Mathematics: Year 10 (foundation)

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 10 pupils continue to study 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 in foundation classes who show the potential to achieve a grade 6 will study selected higher material as extensions to individual topics, with the aim of them sitting a higher paper in year 11.
By the end of year 10 pupils will have studied the majority of content that is tested on the foundation paper. Increasingly this year pupils will look at how to apply their mathematical knowledge to the context of "exam-style" questions, including an emphasis on problem solving that is necessary for success at the new GCSE. The focus that we place on constant revision is now even more important as pupils will need to have as much knowledge as possible at their fingertips as they enter final preparations for GCSE in year 11.

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 10 (foundation)		
	Topic	**Knowledge**	**Skills/Assessment**
Term 1	**Circumference and area**	Use the formulae for area and circumference, including in reverse, calculate the area and perimeter of simple fractions of circles, calculate the area and perimeter of compound shapes involving circles and simple fractions of circles	All topics begin with an initial assessment, and prior knowledge gaps are filled in before moving on to new content. 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. At the end of each half-term there will be an assessment on all of the topics pupils have studied in that block.
	Properties of polygons	A revision and application of plans and elevations, angle rules and angle rules with algebra	
	Indices	Apply any positive or negative integer power to a number as well as unit fraction powers, simplify expressions using the 3 index laws	
	Fractions, ratio and proportion	Closing of any identified gaps in fractions knowledge, questions combining fractions, ratio and percentages, direct and inverse proportion worded questions	
	Graphs	Plot linear and quadratic graphs using tables of values, write the equation of a graph, plot a graph given its equation without using a table of values	
	Constructions and loci	Construct a perpendicular to a line from/at any given point, apply construction skills to solve contextual loci problems	
Term 2	**Scatter graphs**	Understand correlation, use scatter graphs to make estimates, understand the limits of scatter graphs	All topics begin with an initial assessment, and prior knowledge gaps are filled in before moving on to new content. 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. At the end of each half-term there will be an assessment on all of the topics pupils have studied in that block.
	Percentages	Combine successive multipliers including for compound interest and depreciation, solve problems involving reverse percentages	
	Algebra: quadratics	Factorise into double brackets and use for solving, rearranging equations, link the roots of quadratic equations to x-axis intersections on graphs	
	Probability	The product rule for counting, tree diagrams, Venn diagrams and set notation	
	Trigonometry	Use trigonometric ratios to find missing lengths and angles in right-angled triangles, link trigonometry to bearings	
	Real life graphs	Distance-time graphs, conversion graphs, cost graphs	
Term 3	**Algebra and graphs**	Solve or rearrange all forms of linear equation on the foundation GCSE, find the equation of a line parallel to one given that passes through a given point	All topics begin with an initial assessment, and prior knowledge gaps are filled in before moving on to new content. 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. At the end of each half-term there will be an assessment on all of the topics pupils have studied in that block.
	Simultaneous equations	Solve linear and quadratic simultaneous equations graphically, solve linear simultaneous equations algebraically, form and solve simultaneous equations from worded contexts	
	Volume	Calculate the volume of any prims, cones, spheres and pyramids	
	Surds	Simplify expressions involving surds by multiplying, dividing, adding and subtracting, write a surd in its simplest form, multiply brackets containing surds	
	Congruence and similarity	Know and apply the congruency conditions for triangles, use similarity of shapes to calculate missing lengths and angles, combine knowledge angle rules/ Pythagoras etc. to derive simple congruency proofs	