UST

University Schools Trust

Royal Greenwich
Trust School

the constellation

Maths (KS3)

Curriculum Booklet

2020-2021

Our Vision and Approach in Maths

At Royal Greenwich Trust School (RGTS), our Mathematics curriculum is designed to provide students with opportunity to acquire deep and powerful knowledge required to develop fluency, reason mathematically and to solve familiar and non- familiar problems.

Our vision is to support students make excellent progress and passionately enjoy mathematics regardless of background. We nurture cultural capital which makes links to students and other experience and successes within a mathematics context. RGTS students will be prepared for plethora of opportunities to utilise their knowledge and to challenge wide variety of problems solving opportunities that they will encounter in their lives. Our students will achieve excellent academic outcomes with in-depth knowledge and skills to progress to high quality further education and careers.

Key content domains covered in Maths

Number	**Algebra**
• Structure and calculation • Fractions, decimals and percentages • Measures and accuracy	• Notation • Vocabulary and manipulation • Graphs • Solving equations and inequalities • Sequences
Ratio, proportion and rates of change	**Geometry and measures**
• Use scale factors, scale diagrams and maps • Fraction • Ratio • Percentage increase/decrease • Inverse proportion • Compound units	• Properties and constructions; • Angles, polygons • Pythagoras, 2-D & 3-D shapes • Mensuration and calculations • Vectors
Probability	**Statistics**
• Frequency of outcomes • Probabilities of all possible outcomes • Theoretical sample spaces • Mutually exclusive outcomes • Sets • Recording, describing and analysing data	• Discrete, continuous and grouped data • Relationships between data, scatter graphs; • measures of central tendency (mean, mode, median) and spread (range, consideration of outliers) • Construct and interpret appropriate tables;

What do students learn?

Our curriculum is sequenced to cover a series of topics across the academic year in order to give students a full experience of Maths. The breakdown of topics covered across the year groups is detailed in the grid below. Please note this is subject to change as we adapt our curriculum to meet the needs of our students.

	Year 7	Year 8	Year 9
Term 1	**Number skills 1** • The four operations with positive numbers (mental and non-calculator methods) • Revisiting negative numbers (ordering, addition and subtraction) **Analysing and displaying data 1** • Calculating mean, mode, median and range • Grouping and displaying data	**Number skills 2** • Division and divisibility • Four operations with negative numbers including larger numbers and decimals • Powers, roots and brackets **Area and Volume** • Area of triangles, parallelogram and trapezium • Volume of cube and cuboids • Surface area of cube and cuboids • Solve problems in everyday contexts involving measures • Use tonnes and hectares	**Number skills 3 - Indices and Standard Form** • Index Rules • Standard Form • Calculations and estimates **Expressions and formulae – Algebra 3** • Change the subject of the formulae • Index laws and brackets • Expanding double brackets
Term 2	**Expressions, functions and formulae – Algebra 1** • Writing and simplifying expressions • Substituting positive integers into expressions and formulae **Decimals and measures** • Adding and subtracting decimals and rounding • Multiplying ad dividing decimals with integers • Length, mass and capacity • Area and perimeter	**Statistics, Graphs and Charts** • Using charts and tables • Stem and leaf diagrams • Scatter diagrams • Comparing data and misleading graphs **Expressions and Equations – Algebra 2** • Algebraic powers • Expanding brackets and factorising expressions • One and two-step equations • The balancing method	**Dealing with data** • Collecting data • Calculating averages from frequency tables • Construct and use line of best fit • Draw and interpret back-to-back stem and leaf diagram **Multiplicative reasoning** • Enlargement • Negative and fractional scale factors • Finding original value from percentage change using inverse operations

			• Compound measures • Direct and inverse proportion
Term 3	**Fractions, decimal and percentages** • Comparing and simplifying fractions • Adding and subtracting fractions • Working with equivalent fractions, decimals and percentages • Percentages of amount **Probability** • Calculating simple probabilities • Experimental vs theoretical probability	**Real life graphs** • Conversion graphs • Distance time graphs • Line graphs • Linear and non-linear real-life graphs **Decimals and ratio** • The four operations with decimals • Divide and multiply by 0.1 and 0.01 • Share a quantity in a given ratio of 2 or 3 parts • Use ratios involving decimals • Ratios involving different units	**Constructions** • Using scales on maps and diagrams • Constructing perpendicular bisectors and angle bisectors • Constructing triangles • Using accurate scale diagrams. **Sequences, inequalities, equations and proportion** • The nth term of the linear vs non-linear sequences • Solving inequalities graphically and algebraically • Solving equations that involve fractions and powers • Trial and improvement method to solve equations • Use algebra to solve problems involving direct and inverse proportion
Term 4	**Ratio and Proportion** • Writing, using and simplifying ratios • Direct proportion • Ratios, proportion and fractions • Proportion and percentages	**Lines and angles 2** • Alternate angles and proof • Corresponding, vertically opposite and co-interior angles and angles around a point • Exterior and interior angles • Geometric problems involving equations and reasoning	**Circles, Pythagoras' and Prisms** • Circumference and the area of a circle • Pythagoras' Theorem with 2D and 3D shapes • Volume and surface area of prisms and cylinders • Errors and bounds

Term 5	**Lines and angles 1** • Measuring, drawing and calculating angles • Angles in a triangle • Quadrilaterals **Sequences** • Patterns and sequences • Arithmetic vs geometric sequences • Finding the nth term	**Calculating fractions and ratio** • Four operations with fractions • Calculations with mixed numbers **Straight line graphs** • Direct proportion on graphs • Gradients • Equation of straight lines	**Graphs** • Using y=mx+c to solve problem with straight line graphs • Graphs of quadratic equations, non-linear equations and inverse proportion **Probability** • Mutually exclusive events • Experimental and theoretical probability • Sample space diagrams • Two-way tables • Venn-Diagrams
Term 6	**Straight line graphs and Transformations** • Plot straight line graphs from table of values • Name and plot y = x and y = -x • Draw graphs to represent relationships	**Percentages, decimals and fractions** • Change time to decimal hours • Recognise recurring and terminating decimals • Use the equivalence of FDP to compare two proportions • Use the multiplier method to calculate percentage increase/decrease • Percentage questions using measures	**Comparing shapes** • Congruent and similar shapes • Ratios in triangles • Tan, Cos, Sine ratios • Using trigonometry to find angles

How you can support your child's learning in Maths

Top tips:

- Make sure they understand the concepts clearly and can explain them to you in their own words
- Teach her to write clearly and neatly. Tracing letters or writing on graph paper will improve her number writing.
- Be around to refresh their memory or explain forgotten concepts.
- Review math vocabulary to ensure they can define the skills they are learning.
- Promote putting down the calculator. Computing math problems in his head will reinforce concepts more quickly.
- Check to make sure your child is approaching their homework properly.
- Encourage them to tackle more than just the assigned problems.
- Approach word problems together. Suggest that they read aloud, repeat, and draw a picture of each problem.
- Explain how math applies to real-life situations and challenge him to help you solve the math problems you encounter when you're out together, such as figuring out how many apples to buy or calculating change. He'll be more interested in mastering math if he realizes its value.
- Do they *really* know it? If they can answer a basic math question within three seconds, they have mastered the concept. Try drills and flash cards to get them up to speed.

Useful Websites

Exam boards

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

Revision

- **https://www.mathsgenie.co.uk/ - A bank of exam questions by topic with worked solutions**
- **https://www.pearsonactivelearn.com/app/Home - Access to online textbooks for additional examples and practice material with solutions, also with a personalised log-in**
- **http://www.mrbartonmaths.com/**
- https://mathsmadeeasy.co.uk/gcse-maths-revision/