Mathematics at Key Stage 3
At Key Stage 3, pupils are taught in mixed ability classes, where lesson tasks and content are differentiated according to ability.

Curriculum Content

The Mathematics Curriculum at QEGS broadly follows the National Framework for Secondary Mathematics, with pupils studying in four main curriculum areas:

☐Number

rational numbers, their properties and their different representations
rules of arithmetic applied to calculations and manipulations with rational numbers
applications of ratio and proportion
accuracy and rounding

☐Algebra (including graphs)

algebra as generalised arithmetic
linear equations, formulae, expressions and identities
analytical, graphical and numerical methods for solving equations

☐Geometry & Measures

properties of 2D and 3D shapes
constructions, loci and bearings
Pythagoras' theorem
transformations
similarity, including the use of scale
points, lines and shapes in 2D coordinate systems
units, compound measures and conversions
perimeters, areas, surface areas and volumes

☐Statistics

the handling data cycle
presentation and analysis of grouped and ungrouped data, including time series and lines of best fit
measures of central tendency and spread
experimental and theoretical probabilities, including those based on equally likely outcomes

Knowledge, skills and understanding

These are the essential skills and processes in mathematics that pupils need to learn to make progress:

☐Applications and implications of mathematics

knowing that mathematics is a rigorous, coherent discipline
understanding that mathematics is used as a tool in a wide range of contexts
recognising the rich historical and cultural roots of mathematics
engaging in mathematics as an interesting and worthwhile activity
knowing that mathematics is essentially abstract and can be used to model, interpret or represent situations
recognising the limitations and scope of a model or representation

☐Representing

Pupils should be able to:
identify the mathematical aspects of a situation or problem
choose between representations
simplify the situation or problem in order to represent it mathematically, using appropriate variables, symbols, diagrams and models
select mathematical information, methods and tools to use

☐Analysing - Use mathematical reasoning & appropriate mathematical procedures

Pupils should be able to:
make connections within mathematics
use knowledge of related problems
visualise and work with dynamic images
identify and classify patterns
make and begin to justify conjectures and generalisations, considering special cases and counter-examples
explore the effects of varying values and look for invariance and covariance
take account of feedback and learn from mistakes
work logically towards results and solutions, recognising the impact of constraints and assumptions
appreciate that there are a number of different techniques that can be used to analyse a situation, reasoning inductively
make accurate mathematical diagrams, graphs and constructions on paper and on screen
calculate accurately, selecting mental methods or calculating devices as appropriate
manipulate numbers, algebraic expressions and equations and apply routine algorithms
use accurate notation, including correct syntax when using ICT
record methods, solutions and conclusions
estimate, approximate and check working

☐Interpreting and evaluating

Pupils should be able to:
form convincing arguments based on findings and make general statements
consider the assumptions made and the appropriateness and accuracy of results and conclusions
be aware of the strength of empirical evidence and appreciate the difference between evidence and proof
look at data to find patterns and exceptions
relate findings to the original context, identifying whether they support or refute conjectures
engage with someone else's mathematical reasoning in the context of a problem or particular situation
consider the effectiveness of alternative strategies

☐Communicating and reflecting

Pupils should be able to:
communicate findings effectively
engage in mathematical discussion of results
consider the elegance and efficiency of alternative solutions
look for equivalence in relation to both the different approaches to the problem and different problems with similar structures
make connections between the current situation and outcomes, and situations and outcomes they have already

Assessment Opportunities

There are regular assessment opportunities throughout Key Stage 3:

☐**Regular homework tasks, including reflective and revision tasks**

☐**MyMaths.co.uk online tasks**

☐**Regular progress tests**

☐**United Kingdom Intermediate Mathematical Challenge (Year 9)**

☐**United Kingdom Junior Mathematical Challenge (Years 7 and 8)**

☐**End of year examination**