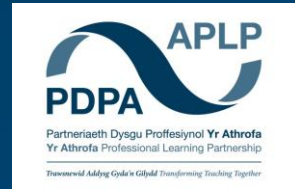




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ECAD6051 – Session 2

Mathematics and Numeracy

PGCE

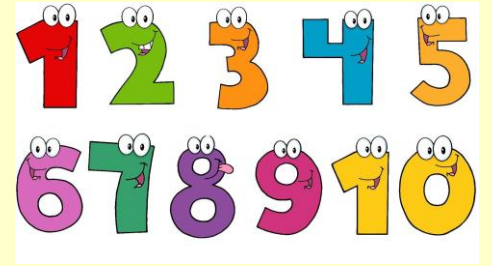
Bethan Sturrock

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Aims

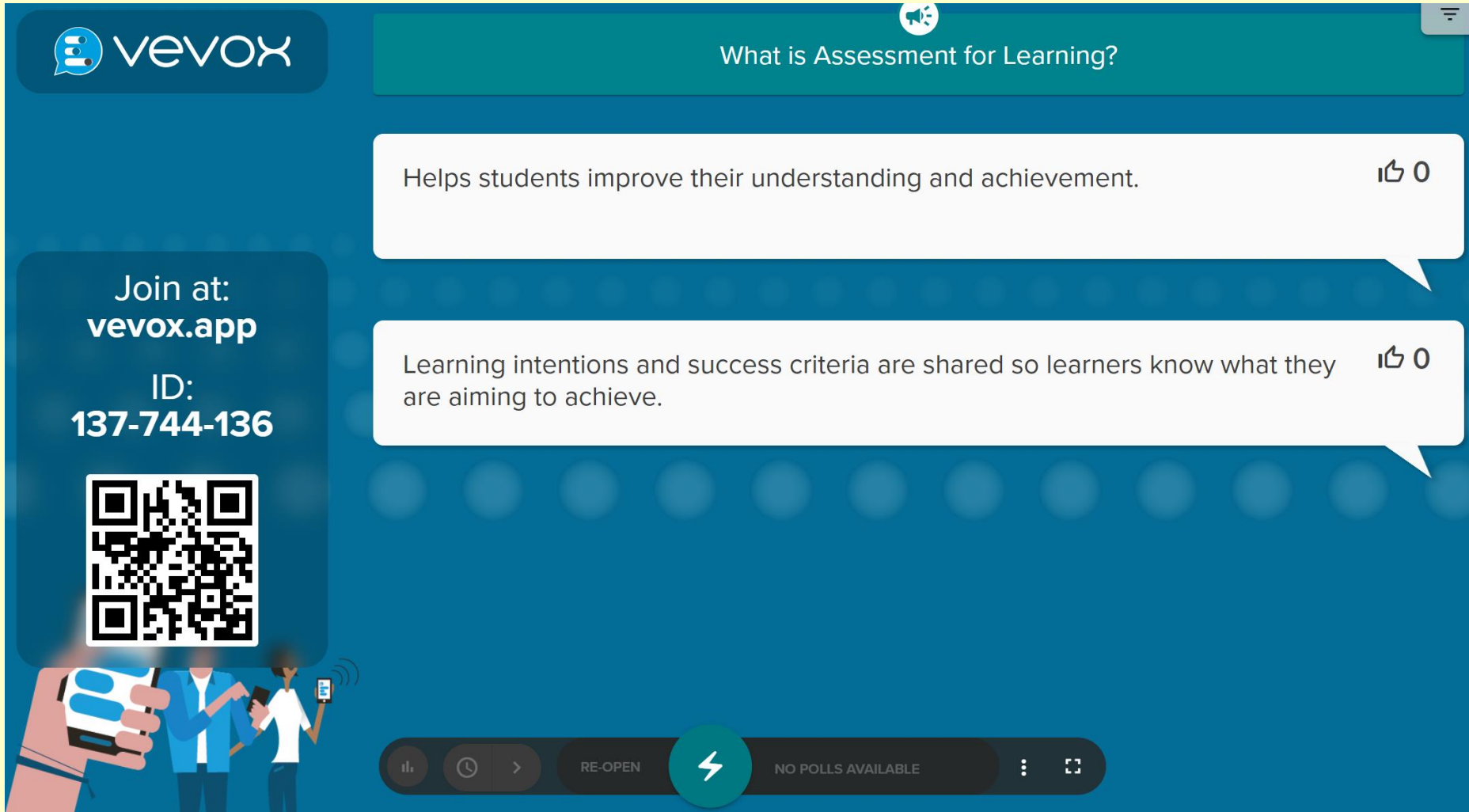


- To understand Assessment for Learning
- To develop an understanding of mathematics and numeracy at Key Stage 2
- To understand cross-curricular mathematics
- To plan Numeracy lessons - examples



What is Assessment for Learning?

<https://vevox.app/#/m/137744136>



The screenshot shows a Vevox poll interface. At the top left is the Vevox logo. The poll title is "What is Assessment for Learning?". There are two poll options displayed in white speech bubbles on a blue background. The first option is "Helps students improve their understanding and achievement." with 0 likes. The second option is "Learning intentions and success criteria are shared so learners know what they are aiming to achieve." with 0 likes. On the left side, there is a box with the text "Join at: vevox.app ID: 137-744-136" and a QR code. At the bottom, there is a navigation bar with icons for a list, a clock, a right arrow, a "RE-OPEN" button, a lightning bolt icon, and the text "NO POLLS AVAILABLE".

Join at:
vevox.app
ID:
137-744-136

What is Assessment for Learning?

Helps students improve their understanding and achievement. 0

Learning intentions and success criteria are shared so learners know what they are aiming to achieve. 0

RE-OPEN NO POLLS AVAILABLE



What are the main elements of Assessment for Learning?

Sharing criteria with learners	Quality of questions/ quality of talk	Use and quality of feedback	Peer and self assessment
<i>Learners know what will make their work good.</i>	<i>All learners actively think up answers to good, open questions.</i>	<i>Ongoing feedback keeps learning on track.</i>	<i>Learners benefit from evaluating each other's work.</i>
<i>Learners know where they are, and the next step, according to the criteria.</i>	<i>Learners explain ideas to each other, reinforcing their learning and understanding.</i>	<i>Learners act on the feedback there and then. Learners take the next step.</i>	<i>Learners gradually become more independent by learning how to self-assess.</i>

Outstanding teachers are those who...

"Are adept and confident in using a range of assessment strategies, reflecting a clear understanding of the theory and practice of assessment. They are skilled at providing well-focused feedback and setting clear and precise targets for improvement...They use assessment information effectively to inform planning and teaching."

Ofsted - (2005)



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Your challenge

Imagine you are planning a **20-minute lesson** for a class of your choice.
Think about...

Learning intention

What do you want pupils to learn?
How will you make this clear to pupils?

Success criteria

What would successful learning look like?
How will pupils know whether they have achieved it?

Eliciting prior knowledge

How will you find out what pupils already know or understand?

Checking understanding

Include at least **two different AfL strategies** you would use during the lesson.
Explain what information each strategy would give you.

Questioning

Give three questions you would ask pupils.
At least one should require pupils to explain their thinking rather than recall an answer.

Feedback

Give an example of feedback you might provide to a pupil.
Explain how the feedback would help move their learning forward.

Responding to assessment

Explain what you would do if your assessment showed that **many pupils had misunderstood the concept**.
Explain what you would do if **most pupils had already mastered it**.

Pupil involvement

Include one opportunity for pupils to assess their own learning or the learning of a peer.

Using assessment for learning to close gaps in pupils' learning

Effective Practice 7 September 2017

Share this page 

Hendredenny Park Primary School



[Using assessment for learning to close gaps in pupils' learning - Estyn](#)

Discuss...

-
- What is the nature of the strategy?
- What is the impact that Assessment for Learning has on pupils' standards?



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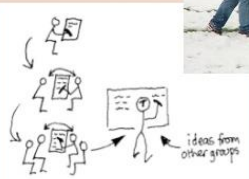
KWL Grids

Maths

WALT: Plan and evaluate

What do I know?	What do I want to know?	What have I learnt?

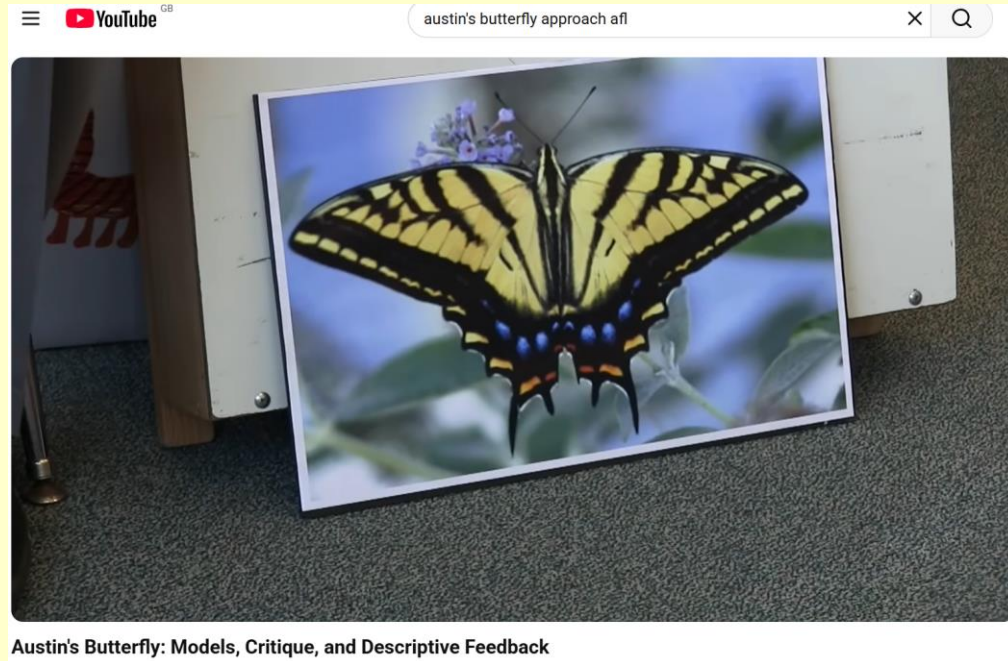
Snowballing



Basketball not Ping Pong!



Austin's Butterfly



What are your thoughts?

Discuss the key points of this video.

[Austin's Butterfly: Models, Critique, and Descriptive Feedback - YouTube](#)



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Spend time making sure there is a consensus between you and the pupils about what makes a piece of 'good' work, and how they can achieve this.

Use questions such as:

"Can you tell me what makes a good piece of work?"

How do you feel about the comments?

Do you always know what needs to be done or thought about next?

Do you know when you've accomplished a good piece of work? How?

Progression Step	Typical Age	Focus of Learning	Example of Learning	Key Question
Progression Step 2	5–8 years	Developing number sense	Counts, reads, writes and orders whole numbers to at least 1,000. Uses place value to compare numbers and performs simple addition and subtraction using mental and written methods.	Can I understand, represent and use numbers confidently?
Progression Step 3	8–11 years	Building fluency and flexibility	Uses place value with larger whole numbers and decimals. Selects efficient mental and written strategies for addition, subtraction, multiplication and division, and explains mathematical thinking.	Can I use number facts and calculation strategies accurately and efficiently?
Progression Step 4	11–14 years	Applying number in complex contexts	Works confidently with integers, decimals, fractions, percentages and powers. Chooses appropriate methods to solve multi-step problems, estimates solutions and justifies mathematical reasoning.	Can I apply my understanding of number to solve complex problems and justify my methods?

Mathematics v Numeracy

Aspect	Mathematics	Numeracy
Definition	The study of mathematical concepts, principles, and patterns.	The application of mathematical skills to solve problems in real-life situations.
Main focus	Developing mathematical knowledge and understanding.	Applying mathematical knowledge in practical contexts.
Where it is developed	Mainly in mathematics lessons.	Across all Areas of Learning and Experience and in everyday life.
Skills	Algebra, geometry, measurement, statistics, probability, calculation.	Budgeting, reading graphs, interpreting data, calculating costs, measuring in real-life contexts.
Types of tasks	Solving equations, calculating area, identifying patterns.	Comparing prices, calculating discounts, using timetables, measuring ingredients or distances.
Purpose	To understand mathematical ideas and concepts.	To use mathematics confidently and effectively in everyday life and work.
Example	Solving $3x + 5 = 20$.	Calculating the cost of an item after a 25% discount.

The Numeracy Framework

The Numeracy Framework (part of the Literacy and Numeracy Framework - LNF) is a national curriculum planning tool from the Welsh Government. It outlines expected skills per year to ensure pupils develop robust numeracy across all subjects between the ages of 5 and 14.

The framework focuses on developing practical skills rather than just memorizing formulas. Its main features are:

- **Core Skills:** Develop an understanding of the number system, measures, and interpretation of data.
- **Application:** Use numeracy skills to solve problems in real-life situations.
- **Consistency across the curriculum:** Helping teachers to incorporate mathematics and numeracy not only in math lessons, but across all subjects.
- **Clear progress:** It provides a continuum that shows clear stages of development from year to year



Numeracy Framework

Numeracy Framework

Strand	Element	Progression step 1	Progression step 2	Progression step 3	Progression step 4	Progression step 5
Developing mathematical proficiency	Conceptual understanding	I can make connections so that basic mathematical concepts can be transferred during play and classroom activities.	I can make connections so that mathematical concepts can be transferred during play and classroom activities.	I can make connections so that mathematical concepts can be built on and deepened.	I can make connections so that mathematical concepts can be built on and deepened.	I can make connections so that mathematical concepts can be built on and deepened.
				I can draw on my understanding of the basic structures of mathematics and can apply them in different contexts.	I can draw on my understanding of the basic structures of mathematics and can apply them in different contexts.	I can draw on my understanding of the basic structures of mathematics and can apply them in different contexts.
				I can explain and express concepts, and find examples (or non-examples).	I can explain and express concepts, and find examples (or non-examples).	I can explain and express concepts, and find examples (or non-examples).
		I can understand and use basic mathematical concepts in a variety of ways.	I can represent a concept in different ways, flowing between different representations including verbal, concrete, visual, digital and abstract.	I can represent a concept in different ways, flowing between different representations including verbal, concrete, visual, digital and abstract.	I can represent a concept in different ways, flowing between different representations including verbal, concrete, visual, digital and abstract.	I can represent a concept in different ways, flowing between different representations including verbal, concrete, visual, digital and abstract.
		I can explore answers within the context of the problem and I am beginning to consider whether answers are sensible.	I can interpret answers within the context of the problem and consider whether answers are sensible.	I can interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible.	I can interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible.	I can interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible.
	Logical reasoning	I can use everyday and mathematical language to talk about my own ideas and choices.	I can use everyday and mathematical language to talk about and explain my own ideas and choices.	I can construct and develop a mathematical argument.	I can construct and develop a mathematical argument.	I can construct and develop a mathematical argument.
				I can justify my procedures and predictions.	I can justify my procedures, predictions and conjectures.	I can justify my procedures, predictions and conjectures.
			I can verify results and solutions.	I can verify results and solutions.	I can verify and prove results and solutions.	I can verify and prove results and solutions.
				I can explain results and procedures precisely using appropriate mathematical language.	I can explain results and procedures precisely using appropriate mathematical language.	I can explain results and procedures precisely using appropriate mathematical language.
	Fluency	I am beginning to apply relevant facts and techniques.	I can identify relevant facts and techniques in order to apply an efficient method.	I can use firmly established, memorable and usable facts and techniques in order to apply the most efficient methods.	I can use firmly established, memorable and usable facts and techniques in order to apply the most efficient methods.	I can use firmly established, memorable and usable facts and techniques in order to apply the most efficient methods.
			I can use checking strategies to decide if answers are reasonable.	I can select and apply appropriate checking strategies.	I can select and apply appropriate checking strategies.	I can select and apply appropriate checking strategies.
				I can use a calculator effectively and efficiently to carry out calculations.	I can use a scientific calculator effectively and efficiently to carry out	I can use a scientific calculator effectively and efficiently to carry out

Discuss...

- What makes numeracy different from teaching math?
- How does the Numeracy Framework support progression?
- How can numeracy be naturally embedded across Curriculum Wales rather than being taught separately?

How to develop thinking and
assessment for learning in
the classroom



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Cymry Ifanc
Young Wales

www.cymru.gov.uk



Guidance

Guidance document No: 044/2010
Date of revision: November 2010

Further Reading...

[untitled](#)



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Examples of Numeracy Activities

Task - Planning a class party with a budget of £250

You'll need to think of...

- The **cost of food**, drinks and decorations must be researched
- **Compare prices** from different stores or websites
- **Don't go over budget**
- **How much will each pupil need to pay** if there are 25 pupils
- Present your work in a **table or spreadsheet** and chart



Examples of Numeracy activities

Task - plan a school trip to a local attraction. Use information about travel costs, entry tickets and travel times, and the best option must be decided.

You will need to:

- Calculate the cost of the bus or train.
 - Calculate the total cost of the trip for 30 odd pupils and 3 members of staff.
 - Compare prices of different attractions or modes of travel.
 - Use timetables to calculate departure times and arrival times.
 - Decide which option offers the best value for money.
- Present their results in a table or short presentation.

Task - Work in pairs/small groups of up to 4

**Design and plan your own numeracy lesson
(to be completed during next maths lecture)**

You will need:

A copy of the Numeracy framework

A guide to the Progression Steps

A copy of the University's Lesson Planning document

[Home | NRICH](#)

[Biscuit Decorations printable sheet](#)

Andrew decorated 20 biscuits to take to a party.

He lined them up and put icing on every second biscuit.

Then he put a cherry on every third biscuit.

Then he put a chocolate button on every fourth biscuit.

So there was nothing on the first biscuit.

How many other biscuits had no decoration? Did any biscuits get all three decorations?

What would happen if Andrew had more than 20 biscuits? Can you predict which numbers will have no decoration, or all three decorations?



[Primary resources, homework help and online games - BBC Bitesize](#)

Maths SATs

Maths SATs reasoning quiz 1

Try this Year 6 reasoning quiz, covering number, measures, place value, fractions, percentages and decimals.

Maths SATs

Maths SATs reasoning quiz 2

Try this Year 6 reasoning quiz, covering number, Roman numerals, fractions, percentages and ratio, measures and area and perimeters.

Numbers



Factors, multiples and primes

3 Guides

[Dr Frost Maths \(Upper KS2\)](#)

[Home | NCETM](#)

<https://vimeo.com/239448000?fl=pl&fe=cm>

[Teaching mathematics | OpenLearn - Open University](#)



Course description

Course content

Course reviews

[Free short courses from the Open University | OpenLearn - Open University](#)

[How to Improve Your Numeracy Skills | Basic Maths for Adults](#)