

Kilwinning Academy

Numeracy Across the Curriculum

Ambition

Inspiration

Belonging

Respect



Dedication

Responsibility

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All teachers have responsibility for promoting the development of numeracy. With an increased emphasis upon numeracy for all young people, teachers will need to plan to revisit and consolidate numeracy skills throughout schooling.

Building the Curriculum 1

Our aim is to raise the attainment of all pupils by seeking to develop their numeracy skills by consistent and accurate application across the curriculum.

Introduction

Numeracy is a fundamental life skill.

Being numerate involves developing a confidence and competence in using number that allows individuals to solve problems, interpret and analyse information, make informed decisions, function responsibly in everyday life and contribute effectively to society. It gives increased opportunities within the world of work and sets down foundations which can be built upon through life-long learning.

Whilst Numeracy is a subset of Mathematics, it is a core skill which permeates all areas of learning, allowing pupils the opportunity to access the wider curriculum.

Numerical skills can be consolidated and enhanced when pupils have opportunities to apply and develop them across the curriculum. Poor numerical skills hold back pupils' progress and can lower their self-esteem. It is therefore important that all teachers look for opportunities to develop and reinforce numeracy skills within their own activities and through inter-disciplinary projects and studies.

The teaching of numeracy is the responsibility of all staff and the school's approaches should be as consistent as possible across the curriculum.

All teachers should consider pupils' ability to cope with the numerical demands of everyday life and provide opportunities to:

- Handle number and measurement competently, mentally, orally and in writing
- Use calculators accurately, effectively and appropriately
- Interpret and use numerical and statistical data represented in a variety of ways.

Numeracy Themes

The Numeracy outcomes are based around the following themes.

- Estimation and rounding
- Number and number processes
- Fractions, decimal fractions and percentages
- Money
- Time
- Measurement
- Data and analysis
- Ideas of chance and uncertainty

It is useful to understand why some learning outcomes are designated Numeracy and others Mathematics. Numeracy outcomes are those which promote the development of the number-based skills that are needed regularly by everyone in their lives.

To illustrate this, consider fractions. Some aspects of fractions have been identified as numeracy skills and others as Mathematics. For example, most people will have the need to find a fraction of an amount and, for this reason, this skill has been considered as numeracy. On the other hand, few people regularly need to add or subtract fractions, and therefore this aspect of fractions will sit within Mathematics.

Similarly, some aspects of information handling have been included within the numeracy outcomes, whilst others will be covered within the Mathematics outcomes. Almost daily, people have the need to find information. Additionally, we are bombarded with data, through advertising and the media, which we must evaluate for robustness and accuracy and interpret for meaning. Because of this, the sourcing and interpretation of data has been included within the Numeracy outcomes. Whilst it is important that we all have an understanding of how statistics are used to convey information, for most of us, making statistical calculations is not a frequent necessity. Similarly, few of us are required to produce graphs on a regular basis.

Calculating statistical information and presenting data graphically are therefore included as important mathematics outcomes.

Development of Numeracy

It is important to note that in any mixed ability class pupils will be at a variety of stages in their level of Numeracy. It cannot be assumed that all pupils in a class will have the skill required to tackle a particular piece of number work. Even if a skill, has been taught in the Mathematics Department many pupils will find it difficult to transfer their knowledge to a new context.

It will always be better to teach the required skill or at least check that it is present before asking pupils to use it in the lesson.

In order to reduce confusion and improve understanding and retention it is important that all teachers teaching numeracy skills use the same methods.

Departmental Guidelines

As a teacher if you help children to acquire proficiency skills in numeracy. The outcome should be numerate pupils who are confident enough to apply their knowledge and understanding to tackle mathematical problems without going immediately to teachers or friends for help.

Approaches

- Have the highest expectations of the students to ensure that the numerical content is of a high standard
- Discourage students from writing down answers only and encourage them to show their numerical working out within the main body of their work.
- Encourage the use of estimation particularly for checking work.
- Encourage students to write mathematically correct statements.
- Recognise that there is never only one correct method and students will be encouraged to develop their own where appropriate rather than be taught 'set' ways.
- Allow and encourage students to 'vocalise' their maths - a necessary step towards full understanding for many students.
- Help students to understand the methods they are using or being taught - students gain more and are likely to remember much more easily if they understand rather than are merely repeating by rote.
- Encourage pupils to use non-calculator methods whenever possible.
- Encourage students to use the correct language e.g. use the word mean rather than average.
- Encourage pupils to use ICT to enhance their learning. **Appendix 1**



Sciences

Almost every scientific experiment or investigation is likely to require some mathematical skills in classifying, counting, measuring, calculating, estimating and recording in charts, tables or graphs. Science will provide a wide range of situations in which numeracy skills will be required in real life contexts.

Computing and Business Education



Within Business Education pupils will learn to budget effectively including the use of spread sheets as part of personal finance. Computing require pupils to use a variety of methods to solve number problems in familiar context involving binary scale and conversion of units.



Social Subjects and RE

In History and Geography pupils may collect data by measuring or counting and record results in the form of charts, tables or graphs. They will also need to interpret data presented in the form of charts and graphs. Historical ideas require an understanding of time and timelines similar to the number line.

Map skills require the understanding of coordinates and ideas of angles, directions, positions, scale and ratios.



Music

“Music” wrote the great 17th century German mathematician Gottfried Leibniz “is the sensation of counting without being aware you were counting”

Links between numeracy and music have been established for centuries and properties of numbers and patterns have helped shape musical culture in a variety of ways.

For example, composers and mathematicians are often drawn to the same structures for their compositions. Bach's Goldberg Variations depend on games of symmetry to create the progression from theme to variation. Messiaen is drawn to prime numbers to create a sense of unease and timelessness in his famous Quartet for the End of Time. Schoenberg's 12-tone system, which influenced so many of the major composers of the 20th century, including Webern, Berg and Stravinsky, is underpinned by mathematical structure. The organic sense of growth found in the Fibonacci sequence of numbers 1,2,3,5,8,13 . . . has been an appealing framework for many composers, from Bartók to Debussy.

Rhythm depends on numerical structure, harmony draws from basic numerical relationships, and the development of musical themes reflects the world of symmetry and geometry. As Stravinsky once said "The musician should find in mathematics a study as useful to him as the learning of another language is to a poet. Mathematics swims seductively just below the surface."

Liaison with Cluster Primary Schools

This document will form the bases for discussions with our cluster schools with a view to finding a common approach not only across faculties but across each of the Cluster Primary Schools.

Evaluating the Policy

After one year the Faculty Head of Mathematics will check, via a questionnaire that staff are operating the policy and seek information on any changes required.