the constellation

Maths (KS4)

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 covered in Maths

Number • Structure and calculation • Fractions, decimals and percentages • Measures and accuracy	**Algebra** Notation, vocabulary and manipulation • Graphs • Solving equations and inequalities • Sequences
Ratio, proportion and rates of change • Ratio and Proportion • Rates of Change and Compound Measures	**Geometry and measures** • Properties and constructions • Mensuration and calculations • Vectors
Probability • Conditional probability • Venn diagram and set notation • Mutually exclusive outcomes • Sets • Combined events	**Statistics** • Understanding and interpreting statistical calculations and representation • Sampling

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.

Foundation Tier Maths:

	Year 10	Year 11
Term 1	**Number** • Integers and place value • Decimals • Indices, powers and roots • Factors, multiples and primes **Algebra** • Algebra: the basics • Expressions and substitution into formulae	**Right-angled triangles** • Right-angled triangles: Pythagoras and trigonometry **Probability** • Probability
Term 2	**Graphs, tables and charts** • Tables, charts and graphs • Pie charts • Scatter graphs **Fractions and percentages** • Fractions, decimals and percentages • Percentages	**Multiplicative reasoning** **Constructions, loci and bearings** • Plans and elevations • Constructions, loci and bearings **Revision and End of term Assessment**
Term 3	**Equations, inequalities and sequences** • Equations (including simultaneous equations) and inequalities • Sequences **Angles** • Properties of shapes, parallel lines and angle facts • Interior and exterior angles of polygons	**Quadratic equations and graphs** • Quadratic equations: expanding and factorising • Quadratic equations: graphs • Rearranging equations, graphs of cubic and reciprocal functions **Perimeter, area and volume 2** • Circles, cylinders, cones and spheres
Term 4	**Averages and range** • Statistics, sampling and the averages **Perimeter, area and volume 1** • Perimeter, area and volume	**Fractions, indices and standard form** • Fractions and reciprocals • Indices and standard form **Congruence, similarity and vectors** • Similarity and congruence in 2D • Vectors
Term 5	**Graphs** • Real-life graphs • Straight-line graphs **Transformations** • Transformations	**Exams Revision and End of Term Assessment**
Term 6	**Ratio and proportion** • Ratio • Proportion	**Exams Revision**

Higher Tier Maths:

	Year 10	Year 11
Term 1	**Number** • Calculations, checking and rounding • Indices, roots, reciprocals and hierarchy of operations • Factors, multiples, primes, standard form and surds **Algebra** • Algebra: the basics, setting up, rearranging and solving equations • Sequences	**Trigonometry** • Graphs of trigonometric functions • Further trigonometry
Term 2	**Interpreting and representing data** • Averages and range • Representing and interpreting data and scatter graphs **Fractions, ratio and percentages** • Fractions and percentages • Ratio and proportion **End of term assessment**	**Further statistics** • Collecting data • Cumulative frequency, box plots and histograms **Equations and graphs** • Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics
Term 3	**Angles and trigonometry** • Polygons, angles and parallel lines • Pythagoras' Theorem and trigonometry **Graphs** • Graphs: the basics and real-life graphs • Linear graphs and coordinate geometry • Quadratic, cubic and other graphs	**Circle theorems** • Circle theorems • Circle geometry **More algebra** • Changing the subject of formulae (more complex), solving equations from algebraic fractions, rationalising surds, proof
Term 4	**Area and volume** • Perimeter, area and circles • 3D forms and volume, cylinders, cones and spheres • Accuracy and bounds **Transformations and constructions** • Transformations • Constructions, loci and bearings	**Vectors and geometric proof** • Vectors and geometric proof **Proportion and graphs** • Reciprocal and exponential graphs; Gradient and area under graphs • Direct and inverse proportion
Term 5	**Equations and inequalities** • Solving quadratic and simultaneous equations • Inequalities **Probability** **Assessment**	**Exams Revision and End of Term Assessment**
Term 6	Multiplicative reasoning **Similarity and congruence** • Similarity and congruence in 2D and 3D End of year Exams	**Exams Revision**

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/**

Books

- Pearson Edexcel GCSE (9-1) Mathematics Higher Student Book 1
  https://www.amazon.co.uk/Pearson-Edexcel-Mathematics-Higher-Student/dp/1292346132/ref=sr_1_1?dchild=1&keywords=%E2%80%A2+Pearson+Edexcel+GCSE+%289-1%29+Mathematics+Higher+Student+Book+1&qid=1601633011&sr=8-1
- Pearson Edexcel GCSE (9-1) Mathematics Foundation Student Book 1
  https://www.amazon.co.uk/Pearson-Edexcel-Mathematics-Foundation-Student/dp/1292346140/ref=pd_bxgy_img_3/257-4100136-2169628?_encoding=UTF8&pd_rd_i=1292346140&pd_rd_r=c96dc587-23d1-4f33-a5dc-c18f9ecfafe2&pd_rd_w=6XzTM&pd_rd_wg=9MO3O&pf_rd_p=dcf35746-0212-418b-a148-30395d107b2d&pf_rd_r=W0QCMP5CAQ0E8BYK1EM0&psc=1&refRID=W0QCMP5CAQ0E8BYK1EM0
- Pearson Edexcel GCSE (9-1) Mathematics Higher Student Book 2
  https://www.amazon.co.uk/Pearson-Edexcel-Mathematics-Higher-Student/dp/1292346396/ref=pd_bxgy_2/257-4100136-

2169628?_encoding=UTF8&pd_rd_i=1292346396&pd_rd_r=6bd0cb02-8e92-4538-b8fc-038415742f0a&pd_rd_w=olvTM&pd_rd_wg=bSMW5&pf_rd_p=dcf35746-0212-418b-a148-30395d107b2d&pf_rd_r=FFVSD0YNGP7DPR1BN3XA&psc=1&refRID=FFVSD0YNGP7DPR1BN3XA

- Pearson Edexcel GCSE (9-1) Mathematics Foundation Student Book 2
  https://www.amazon.co.uk/Pearson-Edexcel-Mathematics-Foundation-Student/dp/1292346388/ref=pd_bxgy_2/257-4100136-2169628?_encoding=UTF8&pd_rd_i=1292346388&pd_rd_r=5d98b8e2-b18f-4467-91fd-d1360a56e42f&pd_rd_w=2VRnz&pd_rd_wg=gcSeC&pf_rd_p=dcf35746-0212-418b-a148-30395d107b2d&pf_rd_r=M0BF5HSF5RKVA9NSXTVP&psc=1&refRID=M0BF5HSF5RKVA9NSXTVP

- Pearson Maths Progress (Confidence, Fluency, Problem solving and Progress)
  https://www.amazon.co.uk/Maths-Progress-Student-Book-Theta/dp/B01LP717VW/ref=sr_1_1?dchild=1&keywords=%E2%80%A2+Pearson+Maths+Progress+%28Confidence%2C+Fluency%2C+Problem+solving+and+Progress%29%5D&qid=1601633063&s=books&sr=1-1