



Brecon High School Numeracy Policy

Rationale

We take the view that learners at Brecon High School should to be provided with the opportunities to solve problems, explore ideas and establish connections working both independently and collaboratively. It is incumbent upon the school when designing the curriculum & delivering it, that it must lead to the development of the Numerical five proficiencies:

- Conceptual understanding
- Communication using symbols – i.e. conventions
- Fluency
- Logical reasoning
- Strategic competence

It is important to note that these can be developed alongside one another (i.e. they are non-hierarchical). That said, they must be applied and connected using a range of real-life contexts to explore mathematical concepts, e.g. percentages can be applied to annual percentage rates (APRs) to demonstrate their use in financial literacy.

The National agenda for Numeracy:

“Numeracy is the application of mathematics to solve problems in real-world contexts – it 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.”

Achieving the ambition in Wales

The ambition for numeracy in Wales will be achieved by ‘raising overall numeracy levels across Wales’ by ‘having robust and consistent standards of numeracy across Wales’ and ‘all teachers will be teachers of numeracy’. (National Numeracy Programme—Welsh Government)

We are dedicated to changing the stigma attached to Numeracy and Maths, specifically by preventing the use of phrases by students, parents and staff such as “I was never good at maths”, “I can’t do maths” and “I’m not a maths person”. These phrases allow for poor numeracy to be socially acceptable and cause unneeded barriers for the school community.

Pedagogical Considerations:

At Brecon High School, the structure and sequence of mathematics and numeracy topics should be informed by the hierarchical and connected nature of mathematical concepts, in order to ensure foundations are built upon and experiences are connected. Pupils should become increasingly fluent in their use of number, through a broad range of experiences, in order to describe, interpret and communicate size, scale and comparisons, both within and beyond mathematics. Numerical delivery should hinge around a reasoning and problem-solving approach to numeracy experiences and pupils should engage in meaningful and substantial tasks. These could be things such as modelling real-life numerical problems, financial calculations such as creating and evaluating budgets for events and analysing risks. Pupils should be encouraged to investigate their own research questions and it is important that learners are able to interpret answers and check that they make sense in the particular context. The school recognises that all teachers have a responsibility to teach numeracy when it arises naturally within the subject. Therefore, as such, all teachers are teachers of numeracy. Staff of Brecon High School share responsibility for the teaching of numeracy throughout the curriculum and recognise their statutory responsibilities, as outlined in National Literacy and Numeracy Framework as well as the school Skills Framework which uses a Teach-Apply-Consolidate model of delivery and review.

A numerate student is able to:

- have a sense of the size of a number and where it fits into the number system;
- recall mathematical facts confidently;
- calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies;
- use proportional reasoning to simplify and solve problems;
- use calculators and other ICT resources appropriately and effectively to solve mathematical problems, and select from the display the number of figures appropriate to the context of a calculation;
- use simple formulae and substitute numbers in them;
- measure and estimate measurements, choosing suitable units, and reading numbers correctly from a range of meters, dials and scales;

- calculate simple perimeters, areas and volumes, recognizing the degree of accuracy that can be achieved;
- understand and use measures of time and speed, and rates such as £ per hour or miles per litre;
- draw figures to given specifications and appreciate the concept of scale in geometrical drawings and maps;
- understand the difference between the mean, median and mode and the purpose for which each is used;
- collect data, discrete and continuous, and draw, interpret and predict, from graphs, diagrams, charts and tables;
- have some understanding of the measurement of probability and risk;
- explain methods and justify reasoning and conclusions, using correct mathematical terms;
- judge the reasonableness of solutions and check them when necessary;
- give results to a degree of accuracy to the context.

Why is numeracy development important?

Poor numeracy is a major, long-standing problem in education, business and indeed society. Many commentators, as well as those affected, have argued that it has been neglected as a national issue for far too long. According to a 2011 Skills for Life survey, almost 17 million adults in the UK have numeracy skills below those needed for the lowest grade at GCSE. The results from this survey are based on a sample of 7,000 adults aged between 16 and 65 normally resident in England. The low levels of numeracy were just as evident in the 16-25 year old cohort as in any other subgroup – and these are the learners who have gone through secondary school during the last ten years. In addition, the successful grasp of Numerical skills has a wider influence, it helps learners become ethical, informed citizens of Wales and the world by providing them with tools to analyse data critically, enabling them to develop informed views. This can be in the social, political, economic and environmental arena. It encourages clarity of thinking, allowing learners to understand and make reasoned decisions in matters that will be personal to them in the future e.g. managing of personal finance or effectively interpreting information and data to assess risk.

The importance of numeracy across the curriculum

Numeracy teaching should be employed across all learning areas (throughout the whole curriculum) to enhance, stimulate and support the pupils learning but these contexts must always be authentic and not ‘forced’.

For example

- Expressive Arts – counting, sequencing, time as well as proportions and fractions in Music; space, patterns, symmetry, shape used across the Arts

- Health & Wellbeing – financial literacy, risk, decision making and personal debt with its associated consequences
- Humanities – potential to collect primary data & then represent and identify trends. Skills such as understanding scale, ratio, rounding and ordering can be taught through worthwhile & authentic contexts.
- Science & Technology – inquiry again readily provides meaningful data and it is safe to say that the pupil’s learning in Science and Technology is underpinned by the progression in their Numerical understanding.

Strengthening numeracy across the curriculum will benefit students. They will develop confidence and proficiency in numerical skills as well as the wider use and application of mathematics. It will strengthen the school’s attainment at GCSE in maths, science and other subjects.

Aims

- To develop and improve standards in numeracy across the school for all our students.
- To establish and maintain consistency of practice including notation, vocabulary and methods.
- To identify and support areas for collaboration between subjects.
- To assist the transfer of students’ knowledge, skills and understanding between subjects.

Objectives

We will:

- develop a shared understanding between all staff of the role of numeracy in pupils' learning.
- involve all staff in the development and assessment of numeracy in their curriculum areas.
- devise whole-school strategies and systems for numeracy improvement.
- assess the numeracy attainments of all pupils, effectively.
- raise pupils' expectations of achievement.

Strategies

We will:

- ensure that all staff are given practical numeracy support and CPD. We will use research in cognitive science and evidence-based strategies to support numeracy development.

- support staff in identifying opportunities within their subject areas to promote numeracy development alongside the use of the BHS Numeracy Skills maps which identify numeracy priorities across the school year.
- allocate time within the school day for bespoke numeracy interventions.
- ensure that all pupils experience numeracy skills progression, regardless of their academic attainment.
- use baseline assessments to inform planning and monitor and track performance.
- promote good communication between all stakeholders.
- ensure consistency by producing a numeracy guide for staff with access to the online platform 'Sparx Maths' for consistent mathematical methods.

Roles and Responsibilities

Lead Practitioner for Skills

- To promote and monitor the implementation of the Numeracy policy and to evaluate its effectiveness.

Senior Leadership Team

- To take an active role in supporting the whole school initiative with the Lead Practitioner, supporting AoLEs in the implementation of the strategies and encouraging colleagues to share good practice.

Maths and Numeracy AoLE

- . Track numeracy skills at the 'Teach' phase of the numeracy skills map.
- Provide students with knowledge, skills and understanding they need to problem solve and comprehend mathematical concepts

AoLE Leads

- To lead and support activities in their team and disseminate pedagogy.
- To ensure learning schedules are planned to provide pupils with opportunities to develop their numeracy skills fully, according to the Numeracy Skills Map and Non-negotiables.
- To ensure that their team engages with pupil progress against LNF strands.

Teaching Staff

- Contribute to students' development of numeracy with consistent approaches to problem solving and communicating Numeracy.
- Check mathematical methods are consistent with 'Hegarty Maths'.

Learning Support Department

- To deliver specific interventions to groups of pupils and monitor the progress of these pupils.
- To ensure that resources are differentiated.
- To coordinate with departments to ensure in-class support is effective in supporting pupils to make progress.

Parents

- Encourage their children to use the range of strategies they have learnt to improve their levels of Numeracy. (Eg Bills, Shopping etc)

Students

- Take increasing responsibility for recognising their own Numeracy needs and making improvements.
- Be prepared for lessons with correct equipment, including a scientific calculator and a protractor.

Governors

- It is the role of the Governing Body to monitor and evaluate the effectiveness of this policy and its practice.

Monitoring and Evaluation

The success of this policy will be measured against the following criteria:

- Assessment data that is used to set targets, inform planning and build progression.
- The quality of the opportunities that are identified to improve students' numeracy skills.
- The improved quality of pupils' work shown through the tracking process and work scrutiny.
- Improved examination results measured against external criteria.

Possible methods of supporting the application of this policy across the school curriculum could include the following examples:

In...	Learners could...
Art	Apply number skills such as measurement, estimates, scale, proportion, pattern and shapes to develop, inform and resource their creative activities.
Design Technology	Use mathematical information and data, presented numerically and graphically, to research and develop their ideas. They use number to measure and calculate sizes, fits and materials.
English	Develop skills in the application of number through activities which include number rhymes, ordering events in time, gathering information in a variety of ways, including questionnaires; accessing, selecting, recording and presenting data in a variety of formats.
Geography	Apply number skills in the classroom and in fieldwork to measure, gather and analyse data. They use mathematical information to understand direction, distances and scale and to determine locations when using plans, maps and globes.
History	Develop their number skills through developing chronological awareness, using conventions relating to time, and making use of data, <i>e.g. census returns and statistics</i> .
Computer Science	Use mathematical information and data presented numerically and graphically in data-handling software. They use number to collect and enter data for interpretation in spreadsheets and simulations and present their findings as graphs and charts, checking accuracy before processing.

MFL	Develop number skills through a range of activities in the target language. These can include number rhymes; ordering numbers; ordering events in time; using number in relevant contexts such as currency exchange; gathering information in a variety of ways, including questionnaires and recording and presenting results in a variety of formats.
PSHE	Select data from given information presented in a range of numerical and graphical ways. Gather information in a variety of ways, including simple questionnaires or databases to support understanding of PSE-related issues [and in KS3 access and select data from relevant information presented in a variety of ways and from different sources], [and in KS4 select from and interpret a variety of methods of presenting data, including pie charts, scatter graphs and line graphs] to support understanding of PSE-related issues.
Physical Education	Develop their number skills by using mathematical information and data. They use the language of position (including co-ordinates and compass points) and movement, as well as data handling and measures in athletic and adventurous activities. They use scale in plans and maps. They measure and record performances, <i>e.g. time, distance and height</i> , and use the data to set targets and improve their performance.
Religious Education	Develop skills in the application of number by using information such as ordering events in time, by measuring time through the calendars of various religions, by calculating percentages of tithing, and by
	considering the significance of number within religions. They interpret results/data and present findings from questionnaires, graphs and other forms of data in order to draw conclusions and ask further questions about issues relating to religion and the world.
Science	Work quantitatively to estimate and measure using non-standard and then standard measures, recording the latter with appropriate S.I. units. They use tables, charts and graphs to record and present information. With increasing maturity they draw lines of best fit on line graphs, use some quantitative definitions and perform scientific calculations.

Appendix

Numeracy Skills Framework