

RAINHAM MARK GRAMMAR SCHOOL

Numeracy and Mathematical Thinking Policy

Review Body:	Senior Leadership Team
Leadership Group Responsibility:	Head of Mathematics
Type of Policy:	Non Statutory
Reviewed:	September 2020

Introduction

Rainham Mark Grammar School is committed to raising the standards of numeracy and mathematical thinking of all its students so they develop the ability to be logical and use numeracy and mathematical thinking effectively in all areas of the curriculum, together with the skills necessary to cope confidently with the demands of further education, employment and adult life. Almost all subjects depend on students having competence in basic numeracy and mathematical thinking skills so there is a need within the school to develop the students' abilities to transfer mathematical skills into other subject areas and to apply these techniques to problem solving.

We therefore aim to:

- Deepen awareness and improve standards of numeracy and mathematical thinking across the school.
- Ensure consistency of practice including methods, vocabulary and notation.
- Indicate areas for collaboration between subjects.
- Assist the transfer of students' knowledge, skills and understanding between subjects.

Numeracy and mathematical thinking skills required outside of Mathematics include:

- Developing logical thought, being aware of underlying assumptions and explaining methods, reasoning and conclusions.
- Analysing problems and using what is known to work out answers mentally.
- Order of magnitude: having a sense of the size of a number and where it fits into the number system.
- Estimating the results of all calculations and knowing when answers are reasonable, giving results to an appropriate degree of accuracy.
- Rates of change: gain an awareness of quantities or qualities that change over time, and how quickly they change
- Being aware of the effects of uncertainty, probability and risk.
- Reading numbers correctly from a range of meters, dials and scales.
- Knowing basic number facts and recalling them quickly and confidently.
- Recognising the operation(s) needed to work confidently with numbers including integers and fractions.
- Understanding and using correct mathematical notation and terminology.
- Using units of measurement of length, angle, mass, capacity and utilising suitable units for measuring these quantities.
- Measuring and estimating measurements, choosing suitable units and calculating simple perimeters, areas and volumes.
- Understanding and using compound measures and rates.
- Drawing plan figures for given specifications and appreciating the concept of scale in geometrical drawings and maps.
- Being able to manipulate algebraic expressions and simple formulae and substituting numbers in them.
- Collecting data, discrete and continuous, and drawing, interpreting and predicting from graphs, diagrams, charts and tables.

- Understanding averages and the pros and cons of using the mean, median and mode in different scenarios.

Implementation:

Teachers of subjects other than Mathematics are expected to consult with the Mathematics Department if they need to know how an area of numeracy and mathematical thinking is taught. Colleagues should aim to

- Be familiar with correct mathematical language, notation, conventions and techniques, relating Mathematics to their own subject, and encourage students to use these correctly.
- Provide information for Mathematics teachers on the stage in their Programmes of Study at which specific numeracy and mathematical thinking skills will be required for particular groups.
- Provide resources for Mathematics teachers to enable them to use examples of applications of numeracy and mathematical thinking relating to their subjects in Mathematics lessons.

Teachers of Mathematics should aim to:

- Be aware of the mathematical techniques used in other subjects and provide assistance and advice to other departments so that correct and consistent approaches are used in all subjects.
- Provide information for other subject teachers on appropriate expectations of students and challenges likely to be experienced in various age and ability groups.
- Through liaison with other teachers, attempt to ensure that students have appropriate numeracy and mathematical thinking skills by the time they are needed for work in other subjects across the curriculum.
- To seek opportunities to use functional skills questions which demonstrate the application of numeracy and mathematical thinking in other subjects.