

Bridlington School

Numeracy Policy

Numeracy is a proficiency which is developed mainly in mathematics but also in other subjects. It is more than an ability to do basic arithmetic. It involves developing confidence and competence with numbers and measures. It requires understanding of the number system, a repertoire of mathematical techniques, and an inclination and ability to solve quantitative or spatial problems in a range of contexts. Numeracy also demands understanding of the ways in which data is gathered by counting and measuring, and presented in graphs, diagrams, charts and tables.

(Department for Education (DFE))

Our Mission Statement:

Bridlington School is committed to raising the standards of numeracy of all of its students, so that they develop the ability to use numeracy skills effectively and with confidence in all areas of the school curriculum and later with the demands of further education, employment and adult life.

Policy Aims and Objectives

- To promote numeracy throughout the curriculum.
- To raise standards of numeracy by enhancing the quality of teaching and learning.
- To ensure the consistency of practice including methods and vocabulary, notation.
- To develop cross curricular use of numeracy by building opportunities for numeracy into all schemes of work.
- To raise the profile of numeracy in school.
- To provide effective numeracy intervention for students whose numeracy skills are below those expected for their chronological age.

The Numerate Student

The following guidelines summarise the numeracy skills required by students to be fully numerate. They are arranged in order from the least to the most challenging.

Students should:

- have a sense of the size of a number and where it fits into the number system.
- be able to do simple addition, subtraction, multiplication and division using either a mental or written method.
- make estimates of measurement and be able to identify different units of measurement.
- have a knowledge of the times tables either by recall or by adding on.
- be able to use mental methods to perform calculations involving addition, subtraction, multiplication and division of numbers including simple decimals.
- be able to convert between metric units.
- have a knowledge of simple equivalent fractions, decimals and percentages ($\frac{1}{2}$, 0.5, 50%, etc).
- be able to find a simple percentage of a quantity (10%, 25%, 50% and 100%).
- be able to perform simple calculations on fractions by cancelling common factors .
- be able to read information from simple diagrams, charts and graphs (bar charts, pictograms and pie charts).
- Be able to make sense of number problems and be able to identify the operations required to solve the problem.
- Be able to calculate accurately using a variety of strategies both mental and written methods, including two and three digit numbers and decimals
- be able to identify equivalent fractions, as well as their related decimals and percentages
- be able to find the percentage of a quantity with or without a calculator and understand problems involving percentage increase and decrease
- be able to explain their methods and reasoning for solving a problem using mathematical language
- be able to judge whether their answers are reasonable and have a range of strategies for checking their answers
- be able to explain and interpret charts, diagrams, graphs and tables.



Teaching Numeracy Skills

Numeracy skills are specifically taught using **Numeracy Ninjas** programme. This is a Key Stage 3 numeracy intervention designed to fill gaps in students' basic mental calculation strategies and also to empower them with the numeracy skills and fluency required to fully access GCSE Maths concepts when they move to Key Stage 4 study.

Through growth mind sets and the promotion of regular practice, the programme ensures students' perception of maths is positive and enjoyable.

Numeracy Ninjas forms part of all Key Stage 3 maths lessons. Each lesson students complete a **5 minute skills test** which includes:

- 10 questions on mental numeracy calculation strategies;
- 10 times tables questions
- 10 questions on key topics that must be mastered before studying GCSE Maths.

The tests are marked in class by students who record their **Ninja Score** out of 30. This corresponds to a particular colour **Ninja Belt**.

Teachers then discuss key mental numeracy strategies related to the questions with the class, before carrying on with their teaching of new learning material.

This little-and-often approach, in combination with a research-informed rota, which systematically plans the revisiting of skills, ensures students' improved numeracy skills and fluency are retained over time.



Numeracy Intervention – Numeracy Ninjas

In addition to the regularly Numeracy Ninja work, we run targeted numeracy intervention. This targets the specific skills covered in the numeracy ninja skills sheets which have been highlighted as weaknesses within collected data from each session. Identified students complete work based on their areas of weakness using the specifically designed Ninja worksheets.

Students below a green belt in year 7, below a red belt in year 8 and those in any year who have had key weaknesses identified by their class teacher have additional Numeracy Intervention sessions. These take place during tutor time on a 1:1 or 1:2 staff: student ratio. Targets are set based on the achievement of a specific colour of Ninja belt. Progress is tracked via results from subsequent Numeracy Ninja tests. Once the target belt has been achieved, the students are removed from the intervention program.

Maths Intervention

In addition to Numeracy intervention, the school provides Maths Intervention. This covers specific skills which have been highlighted as weaknesses in termly/half termly Maths assessments or teacher assessments.

Key Stage 3

Identified students complete a base line test. Results are used to set targets, and monitor progress throughout the intervention sessions. Progress is reviewed at the end of the intervention session period and targets are RAG rated and used to inform further target-setting and intervention if required.

Students selected for Maths Intervention sessions spend an extra one hour a week on a 1:3 or 1:4 teacher: student ratio. Appropriately differentiated tasks are delivered using a variety of different, interactive teaching styles, to promote independent learning skills and boost confidence.

At the end of each round of intervention a progress report (progress postcard) is sent home highlighting progress and further areas for improvement.

Key Stage 4

All students in Years 9, 10 and 11 complete regular half termly assessments. Year 11 also additionally complete 3 full GCSE mock exams during the academic year.

For Year 9 and 10, the half termly assessments highlight areas for improvement and students are given personalised targets and areas for

improvements. Classroom intervention is prioritised during lessons addressing these areas.

Additionally, Year 9 and 10 are offered after school intervention drop in sessions. Compulsory intervention for Year 9 and 10 starts in the spring term, following the first GCSE mock exam that takes place in the Autumn 2 term.

For Year 11, the mock exams throughout the year allow students and teachers to access RAG rated exam question analysis. This is used to identify mathematical areas for improvement and allow teachers to identify specific students that are at risk of underachieving. Identified students receive compulsory intervention after school for 1 hour per week.

All students in Year 11 are encouraged and/or directed to attend a suitable drop-in maths intervention session that caters for their individual needs. There are 5 separate 1 hour sessions that run every week, with specific sessions targeting key mathematical topics. These sessions are timetabled throughout the year and the timetable is issued to all students and parents in the autumn term.

Wave 1 and wave 2 intervention allows teachers to target small groups of 4/5 borderline students. These students receive intensive support to enable rapid progress in preparation for their GCSE exams.

Students in Year 11 also receive an additional 1 hour lesson per week within Positive Discipline time. These lessons are run by maths teachers. Students are encouraged to work independently on mathematical tasks, which consolidate learning from their maths lessons. This work is also personalised to individual student's needs.

Narrowing the Gap

Aim: To narrow the gap between the attainment of Pupil Premium and Non-Pupil Premium students in Maths.

As part of the overall Maths Intervention (See above) Pupil Premium pupils who are under achieving are identified by the and progress by the NTG coordinator. These pupils are targeted to attend specific intervention sessions as a priority and their progress monitored as above.

Cross Curricular Numeracy

In order to develop and promote numeracy skills, the school teaches numeracy across the curriculum, where the use of numeracy skills is relevant.

Role and Responsibilities:

a. The Cross-Curricular Leadership Team should:

- support the development and implementation of cross curricular numeracy policy at the School through Link work
- monitor the effectiveness of cross curricular strategy in raising standards of achievement
- provide INSET opportunities and resources for teachers and support staff as appropriate.

b. The Cross-Curricular Numeracy Coordinator should:

- work with the Cross-Curricular Leadership Team to determine a strategy for dealing with numeracy across the curriculum and to ensure the effective development of the whole School numeracy policy.
- monitor the implementation of the whole School numeracy policy through Schemes of Work
- evaluate the effectiveness of the strategy and modify it as necessary
- lead staff INSET on common practices and methods to be adopted across the whole School and provide exemplar materials for use in classroom
- work with departments and individual staff
- encourage teachers of Mathematics to provide assistance and advice to other departments so that a consistent approach is used across the whole School
- raise the profile of numeracy across the whole School and on the website
- seek opportunities for topics from other subjects to be used in mathematics lessons
- publicise mathematical methods to be used consistently across the School
- ensure that there is constructive communication between the Mathematics Department and the School's cluster primary phase schools.

c. All staff should:

- understand what numeracy is
- be aware of how they can support the delivery of numeracy within their subject

- ensure that numerical tasks included in their lessons are age and ability appropriate and used accurately
- consider numeracy in their short and mid term planning, using the Mathematics Department schemes of work, available on the School website, for guidance.

d. Heads of Department should ensure:

- schemes of work have opportunities for numeracy included and identified in them, where relevant;
- lesson plans include numeracy teaching and learning outcomes, where relevant;
- their department has a resource of relevant mathematical methods accessible to staff;
- their staff are aware of the Numeracy Policy and their responsibilities in terms of teaching numeracy and are trained and supported to teach numeracy effectively;
- the promotion of numeracy in lessons is, where appropriate, included in the regular monitoring of teaching and learning and departmental self-review;
- the Cross-Curricular Numeracy Coordinator is informed of the stage at which specific numeracy skills will be required within each subject or particular groups;
- mathematics teachers are provided with resources which will enable them to include applications of numeracy relating to other subjects in mathematics lessons.

Use of calculators

Departments should:

- indicate in their schemes of work when and where students are likely to require calculators;
- be clear when it would not be appropriate for students to use a calculator for their calculations.

Numeracy Teaching within Subjects:

Art and Design

Students use numeracy in many areas in Art and Design. Many patterns and constructions are based on special ideas and properties of shapes, including symmetry. Designs may need to be enlarged or reduced introducing ideas of ratio and scale factor. In areas of sculpture, proportion and measurement are used. When mixing paints and colours, students use ratio and proportion to produce different shades and colours from the three primary colours.

Business Studies

Numeracy is an essential element of all Business Studies courses. Students use numeracy in both the creation and interpretation of graphs, charts and tables. Percentages are widely used in data comparisons. Students need to be able to estimate using mental calculations but they also need to be confident in the use of a calculator. Skills of analysis are involved when looking at primary and secondary data and in the scrutiny of questionnaire results. Students also use Excel spreadsheets.

Child Development

Students use graphs, charts and measurement skills when learning about nutrition and read data when comparing actual and expected growth rates in young children.

English/Drama

Numeracy is not actively used in English, but does come up in activities associated with texts e.g. contextual work on wages in past times. Timelines are used to set a piece of work within its historical background and graphs can be used to show changes in the emotions of characters.

Geography

Numeracy is used in many aspects of learning in Geography. Scale, direction, ratio and distance are used in map reading. Graphs and charts are used in the interpretation of patterns and trends. Students generate, analyse and present data through fieldwork investigations.

History

Numeracy is used in the interpretation and construction of timelines and chronology and when analysing numerical sources, for example, the military strength of countries at the start of World War One. Students use statistics when looking at economic changes. Graphs and tables are used in the presentation of evidence.

Information and Communication Technology (ICT)

Students will apply numeracy in a variety of ways in ICT lessons. These include collecting and classifying data and entering it into software, producing graphs and tables, interpreting and explaining their results. When students use computer models they will use their ability to interpret numbers and identify patterns and relationships. When designing power point presentations or websites, students will use proportion and their knowledge of shape and space as well as an understanding of enlargement when changing the size of an object. Other numerical skills are used when using formula and formatting within Excel spreadsheets.

Modern Foreign Languages (MFL)

Students use numeracy in MFL when learning to tell the time in Year 7, calculating café bills in Year 8, handling money, working on days and dates and doing simple arithmetic calculations involving addition, subtraction and

multiplication. Work in MFL offers some students the additional opportunity they need to grasp the fundamentals of number work.

Music

The counting of time, beats and half beats are used extensively in Music, as are rhythms and rhythm patterns.

Physical Education

Athletic activities require measurement of height, distance, time, speed and symmetry. Movement and direction are used in areas of dance, gymnastics and ball games. Students also use their numeracy skills when evaluating their own performance over a period of time.

Science

Scientific investigations and experiments require students to use their numeracy skills to classify objects, accurately measure distances and quantities, estimate outcomes and quantities when required, recording results in tables and graphs. In Science, students will order positive and negative numbers, including decimals, calculate means of a set of data and calculate percentages of a quantity. At a higher level students will apply their algebra skills to substitute into formulae and rearrange scientific equations. Choosing an appropriate graph and being able to interpret data and make predictions will also take place in Science lessons.

Philosophy and Ethics

Belief and likelihood in religious education relates to numeracy. The discussion of moral and social issues can lead to the use of primary and secondary data and the interpretation of graphs, charts and tables helps students to make informed decisions and judgements and to recognise biased data and misleading representations. By applying numeracy skills to problems set in financial and other real life contexts, students will develop their financial capability and awareness of the applications of real life numeracy.

Technology

Measuring is used extensively in all areas of technology, involving the use of both metric and imperial units. When making models or constructions students work in millimetres and are required to measure accurately using this unit. The need for plans requires students to be able to produce scale drawings and be able to draw 2D representations of 3D shapes. Identifying and drawing plans and elevations of 3D shapes are also used when planning project work. In Food Technology students require an understanding of proportion when working with and adapting recipes. Students also use percentages when identifying the nutritional content of different foods. In Textiles shape and measurement are used when designing and making different items. 2D shapes and tessellations are used in some designs.