



Ysgol Penglais School

# Numeracy policy

Signed: 

**(Chair of Governors on behalf of the Governing Body)**

**Date: March 2022**

**Date to be reviewed: March 2025  
(by the Full Governing Body)**



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### 1. What is Numeracy?

*“Numeracy is not the same as mathematics. Numeracy is a proficiency with number ... Although students usually learn their numeracy skills during mathematics lessons, to be fully numerate they must be able to apply these skills in other subject areas and real-life contexts’ (Estyn Supplementary guidance: the inspection of numeracy in schools, Autumn 2017)*

*“What is more, numeracy – the application of mathematics to solve problems in real-world contexts – plays a critical part in our everyday lives, and in the economic health of the nation. It is imperative, therefore, that mathematics and numeracy experiences are as engaging, exciting and accessible as possible for learners, and that these experiences are geared towards ensuring that learners develop mathematical resilience.” (Curriculum for Wales: Mathematics and Numeracy, January 2020)*

### 2. Aims and Objectives

At Ysgol Penglais it is our aim:

- To raise standards in both mathematics and in numeracy skills across the curriculum.
- To help learners transfer their mathematics knowledge to other subject areas, through use of a common approach in the teaching of numeracy skills. It is, however, important to note that once a learner has a strong understanding of a concept, or is more able, they may prefer to use a different method. As long as working out is clearly presented using a correct method.
- To use an agreed mathematics vocabulary, methods and notation.
- To promote a positive attitude towards mathematics and numeracy and to help learners appreciate the importance of mathematics in their everyday lives.
- To make frequent links across the curriculum, so that concepts and skills are developed further by being applied in different, relevant contexts.
- To encouraging learners to be independent and to be able to tackle numeracy problems. Using spaced learning and open-ended questioning will help to develop thinking skills.
- Using wherever possible an enquiry-based approach rather than a step by step approach to the teaching of mathematics creates:
  - Learner autonomy
  - Learner independence
  - Capability
  - Self-Regulation

### 3. The Numerate Student

*“Numeracy describes the set of skills needed to tackle real-world problems in a variety of situations by applying numerical reasoning and then carrying out the mathematical procedures to find the solution.” (WAG May 2012)*

*“Numerate individuals are able to function responsibly in everyday life and contribute effectively to society”. (ESTYN April 2010)*

At Ysgol Penglais it is our intention that all students should:

- Handle numbers fluently in mental, oral and written work.
- Exploit patterns within number when calculating and approximating.
- To be able to make and use sensible estimates of a range of measures in everyday situations.
- Measure and calculate accurately and estimate reasonably, using appropriate units of time, length, area, volume, mass, capacity, angle and related compound measures.
- Make sense of number problems and identify and use the required operations to solve them;
- Use calculators accurately and appropriately.
- Use an increasing range of skills to identify, analyse and describe practical problems or tasks involving numerical data.
- Read, extract, interpret and analyse numerical and statistical data from a range of sources and presented in a variety of forms.
- Select appropriate techniques to represent data.

#### 4. Strategy Management

*“A whole school approach to the teaching of numeracy across the curriculum is essential so that there is a shared and coherent vision across the school. Although every teacher plays a central role in supporting the development of numeracy, whole school coordination will be led by senior managers and numeracy coordinator”*  
(WAG Curriculum Planning Guidance January 2013)

Senior Managers should:

- Identify the school’s particular curriculum and assessment needs.
- Work with the Numeracy Coordinator to coordinate feedback to parents/carers.
- Work with the Numeracy Coordinator to organise and disseminate whole school training.
- Report to governors on standards of numeracy across the school.
- Identify opportunities for sharing good practise of numeracy.
- Organise whole school training on numeracy.
- Staff will, where necessary, be supported in identifying numeracy skills within their lesson plans.

Numeracy Coordinator should:

- Monitor and evaluate the delivery and outcomes of numeracy across the school.
- Lead and support teachers/departments in identifying and planning opportunities in the Curriculum for Wales, allowing students to apply their numeracy skills within purposeful contexts.

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- Work with teachers/departments to ensure consistency and progression in the teaching of numeracy.
- Ensure a consistency of approach across the school, to enable students to transfer their skills.
- Encourage all staff to improve and promote numeracy skills, whilst ensuring a positive attitude.
- Provide guidance on the teaching of numeracy skills and identify areas of numeracy that teachers are least confident in.
- Facilitate school-based training in numeracy.
- Provide displays and resources that enable learners to develop, improve and challenge their knowledge and understanding of numeracy.

### Teachers of Mathematics should:

- Provide opportunities for students to apply their numerical skills in purposeful contexts.
- Use topic and examination questions from other subjects.
- Support staff to ensure a correct and consistent approach is used in all subjects.
- Provide information to other subject teachers on appropriate expectations of students and difficulties, misconceptions and misunderstandings likely to be experienced in various age and ability groups.

### Teachers from Departments of High Demand Subjects:

(High demand subjects are defined as Science, Geography, Design and Technology and aspects of Physical Education.)

- Promote positive attitudes towards numeracy when dealing with learners.
- Take advantage of valuable opportunities that arise naturally within their subject to tackle misconceptions and to help learners practise and master essential mathematical skills.
- Plan opportunities for learners to use and apply their numeracy skills in purposeful contexts within the subject and ensuring occasional rich tasks are noted within the SoW.
- Ensure they are familiar with the correct mathematical language, notation, conventions and techniques, relating to their own subject, and encourage learners to use these correctly.
- Promote non-calculator work and encourage students to use effective mental / written strategies. Allow calculators only when appropriate.

### All Teachers should:

- Promote positive attitudes towards numeracy when dealing with learners.
- Take advantage of opportunities that arise naturally within their subject to tackle misconceptions and to help learners' practise and reinforce basic numeracy skills.
- Ensure they are familiar with correct mathematical language, notation, conventions and techniques, relating to their own subject, and encourage learners to use these correctly.
- Promote non-calculator work and encourage students to use effective mental / written strategies. Allow calculators only when appropriate.

- Understand the importance of numeracy skills in relation to raising standards of work in their own subject.
- Fully integrate these skills into their planning to provide exciting new learning experiences for learners.
- Plan tasks that will allow learners to demonstrate understanding and develop and consolidate the range of numeracy skills.

Good Practise in school will be identified and shared.

## 5. Teaching and Learning

- All teachers are responsible for developing learners' numeracy skills.
- Teachers should set tasks that aim to introduce, consolidate, apply and make progress in specific numeracy skills.
- The use of classroom pedagogy will be used to support the successful development of numeracy skills.
- Lesson plans and schemes of work will identify numeracy links in contexts from across the curriculum.
- Teachers will provide differentiation within tasks to provide support towards consolidation and to extend development for focused numeracy skills.
- Challenging tasks will be used to consolidate and extend understanding in focused numeracy skills.
- Interventions will be provided for learners that have mathematical and numerical difficulties as without basic mathematics skills learners cannot progress to higher levels of skills and understanding.

*“Progression in the Mathematics and Numeracy Area of Learning and Experience (Area) involves the development of five connected and interdependent proficiencies which have no hierarchy. These are crucial considerations for schools when designing their curriculum to ensure the progression of learners.*

- *Conceptual understanding*
- *Communication using symbols*
- *Fluency*
- *Logical reasoning*
- *Strategic competence”*

*(Curriculum for Wales: Mathematics and Numeracy, January 2020)*

### *“Developing Numerical Reasoning and Problem Solving*

- *Learners will be given numerical problems to solve across the curriculum, in real-life contexts wherever possible.*
- *Learners will be given thinking time as they access numerical problems to increase their skills in numerical reasoning.*
- *Learners should be encouraged to describe and explain their methods and the reasoning behind their answers.”*

*(WAG June 2012)*

## 6. Evaluation

The numeracy policy will be evaluated through:

- Lesson observations (in line with school policy).
- Discussions with teachers.
- Displays.
- Student voice.
- Lesson plans and schemes of work.
- Teacher records and assessment of pupils.
- Looking at students work.
- Analysis of the numeracy test data; identifying strengths and areas for improvement both with individuals and whole school.
- Use of the numeracy tests to help inform school self-evaluation, development planning and areas of improvement; and identify whole-school resourcing and staff CPD needs.



## Appendix 1: Glossary of Numeracy Terms

Term	Explanation
<b>Appropriate</b>	Suitable for the intended task, context and complexity. The use of 'appropriate' in the framework recognises that different contexts require different treatments.
<b>Approximation</b>	Refers to an estimate, result or check that is not exact but is close enough to be useful in a practical context
<b>Average</b>	Sometimes used synonymously with 'arithmetic mean'. Measures of average include mean, median and mode.
<b>Bar chart/bar graph</b>	A form of representation of numerical data. Frequencies are represented by bars of equal width where the lengths of the bars represent the frequencies. The bars may be presented vertically or horizontally.
<b>Capacity</b>	A measure of quantity of liquids.
<b>Compound measures</b>	Compound measures combine two different types of measurement, <i>e.g. speed in metres per second, population density in number of people per square kilometre or run rate in runs per over.</i>
<b>Compound shape</b>	Complex shapes that can be broken down into separate simple shapes.
<b>Discrete data</b>	Data resulting from a count of separate items or events, <i>e.g. number of people at a football match.</i>
<b>Continuous data</b>	Data that can take any value, <i>e.g. length, capacity, time, temperature.</i>
<b>Proper fractions</b>	The numerator (top number) is less than the denominator (bottom number), <i>e.g. <math>\frac{1}{4}</math>.</i>
<b>Improper fractions</b>	The numerator is greater than the denominator, <i>e.g. <math>\frac{7}{4}</math>.</i>
<b>Mixed numbers</b>	A whole number and a proper fraction together, <i>e.g. <math>1\frac{3}{4}</math>.</i>
<b>Frequency table</b>	A table for a set of observations showing how frequently each event or quantity occurs.
<b>Grouped data</b>	Organising large amounts of data into groups that are consecutive and non-overlapping, where appropriate, arranged in equal intervals

<b>Inverse operations</b>	Operations that are opposite to each other, <i>e.g. addition and subtraction, multiplication and division, square and square root.</i>
<b>Mass</b>	In everyday usage, mass is often referred to as weight, the units of which are often taken to be kilograms ( <i>e.g. a person may state that their weight is 75 kg</i> ). In scientific use, however, the term 'weight' takes gravitational force into account.
<b>Mean</b>	A type of average based on equal sharing. The mean is the sum of quantities divided by the number of them, <i>e.g. the mean of 5, 6, 14, 15 and 45 is <math>(5 + 6 + 14 + 15 + 45) \div 5 = 17</math></i>
<b>Median</b>	A type of average. The median is the middle number or value when all are arranged in order, <i>e.g. the median of 5, 6, 14, 15 and 44 is 14</i> . Where there is an even number of values, the mean of the two middle values is calculated, <i>e.g. the median of 5, 6, 7, 8, 14 and 44 is <math>(7 + 8) \div 2 = 7.5</math></i> .
<b>Mixed numbers</b> See <b>Fractions</b> .	
<b>Mode</b>	A type of average. The most frequently occurring value in a set of data, <i>e.g. the mode of 1, 8, 2, 2, 9, 3, 3, 3, 3, 7 is 3.</i>
<b>Order of operations</b>	A convention of using operations in a particular order often expressed as BODMAS or BIDMAS. <b>B</b> Brackets first <b>B</b> <b>O</b> Orders (i.e. powers, square roots, etc.) <b>I</b> Indices <b>DM</b> Division and Multiplication <b>AS</b> Addition and Subtraction
<b>Pictogram</b>	A form of representation of data. Pictures/symbols/icons are used to represent objects. For large numbers, one symbol represents a number of objects. Part symbol represents a proportion of a number
<b>Pie chart</b>	A form of representation of data. A circle is divided into sectors where the size of the sector represents appropriate proportions of the data.
<b>Proportion</b>	A part of quantity often described using terms such as percentage, fraction, decimal, and ratio.
<b>Range (in relation to data handling)</b>	A measure of spread in statistics, i.e. the numerical value calculated by finding the difference between the greatest and the least values in a set of numerical data.
<b>Ratio</b>	A comparison of quantities written <i>a:b</i> , <i>e.g. a mixture made up of two ingredients in the ratio 3:1 is three parts of the first ingredient to one part of the second.</i>
<b>Reciprocal</b>	What to multiply a value by to get 1, <i>e.g. the reciprocal of 4 is</i>

<b>Round (verb)</b>	To express a number or measurement to a required degree of accuracy, <i>e.g. 537 rounded to the nearest 10 is 540.</i>
<b>Scale</b>	The ratio between the size of something real and the size of a representation of it.
<b>Standard form</b>	Using powers of 10 to record very large or very small numbers, <i>e.g. 6 500 000 can be written as <math>6.5 \times 10^6</math> and <math>0.000000321</math> can be written as <math>3.21 \times 10^{-7}</math>.</i>
<b>Standard units</b>	Units that are agreed throughout a community, <i>e.g. a metre is a standard unit of length.</i> Non-standard units are, therefore, those that are not widely agreed, <i>e.g. cupful.</i>
<b>Table</b>	An orderly arrangement of information, numbers or letters, usually in rows and columns.
<b>Tally</b>	(Make) marks to represent objects counted.
<b>Volume</b>	A measure in three-dimensional space.
<b>Weight: See Mass.</b>	

(Taken from Consultation document National Literacy and Numeracy Framework and Tests)

## [Appendix 2 Whole School Common Approaches to Numeracy](#)

Is to be updated and re-released later this year (2021-2022)

## [Appendix 3: Resources](#)

Resources are stored and updated in: T-Drive, All staff resources, numeracy. (new for 2021)

This area will be updated regularly and contains helps, numeracy activities, websites and Numeracy documents.

The Numeracy store cupboard (between B9 and B10) will be used to store practical resources to support the teaching of numeracy. The room is being given a fresh start in 2021, with tidy resources that can be borrowed and used throughout the school to support whole school numeracy and ALN needs within numeracy. This is a work in progress and is to be developed during 2021-2022.

## Appendix 4: Mathematics department marking policy

These marking codes are used within the mathematics department and may be adopted across the school in numeracy marking.

Ⓘ	This area of your work could be developed or improved. Read the feedback carefully and carry out the improvement in the dedicated reflection and improvement time (DIRT).
Ⓢ	A small <b>slip</b> in your arithmetic; mistake. $3 \times 4 = 16$
RTQ	<b>Read the question.</b> You haven't done what it asked for.
Ⓡ	The <b>rounding</b> of your answer is wrong. $3 \div 11 = 0.2727... \rightarrow 0.2$
Ⓤ	There is a mistake with your <b>units</b> ; they are either wrong, or missing. <b>Area = 6cm</b>
MR	You've <b>misread</b> a number or letter, but your working is correct.
ecf	<b>Error carried forward.</b> You've done correct working following on from an earlier incorrect answer.
(✓)	Everything so far is correct but it doesn't fully answer the question. $23 \times 8 = 20 \times 8 + 3 \times 8 = 160 + 24$
Ⓢp	You have made a <b>spelling</b> mistake. Write out correct spelling three times in green pen.