Eastlea COMMUNITY SCHOOL

Mathematics Curriculum Key Stage 4

Vision

The Mathematics Department aims to build and uphold a rich, diverse and challenging curriculum that is deep and intense in subject knowledge, which not only meets the needs of the annual examinations but simultaneously is inclusive of the needs of all students. We aim to prepare students with the confidence and mathematical skills required in life and the workplace. Our syllabus is led by the national curriculum with a range of tasks that emphasise problem solving, investigations and practical activities. This encourages students to become independent learners.

Students are set from Year 7 through to Year 11. Students are placed initially according to prior attainment and this is subsequently reevaluated on a regular basis.

The key concepts are extended further at Key Stage 4, so students are taught so they:

Develop Fluency

- Consolidate their numerical and mathematical capability from key stage 3 and extend their understanding of the number system to include powers, roots {and fractional indices};
- Select and use appropriate calculation strategies to solve increasingly complex problems, including exact calculations involving multiples of π {and surds}, use of standard form and application and interpretation of limits of accuracy;
- Consolidate their algebraic capability from Key Stage 3 and extend their understanding of algebraic simplification and manipulation to include quadratic expressions, {and expressions involving surds and algebraic fractions};
- Extend fluency with expressions and equations from Key Stage 3, to include quadratic equations, simultaneous equations and inequalities;
- Move freely between different numerical, algebraic, graphical and diagrammatic representations, including linear, quadratic, reciprocal, {exponential and trigonometric} functions.
- Use mathematical language and properties precisely.

Reason Mathematically

- Extend and formalise their knowledge of ratio and proportion, including trigonometric ratios, in working with measures and geometry, and in working with proportional relations algebraically and graphically;
- Extend their ability to identify variables and express relations between variables algebraically and graphically;
- Make and test conjectures about the generalisations that underlie patterns and relationships; look for proofs or counter-examples; begin to use algebra to support and construct arguments {and proofs};
- Reason deductively in geometry, number and algebra, including using geometrical constructions;
- Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning;
- Explore what can and cannot be inferred in statistical and probabilistic settings, and express their arguments formally;
- Assess the validity of an argument and the accuracy of a given way of presenting information.

Solve Problems

- Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial contexts;
- Make and use connections between different parts of mathematics to solve problems;
- Model situations mathematically and express the results using a range of formal mathematical representations, reflecting on how their solutions may have been affected by any modelling assumptions;
- Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem;

Teaching and Learning

There are **six** key strands of Mathematics taught as part of the national curriculum, which are weighted differently depending on the tier of examination:

1. Number
    - Structure and calculation
    - Fractions, decimals and percentages
    - Measures and accuracy
2. Algebra
    - Notation, vocabulary and manipulation
    - Graphs
    - Solving equations and inequalities
    - Sequences
3. Ratio, proportion and rates of change
4. Geometry and measures
    - Properties and constructions
    - Mensuration and calculations
    - Vectors
5. Probability
6. Statistics

Extra Curricular Activities and Homework

Homework Clubs
UKMT
STEM Club

Programmes of Study for KS4 (Foundation)

KS4	YEAR 10	YEAR 11
Term	**GCSE (9-1) Foundation**	**GCSE (9-1) Foundation**
Autumn	Unit 1 Number 1	Unit 19 Bearings
	Unit 2 Algebra 1	Unit 20 Constructions and Loci
	Unit 3 Number 2	Unit 21 Quadratics
	Unit 4 Statistics	Unit 22 Surds
	Unit 5 Angles	Unit 23 Circles
	Unit 6 Algebra 2 - Equations and inequalities	Unit 24 Indices
	End of Term 1 Test	**Dec MOCK 1**
Spring	Unit 7 Sequences and patterns	Unit 25 Volume 2 - Cylinder, pyramids, cones and spheres.
	Unit 8 Fractions and Percentages	Unit 26 Standard index form
	Unit 9 Averages and Range	Unit 27 Congruence and Similarity
	Unit 10 Perimeter and Area	Unit 28 Further graphs
	Unit 11 Formulae	Unit 29 Vectors
	Unit 12 Volume and surface area	Unit 30 Simultaneous equations
	End of Term 2 Test	**Mar MOCK 2**
Summer	Unit 13 Graphs	**Revision**
	Unit 14 Transformation	
	Unit 15 Ratio and Proportion	
	Unit 16 Right-angled triangle	
	Unit 17 Probability	
	Unit 18 Compound measure	
	End of Year Test	**GCSE (9-1) Foundation Exam (3 Papers)**

Programmes of Study for KS4 (Higher)

KS4	YEAR 10	YEAR 11
Term	**GCSE (9-1) Higher**	**GCSE (9-1) Higher**
Autumn	Unit 1 Number 1	Unit 19 Volume and surface area 2
	Unit 2 Algebra 1	Unit 20 Line graphs and scatter graphs
	Unit 3 Number 2	Unit 21 Similarity and Congruence
	Unit 4 Angles	Unit 22 Proportion
	Unit 5 Statistics 1	Unit 23 Probability
	Unit 6 Measure & shapes	Unit 24 Non-right angled triangle
	End of Term 1 Test	**Dec MOCK 1**
Spring	Unit 7 Compound Measure	Unit 25 Transformation of functions
	Unit 8 Algebra 2	Unit 26 Algebraic fractions & proof
	Unit 9 Area and Volume	Unit 27 Vectors
	Unit 10 Averages and Range	Unit 28 Curves and tangents
	Unit 11 Construction and Loci	
	Unit 12 Equations	
	End of Term 2 Test	**Mar MOCK 2**
Summer	Unit 13 Graphs	**Revision**
	Unit 14 Transformations	
	Unit 15 Statistics 3	
	Unit 16 Inequalities and Formula	
	Unit 17 Right-angled triangles	
	Unit 18 Further graphs and equations	
	End of Year Test	**GCSE (9-1) Higher Exam (3 Papers)**

Useful Websites Exam boards

https://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html

Learning Resources

https://www.mathsgenie.co.uk - A bank of exam questions by topic with worked solutions.

https://vle.mathswatch.co.uk/vle - MathsWatch is the complete online Maths platform that makes learning available to your students 24/7 with a personalised log-in.