

HELLESDON HIGH SCHOOL

NUMERACY POLICY

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Signed:



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Chair

Introduction

Hellesdon High school is committed to raising the standards of numeracy of all its students, so that they develop the ability to use numeracy skills effectively in all areas of the curriculum and the skills necessary to cope confidently with the demands of continuing education, employment and adult life. All teachers and support staff have a role to play in supporting students' progress in numeracy.

1. Definition of Numeracy

Numeracy is a proficiency which involves confidence and competence with numbers and measures. It is more than an ability to do basic arithmetic. It requires understanding of the number system, a range of mathematical techniques and an inclination and ability to solve quantitative or spatial problems in a range of contexts. It demands an understanding of the ways in which data are gathered by counting and measuring, and presented in graphs, diagrams, charts and tables. (Department of Children, Families and Schools (DCFS))

2. Policy Aims and Objectives

- to promote numeracy throughout the curriculum
- to raise standards of numeracy by enhancing the quality of teaching and learning
- to develop cross curricular use of numeracy by building opportunities for numeracy into all schemes of work
- to raise the profile of numeracy in the School
- to provide staff training when necessary

3. The Numerate Student

The following guidelines summarise the numeracy skills students, of different abilities, should have.

a. All 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.

b. More able students should:

- 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 fractions by cancelling common factors
- be able to read information from simple diagrams, charts and graphs (bar charts, pictograms and pie charts)
- make sense of number problems and be able to identify the operations required to solve the problem.

c. High ability students should:

- 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
- explain their methods and reasoning for solving a problem using mathematical language
- judge whether their answers are reasonable and have a range of strategies for checking their answers
- explain and interpret charts, diagrams, graphs and tables

4. Leadership and Management of Cross-Curricular Numeracy

a. It is the Role of the Leadership Team to:

- support the development and implementation of cross curricular numeracy policy at the School through Link work
- determine the role of the Numeracy Champion
- 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. It is the Role of the Numeracy Champion / Head of Mathematics to:

- work with the 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. The Role of Staff

In order for the cross curricular strategy to be effective, it is important that all staff:

- understand what numeracy is
- are 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. The Role of Heads of Departments

In order that the policy becomes whole School practice, it is important that Heads of Department ensure that:

- schemes of work have opportunities for numeracy included and identified
- lesson plans include relevant numeracy learning outcomes
- each department has a resource of relevant mathematical methods accessible to staff
- new staff are aware of the Numeracy Policy and its inclusion in the subject
- the promotion of numeracy in lessons is included in the regular monitoring of teaching and learning and departmental self-review

- the Numeracy Champion is informed of the stage at which specific numeracy skills will be required for particular groups
- mathematics teachers are provided with resources which will enable them to include applications of numeracy relating to other subjects in mathematics lessons

6. The 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

7. How Numeracy is Incorporated across the Curriculum

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 Care

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 will 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.

Social Science and Religious Education

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.