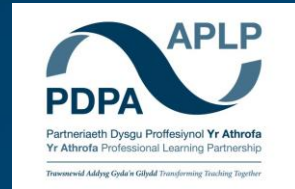




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ECAD6051 – Session 1

Mathematics and Numeracy

PGCE

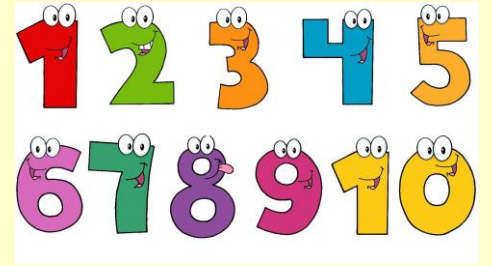
Bethan Sturrock

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Aims



- Understanding how an understanding of number develops in Foundation Learning
- Develop an understanding of the Curriculum and understand expectations
- CPA Approach
- Mathematics through play and in the outer area
- The 5 Proficiencies

Please watch the video



[Be the difference... Teach!](#)

Discuss...

How do children learn best?



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Transforming Education, Transforming Lives*

AREA OF LEARNING AND EXPERIENCE

Mathematics and Numeracy

Guidance to help schools and settings develop their own curriculum, enabling learners to develop towards the four purposes.



Contents

1. Introduction
2. [Statements of what matters](#)
3. [Principles of progression](#)
4. [Descriptions of learning](#)
5. [Designing your curriculum](#)

[Hafan](#) > [Cwricwlwm i Gymru](#) > [Mathemateg a Rhifedd](#)

MAES DYSGU A PHROFIAD

Mathemateg a Rhifedd

Canllawiau i helpu ysgolion a lleoliadau i ddatblygu eu cwricwlwm eu hunain, gan alluogi dysgwyr i ddatblygu o ran y pedwar diben.



Cynnwys

1. Cyflwyniad
2. [Datganiadau o'r hyn sy'n bwysig](#)
3. [Egwyddorion cynnydd](#)
4. [Disgrifiadau dysgu](#)
5. [Cynllunio eich cwricwlwm](#)



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3. Egwyddorion cynnydd

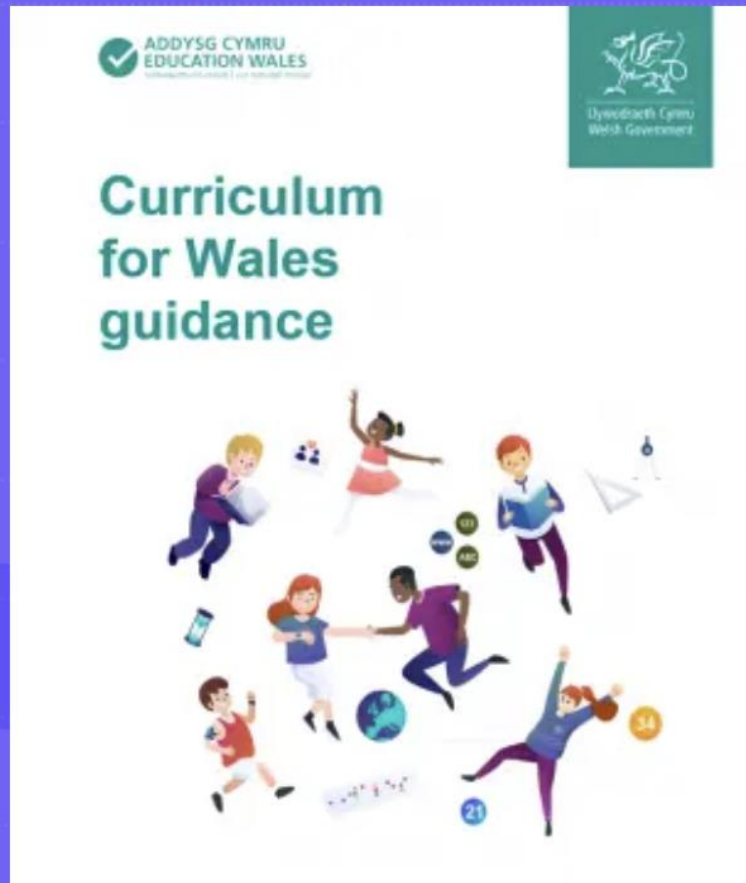


4. Disgrifiadau dysgu
- Cynllunio eich cwricwlwm



Statements of what Matters

1. The number system is used to represent and compare relationships between numbers and quantities.
2. Algebra uses symbol systems to express the structure of mathematical relationships.
3. Geometry focuses on relationships involving shape, space and position, and measurement focuses on quantifying phenomena in the physical world.
4. Statistics represent data, probability models chance, and both support informed inferences and decisions.



Progression Steps

Progression step 1

I have experienced and explored numbers, including [cardinal](#), [ordinal](#) and [nominal](#) numbers, in number-rich indoor and outdoor environments.

I can notice, recognise and write numbers in a range of media, through a multisensory approach, from 0 to 10 and beyond.

I can use mathematical language to describe quantities, and to make estimates and comparisons such as 'more than', 'less than' and 'equal to'.

I have experienced the counting sequence of numbers in different ways, reciting forwards and backwards, and starting at different points.

I can use my experience of the counting sequence of numbers and of [one-to-one correspondence](#) to count sets reliably. I can count objects that I can touch, and ones that I cannot.

Progression step 2

I can read, write and interpret larger numbers, up to at least 1000, using digits and words.

I can understand that the value of a number can be determined by the position of the digits.

I have engaged in practical tasks to estimate and round numbers to the nearest 10 and 100.

I am beginning to estimate and check the accuracy of my answers, using [inverse](#) operations when appropriate.

I can order and sequence numbers, including odd and even numbers, and I can count on and back in step sizes of any [whole number](#) and simple [unit fractions](#).



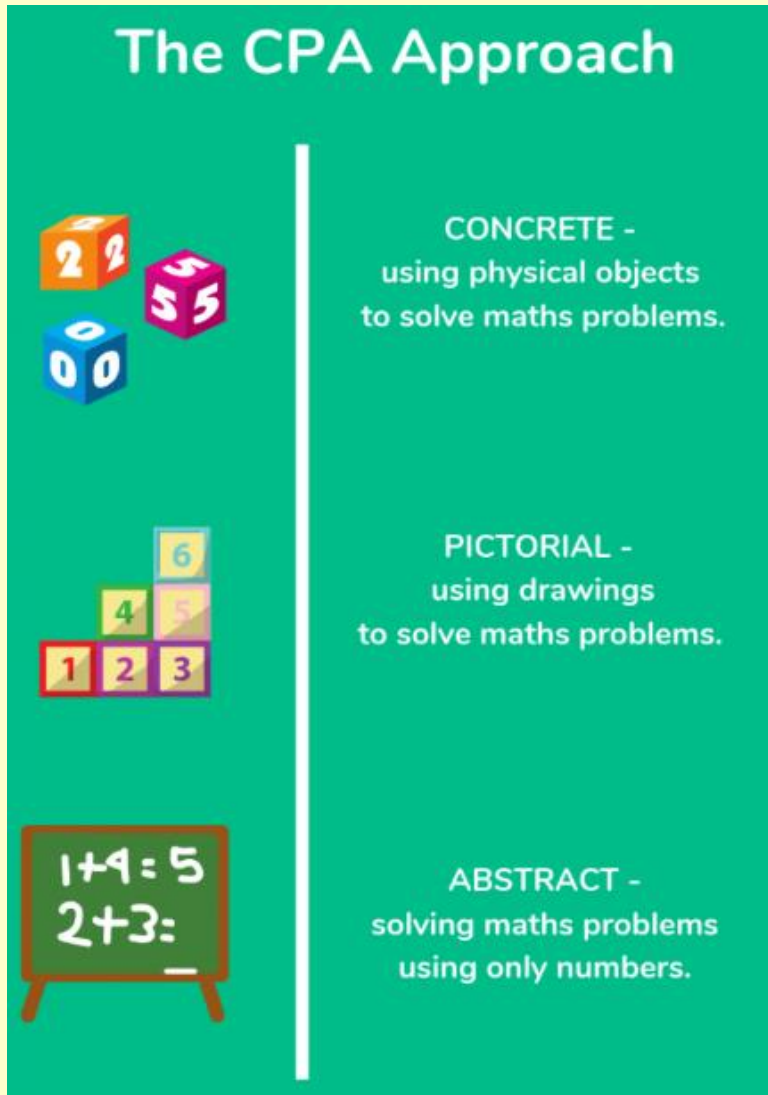
1. 'Stage not Age'

2. Assessment to inform next steps

3. Building on prior understanding

The CPA approach (Concrete, Pictorial, Abstract)

https://youtu.be/R4lcEZiZejw?si=nF08c-w_CVPdpusM



Step 1 - Concrete

Learners use real objects or practical resources to explore a mathematical concept
Examples: cubes, calculators, place-value blocks, coins or numbering sticks
This helps learners to see and touch the maths.

Step 2 - Pictorial

After using objects, learners represent the ideas through pictures, diagrams or models.

Examples: model bar, ten frames, number lines or drawings of the concrete resources.

This stage transitions between the practical experience and the mathematical symbols.

Step 3 - Abstract

In the final stage, learners use numbers, symbols and equations without the need for resources or pictures.

For example:

$$7 + 5 = 12$$

$$24 \div 6 = 4$$

By now, the learners should understand the concept, not just remember the procedure.



DARLUNIADOL



DIRIAETHOL



HANIAETHOL

CPA approach – Jerome Bruner

Why use the CPA method? And why is it so important in children's development?

- It develops conceptual understanding rather than learning by memorization alone
- It helps learners make connections between objects, images and symbol
- It reduces misconceptions and builds confidence in problem solving
- It supports all learners, including those who need more help understanding new concepts.

Maths – Learning through Play

The Five Pillars of Playful Learning

Research promoted by organizations such as the LEGO Foundation identifies five main characteristics that make play a uniquely powerful educational tool:

Fun: Triggering an innate motivation and a genuine love of discovery

Active Engagement: Ensure that the child is deeply involved and invested in the activity.

Meaningful: Connecting the play to their own experiences and the real world.

Repetitive: Allow children to experiment, fail, test new theories, and try again.

Socially interactive: Encourage discussion, share perspectives, and collaborate with peers or adults.



How does play support development?

Play is not just an escape from learning; Here's exactly the mechanism by which early brain development occurs:

Cognitive and Academic: Puzzles and building blocks naturally teach early math (e.g., spatial awareness, geometry, and counting).

Language and Communication: Imaginative play and storytelling expand vocabulary and help children express their thoughts and understand others.

Social and Emotional: Role-playing scenarios (such as a shop or playhouse) teach empathy, impulse control, taking turns, and emotional regulation.

Physical: Activities that involve running, climbing, or manipulating small objects improve gross and fine motor skills.







Outdoor Learning - What are the advantages?

[Vevox - Present view](#)



Outdoor Learning - What are the advantages of outdoor learning?

It improves engagement and motivation. It makes learning more active and enjoyable. 0

Join at:
vevox.app

ID:
142-750-529



[Vevox - Present view](#)



RE-OPEN NO POLLS AVAILABLE



What is the impact that outdoor learning has on learners' standards?

High quality outdoor learning and experiences

Effective Practice 28 February 2023

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Sandycroft C.P. School



[High quality outdoor learning and experiences - Estyn](#)

Note down 5 examples of impact



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The 5 Proficiency What are the 5 Proficiency?

1. Conceptual Understanding

Understand why math works, not just remember rules.

Example: Understand why $3 \times 4 = 12$, not just remember the answer.

2. Communication using Symbols

Use numbers, symbols, diagrams and mathematical words correctly to explain ideas

Example: Write $5 + 7 = 12$ or use a chart to show data.

3. Fluency

Develop accuracy, speed and confidence in the use of mathematical skills and methods

Example: Answer multiplication or addition facts quickly and accurately.

4. Reasoning

Explain mathematical thinking, make connections and justify answers.

Example: Explain why a particular answer is the correct one or test a pattern.

5. Strategic Competence

Choosing and using appropriate strategies to solve mathematical problems.

Example: Deciding whether drawing a diagram, using a table or calculating is the best way to solve a problem.

Mathematical proficiencies

