of the best ways to support pupils' learning. This was either because their subject knowledge was not strong enough or they had not developed their subject pedagogy well enough.

Canfyddiadau'r adroddiad

Cwricwlwm

Lle gwelom drefniadau cwricwlwm **effeithiol**

- Roedd y ffocws ar ddysgu disgyblion
- Addysgu cytbwys o ansawdd uchel
- Cydweithio/ dealltwriaeth o ddilyniant/ camsyniadau

Roedd cynllunio'r cwricwlwm wedi'i gyfyngu gan

- ddiffyg eglurder mewn canllawiau cenedlaethol ac felly dealltwriaeth o ofynion CiG
- ddealltwriaeth anghyson o ddefnydd effeithiol o'r hyfedreddau mathemategol
- orddibyniaeth ar gynlluniau gwaith a brynwyd i mewn

Cefnogaeth gyfyngedig i wella ansawdd addysgu mathemateg. Nid oedd y gefnogaeth yn canolbwyntio'n ddigon da ar addysgeg na sut y dylai athrawon ddefnyddio eu gwybodaeth pwnc yn effeithiol i helpu disgyblion i ddysgu.

Findings from the report

Curriculum

Where we saw **effective** curriculum arrangements

- Focus was on pupils' learning
- High quality balanced teaching
- Collaboration/ understanding of progression/ misconceptions

Curriculum planning was **limited** by

- a lack of clarity in national guidance and therefore understanding of CfW requirements
- inconsistent understanding of the effective use of the mathematical proficiencies
- an overreliance on bought-in schemes of work

Limited support to improve the quality of mathematics teaching. The support wasn't focused well enough on pedagogy or how teachers should use their subject knowledge effectively to help pupils learn.

Where the teaching of mathematics is most effective and pupils make good progress, teachers:

- have **high expectations** and **challenge** all pupils well*:
- make effective use of a **range of teaching and assessment techniques** and use their findings from assessments to guide their teaching, adjusting the pace and level of challenge responsively:
- ensure that pupils **understand** what they are learning and how it connects to other areas of mathematics/ everyday life rather than just following instructions to get the correct answer:
- **question** pupils effectively to deepen their understanding of mathematical concepts and ensure they understand the 'how' and the 'why':
- skilfully *expose* and *address* pupils' **misconceptions** in a timely manner:
- ensure that pupils are constantly **thinking** and that the level of challenge is appropriate, stretching pupils without overwhelming them: and

Lle mae addysgu mathemateg yn fwyaf effeithiol a disgyblion yn gwneud cynnydd da, mae athrawon:

- gyda disgwyliadau uchel ac yn herio pob disgybl yn dda
- yn gwneud defnydd effeithiol o ystod o dechnegau addysgu ac asesu, gan ddefnyddio eu canfyddiadau o asesiadau i lywio'r addysgu trwy addasu cyflymder a lefel yr her yn ymatebol
- yn sicrhau bod disgyblion yn deall yr hyn maen nhw'n ei ddysgu a sut mae'n cysylltu â meysydd eraill o fathemateg/bywyd bob dydd yn hytrach na dilyn cyfarwyddiadau i gael yr ateb cywir
- yn holi disgyblion yn effeithiol i ddyfnhau eu dealltwriaeth o gysyniadau mathemategol a sicrhau eu bod yn deall y 'sut' a'r 'pam'
- yn adnabod a mynd i'r afael â chamsyniadau disgyblion yn fedrus mewn modd amserol
- yn sicrhau bod disgyblion yn meddwl yn gyson a bod lefel yr her yn briodol, gan ymestyn disgyblion heb eu llethu
- rhoi cyfleoedd i ddisgyblion gymhwyso'r sgil hon yn annibynnol pan fydd disgyblion wedi dysgu sgil

Where teaching is less effective, and pupils do not make enough progress, teachers:

- teach pupils a **series of steps** so that they can obtain an answer and then provide pupils with **repetitive practice** without teaching pupils the 'why' and how the mathematical concept connects to other areas of mathematics or everyday life
- do not focus closely enough on **what they want pupils to learn** but instead plan tasks and activities to keep pupils busy:
- do not practice **responsive teaching** within mathematics classrooms, often due to a lack of confidence in their subject knowledge or pedagogy;
- limited the opportunities for pupils to develop **independent learning skills** due to over-directed teaching, lack of challenge, or ineffective questioning, and
- Do not **plan** well enough to **teach the understanding** of mathematical concepts and identify and address misconceptions. They often taught procedural shortcuts(tricks) rather than helping pupils understand mathematical concepts and make connections between topics.

Lle mae addysgu yn llai effeithiol, ac nid yw disgyblion yn gwneud digon o gynnydd, mae athrawon:

- yn addysgu cyfres o gamau i ddisgyblion fel y gallant gael ateb ac yna darparu ymarferion ailadroddus, heb ddysgu disgyblion y 'pam' a sut mae'r cysyniad mathemategol yn cysylltu â meysydd eraill o fathemateg neu fywyd bob dydd
- yn cynllunio tasgau mae disgyblion yn mynd i wneud (ac sydd felly yn eu cadw yn brysur) yn hytrach na chynllunio yr hyn y maent am i ddisgyblion ei ddysgu a meddwl pa weithgareddau sydd yn mynd i alluogi hyn
- ddim yn addysgu'n ymatebol, yn aml oherwydd diffyg hyder yn eu gwybodaeth pwnc neu addysgeg;
- yn cyfyngu ar y cyfleoedd i ddisgyblion ddatblygu sgiliau dysgu annibynnol oherwydd eu bod yn gor-arwain y dysgu, bod diffyg her, neu nad ydynt yn holi disgyblion yn ddigon effeithiol
- ddim yn cynllunio'n ddigon da i addysgu dealltwriaeth o gysyniadau mathemategol a mynd i'r afael â chamsyniadau. Mae'n nhw'n aml yn dysgu triciau gweithdrefnol yn hytrach na helpu disgyblion i ddeall cysyniadau mathemategol a gwneud cysylltiadau rhwng pynciau.

Nodweddion addysgu mathemateg effeithiol

1. Disgwyliad

- Mae ymagwedd gyson ac effeithiol iawn at addysgu a dysgu mathemateg yn yr ysgol
- Mae gan athrawon ddisgwyliadau uchel o'r hyn y gall disgyblion ei wneud
- Mae rhieni a'r gymuned yn ymwneud â dysgu disgyblion

2. Rhinweddau athrawon mathemateg effeithiol

- Mae athrawon yn tynnu ar eu dealltwriaeth o'r hyfedreddau mathemategol yn dda i sicrhau bod disgyblion yn dyfnhau eu dealltwriaeth o fathemateg ac yn gwneud cysylltiadau rhwng cysyniadau gwahanol
- Mae gan athrawon ddealltwriaeth gynhwysfawr o addysgeg fathemategol briodol
- Mae gan athrawon wybodaeth pwnc gadarn ac yn modelu eu meddwl yn effeithiol

Features of effective teaching of mathematics

1. Expectation

- There is a highly effective consistent approach to teaching and learning of mathematics within the school
- Teachers have high expectations of what pupils can do
- Parents and the community are involved in pupils' learning

2. Qualities of effective teachers of mathematics

- Teachers draw on their understanding of the mathematical proficiencies well to ensure pupils deepen their understanding of mathematics and make connections between topics and subjects
- Teachers have a comprehensive understanding of appropriate mathematical pedagogy
- Teachers have a secure subject knowledge and model their thinking effectively

Features of effective teaching of mathematics

3. Planning for learning

- Teachers plan to expose and address misconceptions. They treat misconceptions as opportunities for learning rather than treating them as wrong answers
- Teachers ensure that pupils have regular opportunities for retrieval practice
- Teachers break learning down into manageable chunks which supports the development of pupils' understanding and reduces cognitive load
- Teachers teach for understanding rather than setting tasks for completion
- Even when pupils are taught in attainment groups, teachers differentiate the work appropriately
- Teachers choose carefully the examples they use with pupils, building in small steps and exposing misconceptions
- Teachers provide pupils with opportunities to apply their learning in context and solve problems
- The curriculum is designed to stimulate pupils' engagement and curiosity
- Collaboratively designed schemes of learning highlight suitable opportunities for use of resources/ identification of misconceptions and a balance of direct teaching methods and other pedagogies
- Professional learning supports teachers to improve their subject knowledge and mathematical pedagogy

Nodweddion addysgu effeithol o fathemateg

3. Cynllunio ar gyfer dysgu

- Mae athrawon yn cynllunio ar gyfer adnabod a mynd i'r afael â chamsyniadau. Maent yn trin camsyniadau fel cyfleoedd i ddysgu yn hytrach na'u trin fel atebion anghywir
- Mae athrawon yn sicrhau bod disgyblion yn cael cyfleoedd rheolaidd i adalw
- Mae athrawon yn rhannu dysgu yn ddarnau y mae disgyblion yn gallu ymdopi a hwy, sy'n cefnogi datblygiad dealltwriaeth disgyblion ac yn lleihau llwyth gwybyddol
- Mae athrawon yn addysgu er mwyn meithrin dealltwriaeth yn hytrach na gosod tasgau i'w cwblhau
- Hyd yn oed pan fydd disgyblion yn cael eu haddysgu mewn grwpiau cyrhaeddiad, mae athrawon yn gwahaniaethu'r gwaith yn briodol
- Mae athrawon yn dewis yn ofalus yr enghreifftiau maen nhw'n eu defnyddio gyda disgyblion, gan adeiladu mewn camau bach a datgelu camsyniadau
- Mae athrawon yn rhoi cyfleoedd i ddisgyblion gymhwyso eu dysgu mewn cyd-destun ac i ddatrys problemau
- Mae'r cwricwlwm wedi'i gynllunio i ysgogi ymgysylltiad a chwilfrydedd disgyblion
- Mae cynlluniau gwaith yn tynnu sylw at gyfleoedd addas ar gyfer defnyddio adnoddau/adnabod camsyniadau a chydbwysedd o ddulliau addysgu uniongyrchol ac addysgeg eraill
- Mae dysgu proffesiynol yn cefnogi athrawon i wella eu gwybodaeth pwnc ac addysgeg fathemategol

Features of effective teaching of mathematics

4. Facilitating learning

- Teachers ensure that pupils are always thinking throughout the lesson
- Teachers provide pupils with clear explanations. They use methods and resources effectively so that pupils make good progress in their learning
- Teachers assess pupils learning effectively and use it to inform the direction of learning and future planning. Assessment is integrated seamlessly into each lesson.
- Teachers utilise good quality questioning that probes understanding and informs planning
- Pupils receive instant and/or verbal feedback that helps them know what they are doing well and how to improve
- Teachers place a strong emphasis on teaching the 'why' as well as the 'how'*-
- Teachers encourage pupils to set and test hypothesis.
- Teachers provide pupils with appropriate challenge in their learning

Features of effective teaching of mathematics

4. Hwyluso dysgu

- Mae athrawon yn sicrhau bod disgyblion bob amser yn meddwl trwy gydol y wers
- Mae athrawon yn rhoi esboniadau clir i ddisgyblion. Maent yn defnyddio dulliau ac adnoddau yn effeithiol fel bod disgyblion yn gwneud cynnydd da yn eu dysgu
- Mae athrawon yn asesu disgyblion sy'n dysgu'n effeithiol ac yn defnyddio eu canfyddiadau i lywio cyfeiriad yr addysgu a chynllunio'r gwersi nesaf. Mae'r asesu wedi'i integreiddio gyda'r addysgu ym mhob gwers.
- Mae athrawon yn defnyddio cwestiynau o ansawdd da sy'n archwilio dealltwriaeth ac yn llywio'r cynllunio
- Mae disgyblion yn derbyn adborth ar unwaith ar lafar (neu trey ffyrdd eraill) sy'n eu helpu i wybod beth maen nhw'n ei wneud yn dda a sut i wella
- Mae athrawon yn rhoi pwyslais cryf ar addysgu'r 'pam' yn ogystal â'r 'sut'
- Mae athrawon yn annog disgyblion i osod a phrofi rhagdybiaethau.
- Mae athrawon yn rhoi her briodol i ddisgyblion yn eu dysgu

Problemau a adnabuwyd a datrysiadau posibl /
enghreifftiau o arferion effeithiol

Issues identified and possible solutions /
examples of effective practice

Theori Amrywiad

'nid oedd athrawon yn cynllunio'n ddigon da i addysgu dealltwriaeth o gysyniadau mathemategol'

'Lle mae addysgu yn llai effeithiol, ac nid yw disgyblion yn gwneud digon o gynnydd, mae athrawon yn addysgu cyfres o gamau i ddisgyblion fel y gallant gael ateb ac yna darparu ymarferion ailadroddus'

Variation Theory

'did not plan well enough to teach the understanding of mathematical concepts'

'Where teaching is less effective, and pupils do not make enough progress, teachers teach pupils a series of steps so that they can obtain an answer and then provide pupils with repetitive practice'

Theori Amrywiad

Beth yw theori amrywiad?

Y syniad tu ôl i'r theori hwn yw bod yr athro yn dangos dau (neu fwy) o sefyllfaoedd lle mae'r rhan fwyaf o bethau yn aros yn gyson, ond mae un (neu ychydig o) agwedd(au) yn newid

Bydd disgyblion felly yn sylwi ar beth yw effaith y mae'r newid bychan hwn yn ei gael ar y sefyllfa ac yn ysgogi disgybl i ofyn pam mae hyn wedi digwydd?

Variation Theory

What is variation theory?

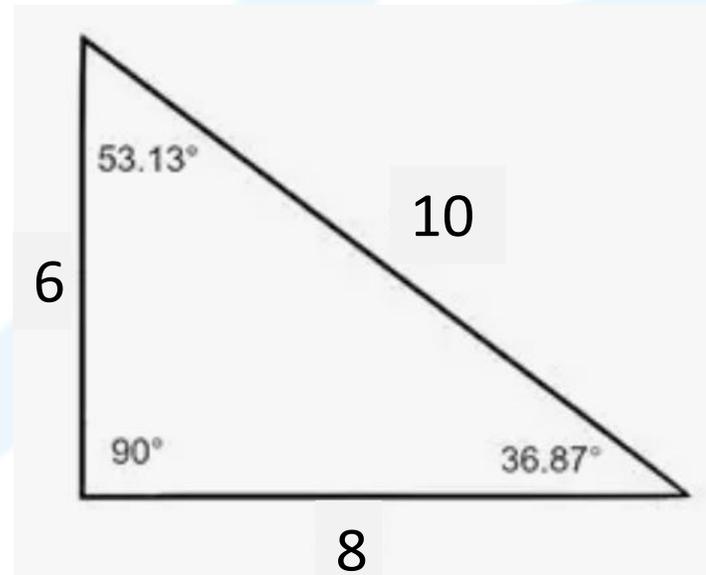
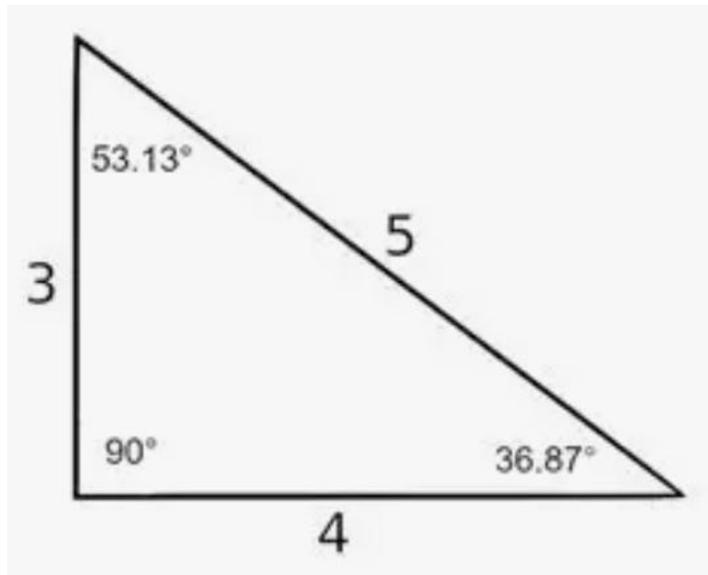
The idea behind the theory is that the teacher shows two (or more) situations where most aspects stay the same but there is a minimal change to one (or a very few) aspect(s)

Pupils will therefore notice the effect that this minimal change has had on the situation and spark their curiosity of why this has happened?

Theori Amrywiad / Variation Theory

Beth sydd yr un peth? Beth sydd wedi newid? Pam bod hyn yn digwydd?

What is the same, what's different? Why is this?



Theori amrywiad – gwerau chwarae rôl ar gyfrifo cymedr set o ddata.

Darn cyntaf y wers:

- Gwirio bod gyda'r disgyblion y wybodaeth blaenorol angenrheidiol – eu bod yn gwybod ystyr y termau cyfanswm ac amllder, a'u bod yn deall sut i rannu.
- Trafodaeth dosbarth ynglŷn â beth mae 'ar gyfartaledd' yn golygu.
- Esboniad bod yna dri mesur o gyfartaledd.
- Esboniad o sut i gyfrifo'r cymedr gan ddewis enghreifftiau yn ofalus.
- Modelu sut i ddangos y dull wrth gyfrifo.

Variation theory – role play lesson on calculating the mean average of a set of data.

First phase of the lesson:

- Check for the necessary prior knowledge: pupils will need to know the meaning of the terms 'total' and 'frequency'. Pupils will need to know how to divide.
- Discussion around what it means to be 'average'.
- Explain that there are three different measures of average but that here we will focus on the mean
- Explain how to calculate the mean using a careful choice of examples.
- Modelling of how to show method/workings out.

Er enghraifft

I gyfrifo cymedr, defnyddiwn y fformwla:

$$\text{Cymedr} = \frac{\text{Cyfanswm}}{\text{Amllder}}$$

Cyfrifwch oedran cymedrig y grŵp canlynol o ddisgyblion:

3, 7, 8, 5, 7

$$\text{Cymedr} = \frac{\text{Cyfanswm}}{\text{Amllder}} = \frac{30}{5} = 6$$

For example:

To calculate the mean:

$$\text{Mean} = \frac{\text{Total}}{\text{Frequency}}$$

Calculate the mean age for this group of pupils:

3, 7, 8, 5, 7

$$\text{Mean} = \frac{\text{Total}}{\text{Frequency}} = \frac{30}{5} = 6$$

Un ffordd y gall theori amrywiad gael ei ddefnyddio

Cymerwch ddarn o bapur ac atebwch cwestiwn 1.

Ar gyfer bob cwestiwn dilynol, defnyddiwch y dull **CRAGEN** i ateb y cwestiwn nesaf

Cymharwch y cwestiwn gyda'r cwestiwn blaenorol. Oes yna batrwm? Beth sydd yn debyg, beth sydd yn wahanol?

Rhagfynegwch beth fydd yr ateb cyn mynd ati i'w gyfrifo.

Atebwch y cwestiwn gan ddefnyddio'r dull ffurfiol sydd wedi ei ddysgu i chi.

Gwerthuswch pa mor dda oedd eich rhagfynegiad.

Esboniwch – ceisiwch esbonio pam roedd eich rhagfynegiad yn gywir neu'n anghywir.

Nesaf – ewch ymlaen i'r cwestiwn nesaf gan ailadrodd y camau.

One way in which variation theory can be used?

Take a piece of paper and answer question 1.

For each subsequent question, follow the **COMPARE** method to answer each question

COMpare the numbers in the question with the numbers in the previous question. Can you see a pattern? What is the same, what is different?

Predict the answer to the new question. Without answering the question, what do you think the answer will be?

AnsWER the question using the formal method.

Reflect on how your answer compares with your prediction

Explain why your prediction was correct / incorrect

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Reflect on how your answer compares with your prediction

Explain why your prediction was correct / incorrect

In each of the following questions, the data represents the ages of a group of pupils. Calculate the mean age (average age) for each group:

Q1	5,	7,	7,	3,	8	
Q2	6,	8,	8,	4,	9	
Q3	5,	9,	8,	4,	9	
Q4	5,	9,	8,	4,	9,	7
Q5	11,	9,	8,	4,	9,	7
Q6	22,	18,	16,	8,	18,	14
Q7.	22.2,	18.2,	16.2,	8.2,	18.2,	14.2
Q8.	-22.2,	-18.2,	-16.2,	-8.2,	-18.2,	-14.2

With questions 9 and 10, compare with question 1 each time:

Q9.	$\frac{5}{8}$,	$\frac{7}{8}$,	$\frac{7}{8}$,	$\frac{3}{8}$,	1
Q10.	5^2 ,	7^2 ,	7^2 ,	3^2 ,	8^2

Un ffordd y gall theori amrywiad gael ei ddefnyddio

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Atebwch y cwestiwn gan ddefnyddio'r dull ffurfiol sydd wedi ei ddysgu i chi.

Gwerthuswch pa mor dda oedd eich rhagfynegiad.

Esboniwch – ceisiwch esbonio pam roedd eich rhagfynegiad yn gywir neu'n anghywir.

Nesaf – ewch ymlaen i'r cwestiwn nesaf gan ailadrodd y camau.

Mae'r data ym mhob un o'r cwestiynau canlynol yn cynrychioli oedrannau grŵp o ddisgyblion. Cyfrifwch oedran cymedrig bob grŵp.

1. 5, 7, 7, 3, 8
2. 6, 8, 8, 4, 9
3. 5, 9, 8, 4, 9
4. 5, 9, 8, 4, 9, 7
5. 11, 9, 8, 4, 9, 7
6. 22, 18, 16, 8, 18, 14
7. 22.2, 18.2, 16.2, 8.2, 18.2, 14.2
8. -22.2, -18.2, -16.2, -8.2, -18.2, -14.2

Gyda cwestiwn 9 a 10, cymharwch yn ôl gyda cwestiwn 1 bob tro:

9. $\frac{5}{8}$, $\frac{7}{8}$, $\frac{7}{8}$, $\frac{3}{8}$, 1
10. 5^2 , 7^2 , 7^2 , 3^2 , 8^2

Defnydd Ysgol Penglais o Theori Amrywiad

How Ysgol Penglais uses Variation Theory

Ysgol Penglais

Theori Amrywiad

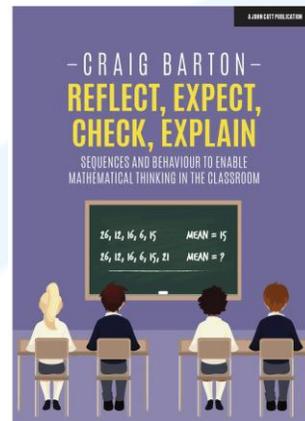
Adnoddau pellach:

- Fideo yn dangos sut mae Ysgol Penglais yn defnyddio'r theori mewn **tri** gwahanol ffordd
- [Astudiaeth achos](#) yn yr adroddiad am wers lle cafodd ei ddefnyddio (tudalen 23)
- Gwefan '[VariationTheory.com](#)'
- Ail lyfr Craig Barton
- Serch hyn – y ffordd orau yw i ddechrau addasu eich deunyddiau a meddwl sut gallwch chi ddefnyddio'r syniad hwn wrth ddewis enghreifftiau a chwestiynu disgyblion

Variation Theory

Further resources:

- Video outlining how Ysgol Penglais uses variation theory in **three** different ways
- A case study in the report about one lesson where the theory is used (page 23)
- The [VariationTheory.com](#) website
- Craig Barton's second book or similar
- However – the best way is to start adapting your own resources and thinking about how you can use this idea when choosing examples and questioning pupils



Eich tro chi

Yn y deg munud nesaf, rydym am i chi geisio:

- Meddwl am destun yr ydych yn mynd i'w addysgu yn ystod yr wythnosau nesaf a chreu cyfres o gwestiynau sydd yn cyd-fynd gyda theori amrywiad.
- Gallwch weithio yn unigol neu mewn parau.
- Os ydych chi'n cytuno y gallai hwn fod yn bwerus, beth am drefnu i rannu eich ymarfer gydag aelodau eraill y bwrdd.

Your turn

For the next ten minutes, we want you to:

- Think of a topic that you will be teaching over the next few weeks and create a set of questions which follows the principles of variation theory.
- You can work individually or in pairs.
- If you agree that this idea could be powerful, why don't you arrange to share your resource with the other members of your table.

Disgwyliadau athrawon ddim yn ddigon uchel

'diffyg eglurder mewn canllawiau cenedlaethol i gynorthwyo athrawon ac arweinwyr i ddeall y disgwyliadau gofynnol o ran dealltwriaeth a chynnydd disgyblion mewn mathemateg. Yn aml, roedd hyn yn golygu nad oedd gan athrawon ac arweinwyr ddisgwyliadau digon uchel o sut dylai disgyblion wneud cynnydd yn eu dealltwriaeth fathemategol'

Teachers not having high enough expectations

'a lack of clarity in national guidance to support teachers and leaders in understanding the minimum expectations of pupils' understanding and progress in mathematics; often, this meant that teachers and leaders did not have high enough expectations of how pupils should progress in their mathematical understanding'

Setting of minimum expectations

MSPW Resource – taken from PS3

DOL - I can use a range of representations to develop and secure my understanding that the value of a digit is related to its position. I can read, record and interpret numbers, using figures and words up to at least one million.

Strand 1. Read, record and interpret numbers

Granular detail 1: Up to 10,000

- Read, write and interpret numbers up to 10,000 using digits and words.
- Use a place value chart to understand numbers up to 10,000, recognising thousands, hundreds, tens and ones.
- Decompose or partition numbers into their place value components and explain how they are structured.
- Compare and order numbers up to 10,000 using place value knowledge and symbols such as $<$, $>$ and $=$.
- Round numbers to the nearest 10, 100 and 1,000 to estimate and check values.

Granular detail 2: Up to a million

- Read, write and interpret numbers up to one million using digits and words.
- Use a range of tools, including number lines and place value charts to understand and compare large numbers.
- Explain the value of digits in numbers up to one million using place value knowledge.
- Apply rounding strategies to estimate large numbers in real-life situations.
- Use an understanding of place value to solve problems involving large numbers, including addition and subtraction.

Granular detail 3: Beyond a million

- Represent numbers up to one million using place value charts, base ten blocks and digital models.
- Use number lines and place value charts to show how the value of digits changes depending on their position.
- Explain how shifting a digit left or right affects its value.
- Use diagrams and visual aids to compare and explain large numbers in real-world contexts.
- Interpret large numbers in different real-life contexts.
- Record and organise large numbers in tables, charts and diagrams to make comparisons.
- Use large numbers in problem-solving tasks, including real-world application.

Gosod disgwyliadau sylfaenol

Adnodd MSPW – wedi ei gymryd o CC3

Disgrifiad dysgu - Rwy'n gallu defnyddio amrywiaeth o gynrychioliadau i ddatblygu a chadarnhau fy nealltwriaeth fod gwerth digid yn ymwneud â'i safle. Rwy'n gallu darllen, ysgrifennu a dehongli rhifau, gan ddefnyddio ffigurau a geiriau hyd at filiwn, o leiaf

I. Darllen, cofnodi a dehongli rhifau

Manylion gronynnog 1: Hyd at 10,000

- Darllen, ysgrifennu a dehongli rhifau hyd at 10,000 gan ddefnyddio digidau a geiriau.
- Defnyddio siart gwerth lle i ddeall rhifau hyd at 10,000, gan adnabod miloedd, cannoedd, degau ac unedau.
- Dadelfennu neu ymrannu rhifau i'w cydrannau gwerth lle ac esbonio sut maent wedi'u strwythuro.
- Cymharu a threfnu rhifau hyd at 10,000 gan ddefnyddio gwybodaeth gwerth lle a symbolau megis $<$, $>$ a $=$.
- Talgrynnu rhifau i'r 10, 100 a 1,000 agosaf i amcangyfrif a gwirio gwerthoedd.

Manylion gronynnog 2: Hyd at filiwn

- Darllen, ysgrifennu a dehongli rhifau hyd at filiwn gan ddefnyddio digidau a geiriau.
- Defnyddio ystod o offer, gan gynnwys llinellau rhif a siartiau gwerth lle, i ddeall a chymharu rhifau mawr.
- Esbonio gwerth digidau mewn rhifau hyd at filiwn gan ddefnyddio gwybodaeth gwerth lle.
- Cymhwyso strategaethau talgrynnu i amcangyfrif rhifau mawr mewn sefyllfaoedd bywyd go iawn.
- Defnyddio dealltwriaeth o werth lle i ddatrys problemau sy'n ymwneud â rhifau mawr, gan gynnwys adio a thynnu.

Manylion gronynnog 3: Y tu hwnt i filiwn

- Cynrychioli rhifau hyd at filiwn gan ddefnyddio siartiau gwerth lle, blociau bôn deg a modelau digidol.
- Defnyddio linellau rhif a siartiau gwerth lle i ddangos sut mae gwerth digidau yn newid yn dibynnu ar eu safle.
- Esbonio sut mae symud digid i'r chwith neu'r dde yn effeithio ar ei werth.
- Defnyddio diagramau a chymhorthion gweledol i gymharu ac esbonio rhifau mawr mewn cyd-destunau byd go iawn.
- Dehongli rhifau mawr mewn gwahanol gyd-destunau bywyd go iawn.
- Cofnodi a threfnu rhifau mawr mewn tablau, siartiau a diagramau i wneud cymariaethau.
- Defnyddio rhifau mawr mewn tasgau datrys problemau, gan gynnwys cymhwysiad yn y byd go iawn.

Hyfedreddau

Er enghraifft:

Dealltwriaeth gysyniadol

- Mae dysgwyr yn datblygu eu dealltwriaeth o werth lle trwy ddefnyddio gwahanol gynrychioliadau, megis blociau bôn deg, llinellau rhif a siartiau gwerth lle, i archwilio sut mae gwerth digid yn newid yn seiliedig ar ei safle mewn rhif.
- Enghraifft: “Pam mae’r ‘5’ yn werth 5,000 yn 5,342 ond dim ond 50 yn 7,654?”

Proficiencies

For example:

Conceptual understanding

- Learners develop their understanding of place value by using different representations, such as base-ten blocks, number lines and place value charts, to explore how the value of a digit changes based on its position in a number.
- Example: “Why is the ‘5’ worth 5,000 in 5,342 but only 50 in 7,654?”

Cwestiynau ar gyfer meddwl yn fathemategol

- Sut mae siart gwerth lle yn helpu i ddeall rhifau hyd at 10,000?
- Pam mae'n ddefnyddiol rhannu rhifau i'w cydrannau gwerth lle?
- Sut mae cymharu rhifau gan ddefnyddio symbolau $<$, $>$ a $=$ yn helpu i wneud penderfyniadau yn y byd go iawn?
- Pa strategaethau allwch chi eu defnyddio i drefnu rhifau hyd at 10,000 yn effeithlon?
- Sut mae talgrynnu rhifau i'r 10, 100 neu 1,000 agosaf yn helpu i amcangyfrif gwerthoedd?
- Ym mha sefyllfaoedd fyddai talgrynnu yn ddefnyddiol mewn bywyd bob dydd?
- Pam mae'n bwysig deall safle pob digid mewn rhif?
- Sut gall deall gwerth lle helpu i adnabod gwallau mewn cyfrifiadau?
- Pam mae darllen ac ysgrifennu rhifau mewn geiriau a digidau yn bwysig?
- Sut mae gwybodaeth gwerth lle yn helpu i wirio rhesymolrwydd rhif?
- Pa batrymau allwch chi ddarganfod wrth dalgrynnu gwahanol rifau?
- Sut mae dadelfennu rhifau yn gwneud problemau cymhleth yn haws i'w datrys?
- Pam rydyn ni'n defnyddio symbolau megis $<$, $>$ a $=$ wrth gymharu rhifau?
- Sut gall amcangyfrif gwerthoedd gan ddefnyddio talgrynnu helpu mewn cyllidebu neu siopa?
- Pam mae'n bwysig darllen a dehongli rhifau yn gywir mewn cyd-destunau byd go iawn?

Questions for mathematical thinking

- How does a place value chart help in understanding numbers up to 10,000?
- Why is it useful to break down numbers into their place value components?
- How does comparing numbers using $<$, $>$ and $=$ symbols help in real-world decision-making?
- What strategies can you use to efficiently order numbers up to 10,000?
- How does rounding numbers to the nearest 10, 100 or 1,000 help in estimating values?
- In what situations would rounding be useful in everyday life?
- Why is it important to understand the position of each digit in a number?
- How can understanding place value help identify errors in calculations?
- Why is reading and writing numbers in both words and digits important?
- How does place value knowledge help in checking the reasonableness of a number?
- What patterns can you find when rounding different numbers?
- How does decomposing numbers make complex problems easier to solve?
- Why do we use symbols such as $<$, $>$ and $=$ when comparing numbers?
- How can estimating values using rounding help in budgeting or shopping?
- Why is it important to read and interpret numbers accurately in real-world contexts?

Aesu ffurfiannol

'nid oedd athrawon yn ymarfer addysgu ymatebol o fewn ystafelloedd dosbarth mathemateg'

'nid oedd athrawon yn defnyddio holi'n ddigon da i fynd i'r afael â chamdybiaethau'

Formative assessment

'did not practice responsive teaching within mathematics classrooms'

'did not use questioning well enough to address pupils' misconceptions'

Nid oes gan Estyn ddull mae'n ei ffafrio OND...

Rydym yn arsylwi tua 100 o wersi bob blwyddyn.

- Hyd yn oed pam mae esboniad athro yn dda iawn, ein profiad ni yw y bydd yna rai disgyblion fydd ddim wedi deall y cysyniad.
- Mae hyn yn debygol iawn o effeithio cynnydd disgyblion ac felly, trwy ein methodoleg ni, ansawdd yr addysgu.
- Mae felly yn gallu bod yn fanteisiol i ddefnyddio strategaeth sydd yn caniatáu i chi 'fesur' pa mor dda mae disgyblion wedi deall neu a oes camsyniadau ganddynt.

Estyn has no preferred method BUT...

We observe around 100 lessons every year.

- Even when the teacher's explanation is brilliant, our experience is that some pupils probably still won't have grasped what the teacher wants them to.
- This is likely to affect pupils' progress and therefore by our methodology the quality of teaching.
- It is therefore advantageous to use some method of 'measuring' how well pupils have understood or whether they have misconceptions which will hold them back.

Lefel yr her a tempo'r addysgu

Yn ein adroddiadau, rydym yn aml yn beirniadu lefel yr her mewn gwersi. Mewn mathemateg, mae gosod y lefel her gywir yn hanfodol.

- Rhy isel a nid yw disgyblion yn dysgu
- Rhy uchel ac mae'r cof gweithio disgyblion yn cael ei orlwytho a disgyblion yn colli hyder

Mae defnyddio dulliau asesu ffurfiannol felly yn fanteisiol ar gyfer gweld a yw lefel yr her a tempo'r addysgu yn gywir.

Level of challenge and pace of teaching

In our reports, we often criticise the level of challenge in lessons. In maths, setting the right level of challenge is essential.

- Too low and pupils are not learning
- Too high and pupils' working memory becomes overloaded and they lose confidence

The use of formative assessment methods is therefore advantageous in allowing the teacher to see whether the level of challenge and the tempo of teaching are correct.

Dulliau posibl o asesu'n ffurfiannol

Defnydd effeithiol o fyrddau gwyn bach

Rhesymau dros ddefnyddio byrddau gwyn bach:

1. Mae'n rhaid i bob disgybl ymgysylltu â'r cwestiwn
2. Mae'r athro yn gweld ymatebion yr holl ddisgyblion
3. Mae'r athro yn gweld a yw pob disgybl wedi deall
4. Gall yr athro adnabod unrhyw gamsyniadau yn gyflym
5. Gall yr athro fesur a yw lefel yr her a chyflymder y wers yn briodol
6. Mae disgyblion yn aml yn fwy parod i roi cynnig ar fwrdd gwyn bach
7. Gall yr athro ddefnyddio'r wybodaeth hon i addysgu'n ymatebol – gan gynyddu lefel yr her neu gymryd cam yn ôl
8. Gallwch ddangos atebion gwahanol ac ysgogi trafodaeth / defnyddio'r atebion fel sail ar gyfer cwestiynau dyfnach
9. Gall disgyblion weld bod yna wahanol ddulliau y gellir eu defnyddio i ddatrys problem yn aml

Possible methods for formative assessment

Effective use of mini whiteboards

Reasons to use mini whiteboards:

1. All pupils have to engage with the question
2. The teacher sees the responses of all pupils
3. The teacher sees whether all pupils have understood
4. The teacher can identify any misconceptions quickly
5. The teacher can gauge whether the level of challenge and pace of the lesson are appropriate
6. Pupils are often more willing to have a go on a mini whiteboard
7. The teacher can use this information to teach responsively – increasing the level of challenge or taking a step back
8. You can show different answers and provoke a discussion / use the answers as the basis for deeper questioning
9. Pupils can see that there are often different methods that can be used to solve a problem

Asesu ffurfiannol

Rhesymau a roddir dros beidio â defnyddio byrddau gwyn bach:

1. Mae'r pennau i gyd wedi rhedeg allan
2. Mae nhw'n rhwystr ac mae'r disgyblion yn tynnu lluniau arnyn nhw yn hytrach na chanolbwyntio ar y gwaith
3. Mae fy nghwestiynu yn ddigon da – nid oes eu hangen arnaf
4. Mae'n llawer o waith i'w rhoi allan a'u casglu yn ôl i mewn
5. Weithiau mae disgyblion yn taflu'r rhwbwyr o gwmpas y dosbarth
6. Ni fydd unrhyw dystiolaeth yn y llyfrau ar gyfer Estyn / UDA

Formative assessment

Reasons given for not using mini whiteboards:

1. All the pens have run out
2. They are a hindrance and pupils doodle on them rather than concentrating on the work
3. My questioning is good enough – I don't need them
4. It is a lot of work to give them out and collect them back in
5. Pupils sometimes throw the erasers around the class
6. There won't be any evidence in the books for Estyn / SLT

Dulliau posibl o asesu'n ffurfiannol

Defnydd effeithiol o fyrddau bach gwyn

Fideos mathemateg:

[Adnoddau Fideo Mathemateg - Estyn](#)

Sgwrs rhwng [Craig Barton ac Adam Boxer](#) – Mr Barton Podcast. Rhif 205 rhwng 19:00 a 38:32 lle maent yn siarad am 'The tick trick'

Llyfr byr penodol gan Craig Barton



Possible methods for formative assessment

Effective use of mini whiteboards

Mathematics videos:

[Mathematics Video Resources – Estyn](#)

Discussion between [Craig Barton and Adam Boxer](#) – Mr Barton Podcast Number 205 between 19:00 and 38:32 where they talk about a strategy called 'The tick trick'

Short book by Craig Barton

Cwestiynau diagnostig Diagnostic questions

Beth yw arwynebedd petryal sydd â hyd 12cm a lled 4cm?

What is the area of a rectangle with length of 12 cm and width of 4 cm?

A: 23cm^2

B: 12cm^2

C: 24cm^2

D: 48cm^2

Cwestiwn gwell

A better question

Beth yw arwynebedd
petryal sydd â hyd 12cm a
lled 4cm?

What is the area of a
rectangle with length of
12cm and width of 4cm?

A: 16cm

Wedi adio'r hyd a'r lled yn lle eu lluosu
Added length and width rather than multiplying

B: 32cm

Wedi cyfrifo'r perimedr yn lle arwynebedd
Calculated the perimeter rather than the area

C: 48cm

Disgybl wdi camddeall unedau arwynebedd
Pupil has misunderstood the units of area

D: 48cm²

Ateb CYWIR CORRECT answer

Defnydd o adnodd cwestiynau diagnostig fel dysgu proffesiynol

Mae yna filoedd o gwestiynau ar [Diagnostic Questions.com](https://www.diagnosticquestions.com)

Mae hi hefyd yn hawdd iawn i greu eich cwestiynau eich hun ar y wefan ac yna ei defnyddio i gael dadansoddiadau o ymatebion disgyblion.

Mae athrawon da yn aml yn gallu rhagweld beth fydd disgyblion yn ei weld yn anodd neu pa gamsyniadau byddant yn eu datblygu. Beth am dreulio peth amser mewn cyfarfod adran yn dylunio cwestiynau o'r math hyn gyda'ch gilydd, gan drafod yr opsiynau gorau fel atebion.

Use of diagnostic questions resource for professional learning

There are thousands of these questions on [Diagnostic Questions.com](https://www.diagnosticquestions.com)

It is also easy to create your own questions on the website and use it to obtain analyses of pupils' responses.

Good teachers often foresee what pupils will find difficult or the misconceptions that pupils may develop. How about spending some time during department meeting time designing questions together and discussing what you will choose as the best options for the answers.

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

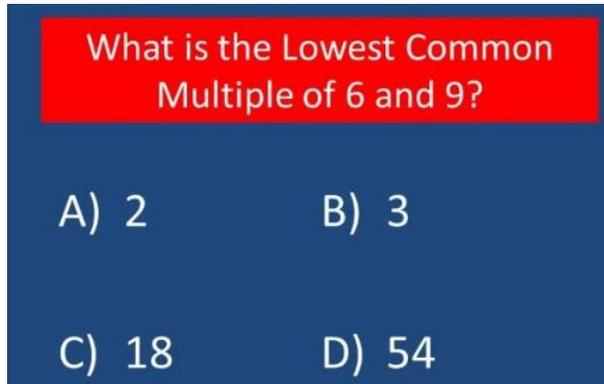
- Mae tystiolaeth o ymchwil sy'n awgrymu bod cynllunio gwers gyda'n gilydd yn weithgaredd dysgu proffesiynol buddiol.
- Mae Craig Barton yn credu, pan fydd athrawon yn gwneud hyn, eu bod yn tueddu i ganolbwyntio gormod ar bethau sydd yn ei farn e yn ddibwys – sut olwg fydd ar y cyflwyniad Pwynt pŵer, pa gefndir / delweddau y dylid ei ddefnyddio, pa weithgareddau y dylid eu cynnwys, a faint o amser y dylid ei neilltuo ar gyfer pob gweithgaredd ac ati.
- Mae'n awgrymu ei bod yn llawer mwy buddiol i athrawon gynllunio pa gwestiynau mae'n nhw am i ddisgyblion allu eu hateb, a pha gwestiynau diagnostig y dylent eu defnyddio i amlygu camsyniadau disgyblion neu mesur eu perfformiad.

Possible slides to use in a departmental meeting

- There is evidence from research suggesting that planning a lesson together is a beneficial PL activity.
- Craig Barton believes that when teachers do this, they tend to focus too much on what he believes to be the unimportant stuff – what the Powerpoint presentation will look like and what background / clipart should be used, what activities should be included, and how much time should be allocated for each activity etc.
- He suggests that it is far more beneficial for teachers to plan what questions they want pupils to be able to answer, and what diagnostic questions they should use to identify pupils' misconceptions / measure performance.

Possible slides to use in a departmental meeting

The following question is taken from [DiagnosticQuestions.com](https://www.DiagnosticQuestions.com):



What is the Lowest Common Multiple of 6 and 9?

A) 2 B) 3

C) 18 D) 54

Why did the teacher who wrote this question include the incorrect answers 2, 3 and 54?

What misconception (if any) does each answer expose? Which do you believe would be the most common wrong option?

Does this depend on whether this is a question included in a retrieval starter or during the teaching of LCM and HCF?

If you were designing this diagnostic question, would you have included the same options?

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Mae'r cwestiwn canlynol wedi ei gymryd o DiagnosticQuestions.com:

Beth yw Lluosrif Cyffredin Lleiaf y rhifau 6 a 9?

A) 2

B) 3

C) 18

D) 54

Pam ydych chi'n meddwl wnaeth yr athro gynnwys yr atebion anghywir 2, 3 a 54?

Pa gamsyniad (os o gwbl) mae pob ateb yn ei ddatgelu?

Pa un ydych chi'n credu fyddai'r opsiwn anghywir mwyaf cyffredin? A yw eich ateb i hyn yn dibynnu ar a yw hwn yn gwestiwn sydd wedi'i gynnwys mewn cychwyn adfer neu yn ystod addysgu LCM a HCF?

Pe baech chi'n dylunio'r cwestiwn diagnostig hwn, a fydddech chi wedi cynnwys yr un opsiynau?

Possible slides to use in a departmental meeting

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

- Ar gyfer bob un o'r cwestiynau canlynol, dewisiwch y pedwar opsiwn byddech chi'n eu cynnwys fel atebion aml-ddewis. Gwnewch hyn yn unigol yn gyntaf, ac yna trafodwch fel adran.
- For each of the following questions choose which four options you would include as multiple choice answers. Do this individually first then discuss the options as a department.

Q1: Calculate / Cyfrifwch -6 - 7

Possible slides to use in a departmental meeting

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Question 2:

30% of a sum of money is £150. What was this original amount of money?

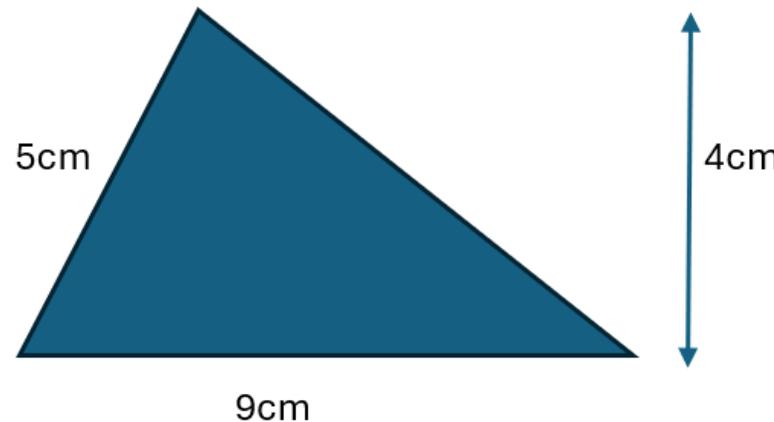
Cwestiwn 2:

30% o swm o arian ydy £150. Beth oedd y swm gwreiddiol hwnnw o arian?

Possible slides to use in a departmental meeting
Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Cw3: Cyfrifwch arwynebedd y triongl hwn:

Q3: Calculate the area of the following triangle



Possible slides to use in a departmental meeting

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Cw4: Datrysych $3(4 - 2y) = 20 - 5y$

Q4: Solve $3(4 - 2y) = 20 - 5y$

Mae hwn yn gwestiwn camarweiniol. Mae cymaint o broblemau y gallai godi wrth i ddisgyblion ateb y cwestiwn hwn. Bydda'n anodd felly dewis 4 opsiwn.

Byddai'r athro yn llawer gwell wrth ddefnyddio byrddau gwyn bach gyda'r cwestiwn hwn a gydag unrhyw gwestiwn algebra aml-gam.

This is a trick question. There are so many traps that pupils could fall into so choosing four options would be difficult.

The teacher would be far better using mini whiteboards with this question and any multi-step algebra question.

Possible slides to use in a departmental meeting

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

- Beth am roi cynnig ar y cwestiynau hyn rydyn ni wedi bod yn eu trafod gyda'ch disgyblion i weld a yw eich rhagfynegiadau am beth yw'r camsyniadau mwyaf cyffredin yn gywir.
- Beth ydym ni fel adran yn mynd i'w wneud i newid ein harfer o ganlyniad i'r drafodaeth hon?
- Beth am ddylunio rhai cwestiynau diagnostig i'w defnyddio pan fyddwch yn addysgu un o'ch dosbarthiadau yr wythnos hon / yr wythnos nesaf?
- Darllen pellach –
'hypercorrection effect' - er enghraifft <https://tipsforteachers.co.uk/confidence-scores/>
- Why not try the questions we have been discussing with your pupils to see whether your gut feelings about the misconceptions you thought would be most common are correct.
- What are we as a department going to do to change our practice as a result of this discussion?
- Why not design some diagnostic questions to use when teaching one for your classes this week / next week?
- Further reading –
The 'hypercorrection effect' – for example:
<https://tipsforteachers.co.uk/confidence-scores/>

Dulliau posibl o asesu'n ffurfiannol

Mae yna ddulliau eraill o gasglu gwybodaeth yn y foment am gynnydd disgyblion. Nid oes dull mae Estyn yn ei ffafrio. a cyn belled bod athrawon:

- yn gwybod pa mor dda mae disgyblion yn deall a defnyddio hyn i lywio'r addysgu
- Yn medru adnabod a mynd i'r afael â chamsyniadau disgyblion

Possible methods of formative assessment

There are other methods of collecting information about pupils' progress. Estyn have no preferred method as long as teachers:

- know how well pupils understand and use this information to guide their teaching
- Identify and address misconceptions in a timely way.

Rhoi cyfleoedd i ddisgyblion feddwl yn ddwfn, datrys problemau ac adnabod strwythur mathemategol problemau

'roedd athrawon yn cyfyngu ar gyfleoedd i ddisgyblion ddatblygu medrau dysgu'n annibynnol o ganlyniad i addysgu â gormod o gyfarwyddyd'

Providing opportunities for pupils to think deeply, solve problems and recognise the underlying mathematical structures

'limited the opportunities for pupils to develop independent learning skills due to over-directed teaching'

Rhoi cyfleoedd i ddisgyblion feddwl yn ddwfn, datrys problemau ac adnabod strwythur mathemategol problemau

Yn Siapan a Singapore, mae llawer o amser mewn gwersi mathemateg yn cael ei dreulio yn rhoi cyfleoedd i ddisgyblion edrych ar strwythurau mathemategol problemau gwahanol.

Fe welon ni wers lle gwnaed hyn yn dda iawn llynedd. Roedd y disgyblion Blwyddyn 9 wedi bod yn dysgu am rannu mewn cymhareb ac roedd yr athro wedi defnyddio modelau bar i gyflwyno'r pwnc. Yn y wers hon – yr olaf ar cymhareb, roedd disgyblion yn ceisio paru'r modelau bar anghyflawn gyda'r cwestiynau. Yn ein barn ni, roedd y disgyblion wedi gwneud cynnydd da, wedi meddwl llawer a datblygu eu dealltwriaeth nhw o strwythurau mathemategol problemau cymhareb.

Cymerwch 5 munud i roi tro ar y weithgaredd.

Providing opportunities for pupils to think deeply, solve problems and recognise the underlying mathematical structures

In Japan and Singapore, a lot of time in mathematics lessons is spent giving pupils opportunities to look at the mathematical structures of different problems.

We saw a lesson where this was done very well last year. The Year 9 pupils had been learning about dividing in ratio and the teacher had used bar models to introduce the subject. In this lesson, the last on ratio, pupils tried to match the incomplete bar models with the questions. In our opinion, the pupils made good progress, were thinking hard throughout the activity, and developed their understanding of the mathematical structures of ratio problems.

Take 5 minutes to have a go at the activity.

Rhoi cyfleoedd i ddisgyblion feddwl yn ddwfn, datrys problemau ac adnabod strwythur mathemategol problemau

- Pwysigrwydd cynllunio ar gyfer y dysgu, nid cynllunio tasgau

OND

- Tasgau sydd yn dod a phopeth at ei gilydd / rhoi cyfleoedd i gymhwyso / cyfleodd i resymu ayyb yn hynod werthfawr pan fo disgyblion wedi meistroli cysyniad.

Providing opportunities for pupils to think deeply, solve problems and recognise the underlying mathematical structures

- The importance of planning for the learning, not planning tasks (what pupils will do)

However

- Tasks that bring everything together / give opportunities for application / opportunity for reasoning etc are extremely valuable when pupils have mastered a concept.

Rhoi cyfleoedd i ddisgyblion feddwl – model 3D o gynnydd yn mathemateg a rhifedd

Providing opportunities for pupils to think deeply – 3D model of progression in mathematics and numeracy

✓ **Algebra uses symbol systems to express the structure of mathematical relationships.**

Progression step 3

I can explore and create patterns of numbers and shapes. I can explain numerical sequences and spatial patterns in words and by generalising them.

I can use [commutativity](#), [distributivity](#) and [associativity](#) to explore equality and [inequality](#) of expressions.

Progression step 4

I can explore, generate, identify and represent both numerical and spatial [linear](#) sequences, including finding and using a general term.

I can demonstrate my understanding of the concept of a [variable](#), using algebraic notation to form [linear](#) expressions, equations and inequalities. I can interpret [algebraic](#) expressions because I understand the way symbols are used to represent operations, multiples and powers.

Progression step 5

I can explore, generate, identify and represent both numerical and spatial patterns, using [linear](#) and [non-linear](#) sequences.

I can explore the concepts of equality and [identity](#), connecting geometric, algebraic and graphical representations.

Gwneud cysylltiadau rhwng cysyniadau / Making connections between concepts

Dysgu'n dyfnhau – yr hyfedreddau
Learning gets deeper – the proficiencies

Cysyniadau yn mynd yn fwy cymhleth / Content gets more difficult

Rhoi cyfleoedd i ddisgyblion feddwl yn ddwfn, datrys problemau ac adnabod strwythur mathemategol problemau

TASGAU BOWLANDS

- Tasgau byr (1-2 gwrs fel arfer).
- Tasgau datrys problem pur lle nad yw'r fathemateg sydd ei angen i ddatrys y broblem bob amser yn hawdd i'w adnabod.
- Mae disgyblion yn gorfod meddwl am pa fathemateg maent am ei ddefnyddio – rhywbeth nad ydyn ni yn gweld digon ohono yng Nghymru.
- Dim copïau Cymraeg ar gyfer bob un ar gael ond roedd Abertawe wedi eu cyfieithu nhw flynyddoedd yn ôl.

Providing opportunities for pupils to think deeply, solve problems and recognise the underlying mathematical structures

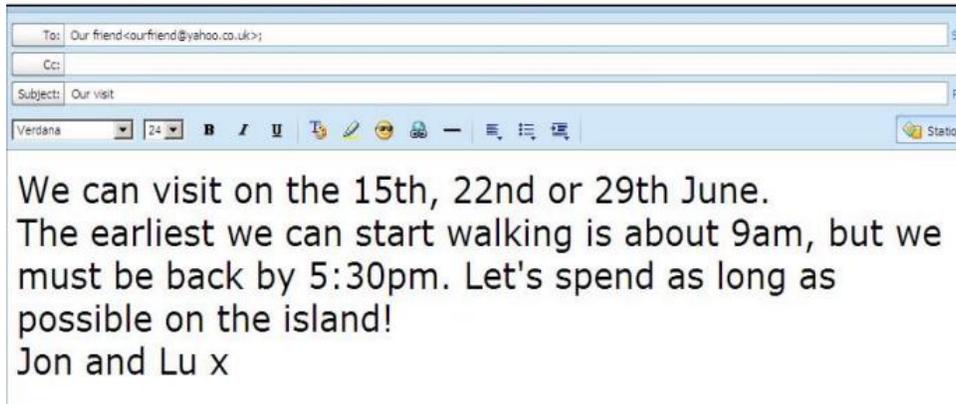
BOWLANDS TASKS

- Short tasks (1-2 lessons usually).
- Pure problem solving – the mathematics needed will not always be immediately apparent.
- Pupils have to think of what mathematics they need to use – something we don't see enough of in Wales.
- Copies in Welsh not available for all of the tasks although Swansea LA translated them years ago.

Tasg Ynys Hilbre / Hilbre Island task

You can walk to Hilbre Island only if the tide is out. At high tide the footpath is under water.

You are planning to walk to the island with your friends. Here is an email from them and information you need to plan your visit.



Allow **one hour** to walk to the island, and **one hour** to walk back

WARNING!
Do not walk between **3 hours before** and **3 hours after** high tide

Times of high tide
15th June: 14:00
22nd June: 09:04
29th June: 12:57

Reply to your friends, telling them which date is best for your visit and explaining why some dates are better than others.

You can use this chart to plan your answer.

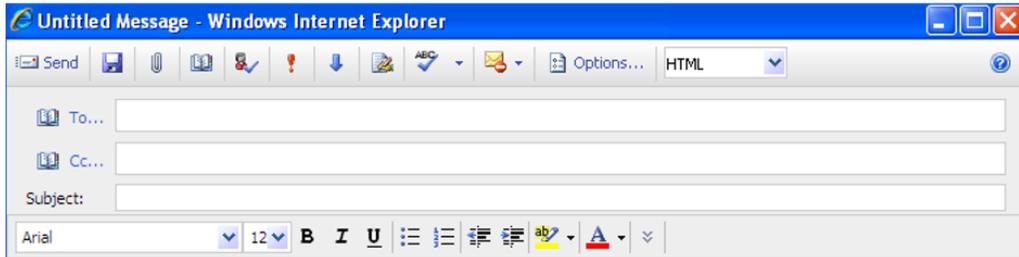
	8am	9am	10am	11am	Midday	1pm	2pm	3pm	4pm	5pm	6pm
15th											
22nd											
29th											



Tasg Ynys Hilbre / Hilbre Island task

Mae modd cerdded i Ynys Hilbre ond dim ond pan fo'r môr ar drai (low tide). Pan fo'r llanw'n uchel (high tide), bydd y llwybr cerdded dan ddŵr.

Rydych chi'n bwriadu cerdded i'r ynys gyda'ch ffrindiau. Dyma e-bost ganddynt ynghyd â'r wybodaeth angenrheidiol i drefnu eich ymweliad.



Gallwn ymweld ar 15, 22 neu 29 Mehefin.
Yr amser cynharaf y gallwn ni ddechrau cerdded yw tua 9am, ond mae'n rhaid i ni ddychwelyd erbyn 5.30pm. Gadewch i ni dreulio mor hir â phosib ar yr ynys!

Caniatewch awr i gerdded i'r ynys ac awr i gerdded yn ôl

RHYBUDD!

Peidiwch â cherdded 3 awr cyn a 3 awr ar ôl y penllanw (high tide)

Amserau'r penllanw

15 Mehefin: 14:00

22 Mehefin: 09:04

29 Mehefin: 12:57

Rhowch ymateb i'ch ffrindiau gan ddweud wrthynt pa ddyddiad sydd orau i'ch ymweliad ac esbonio wrthynt pam mae rhai dyddiadau'n well nag eraill.

Gallwch ddefnyddio'r siart hwn i baratoi eich ateb

	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm
15fed											
22ain											
29ain											



Rhoi cyfleoedd i ddisgyblion feddwl yn ddwfn, datrys problemau ac adnabod strwythur mathemategol problemau

Gadewch i ni feddwl / CAME (Cognitive acceleration in maths education)

[Thinking Mathematics Lessons – Simple Book Publishing](#)

Tasg 1 – To tŷ ai peidio?

Tasg 2 – Negeseuon testun

Tasg 7 – Pa gynnig dylwn i fynd amdano?

Providing opportunities for pupils to think deeply, solve problems and recognise the underlying mathematical structures

Let's think / CAME (Cognitive acceleration in maths education)

[Thinking Mathematics Lessons – Simple Book Publishing](#)

Task 1 - Roofs

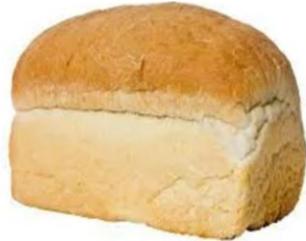
Task 2 – Text and talk

Task 7 – Which offer shall I take?

Adnabod pa fathemateg mae angen ei ddefnyddio

- [Gwefan SSDD](#) - Adnodd o broblemau sydd yn edrych yn debyg ar yr wyneb ond sydd yn fathemategol wahanol.

Mae torth o fara yn costio 89c. Mae'r pris yn codi 22%. Beth yw'r pris newydd i'r geiniog agosaf?



Mae pris torth o fara yn codi o 89c i £1.20. Beth yw'r cynnydd canrannol i 1 lle degol?

Pum mlynedd yn ôl, pris torth o fara oedd 89c. Ers hynny, mae'r pris wedi codi 3% bob blwyddyn. Beth yw pris y dorth heddiw?

Mae siop yn cynnig 30% oddi ar pris torth o fara. Y pris nawr yw 63c. Beth oedd y pris cyn y cynnig hwn?

Identifying the mathematics that needs to be used

[SSDD website](#) - Same surface, different depth problems

A loaf of bread costs 89p, the price increases by 22% what is the new price to the nearest penny?

The price of a loaf of bread rises from 89p to £1.20. What is the change as a percentage to 1dp?



A loaf of bread cost 89p five years ago, this price has increased by 3% per annum. How much does it cost now to the nearest penny?

A shop marks down a loaf of bread. It has been marked down by 30% to 63p. What did it cost originally?

Adnabod pa fathemateg mae angen ei ddefnyddio

- [Goal Free Problems](#) - Adnodd o broblemau lle mae llawer o wybodaeth yn cael ei roi ond dim cwestiwn.

neu

- Crëwch un eich hyn e.e.

Mae eich teulu yn ystyried prynu car newydd. Rydych am ymchwilio i'r gost o brynu a rhedeg car gydag injan petrol yn erbyn cost prynu a rhedeg car trydan.

Milltiroedd cyfartaledd	800 milltir y mis
Defnydd tanwydd petrol	55 milltir y galwyn
Pris petrol	143.9c y litr
	1 galwyn = 4.55 litr
Cost rhedeg y car trydan	6c y filltir
Gwahaniaeth cost prynu	Car trydan £2000 yn fwy na'r car petrol

Beth gallwch chi weithio allan gyda'r wybodaeth hwn?
Pa wybodaeth arall fydddech chi eisiau cyn penderfynu?

Identifying the mathematics that needs to be used

[Goal Free Problems](#) - This resource includes problems where a lot of information is provided but no question.

or

- Create your own e.g.

Your family are considering buying a new car. Your research into the cost of buying and running a petrol car against the purchase and running cost of an electric car shows that:

Average mileage	800 miles per month
Petrol fuel economy	55 miles per gallon
Price of petrol	143.9p per litre
	1 gallon = 4.55 litres
Running cost electric car	6p per mile
Difference in purchase price	Electric car £2000 costs More than the petrol car

What can you find out using this information?

What further information would you need before deciding?

Rhoi cyfleoedd i ddisgyblion feddwl yn ddwfn, datrys problemau ac adnabod strwythur mathemategol problemau

Maths Shell

Formative Assessment Lessons

- Tasgau byr 1-2 wers
- Tasgau sydd yn anelu at ddatblygu dealltwriaeth cysyniadol disgyblion o syniadau mathemategol
- Ddim ar gael yn y Gymraeg ar hyn o bryd (ond os byddai'r gofyn yn codi yna fe allen ni wneud cais i Adnodd

Providing opportunities for pupils to think deeply, solve problems and recognise the underlying mathematical structures

Maths Shell

Formative Assessment Lessons

- Short tasks 1-2 lessons
- Tasks which are aimed at developing pupils' conceptual understanding of mathematical ideas
- Not currently available in Welsh (we believe), but should the demand arise, we could make a request to Adnodd

Maths Shell

Defnyddio trefnolion i ddisgylion feithrin ddealltwriaeth o rifau cyfeiriol
Using manipulatives to develop pupils' understanding of directed numbers

How much is this?

Making 3

Show me three more ways of making 3.

Can you do one using 11 charges altogether?

How would you describe what happens here?

$4 + (-2)$

Or / Neu

$-2 + (+4)$

How would you describe what happens here?

+2

How would you describe what happens here?

What do we get when we take away a negative?

How can I draw $(+2) - (+5)$?

Slides P-27 to P-29 show how other ways of writing $(+2)$ are more useful here:

How can I draw $(+2) - (+5)$?

And another...

Do you agree that this is still $(+2)$?

Then Slides P-30 to P-32 show how $(+5)$ can now be subtracted:

How can I draw $(+2) - (+5)$?

And another...

$(+2) - (+5) = (-3)$

Syniadaeth Yr Athro Yeap Ban Har

Mae Llywodraeth Cymru wedi rhoi grant i 'The Learning Partnership' sydd yn gweithio gydag ysgolion (cynradd yn bennaf) i ddatblygu addysgu mathemateg yn ôl syniadau'r Athro Ban Har.

Rhai o'i syniadau:

"Mae'n well datrys un broblem 5 ffordd, nag yw datrys 5 problem wahanol."

Tri chwestiwn i'w defnyddio fel estyniad:

- A oes ffordd arall o ddatrys y broblem hon?
- Allwch chi dynnu model o sut y gwnaethoch chi ddatrys y broblem?
- Ysgrifennwch sut i ddatrys y broblem hon i rywun sydd i ffwrdd heddiw (neu'ch rhieni!)

Cymerwch ychydig o amser i edrych ar rai o'i fideos ar-lein

Professor Yeap Ban Har's ideas

Welsh Government have provided a grant to The Learning Partnership who are working with schools (mainly primary) to develop mathematics teaching according to Professor Ban Har's ideas.

Some of his ideas:

"It's better to solve one problem 5 ways, than it is to solve 5 different problems"

Three questions to use as extensions:

- Is there another way to solve this problem?
- Can you draw a model of how you solved the problem?
- Write out how to solve this problem for someone who is away today (or your parents!)

Take some time to look at some of his videos online

Rhoi cyfleoedd i ddisgyblion feddwl yn ddwfn, datrys problemau ac adnabod strwythur mathemategol problemau

Adnoddau eraill posibl ar gyfer ymchwiliadau:

- [nrich](#)
- [Inquiry maths](#)
- [Enquiry-Based Maths](#)
- [MEDIAN Don Steward mathematics teaching](#)
- [mathematicaletudes.com](#)

Beth gallwch chi ddweud am y chwe ffracsiwn yma:

$$\frac{1}{6} \quad \frac{1}{25} \quad \frac{3}{5} \quad \frac{3}{20} \quad \frac{4}{15} \quad \frac{5}{8}$$

Dwi am i chi adio gymaint a chi'n gallu o'r ffracsiynau hyn er mwyn cael ateb sydd mor agos a phosibl i 1. Dim ond unwaith gallwch chi ddefnyddio bob ffracsiwn ym mhob swm.

Providing opportunities for pupils to think deeply, solve problems and recognise the underlying mathematical structures

Other possible sources of investigative tasks:

- [nrich](#)
- [Inquiry maths](#)
- [Enquiry-Based Maths](#)
- [MEDIAN Don Steward mathematics teaching](#)
- [mathematicaletudes.com](#)

What can you say about these six fractions:

$$\frac{1}{6} \quad \frac{1}{25} \quad \frac{3}{5} \quad \frac{3}{20} \quad \frac{4}{15} \quad \frac{5}{8}$$

Add together as many of the six fractions as you like to get an answer that is as near to 1 as possible. You can use each fraction only once in each sum.

Dim dysgu triciau

'nid oedd athrawon yn cynllunio'n ddigon da i addysgu dealltwriaeth o gysyniadau mathemategol'

Not teaching tricks

'did not plan well enough to teach the understanding of mathematical concepts'

Compound measures

How much time would Aled take to travel 36km at a Speed of 16 km/hour?

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$16 = \frac{36}{t}$$

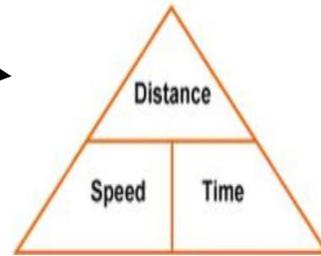
$$16t = 36$$

$$16t = 36$$

$$t = \frac{36}{16}$$

$$t = 2.25$$

Time = 2 hours 15 minutes



$$\text{Time} = \frac{36}{16}$$

Idea (Adam Boxer's idea, not ours)

Start by teaching the relationship between speed, distance and time using pupils' everyday knowledge of the concept of speed and proportional reasoning and then introduce the formula.

Then: If you travel on a motorway at 60mph for 3 hours, how far do you travel?

$$60 \times 3 = 180 \text{ miles}$$

What have you done with the 60 (the speed) and the 3 (the time)? -> Multiplied the speed by the time.

What therefore would the general formula be -> if you know the speed and the time, what do you do to get the time?

$$\text{speed} \times \text{time} = \text{distance}$$

With this formula, the rearranging of the formula has, at most, one step.

$$s \times t = d$$

$$16t = 36$$

$$t = \frac{36}{16}$$

$$t = 2.25$$

Time = 2 hours 15 minutes

Mesurau cyfansawdd

Faint o amser fyddai Aled yn ei gymryd i deithio 36km ar fuanedd o 16 km/awr?

buanedd = pellter

$$16 = \frac{36}{a}$$

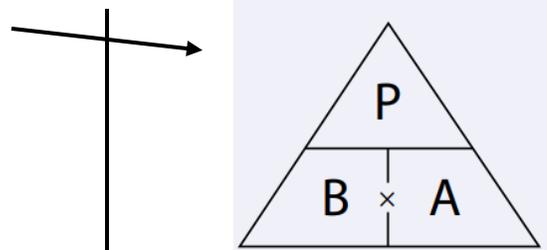
$$\textcircled{\times a} \quad \textcircled{\times a}$$

$$16a = 36$$

$$\textcircled{\div 16} \quad \textcircled{\div 16}$$

$$a = 2.25$$

Amser = 2 awr 15 munud



$$A = \frac{36}{16}$$

Syniad (un Adam Boxer, nid un ni)

Dechrau trwy gyflwyno'r cysylltiad rhwng buanedd, pellter ac amser gan ddefnyddio dealltwriaeth bob dydd y disgyblion o'r cysyniad a rhesymu cyfrannol cyn dysgu'r fformwla.

Wedyn: Os ydych chi'n teithio ar 60mya ar draffordd am dair awr, pa mor bell ydych chi wedi teithio?

$$60 \times 3 = 180 \text{ milltir}$$

Beth ydych chi wedi gwneud gyda'r 60 (y buanedd) a'r 3 (yr amser)? -> Lluosi

Beth felly fyddai'r fformwla?

$$\text{buanedd} \times \text{amser} = \text{pellter}$$

Wrth ddefnyddio'r fformwla hon, does yna byth mwy nac un cam o aildrefnu

$$b \times a = p$$

$$16a = 36$$

$$\textcircled{\div 16} \quad \textcircled{\div 16}$$

$$a = 2.25 \rightarrow \text{Amser} = 2 \text{ awr ac } 15 \text{ munud}$$

Trafodaethau mewn cyfarfodydd adran – rhan 1

Discussions in a departmental meeting – part 1

Possible slides to use in a departmental meeting

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Cyfarfod 1:

Ystyriwch y cwestiwn:

1.5 x 8

Mewn sawl ffordd gwahanol allwn ni wneud y cyfrifiad hwn?

Meeting 1:

Consider the question:

1.5 x 8

In how many different ways can we do this calculation?

Possible slides to use in a departmental meeting

Questions to provoke discussion:

- How often do we expose pupils to different methods of solving a problem, ask them to evaluate the methods, and see the connections between them?
- Do we provide our pupils with enough opportunities to look at different methods, eg ways of doing this calculation (1.5×8) and those that are similar? Do all the methods work for questions of a similar type or does it depend on the numbers?
- Do we get pupils to analyse the efficiency of each method? For example, we could carry out 1.5×8 by doubling 1.5 three times or by taking 8 and half of 8. Either of these is efficient for this specific question but when are these efficient methods possible?
- In Japan and Singapore, the answer to a problem is often only the start of a lengthy discussion on the different ways of solving that problem. By doing this, pupils spend a lot of time thinking about their thinking (metacognition), analysing different methods and seeing the connections between them. In doing so, they build a better understanding of the underlying mathematical structures – an essential feature if pupils are to transfer their understanding of that concept. How often do we as a department provide opportunities for pupils to look at different methods?

Possible slides to use in a departmental meeting

Questions to provoke discussion (continued):

- Consider a topic which the department will be teaching over the next few weeks. Could we provide pupils with opportunities to look at different methods for solving a problem? (If you can't think of an example off the top of your head, why not discuss one of the following:
 - divide by a decimal (start with e.g. $4 \div 0.2$)
 - solving linear equations (start with $3x + 4 = 16$)
 - how to work out how many objects (e.g. matches / tiles etc) there are in the 10th shape in a pattern of shapes that follows a linear sequence
 - calculate 23% of a number using a calculator (work out 1% by dividing by 100 then multiply by 23 on a calculator, using a multiplier method with 0.23, working out 10%, 10%, 1%, 1%, 1% then adding them etc)
- What are we going to do to change our practice as a result of this discussion? Should we agree to follow-up on this discussion in a few weeks after trialling a lesson / series of lessons where we have given pupils opportunities to look at different methods for solving a problem?
- Possible further reading – Jo Morgan – A Compendium of Mathematical Methods

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Cwestiynau i ysgogi trafodaeth:

- Pa mor aml ydyn ni'n dangos a thrafod gwahanol ddulliau o ddatrys problem gyda'r disgyblion gan ofyn iddynt werthuso'r dulliau a gweld y cysylltiadau rhyngddynt?
- Ydyn ni'n rhoi digon o gyfleoedd i'n disgyblion edrych ar wahanol ffyrdd o wneud cyfrifiadau ee rhai tebyg i hwn (1.5×8) a rhai sy'n debyg? A yw'r holl ddulliau yn gweithio ar gyfer cwestiynau tebyg i hwn neu a yw'n dibynnu ar y rhifau yn y cwestiwn?
- Ydyn ni'n cael disgyblion i ddadansoddi effeithlonrwydd pob dull? Er enghraifft, gallem gyflawni 1.5×8 trwy ddyblu 1.5 dair gwaith neu drwy gymryd 8 a hanner o 8. Mae'r naill neu'r llall o'r rhain yn effeithlon ar gyfer y cwestiwn penodol hwn, ond pryd mae'r dulliau effeithlon hyn yn bosibl?
- Yn Japan a Singapore, mae llawer o'u gwersi yn ymwneud gyda disgyblion yn gwerthuso dulliau. Dim ond dechrau'r wers yw darganfod yr ateb. Trwy wneud hyn, mae disgyblion yn treulio llawer o amser yn meddwl am eu meddwl (metagoeneg / metacognition) , yn dadansoddi gwahanol ddulliau a gweld y cysylltiadau rhyngddynt. Wrth wneud hynny, maent yn adeiladu gwell dealltwriaeth o'r strwythurau mathemategol sylfaenol – nodwedd hanfodol os yw disgyblion am droglwyddo eu dealltwriaeth o'r cysyniad hwnnw. Pa mor aml rydyn ni fel adran yn darparu cyfleoedd i ddisgyblion edrych ar wahanol ddulliau?

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Cwestiynau i ysgogi trafodaeth (parhad):

- Os oes amser (os na, beth am ddechrau'r cyfarfod nesaf trwy wneud hyn), ystyriwch bwnc y bydd yr adran yn ei ddysgu dros yr wythnosau nesaf. A allwn ni roi cyfleoedd i ddisgyblion edrych ar wahanol ddulliau o ddatrys problem? (Os na allwch feddwl am enghraifft, beth am drafod un o'r canlynol:
 - rhannu gyda degolyn (dechrau gyda e.e. $4 \div 0.2$)
 - datrys hafaliadau llinol (dechrau gyda $3x + 4 = 16$)
 - sut i weithio allan faint o wrthrychau (e.e. gemau / teils ac ati) sydd yna yn y 10fed siâp mewn patrwm o siapiau sy'n dilyn dilyniant llinol
 - Cyfrifwch 23% o rif gan ddefnyddio cyfrifiannell (gweithiwch allan 1% trwy rannu â 100 yna lluosî â 23 ar gyfrifiannell, gan ddefnyddio dull lluosydd gyda 0.23, gan weithio allan 10%, 10%, 1%, 1%, 1% ac yna eu hychwanegu ac ati)
- Beth ydyn ni'n mynd i'w wneud fel adran i newid ein harfer o ganlyniad i'r drafodaeth hon? A ddylem gytuno i ddilyn y drafodaeth hon mewn ychydig wythnosau ar ôl treialu gwrs / cyfres o wersi lle rydym wedi rhoi cyfleoedd i ddisgyblion edrych ar wahanol ddulliau o ddatrys problem?
- Darllen pellach posibl – Jo Morgan – A Compendium of Mathematical Methods

Trafodaethau mewn cyfarfodydd adran – rhan 2

Discussions in a departmental meeting – part 2

Possible slides to use in a departmental meeting

If you have time over the summer, or are an avid reader, Daniel Willingham's book, 'Why don't students like school' is well worth a read and will undoubtedly provoke you to think about your teaching practice.

In the book (Second edition page 111), he talks about how the understanding that pupils have of a concept is initially shallow. He states that for deep understanding to develop, pupils need to be exposed to different components of the idea, and this takes experience so that pupils make more connections. He argues that when pupils have worked with the same idea in a number of different guises, they will then start to develop an appreciation of the deep mathematical structure of the concept. He concludes that:

'... until then, pupils' understanding will cling to the examples they've seen, and transfer will be uncertain.'

He continues by considering implications for classroom teaching and states:

'After all, if understanding were easy for students, teaching would be easy for you! ... Be Wary of Promises of Broad Transfer. The history of education is littered with abandoned attempts to teach students a skill that will "train the mind" and help students think more critically about, well, everything.'

He provides examples of where this has failed in the past. This is suggesting that, except for some teaching strategies such as draw a diagram, in general, you cannot teach pupils problem solving strategies that work across all areas of maths.

Possible slides to use in a departmental meeting

Questions to provoke discussion

- What problem solving strategies do we teach pupils which are more general? How often do we give pupils opportunities to apply and develop these strategies?
- Willingham is suggesting that in order to solve problems, pupils need to understand the underlying mathematical structures of a concept, so that they can see when this concept can be applied to solve a problem. How well do we teach to ensure that pupils build their conceptual understanding and recognise mathematical structures?
- Think back to the last discussion we had on the different methods for solving 1.5×8 . How have we adapted our teaching following that discussion to expose pupils to more than one method of answering a question?
- Estyn's thematic report on mathematics states that teachers spend a lot of time teaching pupils how to use a mathematical skill and not enough time in developing their ability to recognise when to use different mathematical skills. How well do we do this as a department? Do we, for instance, give pupils SSDD problems? (If you are not aware of SSDD problems have a look at [SSDD Problems – Same Surface, Different Deep Structure maths problems](#))
- Further possible reading – Third Space Learning – The Ultimate Guide to Problem Solving

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Os oes gennych amser dros yr haf, neu os ydych chi'n ddarllen ydd brwd, mae llyfr Daniel Willingham, 'Why don't students like school' yn werth ei ddarllen a bydd yn bendant yn eich ysgogi i feddwl am eich arferion addysgu.

Yn y llyfr (Ail argraffiad tudalen 111), mae'n sôn am sut mae'r ddealltwriaeth sydd gan ddisgyblion o gysyniad yn denau i ddechrau. Mae'n nodi, er mwyn datblygu dealltwriaeth ddwfn, mae angen i ddisgyblion fod yn agored i wahanol elfennau o'r syniad ac mae hyn yn cymryd profiad a gyda'r profiad hyn bydd disgyblion yn gwneud mwy o gysylltiadau. Mae'n dadlau bod os yw disgyblion wedi gweithio gyda'r un syniad mewn nifer o wahanol ffurfiau, byddant wedyn yn dechrau datblygu gwerthfawrogiad o strwythur mathemategol dwfn y cysyniad.

Mae'n dod i'r casgliad:

'... Tan hynny, bydd dealltwriaeth disgyblion yn glynu wrth yr enghreifftiau maen nhw wedi'u gweld, a bydd y trosglwyddiad i gyd-destunau eraill yn ansicr.'

Mae'n parhau trwy ystyried goblygiadau i addysgu yn yr ystafell ddosbarth a datgan:.

'Wedi'r cyfan, pe bai dealltwriaeth yn hawdd i fyfyrwyr, byddai addysgu yn hawdd i chi! ... Byddwch yn wylidwrus o addewidion o drosglwyddiad eang. Mae hanes addysg yn llawn ymdrechion aflwyddiannus o athrawon yn ceisio darganfod ffyrdd a fydd yn "hyfforddi'r meddwl" disgyblion a'u helpu i feddwl yn fwy beirniadol syth yn gweithio ar draws popeth.' Mae'n darparu enghreifftiau o ble mae hyn wedi methu yn y gorffennol. Mae hyn yn awgrymu bod, ar y cyfan (heblaw am strategaethau syml tebyg i 'Tynnwch lun', nid oes modd addysgu strategaethau datrys problemau sydd yn gweithio ar gyfer bob cysyniad.

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Cwestiynau i ysgogi trafodaeth

- Pa strategaethau datrys problemau rydyn ni'n eu dysgu i ddisgyblion sy'n fwy cyffredinol? Pa mor aml ydyn ni'n rhoi cyfleoedd i ddisgyblion gymhwyso a datblygu'r strategaethau hyn?
- Mae Willingham yn awgrymu bod angen i ddisgyblion ddeall strwythurau mathemategol sylfaenol cysyniad er mwyn datrys problemau, fel y gallant weld pryd y gellir cymhwyso'r cysyniad hwn i ddatrys problem. Pa mor dda ydym ni'n addysgu i sicrhau bod disgyblion yn adeiladu eu dealltwriaeth gysyniadol ac yn adnabod strwythurau mathemategol?
- Meddyliwch yn ôl i'r drafodaeth ddiwethaf a gawsom ar y gwahanol ddulliau ar gyfer datrys 1.5×8 . Sut rydym wedi addasu ein haddysgu yn dilyn y drafodaeth honno i gael disgyblion i weld mwy nag un dull o ateb cwestiwn?
- Mae adroddiad thematig Estyn ar fathemateg yn nodi bod athrawon yn treulio llawer o amser yn dysgu disgyblion sut i ddefnyddio sgiliau mathemategol a dim digon o amser yn datblygu gallu disgyblion i adnabod pryd i ddefnyddio gwahanol gysyniadau mathemategol. Pa mor dda ydyn ni'n gwneud hyn fel adran? Ydyn ni, er enghraifft, yn rhoi problemau SSDD i ddisgyblion? (Os nad ydych yn ymwybodol o broblemau SSDD edrychwch ar [Problemau SSDD](#))
- Darllen pellach posibl – Dysgu Trydydd Gofod – Y Canllaw Eithaf i Ddatrys Problemau

Trafodaethau mewn cyfarfodydd adran
Discussions in a departmental meeting

Sleidiau y gellid eu defnyddio mewn cyfarfod adran

Pa mor aml ydym ni, fel adran, yn trafod dulliau addysgu? Er enghraifft, a ydym ni'n dewis testun, meddwl am y cwestiynau ni am i ddisgyblion fod yn gallu ateb erbyn diwedd yr uned ac wedyn yn ystyried ac yn trafod:

- pa wybodaeth a medrau fydd eu hangen ar ddisgyblion cyn iddynt ddechrau dysgu am y testun newydd?
- y gwahanol ymagweddau at addysgu'r testun hwnnw?
- sut gellir rhannu'r testun hwn yn gamau llai?
- beth fydd yn anodd i ddisgyblion wrth ddysgu am y testun hwn?
- pa enghreifftiau fyddwn ni'n eu dewis, a pham? Beth am wrth-enchreifftiau?
- pa gyfleoedd y mae'r testun yn eu darparu i ddisgyblion ddatblygu eu medrau datrys problemau?
- sut bydd disgyblion yn gwybod sut a phryd i gymhwyso'r cysyniad hwn wrth ddatrys problemau?
- pa gysyniadau eraill allai fod â phroblemau wedi'u gosod mewn cyd-destunau tebyg
- pa gyfleoedd a geir wrth addysgu'r testun hwn i ddatblygu medrau rhesymu disgyblion?
- pa gamdybiaethau allai disgyblion eu gwneud wrth ddysgu am y testun hwn? Sut byddwn ni'n mynd ati i'w canfod?
- p'un a oes modd addasu'r dull yr ydym yn ei addysgu ar gyfer pob sefyllfa y deuir ar ei thraws wrth astudio'r testun hwnnw?
- Pa gwestiynau agored y gellid eu gofyn wrth addysgu'r cysyniad hwn?

Possible slides to use in a departmental meeting

How often do we, as a department, discuss teaching approaches?

For example, do we choose a topic, think about questions we want pupils to be able to answer by the end of the unit and then consider and discuss:

- what knowledge and skills pupils will need before commencing the learning of the new topic?
- the different approaches to teaching that topic?
- how this topic can be broken into smaller steps?
- what pupils are going to find hard when learning this topic?
- what examples will we choose and why?
- what opportunities this topic provides for pupils to develop their problem-solving skills?
- how pupils will know how to identify and when to apply this concept when problem solving?
- what other concepts could have problems set in similar contexts (e.g. what type of questions might be set with right angled triangles?)
- what opportunities there are during the teaching of this topic to develop pupils' reasoning skills?
- what misconceptions pupils might make during the learning of this topic? How will we identify them?
- whether the method we are teaching is adaptable for all situations encountered in the study of that topic?
- what the open questions are that could be asked during the teaching of this concept?

Hunan werthuso / Self evaluation

Pam ffocysu ar hunan werthuso?

Er mwyn creu cyfundrefn addysg lwyddiannus, mae'n rhaid bod unigolion a sefydliadau yn hunan-feirniadol a bob amser yn edrych am ffyrdd i wella.

Mae'r gallu i fedru hunanwerthuso yn gywir a manwl felly yn hanfodol er mwyn adnabod:

- Beth sydd yn gweithio'n dda ac felly angen cael ei rannu ymhellach
- Beth yw'r meysydd sydd angen eu gwella.

Er bod hyn yn hanfodol, argymhelliad i wella prosesau hunanwerthuso yw'r un mwyaf poblogaidd y mae Estyn yn ei osod mewn arolygiadau uwchradd a bob oed.

Why focus on self-evaluation?

In order to create a successful education system, individuals and institutions must be self-critical and always be looking for ways to improve.

The ability to self-evaluate precisely and accurately is therefore essential in order to identify:

- What works well and therefore needs to be shared further
- What are the areas that need improvement.

While this is essential, a recommendation to improve self-evaluation processes is the most popular one that Estyn provides in secondary and all-age inspections.

Ystyriwch yr esiampl canlynol:

- Roedd gan yr athro berthynas waith gynhyrchiol gyda'r dosbarth ac roedd yn rheoli ymddygiad ac ymroddiad disgyblion yn dda.
- Gosododd ddechreuwr i'r disgyblion i adalw eu gwybodaeth o ffactorau. Cofrestrodd y dosbarth a rhannodd nod y wers.
- Defnyddio y dull i 'Fi, ni, chi' i fodelu sut i fynd ati i ddarganfod ffactorau dau rif cyfan, eu ffactorau cyffredin ac yna'r ffactor cyffredin mwyaf.
- Gofynnodd amrywiaeth o gwestiynau caeedig ac agored a gofynnodd i ddisgyblion esbonio eu rhesymeg.
- Defnyddiodd fyrddau bach gwyn i wirio ymatebion y disgyblion.
- Roedd yr athro wedi paratoi gweithgareddau fel bod disgyblion yn gallu ymarfer sut i ddarganfod y ff.c.m
- Cafodd y disgyblion gyfle i asesu gwaith cymheiriaid tua diwedd y wers.
- Gwnaeth yr athro gloi y wers.

Beth yw eich barn chi am y wers?

Consider the following example:

- The teacher had a positive working relationship with the class and managed pupils' behaviour and engagement well.
- He set a starter for the pupils to retrieve their knowledge of factors. He registered the class and shared the lesson objectives.
- He used the 'I do, we do, you do' method to model how to find out the factors of two whole numbers, then their common factors and then the highest common factor.
- He asked a variety of closed and open questions and asked pupils to explain their rationale.
- He used mini white boards to check the pupils' responses.
- The teacher planned activities so that pupils could practise how to find the highest common factor.
- Pupils had the opportunity to carry out peer assessment towards the end of the lesson.
- The teacher did a plenary at the end of the lesson.

What is your opinion on this lesson?

Defnyddio cyfrannau / Use of proportions

Cyfrannau / Proportions

Ystyr / Meaning

Bron bob un / **nearly all**

Bron heb eithriad / **Almost without exception**

Rhan fwyaf / **most**

90% neu fwy / **90% or more**

Llawer / **many**

Rhwng 70% a 90% / **Between 70% and 90%**

Mwyafrif / **a majority**

Rhwng 60% a 70% / **Between 60 and 70%**

Hanner / **a half**

50%

Tua hanner / **around half**

Agos at 50% / **close to 50%**

Lleiafrif / **a minority**

Rhwng 20% a 40% / **Between 20% and 40%**

Ychydig / **a few**

Rhwng 10% a 20% / **Between 10 and 20%**

Ychydig iawn / **a very few**

Llai na 10% / **less than 10%**

Ansoddeiriau arfarnol

Addas Anaddas
Angerddol
Amhriodol
Amrywiol
Amserol
Aneffeithiol
Aneffeithlon
Anghyson
Annigonol
Apelgar
Arbennig
Argyhoeddedig
Atyniadol
Bachog
Bendigedig
Blaengar Brwd
Buddiol
Bwriadus

Byrlymus
Gwych Huawdl
Hyfedr Hynod
Caboledig
Cadarn
Cadarnhaol
Campus
Celfydd
Creadigol
Crefftus
Cryf / gref
Cyfoethog
Cymwys
Cynhaliol
Cynhwysfawr
Cynhwysol
Cynhyrchiol
Cyson

Cyson dda
Cyfyngedig
Datblygedig
Defnyddiol
Deniadol
Diffwdan
Digonol Dilys
Diogel Doeth
Dylanwadol
Eithriadol
Effeithlon
Godidog
Gofalus
Graenus
Gwan
Gweithgar
Gwerthfawr
Gwreiddiol

Heriol
Llwyddiannus
Medrus
Meistrolgar
Methu
Nerthol
O ansawdd / safon uchel iawn
Penigamp
Pendant
Perthnasol
Priodol
Pwrpasol
Rhagori ar
Rhagweithiol
Sionc
Trefnus
Trwyadl
Ymestynnol
Ymhell uwchlaw'r disgwyl
Ysgogol

Evaluative adjectives

- appropriate
- beneficial
- competent
- comprehensive
- efficient
- exceptional
- exemplary
- extensive
- highly effective
- inappropriate
- ineffective
- inefficient
- insufficient
- limited
- mediocre
- not fit for purpose
- outstanding
- poor
- positive
- purposeful
- relevant
- restricted
- satisfactory
- skilful
- solid
- sound
- strong
- successful
- sufficient
- suitable
- superb
- thorough
- unsuitable
- useful
- valid
- valuable
- weak
- well
- worthwhile

Ysgrifennu'n arfarnol

Wrth ysgrifennu'n arfarnol, mae'r strwythur hwn y ddefnyddiol:

'Faint o ddisgyblion / athrawon sydd yn gwneud beth pa mor dda.'

Enghraifft:

Cyfran 70-90% yn gallu (10-30% ddim yn medru)

'Mae llawer o ddisgyblion yn arddangos adalw cadarn o sut i defnyddio'r dull lluoswm yn hyderus wrth gyfrifo adlog a dibrisiant'.

Geiriau arfarnol yn dangos pa mor dda mae'n nhw'n gwneud hyn

Rhywbeth penodol mae'r disgyblion yn ei wneud yn dda / wael

Writing evaluatively

When writing evaluatively, this sentence structure can be helpful:

'How many pupils / teachers do what how well.'

Example:

Proportion: 70-90% can do this (10-30% can't)

'Many pupils show sound recall of how to use multipliers confidently to calculate compound interest and depreciation'.

Evaluative words show how well the pupils do this

The specific aspect that the pupils do well / badly

Enghraifft 2

'Nid yw mwyafrif yr athrawon yn rhoi digon o gyfleoedd i ddisgyblion ddatrys problemau mwy pen agored'.

Eich tro chi

Example 2

'The majority of teachers do not provide pupils with sufficient opportunities to solve more open-ended problems'.

Your turn

Gweithgaredd

Ystyriwch y ddwy ffurflen hon. Beth yw cryfderau a gwendidau'r rhain fel dulliau hunanwerthuso? Ystyriwch y fformat a'r cynnwys.

Activity

Consider these two forms. What are the strengths and weaknesses of these as self-evaluation methods? Consider the format and content.

Lesson observation form 1

FORMAL LESSON OBSERVATION

Teacher		Observer	
Date		Lesson	
Subject		Class	
Boys		Girls	
SEN		MAT	
EAL			
Judgement	Good		

E – Excellent G - Good A – Adequate U – Unsatisfactory

Aspect of Lesson	Strength	Area for improvement
Standards		
Teaching		
Starter	x	
Engagement of students	x	
Style of teaching	x	
Teaching methods	x	
Differentiation		x
Independence of students	x	
Relationships	x	
Behaviour	x	
Cross-curricular skills	x	
Questioning	x	
Assessment	x	
Use of other adults in classroom		
Homework		
Plenary	x	
Use of Welsh	x	

Standards

Starter was very effective and pupils enjoyed this.

Pupils worked hard in the lesson.

The teacher explained everything well.

Some pupils found it hard to divide the numbers without a calculator, so the teacher modelled the use of the bus stop method.

The task was suitable for this set.

Pupils who finished their work early helped other pupils, which was positive.

There were helpful opportunities for pupils to use their numeracy skills.

All pupils behaved well and made good progress.

Pupils recalled their previous knowledge very well.

Pupils listened well.

All pupils answered the register in Welsh.

Teaching

The teacher has a good relationship with the pupils.

Clear and effective strategies for engaging and challenging pupils.

Brisk starter and probing open-ended questioning.

Overall learning objectives for the lesson clearly explained and revisited regularly.

Teacher greeted pupils in Welsh.

All pupils did the same work

Numeracy development

Teacher had lots of opportunities for pupils to develop fluency

The pupils had lots of opportunities to practice sharing in a ratio

Assessment opportunities

Teacher asked questions regularly throughout the lesson

Teacher circulated the class and provided feedback to pupils when they needed it

Teacher provided answers to some of the questions and pupils were able to self-assess

Lesson observation form 2

FORMAL LESSON OBSERVATION

Teacher		Observer	
Date		Lesson	
Subject		Class	
Boys		Girls	
SEN		MAT	
EAL			

Standards

- Many pupils recall prior learning well. They are able to respond well to teacher's questions and apply this prior learning well to new concepts.
- Many pupils make strong progress in their learning. They are able to apply their knowledge and understanding well, for example, when applying their understanding of creating and solving equations to solve problems involving angles.
- Most pupils with SEN make suitable progress and through support, display a good understanding.
- Nearly all pupils behave well in lessons and engage effectively and most show high levels of respect for teachers and peers.
- Many pupils show strong resilience in the lesson when tasks become challenging, and they are able to persist.
- Most pupils have positive attitudes towards work and respond quickly and actively to instructions.
- Many pupils engage well in class discussion and use a suitable range of vocabulary to express their thoughts. A majority can provide detailed and well thought out verbal responses to teacher's questions.
- Many pupils listen actively and with respect to their teachers and are able to respond well to questions that test their knowledge and skills.
- Most pupils have a suitable understanding of angle facts and when to utilise each rule. They can solve multi-step problems involving finding missing angles in a variety of shapes. Many show good mental-mathematics skills when calculating with angles.
- A few struggle with questions involving algebra
- Most pupils take pride in the presentation of their work.

Teaching

- Teacher has good subject knowledge and uses this well to explain important concepts to pupils and to choose examples and non-examples.
- Teacher provides clear and useful explanations and instructions, modelling the method well.
- Teacher asks suitable questions to test pupils' understanding and, in a few cases, to probe and develop it. However, occasionally the teacher provides answers too quickly which limits pupils' ability to develop their knowledge and skills.
- Teacher successfully plans to build on prior learning and provides beneficial opportunities for pupils to develop their knowledge and skills.
- Teacher develops a positive working environment and has positive working relationships with pupils.
- Challenge is generally suitable for most abilities. The teacher uses diagnostic questions suitably to guide his teaching. However, pupils with ALN are not always supported well enough to develop their mental arithmetic skills.

Skills development (literacy, numeracy and ICT)

- Teacher plans useful opportunities for pupils to develop their speaking and listening skills
- Teacher offers valuable opportunities to develop geometry skills. There are useful opportunities to consolidate algebra skills from previous units.

Assessment opportunities

- The effective use of diagnostic questions allows the teacher to recognise and address misconceptions in a timely way and know when they can challenge pupils further.
- Teacher circulates the classroom and provides strong verbal feedback that supports pupils well to develop their understanding and improve their work.

Lesson observation form 1 Exemplification

FORMAL LESSON OBSERVATION

Teacher		Observer	
Date		Lesson	
Subject		Class	
Boys		Girls	
SEN		MAT	
EAL			
Judgement	Good		

E – Excellent G - Good A – Adequate U – Unsatisfactory

There is a risk that this encourages a 'tick box' approach to evaluating and planning of teaching. This may not support the development of teaching and learning well across the school.

Aspect of Lesson	Strength	Area for improvement
Standards		
Teaching		
Starter	x	
Engagement of students	x	
Style of teaching	x	
Teaching methods	x	
Differentiation		x
Independence of students	x	
Relationships	x	
Behaviour	x	
Cross-curricular skills	x	
Questioning	x	
Assessment	x	
Use of other adults in classroom		
Homework		
Plenary	x	
Use of Welsh	x	

This makes it difficult to identify the specific aspects that are a strength/ area for improvement. For example, which aspects of questioning are strong?

Lesson observation form 1

Exemplification

All highlighted text refers to provision and not standards

It is not clear how many pupils did this. In addition, although it might support judgements regarding attitudes to learning, 'working hard' may not be clear enough.

Is this considered to be a strength or area for improvement? The evaluation is unclear. Did the teacher check well enough for pre-requisite knowledge?

All three of these bullets consider standards but they don't provide enough information to support evaluation and triangulation of evidence.

This is not supported in the standards section by the fact that pupils finish early.

None of these statements consider the quality of provision. For example, is questioning effective in developing pupils' knowledge, skills and understanding?. What about assessing all pupils' understanding and using this to inform the teaching?

Standards

Starter was very effective and pupils enjoyed this.

Pupils worked hard in the lesson.

The teacher explained everything well.

Some pupils found it hard to divide the numbers without a calculator, so the teacher modelled the use of the bus stop method.

Pupils who finished their work early helped other pupils, which was positive.

There were helpful opportunities for pupils to use their numeracy skills.

The task was suitable for this set.

All pupils behaved well and made good progress.

Pupils recalled their previous knowledge very well.

Pupils listened well.

All pupils answered the register in Welsh.

Teaching

The teacher has a good relationship with the pupils.

Clear and effective strategies for engaging and challenging pupils.

Brisk starter and probing open-ended questioning.

Overall learning objectives for the lesson clearly explained and revisited regularly.

Teacher greeted pupils in Welsh.

All pupils did the same work

Numeracy development

Teacher had lots of opportunities for pupils to develop fluency

The pupils had lots of opportunities to practice sharing in a ratio

Assessment opportunities

Teacher asked questions regularly throughout the lesson

Teacher circulated the class and provided feedback to pupils when they needed it

Teacher read some examples of the extended writing and gave instant feedback. The class also peer reviewed some of these.

Considering that Welsh was ticked as a strength, this does not seem to be particularly strong.

Not a strong use of Welsh.

This is unclear

Are these opportunities sufficiently challenging?
What about the development of the proficiencies?

Lesson observation form 2 Exemplification

FORMAL LESSON OBSERVATION

Teacher		Observer	
Date		Lesson	
Subject		Class	
Boys		Girls	
SEN		MAT	
EAL			

Standards

- Many pupils recall prior learning well. They are able to respond well to teacher's questions and apply this prior learning well to new concepts.
- Many pupils make strong progress in their learning. They are able to apply their knowledge and understanding well, for example, when applying their understanding of creating and solving equations to solve problems involving angles.
- Most pupils with SEN make suitable progress and through support, display a good understanding.
- Nearly all pupils behave well in lessons and engage effectively and most show high levels of respect for teachers and peers.
- Many pupils show strong resilience in the lesson when tasks become challenging and they are able to persist.
- Most pupils display positive attitudes towards work and respond quickly and actively to instructions.
- Many pupils engage well in class discussion and use a suitable range of vocabulary to express their thoughts. A majority are able to provide detailed and well thought out verbal responses to teacher's questions.
- Many pupils listen actively and with respect to their teachers and are able to respond well to questions that test their knowledge and skills.
- Most pupils have a suitable understanding of angle facts and when to utilise each rule. They can solve multi-step problems involving finding missing angles in a variety of shapes. Many show good mental-mathematics skills when calculating with angles.
- A few struggle with questions involving algebra
- Most pupils take pride in the presentation of their work.

Clear about the proportions of pupils

Clearer evaluations of progress

Clear about pupils persisting when work is difficult and about pupils' attitudes to learning

Clear about the standards of pupils' skills

It may have been useful to separate the strengths and afi

Lesson observation form 2

Exemplification

Teaching

- Teacher has good subject knowledge and uses this well to explain important concepts to pupils and to choose examples and non-examples.
- Teacher provides clear and useful explanations and instructions, modelling the method well.
- Teacher asks suitable questions to test pupils' understanding and in a few cases to probe and develop it. However, occasionally the teacher provides answers too quickly which limits pupils' ability to develop their knowledge and skills.
- Teacher successfully plans to build on prior learning and provides beneficial opportunities for pupils to develop their knowledge and skills.
- Teacher develops a positive working environment and has positive working relationships with pupils.
- Challenge is generally suitable for most abilities. The teacher uses diagnostic questions suitably to guide his teaching. However, pupils with ALN are not always supported well enough to develop their mental arithmetic skills.

Skills development (literacy, numeracy and ICT)

- Teacher plans useful opportunities for pupils to develop their speaking and listening skills
- Teacher offers valuable opportunities to develop geometry skills. There are useful opportunities to consolidate algebra skills from previous units.

Assessment opportunities

- The effective use of diagnostic questions allows the teacher to recognise and address misconceptions in a timely way and know when they can challenge pupils further.
- Teacher circulates the classroom and provides strong verbal feedback that supports pupils well to develop their understanding and improve their work.
-

Clear indication of strengths and areas of development

Identifies clearly how the teacher supports prior learning and builds new knowledge, skills, and understanding

A more precise evaluation of planning for skills.

Clear evaluations of assessment to support learning

Ffurflen arsylwi gwera 1

ARSYLWAD GWERS FFURFIOL

Athro		Arsyllwr	
Dyddiad		Gwers	
Pwnc		Dosbarth	
Bechgyn		Merched	
ADY		MAT	
SIY			
Barn	Da		

Rh – Rhagorol D - Da B – Boddhaol A – Anfoddfaol

Agwedd o'r wers	Cryfder	Maes i'w wella
Safonau		
Addysgu		
Tasg gychwynnol	x	
Ymgysylltiad y disgyblion	x	
Arddull yr addysgu	x	
Dulliau addysgu	x	
Gwahaniaethu		x
Annibyniaeth disgyblion	x	
Perthnasoedd	x	
Ymddygiad	x	
Medrau trawsgwricwlaidd	x	
Cwestiynu	x	
Asesu	x	
Defnydd o oedolion eraill		
Gwaith cartref		
Clo	x	
Defnydd o'r Gymraeg	x	

Safonau

Roedd y dasg gychwynnol yn effeithiol iawn a'r disgyblion yn mwynhau hyn.

Roedd y disgyblion yn gweithio'n galed yn y wers.

Eglurodd yr athro bopeth yn dda.

Roedd rhai disgyblion yn ei chael hi'n anodd i rannu'r rhifau heb gyfrifiannell. felly roedd yr athro wedi modelu'r defnydd o rannu hir.

Roedd disgyblion a orffennodd eu gwaith yn gynnar yn helpu disgyblion eraill, ac roedd hynny'n bositif.

Roedd cyfleoedd defnyddiol i ddisgyblion ddefnyddio eu medrau rhifedd.

Roedd y dasg yn addas i'r set yma.

Roedd pob disgybl yn ymddwyn yn dda ac yn gwneud cynnydd da.

Roedd y disgyblion yn cofio eu gwybodaeth flaenorol yn dda iawn.

Roedd disgyblion yn gwrando'n dda.

Bu pob disgybl yn ateb y gofrestr yn Gymraeg.

Addysgu

Mae gan yr athro berthynas dda gyda'r disgyblion.

Strategaethau clir ac effeithiol ar gyfer ymgysylltu a herio disgyblion.

Dechreuwr chwim a chwestiynu penagored.

Roedd amcanion dysgu cyffredinol ar gyfer y wers wedi eu hegluro'n glir ac roedd yr athro wedi ail-ymweld yn rheolaidd.

Athro yn cyfarch disgyblion yn y Gymraeg.

Roedd bob disgybl yn gwneud yr un gwaith

Datblygu rhifedd

Athro wedi cael llawer o gyfleoedd i ddisgyblion ddatblygu rhuglder

Roedd digon o gyfleoedd i ddisgyblion ymarfer rhannu mewn cymhareb

Cyfleoedd asesu

Gofynnodd athro gwestiynau'n rheolaidd drwy gydol y wers

Cylchodd yr athro y dosbarth a rhoddodd adborth i ddisgyblion pan oedd ei angen arnynt

Rhoddodd yr athro atebion i rai cwestiynau felly roedd y disgyblion yn gallu hunan-asesu

Ffurflen arsylwi gwers 2

ARSYLLIAD GWERS FFURFIOL

Athro		Arsyllwr	
Dyddiad		Gwers	
Pwnc		Dosbarth	
Bechgyn		Merched	
ADY		MAT	
SIY			

Safonau

- Mae llawer o ddisgyblion yn adalw dysgu blaenorol yn dda. Maent yn gallu ymateb yn dda i gwestiynau athrawon ac cymhwyso hyn yn dda i gysyniadau newydd.
- Mae llawer o ddisgyblion yn gwneud cynnydd cryf yn eu dysgu. Maent yn gallu cymhwyso eu gwybodaeth a'u dealltwriaeth yn dda, er enghraifft, wrth greu a datrys hafaliadau i gyfrifo maint onglau.
- Mae'r rhan fwyaf o ddisgyblion sydd ag ADY yn gwneud cynnydd addas a gyda cymorth, yn arddangos dealltwriaeth dda.
- Mae bron pob disgybl yn ymddwyn yn dda mewn gwersi ac yn ymgysylltu'n effeithiol ac mae'r rhan fwyaf yn dangos lefelau uchel o barch at athrawon a chyfoedion.
- Mae llawer o ddisgyblion yn dangos gwydnwch gref yn y wers pan fydd tasgau'n mynd yn heriol ac maen nhw'n gallu dyfalbarhau.
- Mae gan y rhan fwyaf o ddisgyblion agweddau cadarnhaol tuag at waith ac maent yn ymateb yn gyflym i gyfarwyddiadau.
- Mae llawer o ddisgyblion yn cymryd rhan yn dda mewn trafodaeth yn y dosbarth ac yn defnyddio ystod addas o eirfa i fynegi eu meddyliau. Mae'r mwyafrif yn cynnig ymatebion manwl i gwestiynau athrawon.
- Mae nifer o ddisgyblion yn gwranddo'n frwd a gyda pharch at eu hathrawon ac yn gallu ymateb yn dda i gwestiynau sy'n profi eu gwybodaeth a'u sgiliau.
- Mae gan y rhan fwyaf o ddisgyblion ddealltwriaeth addas o ffeithiau onglau a pryd i ddefnyddio pa reol. Maent yn medru datrys problemau aml gam sydd yn ymwneud gydag onglau. Mae llawer yn arddangos gwaith pen da wrth wneud hyn gan adio a thynnu yn rhugl.
- Mae ychydig yn ei chael hi'n anodd gyda chwestiynau sy'n cynnwys algebra
- Mae'r rhan fwyaf o'r disgyblion yn cymryd balchder yng nghyflwyniad eu gwaith.

Addysgu

- Mae gan yr athro wybodaeth bynciol gyfredol ac mae'n defnyddio hyn yn dda i esbonio cysyniadau pwysig i ddisgyblion ac i ddewis enghreifftiau a gwrth enghreifftiau.
- Mae'r athro yn rhoi esboniadau a chyfarwyddiadau clir a defnyddiol gan foddu'r dull yn effeithiol.
- Mae'r athro yn gofyn cwestiynau addas i brofi dealltwriaeth disgyblion ac mewn ychydig o achosion yn eu holi er mwyn datblygu eu dealltwriaeth. Fodd bynnag, o bryd i'w gilydd mae'r athro'n rhoi atebion yn rhy gyflym sy'n cyfyngu ar allu'r disgyblion i ddatblygu eu gwybodaeth a'u medrau.
- Mae'r athro yn llwyddo i gynllunio i adeiladu ar ddysgu blaenorol ac yn cynnig cyfleoedd buddiol i ddisgyblion ddatblygu eu gwybodaeth a'u medrau.
- Mae'r athro'n datblygu amgylchedd weithio cadarnhaol ac mae ganddo berthynas weithio bositif gyda disgyblion.
- Ar y cyfan mae lefel yr her yn addas i'r rhan fwyaf o alluoedd. Mae'r athro yn defnyddio cwestiynau diagnostig yn effeithiol i lywio'r addysgu. Fodd bynnag, nid yw disgyblion ag ADY bob amser yn cael eu cefnogi'n ddigon da i ddatblygu eu medrau cyfrifo yn y pen.

Datblygu'r medrau (llythrennedd, rhifedd a chymhwysedd digidol)

- Mae'r athro yn cynllunio cyfleoedd defnyddiol i ddisgyblion ddatblygu eu medrau siarad a gwranddo.
- Mae cyfleoedd buddiol i ddisgyblion ddatblygu eu medrau geometreg ac i gymhwyso eu medrau algebra o unedau blaenorol.

Cyfleoedd asesu

- Mae'r defnydd effeithiol o gwestiynau diagnostig yn caniatáu'r athro i adnabod camsyniadau yn fuan a gwybod pryd gellir herio ymhellach.
- Mae'r athro yn cylchu'r dosbarth wrth i'r disgyblion weithio'n annibynnol gan ddarparu adborth llafar cadarn sy'n cefnogi'r disgyblion yn dda i ddatblygu eu dealltwriaeth a gwella eu gwaith.

Ffurflen arsylwi gwera 1

ARSYLWAD GWERS FFURFIOL

Athro		Arsyllwr	
Dyddiad		Gwers	
Pwnc		Dosbarth	
Bechgyn		Merched	
ADY		MAT	
SIY			
Barn	Da		

Rh – Rhagorol D - Da B – Boddhaol A – Anfoddhaol

Mae perygl bod hyn yn annog dull 'tic bocs' o werthuso a chynllunio addysgu. Efallai na fydd hyn yn cefnogi datblygiad addysgu a dysgu da ar draws yr ysgol.

Agwedd o'r wers	Cryfder	Maes i'w wella
Safonau		
Addysgu		
Dechreuwr	x	
Ymgysylltiad y disgyblion	x	
Arddull yr addysgu	x	
Dulliau addysgu	x	
Gwahaniaethu		x
Annibyniaeth disgyblion	x	
Perthnasoedd	x	
Ymddygiad	x	
Medrau trawsgwricwlaidd	x	
Cwestiynu	x	
Asesu	x	
Defnydd o oedolion eraill		
Gwaith cartref		
Clo	x	
Defnydd o'r Gymraeg	x	

Mae hyn yn ei gwneud hi'n anodd adnabod yr agweddau penodol sy'n gryfder/maes i wella. Er enghraifft, pa agweddau o gwestiynu sy'n gryf?

Ffurflen arsylwi gwerau 1. Enghraifft

Mae'r holl destun sydd wedi'i uwchleuo yn cyfeirio at ddarpariaeth nid safonau

Nid yw'n glir faint o ddisgyblion wnaeth hyn. Yn ogystal, er y gallai gefnogi barn ynghylch agweddau at ddysgu, efallai na fydd 'gweithio'n galed' yn ddigon clir.

A yw hyn yn cael ei ystyried yn gryfder neu'n faes i'w wella? Mae'r gwerthusiad yn aneglur. A oedd yr athro wedi gwirio gwybodaeth flaenorol yn ddigon da?

Mae'r tri pwynt bwled hyn yn ystyried safonau ond dydyn nhw ddim yn darparu digon o wybodaeth i gefnogi gwerthuso a thriongli tystiolaeth.

Nid yw hyn yn cael ei gefnogi yn yr adran safonau gan y ffaith bod disgyblion yn gorffen yn gynnar.

Nid oes yr un o'r datganiadau hyn yn ystyried ansawdd y ddarpariaeth. Er enghraifft, ydy cwestiynu'n effeithiol wrth ddatblygu gwybodaeth, medrau a dealltwriaeth disgyblion? Beth am dulliau asesu yr holl ddisgyblion?

Safonau

Roedd y dasg gychwynnol yn effeithiol iawn a'r disgyblion yn mwynhau hyn.

Roedd y disgyblion yn gweithio'n galed yn y wers.

Eglurodd yr athro bopeth yn dda.

Roedd rhai disgyblion yn ei chael hi'n anodd i rannu'r rhifau heb gyfrifiannell, felly roedd yr athro wedi modelu'r defnydd o rannu hir.

Roedd disgyblion a orffennodd eu gwaith yn gynnar yn helpu disgyblion eraill, ac roedd hynny'n bositif.

Roedd cyfleoedd defnyddiol i ddisgyblion ddefnyddio eu medrau llythrennedd.

Roedd y dasg yn ddiddorol a heriol.

Roedd pob disgybl yn ymddwyn yn dda ac yn gwneud cynnydd da.

Roedd y disgyblion yn cofio eu gwybodaeth flaenorol yn dda iawn.

Roedd disgyblion yn gwranddo'n dda.

Bu pob disgybl yn ateb y gofrestr yn Gymraeg.

O ystyried bod Cymraeg wedi'i adnabod fel cryfder, nid yw'n ymddangos yn arbennig o gryf.

Addysgu

Mae gan yr athro berthynas dda gyda'r disgyblion.

Strategaethau clir ac effeithiol ar gyfer ymgysylltu a herio disgyblion.

Dechreuwr chwim a chwestiynu penagored.

Roedd amcanion dysgu cyffredinol ar gyfer y wers yn egluro'n glir ac yn ail-ymweld yn rheolaidd.

Athro yn cyfarch disgyblion yn y Gymraeg.

Bu pob disgybl yn gwneud yr un gwaith

Ddim yn ddefnydd cryf o'r Gymraeg

Hyn yn aneglur

Datblygu rhifedd

Athro wedi cael llawer o gyfleoedd i ddisgyblion ddatblygu eu rhuglder

Roedd digon o gyfleoedd i ddisgyblion ymarfer rhannu mewn cymhareb

A yw'r cyfleoedd hyn yn ddigon heriol? Beth am ddatblygiad yr hyfedreddau?

Cyfleoedd asesu

Gofynnodd athro gwestiynau'n rheolaidd drwy gydol y wers

Cylchodd yr athro y dosbarth a rhoddodd adborth i ddisgyblion pan oedd ei angen arnynt

Rhoddodd yr athro atebion i rai cwestiynau felly roedd y disgyblion yn gallu hunan-asesu

Ffurflen arsylwi gwers 2 Enghraifft

ARSYLLIAD GWERS FFURFIOL

Athro		Arsyllwr	
Dyddiad		Gwers	
Pwnc		Dosbarth	
Bechgyn		Merched	
ADY		MAT	
SIY			

Safonau

- Mae llawer o ddisgyblion yn adalw dysgu blaenorol yn dda. Maent yn gallu ymateb yn dda i gwestiynau athrawon ac cymhwysu hyn yn dda i gysyniadau newydd.
- Mae llawer o ddisgyblion yn gwneud cynnydd cryf yn eu dysgu. Maent yn gallu cymhwysu eu gwybodaeth a'u dealltwriaeth yn dda, er enghraifft, wrth greu a datrys hafaliadau i gyfrifo maint onglau.
- Mae'r rhan fwyaf o ddisgyblion sydd ag ADY yn gwneud cynnydd addas a gyda cymorth, yn arddangos dealltwriaeth dda.
- Mae bron pob disgybl yn ymddwyn yn dda mewn gwersi ac yn ymgysylltu'n effeithiol ac mae'r rhan fwyaf yn dangos lefelau uchel o barch at athrawon a chyfoedion.
- Mae llawer o ddisgyblion yn dangos gwydnwch gref yn y wers pan fydd tasgau'n mynd yn heriol ac maen nhw'n gallu dyfalbarhau.
- Mae gan y rhan fwyaf o ddisgyblion agweddau cadarnhaol tuag at waith ac maent yn ymateb yn gyflym i gyfarwyddiadau.
- Mae llawer o ddisgyblion yn cymryd rhan yn dda mewn trafodaeth yn y dosbarth ac yn defnyddio ystod addas o eirfa i fynegi eu meddyliau. Mae'r mwyafrif yn cynnig ymatebion manwl i gwestiynau athrawon.
- Mae nifer o ddisgyblion yn gwrando'n frwd a gyda pharch at eu hathrawon ac yn gallu ymateb yn dda i gwestiynau sy'n profi eu gwybodaeth a'u sgiliau.
- Mae gan y rhan fwyaf o ddisgyblion ddealltwriaeth addas o ffeithiau onglau a pryd i ddefnyddio pa reol. Maent yn medru datrys problemau aml gam sydd yn ymwneud gydag onglau. Mae llawer yn arddangos gwaith pen da wrth wneud hyn gan adio a thynnu yn rhugl.
- Mae ychydig yn ei chael hi'n anodd gyda chwestiynau sy'n cynnwys algebra
- Mae'r rhan fwyaf o'r disgyblion yn cymryd balchder yng nghyflwyniad eu gwaith.

Clir o ran meintioli disgyblion

Gwerthusiadau cliriach o gynnydd

Clir o ran disgyblion yn dyfalbarhau pan fo gwaith yn anodd ac am agweddau disgyblion at ddysgu

Clir o ran safonau medrau disgyblion

Byddai wedi bod yn fuddiol i roi'r cryfderau a'r m.i.g. ar wahan

Ffurflen arsylwi gwera 2. Enghraifft

Arwydd clir o gryfderau a meysydd i'w gwella

Nodi'n glir sut mae'r athro'n cefnogi dysgu blaenorol ac yn adeiladu gwybodaeth, medrau, a dealltwriaeth newydd

Gwerthusiad mwy manwl gywir o gynllunio ar gyfer y medrau.

Gwerthusiadau clir o asesu i gefnogi dysgu

Addysgu

- Mae gan yr athro wybodaeth bynciol dda ac mae'n defnyddio hyn yn dda i esbonio cysyniadau pwysig i ddisgyblion ac i ddewis enghreifftiau a gwrth enghreifftiau.
- Mae'r athro yn rhoi esboniadau a chyfarwyddiadau clir a defnyddiol gan foddu'r dull yn effeithiol.
- Mae'r athro yn gofyn cwestiynau addas i brofi dealltwriaeth disgyblion ac mewn ychydig o achosion yn eu holi er mwyn datblygu eu dealltwriaeth. Fodd bynnag, o bryd i'w gilydd mae'r athro'n rhoi atebion yn rhy gyflym sy'n cyfyngu ar allu'r disgyblion i ddatblygu eu gwybodaeth a'u medrau.
- Mae'r athro yn llwyddo i gynllunio i adeiladu ar ddisgyblion blaenorol ac yn cynnig cyfleoedd buddiol i ddisgyblion ddatblygu eu gwybodaeth a'u medrau.
- Mae'r athro'n datblygu amgylchedd weithio cadarnhaol ac mae ganddo berthynas weithio positif gyda disgyblion.
- Mae'r athro yn defnyddio cwestiynau diagnostig yn effeithiol i lywio'r addysgu. Fodd bynnag, nid yw disgyblion ag ADY bob amser yn cael eu cefnogi'n ddigon da i ddatblygu eu medrau cyfrifo yn y pen.

Datblygu'r medrau (llythrennedd, rhifedd a chymhwysedd digidol)

- Mae'r athro yn cynllunio cyfleoedd defnyddiol i ddisgyblion ddatblygu eu medrau siarad a gwranddo.
- Mae cyfleoedd buddiol i ddisgyblion ddatblygu eu medrau geometreg ac i gymhwyso eu medrau algebra o unedau blaenorol.

Cyfleoedd asesu

- Mae'r defnydd effeithiol o gwestiynau diagnostig yn caniatáu'r athro i adnabod camsyniadau yn fuan a gwybod pryd gellir herio ymhellach.
- Mae'r athro yn cylchu'r dosbarth wrth i'r disgyblion weithio'n annibynnol gan ddarparu adborth llafar cadarn sy'n cefnogi'r disgyblion yn dda i ddatblygu eu dealltwriaeth a gwella eu gwaith.

Dull posibl o arfarnu yn ôl effaith:

Wrth arfarnu darpariaeth, ystyriwch y pedwar cwestiwn canlynol:

- Beth mae disgyblion yn ei wneud yn dda?
- Pam oedd hyn – beth oedd wedi achosi'r disgyblion i lwyddo gyda hyn?
- Beth mae disgyblion yn cael trafferth gyda neu ddim yn ei wneud yn dda?
- Pam oedd hyn – beth oedd wedi achosi'r disgyblion i gael trafferth / fethu?

Pan fyddwch yn arfarnu, meddyliwch:

Effaith ac yna achos

yn hytrach nac achos ac effaith

Possible method for evaluating by impact:

When evaluating provision, consider the following four questions:

- What do pupils do well?
- Why was this – what caused the pupils to succeed with this?
- What are pupils struggling with or not doing well?
- Why was this – what had caused the pupils to struggle / fail?

When evaluating, think:

Effect and then cause

rather than cause and effect

Pupils +

Pupils enter the lesson in a disciplined way
Pupils settle quickly to work on the starter
Starter: Most (90%+) pupils able to add fractions, simplify expressions, expand and simplify
Many (70-90%) able to find area of trapezium
Minority (20-40%) able to solve ratio problem
Most pupils appear to be listening to the explanation and about half can answer the first three questions set

Teacher +

Teacher has useful routines for starting lessons
Teacher has positive working relationships with the pupils – they respect the teacher
Good teaching of adding fractions, simplifying and area over time / regular opportunities for retrieval.
Generally clear explanation (although...) of the new concept.
Teacher realised (after around 15 minutes) that pupils were struggling and re-explained, providing further examples.

Pupils -

Majority (60-70%) struggle with ratio problem – can't see that the amount given is not the total
Around half of pupils struggled with the first exercise

Teacher -

Question marks over how well ratio was taught – pupils seem to think that they always divide the amount of money by the sum of the numbers in the ratio.
The teacher did not use a formative assessment method to check pupils understanding before giving them independent practice.

Areas to consider for development:

- Revisit how ratio is taught in the department
- Look into methods they could use to measure whether pupils have understood – MWB / Diagnostic Qs / other methods

Disgyblion +

Disgyblion yn cyrraedd mewn modd disgybledig
Disgyblion yn setlo'n sydyn i ateb y dechreuwr

Dechreuwr: Rhan fwyaf (90%+) yn gallu adio ffracsiynau,
symleiddio mynegiad ac ehangu a symleiddio
Llawer (70-90%) yn llwyddo i gyfrifo arwynebedd trapesiwm
Lleiafrif (20-40%) yn llwyddo gyda'r cw cymhareb

Rhan fwyaf yn ymddangos i wrando i'r esboniad a tua hanner
yn gallu ateb y 3 cwestiwn cyntaf

Disgyblion -

Dechreuwr - Mwyafrif (60-70%) yn cael trafferth gyda'r
cwestiwn cymhareb – ddim yn deall nad y cyfanswm sydd wedi
ei roi

Tua hanner yn cael trafferth gyda'r ymarfer cyntaf ym
mhrif ddarn y wers

Athro +

Mae gan ayr athro arferion cyson ar gyfer dechrau gwersi.
Mae gan yr athro berthynas waith positif gyda'r disgyblion ac maent
yn parchu'r athro.

Addysgu da dros amser / cyfleoedd cyson i adalw adio ffracsiynau,
symleiddio ac arwynebedd.

Esboniad clir ar y cyfan o'r cysyniad newydd.

Yr athro wedi sylweddoli (er roedd hyn ar ôl 15 munud) nad oedd
disgyblion yn deall ac wedi ail esbonio gan ddarparu enghreifftiau
pellach.

Athro -

Marc cwestiwn dros pa mor dda oedd cymhareb wedi cael ei
addysgu yn y gorffennol – disgyblion yn amlwg ddim deall y cysyniad
a meddwl eich bod yn rhannu gyda cyfanswm y gymhareb bob tro.

Doedd yr athro ddim wedi defnyddio unrhyw strategaeth asesu
ffurfiannol cyn rhoi cyfle i'r disgyblion ymarfer.

Meysydd 'w hystyried ar gyfer datblygu:

- Ail ymweld gyda sut mae cymhareb yn cael ei addysgu yn yr adran
- Gwneud defnydd o strategaethau asesu ffurfiannol a fydd yn caniatáu i'r athro weld a yw'r disgyblion wedi deall.

Quality assurance - booklooks

Subject:

Mathematics

Year:

8

Date:

28/05/2025

Name	Class	Teacher	Target	Current	Effort	On track	A1	A2	A3	L1	L2	Num	Dig	Pr
AAA	8X1	GD	7	7	A	Y	y	y	y	n	n	y	y	y
BBB	8X3	MJ	5	5	B	Y	y	y	n	n	n	y	n	y
CCC	8X2	DM	6	5	D	N	n	n	n	y	n	y	n	n
DDD	8X3	MJ	5	5	B	Y	y	n	n	n	n	y	n	y
EEE	8X2	DM	5	5	B	Y	n	n	n	y	n	y	n	n
FFF	8X1	GD	7	6	C	N	y	y	n	n	n	y	y	n
GGG	8X1	GD	8	7	B	N	y	y	y	n	n	y	y	y
HHH	8X3	MJ	4	4	B	Y	y	y	n	n	n	y	n	n

Key

- A1 Is all work marked according to school policy?
 A2 Does the teacher identify two good features and aspect to improve?
 A3 Does teacher provide feedback on CTG form and ensure that pupils respond?
 Lit1 Is there evidence of reading tasks in the work?
 Lit2 Is there evidence of pupils writing at length?
 Num Are there opportunities for pupils to develop their numeracy skills?
 Dig Are there opportunities for pupils to develop their digital skills?
 Pr Do pupils take sufficient pride in their work?

Feedback to department:	Need to develop opportunities for reading - very little evidence seen DM to ensure that all work is marked MJ and DM to ensure that they provide valuable written feedback and that pupils respond
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Sicrhau ansawdd - edrych ar waith

Pwnc:

Year:

Date:

Enw	Dosbarth	Athro	Targed	Cyfredol	Ymdrech	Ar drac	A1	A2	A3	Ll1	Ll2	Rhif	Dig	Ba
AAA	8X1	GD	7	7	A	Y	y	y	y	n	n	y	y	y
BBB	8X3	MJ	5	5	B	Y	y	y	n	n	n	y	n	y
CCC	8X2	DM	6	5	D	N	n	n	n	y	n	y	n	n
DDD	8X3	MJ	5	5	B	Y	y	n	n	n	n	y	n	y
EEE	8X2	DM	5	5	B	Y	n	n	n	y	n	y	n	n
FFF	8X1	GD	7	6	C	N	y	y	n	n	n	y	y	n
GGG	8X1	GD	8	7	B	N	y	y	y	n	n	y	y	y
HHH	8X3	MJ	4	4	B	Y	y	y	n	n	n	y	n	n

Allwedd:

- A1 Ayw'r holl waith wedi'i farcio yn ôl polisi'r ysgol?
- A2 Ayw'r athro yn nodi dwy nodwedd bositif ac agwedd i'w gwella?
- A3 Ayw athro yn darparu adborth ar ffurflen cau'r bwlch ac yn sicrhau bod disgyblion yn ymateb?
- Ll1 A oes tystiolaeth o dasgau darllen yn y gwaith?
- Ll2 A oes tystiolaeth o ddisgyblion yn ysgrifennu'n estynedig?
- Rhif A oes cyfleoedd i ddisgyblion ddatblygu eu medrau rhifedd?
- Dig A oes cyfleoedd i ddisgyblion ddatblygu eu medrau digidol?
- Ba Ayw disgyblion yn cymryd balchder yn eu gwaith?

Adborth i'r adran	<p>Angen datblygu cyfleoedd i ddisgyblion ddatblygu medrau darllen</p> <p>DM i sicrhau bod pob darn o waith wedi ei farcio</p> <p>MJ a DM i sicrhau eu bod yn darparu adborth ysgrifenedig gwerthfawr a bod disgyblion yn ymateb</p>
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Adroddiad blynyddol 2023 Annual Report

Cwestiynau hunanfyfyrto i gynorthwyo ysgolion uwchradd i werthuso addysgu yn sgil ei effaith ar ddysgu

Yn gynyddol, mae ysgolion yn defnyddio ystod o weithgareddau gwerthfawr i werthuso addysgu a dysgu. Diffyg cyffredin rydym yn ei weld mewn ysgolion yw diffyg dealltwriaeth o sut i werthuso addysgu yn sgil ei effaith ar ddysgu. Gallai'r ystyriaethau canlynol eich helpu i feddwl am ba mor dda y caiff hyn ei wneud yn eich ysgol chi:

- Pan fyddwch yn arsylwi gwersi ac yn craffu ar waith:
 - a ydych yn gwerthuso **pa mor dda** y gall disgyblion wneud pethau (e.e. siarad yn glir ac ategu eu safbwyntiau â thystiolaeth, trefnu eu hysgrifennu'n rhesymegol a defnyddio geirfa eang a chyfoethog)?
 - a ydych yn **meintioli** sawl disgybl sy'n gallu/methu gwneud pethau?
 - a ydych yn dueddol o ysgrifennu/dweud mwy am yr addysgu na'r dysgu?
 - a ydych yn symud o gwmpas yr ystafell ddosbarth, yn edrych ar waith disgyblion ac yn siarad â disgyblion am eu dysgu?
 - a ydych yn canolbwyntio gormod ar b'un a yw disgyblion yn gorffen eu gwaith ai peidio, yn hytrach nag ar ansawdd yr hyn maent yn ei gynhyrchu?
 - a ydych yn ystyried pa mor dda y mae gweithgareddau dysgu yn galluogi disgyblion i wneud cynnydd yn hytrach na'u cadw'n brysur yn unig?
- A ydych wedi ystyried tynnu ychydig o ddisgyblion allan o wersi tua diwedd y wers a'u holi am beth maent wedi'i ddysgu?
- A yw'r ffurflenni/systemau rydych yn eu defnyddio i arsylwi gwersi a chraffu ar waith yn annog staff i ganolbwyntio'n ddigonol ar ddysgu? A oes gorddibyniaeth ar ddull ticio blwch? I ba raddau y mae'ch ffurflenni/systemau yn ymwneud â chydymffurfio yn hytrach nag ansawdd?
- Pan fyddwch yn siarad â disgyblion mewn ymarferion llais y disgybl ar addysgu a dysgu, a oes cydbwysedd priodol rhwng gofyn am eu barn a phrociô'r hyn y maent wedi'i ddysgu?
- A ydych yn tynnu eich holl ganfyddiadau o arsylwi gwersi, craffu ar waith a llais y disgybl at ei gilydd i roi trosolwg i chi o addysgu a dysgu mewn adrannau ac ar draws yr ysgol?
- A yw eich darpariaeth dysgu proffesiynol yn ymateb i anghenion athrawon unigol ac yn mynd i'r afael â materion cyffredin ar draws yr ysgol?

Self-reflection questions to support secondary schools to evaluate teaching in light of its impact on learning

Increasingly, schools are using a range of valuable activities to evaluate teaching and learning. A common shortcoming that we see in schools is a lack of understanding of how to evaluate teaching in light of its impact on learning. The following considerations may help you to think about how well this is done in your school:

- When you observe lessons and scrutinise work:
 - do you evaluate **how well** pupils can do things (e.g. speaking clearly and supporting their opinions with evidence, organising their writing logically and using a broad and rich vocabulary)?
 - do you **quantify** how many pupils can/can't do things?
 - do you tend to write/say more about the teaching than the learning?
 - do you move around the classroom, look at pupils' work and speak to pupils about their learning?
 - do you focus too much on whether or not pupils finish work, rather than the quality of what they produce?
 - do you consider how well learning activities enable pupils to make progress and not just keep them busy?
- Have you considered taking a few pupils out of lessons towards the end of the lesson, and questioning them about what they have learned?
- Do the forms/systems that you use to observe lessons and scrutinise work encourage staff to focus sufficiently on the learning? Is there an over-reliance on a tick box approach? To what extent are your forms/systems about compliance, not quality?
- When you speak to pupils in pupil voice exercises on teaching and learning, is there an appropriate balance between asking for their opinions and probing their learning?
- Do you pull together your findings from lesson observations, work scrutiny and pupil voice to give you an overview of teaching and learning within departments and across the school?
- Does your professional learning provision respond to the needs of individual teachers and address common issues across the school?

Materion sydd fwy penodol ar gyfer mathemateg wrth hunan werthuso:

Dysgu:

- Pa mor dda yw medrau rhif elfennol y disgyblion? Mae hwn yn sail i bopeth. Edrychwch ar eu dealltwriaeth o werth lle, gallu i gyfrifo gyda'r pedair rheol, rhuglder wrth weithio gyda ffracsiynau, degolion a chanrannau?
- A oes gan y disgybl deimlad am rif? A ydynt yn gallu gweld pam mae ateb ddim yn swnio'n gywir / A ydynt yn gallu amcangyfrif ateb / A ydynt yn gwirio eu hatebion yn ôl cyd-destun y cwestiwn?
- Pa mor dda yw medrau algebra'r disgybl? A ydynt yn medru trin mynegiadau a datrys hafaliadau yn rhugl?
- Pa mor dda yw gafael y disgyblion o gysyniadau siâp a mesur?
- Pa mor dda mae disgyblion yn dadansoddi data? A ydynt yn defnyddio eu canfyddiadau / graffiau i ddod i gasgliadau synhwyrol?
- A oes gan y disgyblion gamsyniadau?
- Pa mor dda yw disgyblion am ddatrys problemau mwy agored? Pa mor dda mae disgyblion wrth ddewis y fathemateg gywir ar gyfer problem? (Yn aml, dydyn ni ddim yn gweld digon o gyfleoedd i ddisgyblion wneud hyn)
- Pa mor dda mae disgyblion yn adalw dysgu blaenorol pan gant y cyfle i wneud hyn?
- A yw disgyblion yn gallu gwneud cysylltiadau gyda chysyniadau mathemategol eraill / cymwysiadau byd real?
- Pa mor dda mae disgyblion yn perfformio mewn asesiadau? Sut mae eu perfformiad mewn asesiadau yn cymharu gyda'u perfformiad ar yr un gwaith yn hwyrach ymlaen yn y flwyddyn (mewn, er enghraifft, asesiad arall neu arholiad diwedd blwyddyn)?
- A yw disgyblion yn dangos agweddau da at fathemateg a rhifedd?
- A yw'r disgyblion yn ymateb i unrhyw adborth a gwella eu medrau mathemateg?

Aspects which are more specific to mathematics when self-evaluating:

Learning:

- How good are pupils' number skills? This is the basis of everything. Look at how well they understand place value, their ability to calculate with the four rules, fluency in working with fractions, decimals and percentages?
- Does the pupil have a sense of number? Do they have a feel for why an answer doesn't sound right / Are they able to estimate an answer / Do they check their answers according to the context of the question?
- How good are the pupils' algebra skills? Are they able to manipulate expressions and solve equations fluently?
- Do pupils have a firm grasp of concepts related to shapes and measures?
- How well do pupils analyse data? Do they use their findings/graphs to come to sensible conclusions?
- Do the pupils have misconceptions?
- How good are pupils at solving more open problems? How good are pupils at choosing the right maths for a problem? (Often, we don't see enough opportunities for pupils to do this)
- How well do pupils recall previous learning when given the opportunity to do so?
- Are pupils able to make connections between different areas of mathematics and applications in real-life?
- How well do pupils perform in assessments? How does their performance in assessments compare to their performance on the same work later in the year (for example, in another assessment or year-end exam)?
- Do pupils show positive attitudes towards mathematics and numeracy?
- Do pupils respond to any feedback and improve their maths skills?

Materion sydd fwy penodol ar gyfer mathemateg wrth hunan werthuso:

Darpariaeth:

- A yw camsyniadau disgyblion yn cael eu hadnabod a'u cywiro? Dydy hyn ddim yn golygu bod yr athro wedi marcio popeth.
- A oes cyfleoedd i ddisgyblion ddatrys problemau lle mae mwy o ffocws ar ddisgyblion yn gorfod dewis y mathemateg sydd ei angen i ddatrys y broblem?
- A oes cyfleoedd cyson i ddisgyblion ail-ymweld gyda gwaith? Ydy hwn wedi ei gynllunio'n strategol neu ydy o'n digwydd ar hap a damwain mewn dechreuwyr?
- A yw enghreifftiau wedi eu dewis yn ofalus er mwyn adeiladu dealltwriaeth disgyblion a datgelu camsyniadau disgyblion?
- Ydy'r gwaith yn adeiladu yn rhesymegol fel bod disgyblion bob amser yn symud o beth maent yn gwybod i'r cysyniad newydd mewn camau bach?

Aspects which are more specific to mathematics when self-evaluating:

Provision:

- Do teachers identify and address pupils' misconceptions in a timely manner?
- Are there opportunities for pupils to solve problems where there is more focus on pupils having to choose the mathematics needed to solve the problem?
- Are there regular opportunities for pupils to carry out retrieval of previous learning? Is this strategically planned, or does it happen in a more ad-hoc way?
- Are examples carefully chosen in order to build pupils' understanding and expose pupils' misconceptions?
- Does the work build logically so that pupils are moving from the familiar to the unfamiliar in small steps?

Materion sydd fwy penodol ar gyfer mathemateg wrth hunan werthuso:

Darpariaeth (parhad):

- Ydy'r athro yn torri'r dysgu newydd i gamau bach ond wedyn, pam mae disgyblion yn fwy profiadol, yn rhoi cyfleoedd iddynt gymhwyso eu dealltwriaeth yn annibynnol mewn cyd-destunau neu trwy ddatrys problemau aml-gam?
- A yw ymarferion wedi eu dylunio'n ofalus i sicrhau bod disgyblion yn parhau i gael eu herio? A yw trefn y cwestiynau yn synhwyrol?
- Ydy disgyblion bob amser yn cael eu herio i feddwl? A oes gormod o bwyslais ar gael disgyblion i gofio ffeithiau / dulliau?
- Oes yna ddigon o gyfleoedd i ddatrys problemau mwy agored neu tasgau lle mae'n rhaid i ddisgyblion adnabod y fathemateg?
- Wrth edrych ar dystiolaeth ar gyfer mathemateg, mae'n hanfodol bwysig triongli canfyddiadau o wahanol ffynonellau – gall llyfrau fod yn dwyllodrus yn mathemateg gan nad oes modd bob amser gweld sut cafodd ei ddysgu

Aspects which are more specific to mathematics when self-evaluating:

Provision (continued):

- Does the teacher break down the new learning into small steps but then, when pupils are more experienced, give them opportunities to apply their understanding independently in contexts or by solving multi-step problems?
- Are exercises carefully designed to ensure pupils continue to be challenged? Is the order of the questions sensible?
- Are pupils always made to think? Is there over-reliance on pupils having to memorise facts / methods?
- Are there sufficient opportunities for more open problem solving tasks or tasks where pupils have to identify the mathematics required?
- When looking at evidence for mathematics, it is vitally important to triangulate findings from different sources – books can be deceptive in mathematics as it cannot always be seen how it was taught.

Hunan werthuso a Cynllunio gwelliant

Pwyntiau defnyddiol:

- Byddwch yn onest – nid yw hunanwerthuso ar gyfer cynulleidfa allanol. Dylai fod i chi nodi beth sy'n dda ac sydd angen ei rannu, a beth nad yw'n gweithio'n dda, ac felly mae angen ei wella.
- Os nad yw gweithgaredd yn mynd i elwa disgyblion yna peidiwch ei wneud
- Defnyddiwch yr holl ffynonellau tystiolaeth posibl a thriongli'r rhain. Peidiwch â dod i gasgliad ar sail un darn o dystiolaeth yn unig.
- Defnyddiwch ddata i nodi cwestiynau ac yna defnyddiwch dystiolaeth uniongyrchol i ateb y cwestiynau hyn.
- Er enghraifft–
 - Pam mae disgyblion yn perfformio'n wael ar y cwestiynau datrys hafaliadau?
 - Ateb o arsylwadau : Nid yw athrawon yn defnyddio asesiad ffurfiannol yn ddigon da i nodi camsyniadau disgyblion a gweld beth nad ydynt yn ei ddeall.
- Peidiwch â phoeni gormod am yr adroddiad ysgrifenedig. Prif fwriad hunanwerthuso yw adnabod beth sydd angen i ni ei wella.

Self-evaluation and improvement planning

Useful pointers:

- Be honest – SE is not for an external audience. It should be for you to identify what is good and needs sharing, and what is not working as well, and therefore needs to improve.
- If any activity does not benefit pupils stop doing it.
- Use all evidence sources possible and triangulate. Do not come to a conclusion based on only one piece of evidence.
- Use data to pose questions and use first-hand evidence to answer these questions.
For example –
 - Why are pupils performing poorly on the solving equations questions?
 - Answer from LWs: Teachers not using formative assessment well enough to identify pupils' misconceptions and see what pupils find difficult.
- Don't worry too much about the written report. SE is a process and is merely a vehicle to identify what we need to improve.

Cynllunio gwelliant

Pwyntiau defnyddiol:

- Defnyddiwch y dystiolaeth o'ch hunanwerthusiad i nodi blaenoriaethau clir
- Blaenoriaethwch eich blaenoriaethau fel eich bod yn canolbwyntio'n agos ar nifer fach o agweddau
- Mae cylchoedd gweithredu byr wedi'u dilyn gan adolygiad yn aml yn fwy effeithiol
- Dylai eich camau gweithredu fod y pethau y byddwch yn eu gwneud i wella'r agwedd hon
- Lle bynnag bo'n bosibl, dylai meini prawf llwyddiant fod yn fesuradwy ac yn nhermau safonau ddisgyblion – rydych wedyn yn mesur yr effaith. Yn aml mae'n haws cael meini prawf llwyddiant ar gyfer blaenoriaeth yn hytrach nag ar gyfer pob gweithred r wahân.

Planning for improvement

Useful pointers:

- Use the evidence from your self evaluation to identify clear priorities
- Prioritise your priorities so that you are focusing closely on a small number of aspects
- Short cycles of action followed by review are often more effective
- Actions should be the things you will put in place to improve the aspect
- Wherever possible, success criteria should be measurable and in terms of pupils – you are then measuring the impact. It is often easier to have success criteria overall rather than for each action

Cynllunio gwelliant

Pwyntiau defnyddiol (parhad):

- Gosodwch ddyddiadau dyddiad cau penodol ar gyfer pob gweithred. Nodwch pwy sy'n gyfrifol a phwy fydd yn adolygu'r cynnydd (person gwahanol – rheolwr llinell fel arfer)
- Adolygu'r cynnydd yn rheolaidd – efallai yr hoffech ychwanegu cerrig milltir.
- Byddwch yn benodol ynglŷn a sut, pryd a beth rydych yn mynd i wneud i arfarnu.
- Defnyddiwch dystiolaeth o weithgareddau hunanwerthuso / adolygiadau i benderfynu a yw'r flaenoriaeth wedi'i gwella digonol fel y gellir edrych ar flaenoriaeth arall, neu a oes angen i chi barhau â'r agwedd hon.
- Defnyddiwch y cynllun a thystiolaeth o'r gweithgareddau / adolygiadau i yrru atebolrwydd.

Planning for improvement

Useful pointers (continued):

- Set specific deadline dates for each action. State who is responsible and who will review progress (different person – usually line manager)
- Review progress regularly – you may want to add milestones.
- Be specific about exactly how, when and what you will do to monitor and evaluate.
- Use evidence from self evaluation activities / reviews to decide whether the priority has been improved sufficiently and can be replaced by another priority or whether you need to continue with this aspect.
- Use the plan and any evidence from activities / reviews to drive accountability.

Diolch am wrando

Rydym am eich gadael gyda dyfyniad Doug Lemov eto:

"Nid yw hyd yn oed y gweithdy gorau yn y byd (ac nid ydym yn honni bod y gweithdy hwn wedi bod yn un o'r rheini) yn ddigon i newid ymddygiad oni bai bod rhyw fath o ddilyniant cadarnhaol"

Ar y ffordd adref heddiw:

- Ceisiwch adnabod dau flaenoriaeth byr dymor sydd yn seiliedig ar beth rydych chi wedi clywed heddiw. (Efallai y bydd mwy o syniadau tymor hir gennych ond cadwch y blaenoriaethau byr-dymor i ddau)
- ceisiwch lunio cynllun anffurfiol yn eich pen o sut yr ydych yn mynd i fynd ati i dreialu / ymgorffori'r rhain gyda'ch adran

Thanks for listening

We will leave you with Doug Lemov's quote:

"Even the best workshop in the world (and we're not claiming that this has been one of those) isn't sufficient to change behaviour unless there is some kind of positive follow-up"

On the way home today:

- Set two short-term priorities based on what you've heard today. (You may want to think about longer term priorities but in the short term prioritise two)
- formulate an informal plan in your head of what action you're going to take to trial / implement these with your department



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Dros ddysgwyr, dros Gymru
For learners, for Wales

Diolch / Thank you

Cadw mewn cyswllt / Keeping in touch

Gari.Jones@dysgu.llyw.cymru
