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Y Drindod Dewi Sant
University of Wales
Trinity Saint David

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



Partneriaeth Dysgu Proffesiynol **Yr Athrofa**
Yr Athrofa Professional Learning Partnership

Trawsnewid Addysg Gyda'n Gilydd Transforming Teaching Together

Dyfnhau Arfer:
Mathemateg a Rhifedd

Deepening Practice:
Mathematics and
Numeracy

Sesiwn 4
Session 4



Partneriaeth Dysgu Proffesiynol **Yr Athrofa**
Yr Athrofa Professional Learning Partnership

Sesiwn 4 - Adnoddau

Session 4 - Resources



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Trawsnewid Addysg, Trawsnewid Bywydau
Transforming Education, Transforming Lives

Sut mae plant yn dysgu orau?

How do children learn best?



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Sut mae plant yn dysgu orau?

Cymryd risg

Defnyddio offer priodol

Cael hwyl

Ailadrodd

Adfyfyrion

Arbrofi

Gwranddo

Gofyn

Gwneud

Gwneud camgymeriadau

Gwyllo

Profi llwyddiant/
Cael eu canmol

Ymchwilio

Copio/dynwared

Cyfathrebu

Yn unigol / mewn grŵp /
gyda phartner

Gweithio ar lefel briodol

How do children learn best?

Using appropriate equipment

Risk-taking

Reflecting

Asking questions

Repetition

Watching

Experience
Success

Making mistakes

Copy or imitate

Having fun

Researching

Communicating

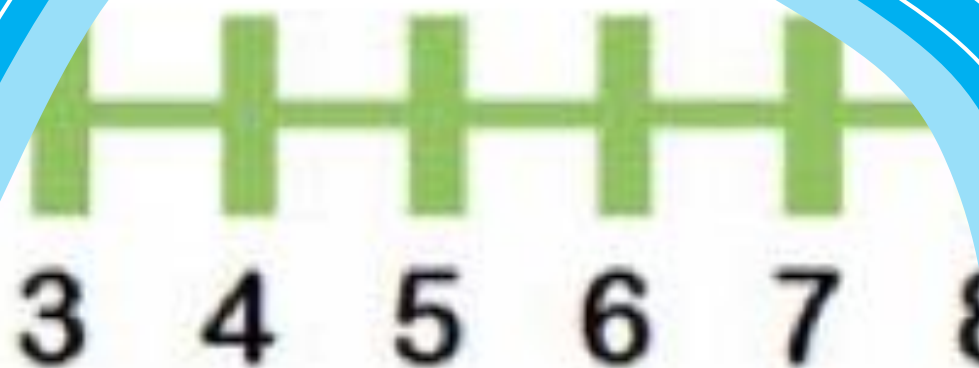
Working independently/ in a
group/ with a partner

Doing

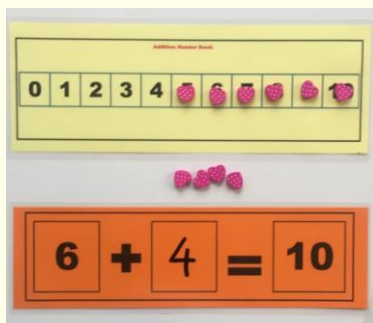
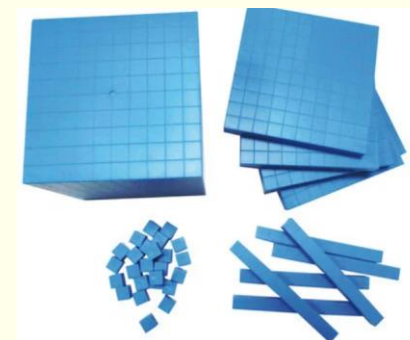
Listening



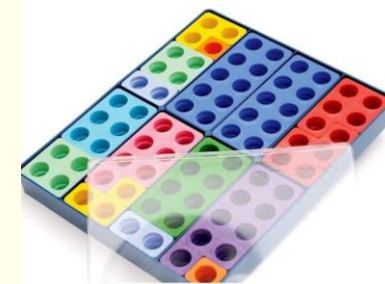
Adnoddau - Resources



Adnoddau Dysgu ac Addysgu Teaching and Learning Resources



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Gweithgareddau Numicon

Numicon Activities

[EYFS: How to teach a child to count using Numicon](#)

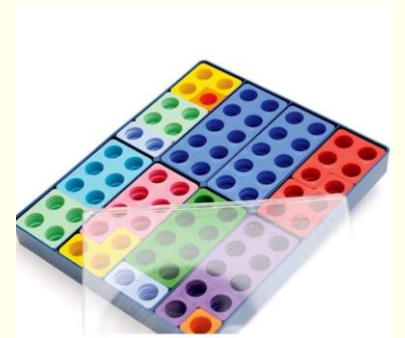
[Numicon: Matching the shapes | Oxford Owl - YouTube](#)

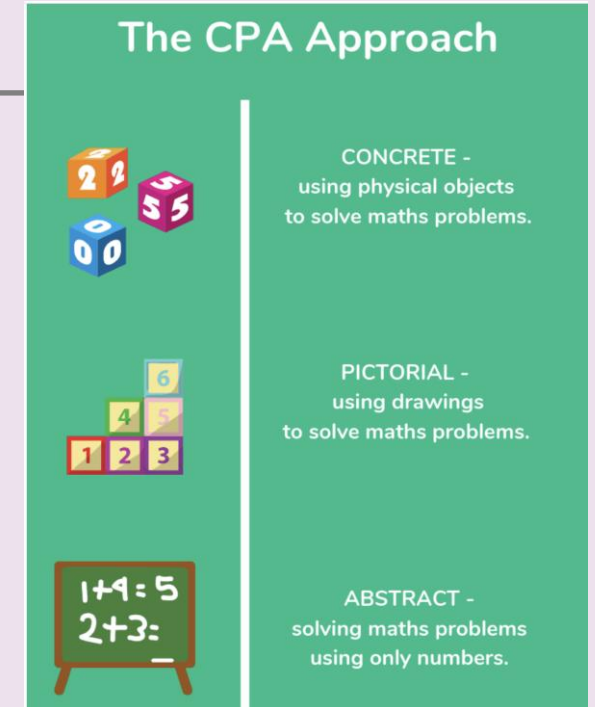
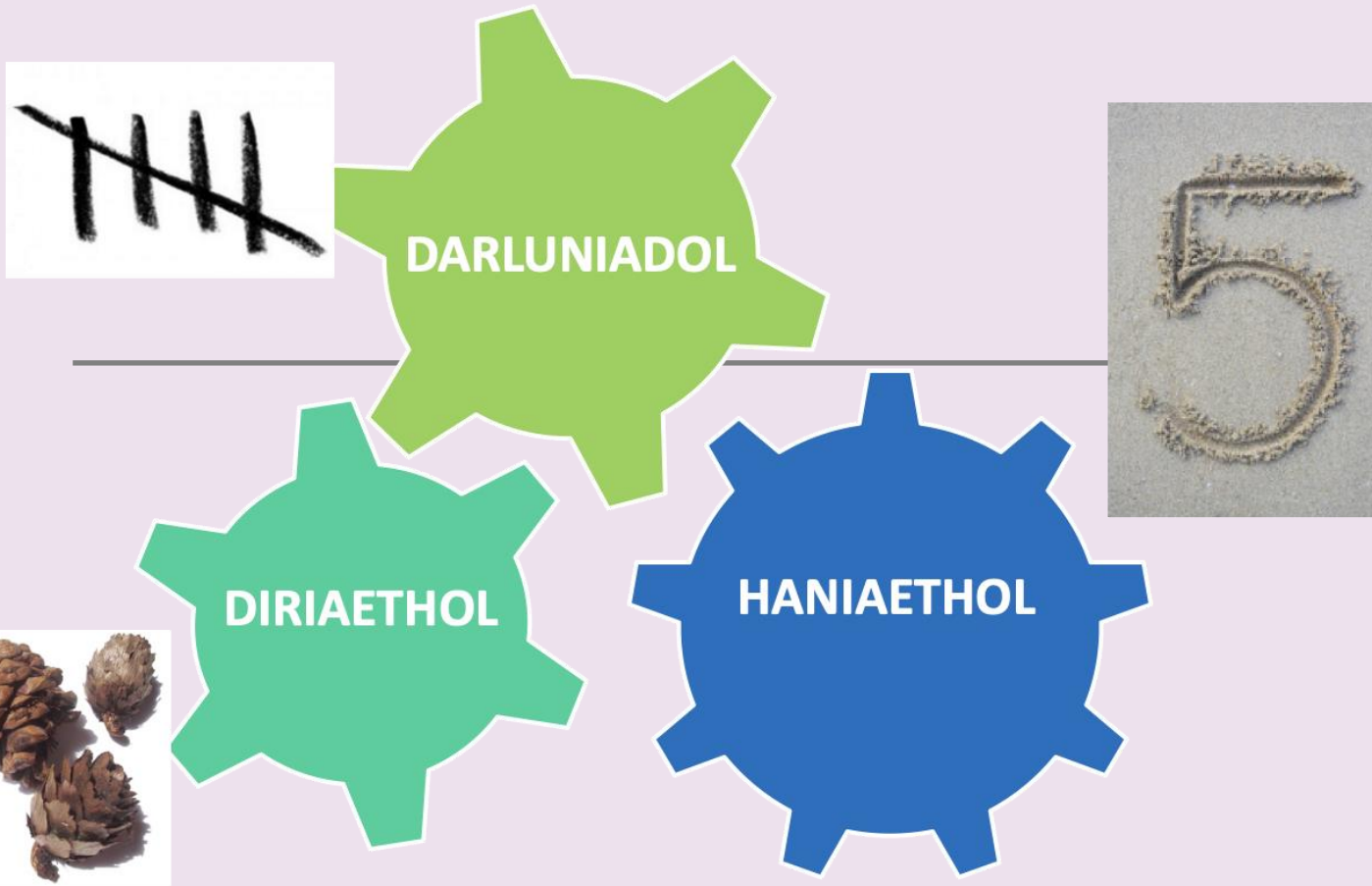
[Year 1 and 2 - Multiplication - Numicon](#)

[Year 3 - Division - Numicon](#)

[Adding with Numicon](#)

[Game Series: Numicon - Race to... - YouTube](#)





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CPA approach – Jerome Bruner



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Trawsnewid Addysg, Trawsnewid Bywydau
Transforming Education, Transforming Lives

Yr Amgylchedd | The Environment

Amgylchedd Cyfoethog mewn

Rhif

- Rhif lle bynnag y bo'n bosibl - blychau, arwyddion, ardal chwarae rôl
- Gwrthrychau pob dydd - clociau, calendrau, amserlenni, cyfrifianellau
- Ardal Fathemateg - rhyngweithiol, offer, gweithgareddau, heriau
- Traciau rhif, llinellau rhif a sgwariau cant - uchder plant
Arddangosfa - cefnogi dysgu cyfredol, 2D a 3D, gwaith plant, addas i'r dysgu (amser real)
- Chwarae rôl, chwarae mawr, creadigol, traws gwricwlaidd
- Annibyniaeth
- Creadigol a chyd-destunol

Number rich Environment

- Numbers wherever possible - boxes, signs, role play area
- Everyday objects - clocks, calendars, timetables, calculators
- Mathematics Area - interactive, tools, activities, challenges
- Number tracks, number lines and hundred squares - child height

Exhibition - supporting current learning, 2D and 3D, children's work, relevant to their learning in real time.

Role play, big play, creative, cross-curricular

Independence

Creative and contextual



[The Proven Theories Behind Singapore Maths | Maths – No Problem!](#)



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Sut mae rhain yn siapio Mathemateg Singapore?

How do these shape Singapore Math?

- Sut mae'r damcaniaethau hyn yn siapio mathemateg Singapore?
- Gyda'i gilydd, mae'r damcaniaethau hyn yn ffurfio sylfaen gadarn ar gyfer sut mae Mathemateg Singapore yn cael ei addysgu:
- Mae myfyrwyr yn adeiladu gwybodaeth yn weithredol yn hytrach na chofio'n goddefol.
- Mae gwersi yn symud o ddeunyddiau ymarferol i fodelau gweledol ac yn olaf i symbolau haniaethol.
- Mae dealltwriaeth gysyniadol a datrys problemau yn cael eu blaenoriaethu dros weithdrefnau rote.

How These Theories Shape Singapore Math?

Together, these theories form a strong foundation for how Singapore Math is taught:

- Students construct knowledge actively rather than memorise passively.
- Lessons move from hands-on materials to visual models and finally to abstract symbols.
- Conceptual understanding and problem solving are prioritised over rote procedures.



[Year 4 Singapore Maths Model Lesson: Measuring Area |
Maths — No Problem!](#)



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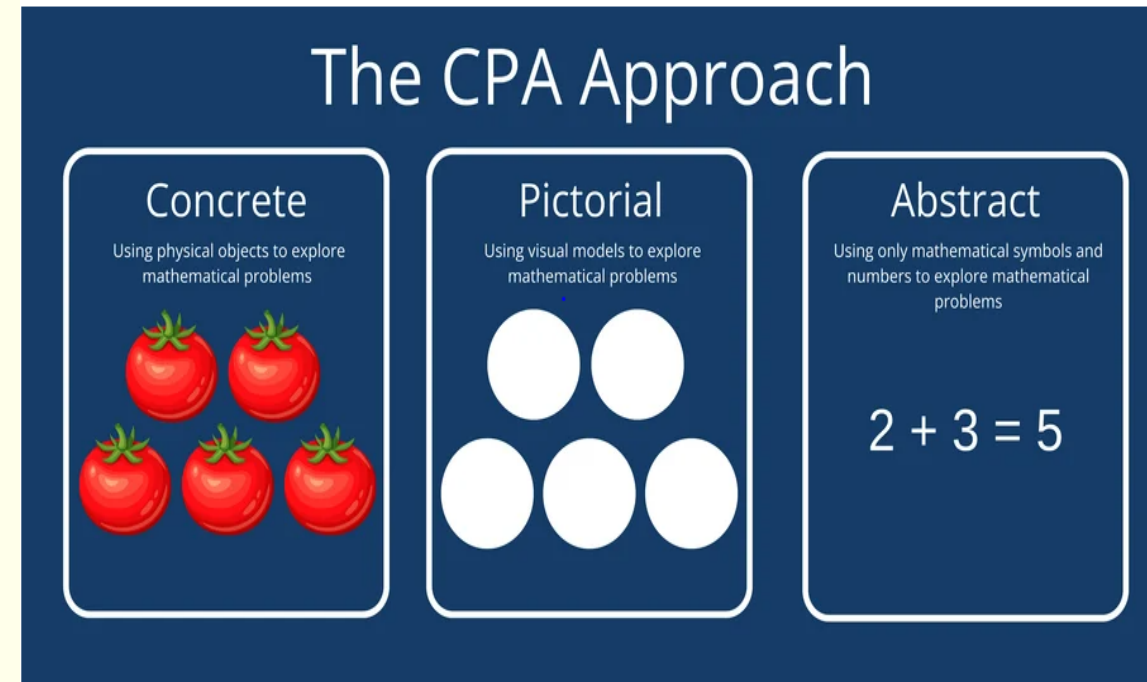
The CPA approach

The **Concrete Pictorial Abstract** (CPA) approach is a highly effective method to teaching maths that helps pupils build and deepen their understanding of mathematical concepts. The CPA approach involves three stages: Concrete, Pictorial, and Abstract.

In the **Concrete stage**, learners use real-world objects, like tomatoes, toy cars, or building blocks, to explore maths concepts. Handling everyday items gives them a practical way to make sense of new ideas.

The **Pictorial stage** moves learners from physical objects to visual models, such as diagrams, number lines, or bar models. These images help bridge hands-on learning and abstract thinking.

Finally, in the **Abstract stage**, pupils use mathematical symbols and equations alone. By this point, they're able to solve problems confidently using just numbers and notation.



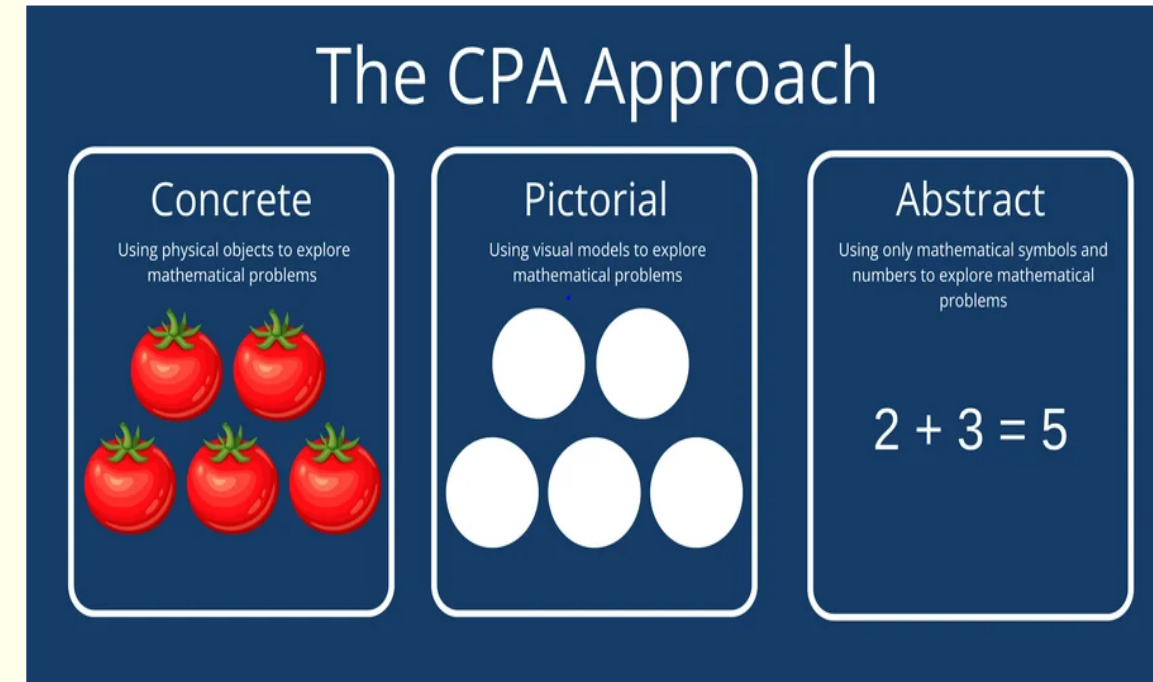
Y Dull CPA

Mae'r dull Concrete Pictorial Abstract (CPA) yn ddull hynod effeithiol o addysgu mathemateg sy'n helpu disgyblion i adeiladu a dyfnhau eu dealltwriaeth o gysyniadau mathemategol. Mae'r dull CPA yn cynnwys tri cham: Concrit, Darluniadol a Haniaethol.

Yn y cam Concrit, mae dysgwyr yn defnyddio gwrthrychau byd go iawn, fel tomatos, ceir tegan, neu flociau adeiladu, i archwilio cysyniadau mathemateg. Mae trin eitemau bob dydd yn rhoi ffordd ymarferol iddynt wneud synnwyr o syniadau newydd.

Mae'r cam Pictorial yn symud dysgwyr o wrthrychau corfforol i fodelau gweledol, fel diagramau, llinellau rhif, neu fodelau bar. Mae'r delweddau hyn yn helpu i bontio dysgu ymarferol a meddwl haniaethol.

Yn olaf, yn y cam Haniaethol, mae disgyblion yn defnyddio symbolau a hafaliadau mathemategol yn unig. Erbyn y pwynt hwn, maen nhw'n gallu datrys problemau'n hyderus gan ddefnyddio rhifau a nodiant yn unig



Beth yw'r prif bwyntiau? Trafodwch:

- Ffocws ar ddealltwriaeth
- Dull CPA
- Sylfaen gref mewn datrys problemau
- Pwyslais ar feistri o wthio ymlaen

What are the main points? Discuss:

- Focus on understanding
- The CPA approach
- Strong foundations in problem solving
- Emphasis on master from pushing forward



[What is Singapore Math®?](#)



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Sut mae athrawon yn mesur cynnydd?

Mae ysgolion yng Nghymru yn mesur cynnydd disgyblion yn wahanol i Loegr, yn enwedig ers cyflwyno'r **Cwricwlwm i Gymru**. Mae'r ffocws yn llai ar sgoriau prawf yn unig a mwy ar **gynnydd parhaus**.

1. Cwricwlwm i Gymru

Beth mae athrawon yn edrych arno -

Mae athrawon yn asesu cynnydd drw:

-
- Gwaith a phrosiectau yn yr ystafell ddosbarth
- Arsylwadau a thrafodaethau
- Hunanfyfyrion dysgwyr
- Datblygu sgiliau (nid gwybodaeth yn unig)
- Mae cynnydd yn cael ei farnu yn erbyn disgrifiadau o ddysgu o fewn y chwe **Maes Dysgu a Phrofiad (MDaPh)**

How do teachers measure progress?

Schools in **Wales** measure pupil progress differently from England, especially since the introduction of the **Curriculum for Wales**. The focus is less on test scores alone and more on **ongoing progression**.

1. Curriculum for Wales

What teachers look at -

Teachers assess progress through:

- Classroom work and projects
- Observations and discussions
- Learner self-reflection
- Skills development (not just knowledge)
- Progress is judged against **descriptions of learning** within the six **Areas of Learning and Experience (AoLEs)**:



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2. Asesiad ffurfiannol (pwysicaf)

Yn digwydd bob dydd mewn gwersi

Defnyddir i addasu addysgu a chefnogi'r camau nesaf

Yn cynnwys adborth yn hytrach na graddau

2. Assessment methods (ongoing, not one-off)

Formative assessment (most important)

Happens daily in lessons

Used to adapt teaching and support next steps

Includes feedback rather than grades

3. Asesiadau Personol Cenedlaethol (Blynyddoedd 2-9 yn fra

Mae'r rhain yn brofion addasol ar-lein, a ddefnyddir i gefnogi dysgu - nid i raddio ysgolion.

Maent yn cwmpasu:

Darllen (Saesneg neu Gymraeg)

Rhifedd - Gweithdrefnol

Rhifedd - Rhesymu

Cymerir unwaith y flwyddyn

Mae'r canlyniadau'n dangos cryfderau a meysydd i'w datblygu

Athrawon yn defnyddio canlyniadau i gynllunio addysgu

Heb ei ddefnyddio fel mesurau atebolrwydd uchel

3. National Personalised Assessments (Years 2-9 approx.)

These are **online adaptive tests**, used to support learning—not to rank schools.

They cover:

Reading (English or Welsh)

Numeracy - Procedural

Numeracy - Reasoning

Taken once per year

Results show **strengths and areas for development**

Teachers use results to plan teaching

Not used as high-stakes accountability measures

4. Anghenion Dysgu Ychwanegol (ADY)

Mae gan ddisgyblion ag **ADY Gynlluniau Datblygu Unigol (IDPs)**

Mae cynnydd yn cael ei fesur yn erbyn **targedau wedi'u personoli**,

nid disgwyliadau oedran

4. Additional Learning Needs (ALN)

Pupils with ALN have **Individual Development Plans (IDPs)**

Progress is measured against **personalised targets**, not age expectations



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