Eastlea COMMUNITY SCHOOL

Mathematics Curriculum Key Stage 3

Vision

The Mathematics Faculty 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.

Decisions about progression are based on the security of students' understanding and their readiness to progress to the next stage of their education. Students who grasp concepts rapidly will be challenged by more sophisticated problem solving tasks before progressing onto new content. Those who are not sufficiently fluent and mid-phase admissions will be given the opportunity to consolidate their understanding at a more preliminary level before moving on. At Key Stage 3 students are taught so they:

Develop fluency

- Consolidate their numerical and mathematical capability from Key Stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots;
- Select and use appropriate calculation strategies to solve increasingly complex problems;
- Use algebra to generalise the structure of arithmetic, including formulating mathematical relationships;
- Substitute values in expressions, rearrange and simplify expressions, and solve equations;
- Move freely between different numerical, algebraic, graphical and diagrammatic representations;
- Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions;
- Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics.

Reason mathematically

- Extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations;
- Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically;
- Identify variables and express relations between variables algebraically and graphical;
- Make and test conjectures about patterns and relationships; look for proofs or counter-examples;
- Begin to 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 begin to express their arguments formally;

Solve problems

- Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems;
- Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics;
- Begin to model situations mathematically and express the results using a range of formal mathematical representations;
- Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems.

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
STEM Club
UKMT

Programmes of Study for KS3 (Foundation) - Aimed at students in sets 5+

KS3	YEAR 7	YEAR 8	YEAR 9
Term	**FOUNDATION SOW**	**FOUNDATION SOW**	**FOUNDATION SOW**
Autumn 1	Unit 1 Analysing and displaying data Unit 2 Number skills	Unit 1 Number properties and calculations Unit 2 Shapes and measures	Unit 1 Roots, powers, factors and multiples Unit 2 Sequences and linear equations
Autumn 2	Unit 3 Expressions, functions and formulae Unit 4 Decimals and Measures	Unit 3 Statistics Unit 4 Expressions and equations	Unit 3 Area and Volume of shapes Unit 4 Calculations with fractions, percentages and ratios Unit 5 Averages from frequency tables, charts and diagrams
Spring 1	Unit 5 Fractions Unit 6 Probability	Unit 5 Real-life graphs Unit 6 Decimal and ratio	Unit 6 Algebraic manipulation and simultaneous equations Unit 7 Angles and 3D drawings
Spring 2	Unit 7 Ratio and Proportion	Unit 7 Lines and Angles	Unit 8 Quadratic and Linear graphs Unit 9 Probability and diagrams
Summer 1	Unit 8 Lines and Angles Unit 9 Sequences and Graphs	Unit 8 Fractions Unit 9 Graphs	Unit 10 Calculations with decimals Unit 11 Graphs Unit 12 Transformations and Symmetry Unit 13 Graphs and Statistics
Summer 2	Unit 10 Transformations	Unit 10 Percentages, fractions and decimals	Unit 14 Further algebraic manipulation Unit 15 Probability, tables and diagrams Unit 16 Constructions and Loci

Programmes of Study for KS3 (Higher) - Aimed at students in sets 1-4

KS3	YEAR 7	YEAR 8	YEAR 9
Term	**Higher SOW**	**Higher SOW**	**Higher SOW**
Autumn 1	Unit 1 Analysing and displaying data Unit 2 Number skills	Unit 1 Factors and powers Unit 2 Working with powers	Unit 1 Powers, roots, factors and multiples Unit 2 Linear equations and sequences Unit 3 Surface area and volume of 3D shapes
Autumn 2	Unit 3 Equations, functions and formulae Unit 4 Fractions	Unit 3 2D shapes and 3D solids Unit 4 Real-life graphs and rates of change	Unit 4 Ratios, fractions and percentages Unit 5 Calculating statistics Unit 6 Algebraic manipulation and solving equations
Spring 1	Unit 5 Angles and shapes Unit 6 Decimals	Unit 5 Transformations Unit 6 Fractions, decimals and percentages	Unit 7 Angles and 3D drawings Unit 8 Quadratics and Linear graphs
Spring 2	Unit 7 Equations	Unit 7 Constructions and loci	Unit 9 Probability and diagrams Unit 10 Approximations and Standard form
Summer 1	Unit 8 Multiplicative reasoning and ratios Unit 9 Perimeter, area and volume	Unit 8 Probability Unit 9 Ratio, scale drawings and measurements	Unit 11 Real life graphs and Cubic equations Unit 12 Transformations Unit 13 Further statistics and Scatter graphs
Summer 2	Unit 10 Sequences and graphs	Unit 10 Graphs	Unit 14 Further algebraic manipulation Unit 15 Probability, tables and diagrams Unit 16 Angles, Constructions and Loci

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://hegartymaths.com/ - This is the online platform used for KS3 homework setting. The learning is available to students 24/7 and each student receives a personalised login.