

Mathematics: Year 11 (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 11 pupils continue to study either the higher or foundation GCSE course. Teaching staff work closely with the head of mathematics to ensure that all pupils are entered for the correct tier. Students predicted to achieve a grade 7 or above will also be encouraged to enter for GCSE Further Mathematics. This will be decided in conversation with each individual pupil, in consultation with their parents or carers. This gives those able to opportunity to study material beyond the scope of GCSE mathematics and is an excellent opportunity to showcase their mathematical prowess. They will be supported in this by their class teacher.

A significant amount of time in year 11 is allocated for revision to consolidate previously studied material and to allow pupils ample time to prepare for the demands of a GCSE exam paper. Staff use information from the 2 mock exam series that pupils sit to guide them as to what should be covered, as well as each class' year 10 assessment data. As the exam season approaches class time will increasingly be given over to exam paper practice.

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. In year 11 pupils will also receive weekly partial papers to complete at home. These begin with just the first section of the exam paper and gradually build up over time to encompass the full paper.

Term	Year 11 (higher)		
	Topic	Knowledge	Skills/Assessment
Term 1	Function notation	Understand the function notation for substitution, solving, inverse functions and compound functions	<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>
	Inequalities regions	Solve any linear or quadratic inequality, use sketches of graphs to test critical values, revise inequalities regions on graphs	
	Algebraic fractions	Perform the 4 operations with algebraic fractions, solve equations and inequalities involving algebraic fractions, including those resulting in a quadratic	
	Congruence and similarity	Form fully reasoned proofs for congruent and similar shapes	
	Equation of a circle	Write the equation of any circle centred on the origin, write the equation of radii and tangents to circles through given points	
	Sketching and transforming graphs	Sketch the graphs of trigonometric functions, recognise how changes to a function will transform the graph of that function	
	Vectors	Describe movements using algebraic vectors including combining with fraction and ratio skills, prove algebraically that 2 vectors are parallel or lie on a straight line	
Term 2	Sequences	Nth term rules of linear and quadratic sequences, identifying common ratios of geometric sequences and continuing geometric sequences (including algebraic geometric sequences)	<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>
	Algebraic proof	Understand the algebraic notation for consecutive numbers, consecutive square numbers, even numbers and odd numbers and combine these to form fully reasoned proofs	
	Iteration	Prove a solution lies between 2 integers, rearrange an equation to give one that can be used for iteration, use iteration to approximate solutions	
Term 3	Exponential functions	Recognise and plot exponential graphs, given coordinates on an exponential graph deduce the equation	<p>During this part of the year pupils will complete formal mock examinations. The results from this will be used alongside other data to write personalised revision plans for each class.</p>
	Revision and exam preparation	During the final part of the year pupils will complete whole class revision on areas of weakness identified by their teachers. They will also be signposted to specific areas of weakness for them to address individually and complete exam paper practise on whole papers and specific topics	<p>Students will regularly complete past exam papers during this period of time, including additional papers completed in exam conditions during lessons, and these will be marked by the class teacher and used to refine their planning.</p>