

Mathematics: Year 9 (higher)

Intent:

At Brayton Academy, we recognise the importance of mathematics as a life skill in society and industry, as well as a beautiful and elegant subject in its own right.

We have carefully sequenced the foundational skills to be consistently developed throughout pupils' time at school, to provide students with the fluency they need to tackle problems confidently.

Our curriculum is grounded in using assessment to identify where students are and builds up knowledge securely to ensure no gaps are left. Our expectations are very high; we expect pupils to take pride in their work, to complete homework to a high standard, bring a positive attitude to the classroom and always strive to be their best. This goes hand-in-hand with helping students to develop a love of learning maths by supporting them to be successful at every step through expert teaching. We believe that all students have the potential to learn maths to a high level when we take this approach.

- Create an atmosphere where ALL students feel comfortable to give their all to learning maths without being scared of making mistakes
- Open ALL students' eyes to the real world transferable skills that maths equips them with and the opportunities that arise from this
- Encourage ALL students to further develop their resilience skills with a determined mind-set when approaching new material and problem-solving tasks
- Eliminate any fear of maths through meeting ALL students at their level and supporting them to be successful

Implementation:

In year 9 pupils begin studying either the higher or foundation GCSE course. Staff constantly assess whether pupils are in the appropriate band and there is still the opportunity to move between tiers throughout the year if appropriate.

Pupils following the higher programme of study will begin to learn content that is exclusive to the higher paper in year 9. Staff still use start of topic assessments to ascertain where their classes are and foundation knowledge will be re-covered if needed. In this year students will significantly develop their algebra skills beyond what is required at foundation level and will look much more at how skills are strung together in "exam-style" questions than they did in years 7 and 8. Staff will begin to identify which students they think have the potential to study GCSE Further Mathematics in year 11 and stretch these pupils accordingly.

Throughout the year pupils will be set homework on the Hegarty Maths platform that will revise content they have already studied, rather than focusing on what they are currently looking at in class. This gives them another opportunity to ensure that previously studied material is retained.

The following table lists core skills only. These are the concepts all pupils are expected to master. Some students will go on to study related extension material.

Term		Year 9 (higher)	
	Topic	Knowledge	Skills/Assessment
Term 1	Number	Prime factors, raise numbers to negative and fractional indices, write a number as a product of its prime factors, use this to find HCF and LCM	<p>All topics begin with an initial assessment, and prior knowledge gaps are filled in before moving on to new content.</p> <p>Pupils complete a revision quiz part-way through each half term to be marked by their teacher. This will allow gaps to be closed before the end of half-term assessment.</p> <p>At the end of each half-term there will be an assessment on all of the topics pupils have studied in that block.</p>
	Angles	Angles between parallel lines, the interior/ exterior angle sum of any polygon, multi-step problems	
	Congruence and similarity	Recognise the conditions for triangles to be congruent, use similarity to find missing lengths on shapes, apply similarity to area and volume	
	Algebra	Revision of solving linear equations including those involving simple algebraic fractions, factorise into a single bracket, expand and factorise double brackets and use to solve quadratic equations, rearrange equations	
	Fractions	Perform all 4 operations with mixed numbers, convert between fractions, decimals and percentages to solve problems including ordering	
	Coordinates and linear graphs	Use tables of values to plot linear, quadratic, cubic and reciprocal graphs, solve problems using $y=mx+c$, apply Pythagoras to coordinate grid problems	
	Rounding and bounds	Estimate answers to complex real life problems using rounding, write down the error interval for a number that has been rounded or truncated, find the maximum and minimum possible values for a calculation using bounds	
Term 2	Sequences	Numerical and algebraic Fibonacci sequences, nth term rules of linear and quadratic sequences, write and solve equations to determine if a number is a term in a sequence	<p>All topics begin with an initial assessment, and prior knowledge gaps are filled in before moving on to new content.</p> <p>Pupils complete a revision quiz part-way through each half term to be marked by their teacher. This will allow gaps to be closed before the end of half-term assessment.</p> <p>At the end of each half-term there will be an assessment on all of the topics pupils have studied in that block.</p>
	2D representation of 3D shapes	Draw to-scale plans and elevations including scales written as fractions or ratios	
	Collecting and representing data	Scatter graphs, averages from grouped data tables, cumulative frequency diagrams, box plots, histograms	
	Area and perimeter	Calculate the area and perimeter of any shape, including compound shapes containing circles or simple fractions of circle, work backwards with these	
	Measures	Convert between any units of measure, use the formulae for speed, density and pressure, perform increasingly difficult compound measures calculations that involve converting between units	
	Percentages	Reverse percentage problems, combine successive decimal multipliers including for compound interest and depreciation	
Term 3	Scale diagrams and bearings	Combine scale diagrams and bearings knowledge to solve problems, apply angle rules regarding parallel lines and Pythagoras to bearings problems	<p>All topics begin with an initial assessment, and prior knowledge gaps are filled in before moving on to new content.</p> <p>Pupils complete a revision quiz part-way through each half term to be marked by their teacher. This will allow gaps to be closed before the end of half-term assessment.</p> <p>At the end of each half-term there will be an assessment on all of the topics pupils have studied in that block.</p>
	Quadratics and cubics	Factorise double brackets where the coefficient of x^2 is not 1, expand triple brackets, solve quadratic equations and inequalities using the formula and factorising	
	Transformations	Perform any transformation including enlargements by negative scale factors and reflections in lines with equations of the form $y=mx+c$	
	Surds	Multiply, divide and simplify surds, add and subtract surds, expand brackets containing surds, rationalise the denominator of an expression	
	Pythagoras and trigonometry	Find missing sides and angles in right-angled triangles using Pythagoras/ trigonometry, including trigonometry with exact values (non-calculator), multi-step problems combining both techniques	