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 work place. Our syllabus is led by the national curriculum with a range of tasks that emphasize problem solving, investigations and practical activities. This encourages students to become independent learners.

Students are set from Year 7 through to Year 11 (they are placed according to prior attainment and are able to move between sets depending on their progress)

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 through being offered rich and sophisticated problems before any acceleration through new content in preparation for the next stage of their education. Those who are not sufficiently fluent will be given the opportunity to consolidate their understanding, including through additional practice, 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
UKMT

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***Programmes of Study for KS3 (Foundation)***

| KS3 | YEAR 7 | YEAR 8 | YEAR 9 |
|---|---|---|---|
| **Term** | **FOUNDATION SOW** | **FOUNDATION SOW** | **FOUNDATION SOW** |
| Autumn 1 | Unit 1 Analysing and displaying data | Unit 1 Number properties and calculations | Unit 1 Roots, powers, factors and multiples |
| | Unit 2 Calculating | Unit 2 Shapes and measures in 3D | Unit 2 Sequences and linear equations |
| Autumn 2 | Unit 3 Expressions, functions and formulae | Unit 3 Statistics | Unit 3 Area and Volume of shapes |
| | Unit 4 Graphs | Unit 4 Expressions and equations | Unit 4 Calculations with fractions, decimals and percentages |
| | | | Unit 5 Averages from frequency tables and diagrams |
| | | | |
| Spring 1 | Unit 5 Factors and multiples | Unit 5 Decimal calculations | Unit 6 Calculations with decimals and Standard form |
| | Unit 6 Decimals and measures | Unit 6 Angles | Unit 7 Quadratics and real-life graphs |
| Spring 2 | Unit 7 Angles and lines | Unit 7 Number properties | Unit 8 Angles, polygons and transformations |
| | | | Unit 9 Probabilities and diagrams |
| | | | |
| Summer 1 | Unit 8 Measuring and shapes | Unit 8 Sequences | Unit 10 Algebraic manipulation and simultaneous equations |
| | Unit 9 Fractions, decimals and percentages | Unit 9 Fractions and percentages | Unit 11 Constructions and Loci |
| Summer 2 | Unit 10 Transformation | Unit 10 Probability | Unit 12 Probability and Cumulative frequency |

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***Programmes of Study for KS3 (Higher)***

| KS3 | YEAR 7 | YEAR 8 | YEAR 9 |
|---|---|---|---|
| **Term** | **Higher SOW** | **Higher SOW** | **Higher SOW** |
| Autumn 1 | Unit 1 Analysing and displaying data | Unit 1 Factors and powers | Unit 1 Powers, roots, factors and multiples |
| | Unit 2 Number skills | Unit 2 Working with powers | Unit 2 Linear equations and sequences |
| Autumn 2 | Unit 3 Equations, functions and formulae | Unit 3 2D shapes and 3D solids | Unit 3 Surface area and volume of 3D shapes |
| | Unit 4 Fractions | Unit 4 Real-life graphs | Unit 4 Ratios and percentages |
| | | | Unit 5 Calculating statistics |
| | | | |
| Spring 1 | Unit 5 Angles and shapes | Unit 5 Transformations | Unit 6 Approximations and Standard form |
| | Unit 6 Decimals | Unit 6 Fractions, decimals and percentages | Unit 7 Non linear graphs |
| Spring 2 | Unit 7 Equations | Unit 7 Constructions and loci | Unit 8 Angles, polygons and transformations |
| | | | Unit 9 Probability and diagrams |
| | | | |
| Summer 1 | Unit 8 Multiplicative reasoning | Unit 8 Probability | Unit 10 Algebraic fractions and simultaneous equations |
| | Unit 9 Perimeter, area and volume | Unit 9 Scale drawings and measurements | Unit 11 Constructions and Loci |
| Summer 2 | Unit 10 Sequences and graphs | Unit 10 Graphs | Unit 12 Box plots and experimental probability |

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**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.