

MATHEMATICS

CURRICULUM MAP



Our subject vision:

Mathematics is a language that we can use to unlock and understand so many different elements of our natural and constructed world. Beyond the intricate beauty of Pure Mathematics itself, it also provides important tools for work in a plethora of different fields. Fitzharrys students will learn fluency in this elegant gateway language as well as the wider Mathematical themes of visualising and representing ideas differently, organising information, generalising, conjecturing and modelling to name but a few.

Being a Mathematician is a way of being; it is a way of interacting with the universe; it is a way of thinking. Fitzharrys students will become curious about the fascinating construct that is Maths and how they can use it to solve problems and explore ideas.

Here at Fitzharrys, students are stretched and supported dynamically to achieve their very best; we use diagnostic assessment to ensure that all students are learning the concepts most pivotal to their progress. We build firm foundations that allow students to take their next Mathematical steps.

Fitzharrys students know that they are learning; progress in Maths is visible, celebrated and shared regularly with home. We ensure our students have mastered the skills and consumed the knowledge they will need for their futures, no matter what course those futures take.

How this document works:

This Curriculum Map will show you everything we do in Maths. It shows the learning journey from year 7 to year 11 and beyond.

At each point it will show you what is covered and how it will be assessed. Click on each topic and it will automatically take you to an explanation of why we learn it.

If you have any further questions, contact Miss Alison Twyford - Head of Maths

MATHS CURRICULUM MAP



Our subject vision:

<p>Aspiration</p>	<p>We firmly believe that Maths is a fascinating and elegant language that everyone can enjoy learning. Not only is it beautiful, but it is also a gateway to so many other subjects and futures for students. We intend to equip all students with a confident grasp of the knowledge, skills and understanding of mathematical concepts that they will need for their futures.</p> <p>Knowledge: Maths is a series of building blocks, every new block relying on the soundness of the one beneath it for a firm footing to the next. Our diagnostic curriculum ensures that we enable students to fill gaps and build new bricks in every lesson. Teachers are empowered to plan for individual student needs and aim high for all.</p> <p>Skills: Students will learn to model situations, to generalise patterns and create rules. They will learn to follow Mathematical instructions, to present information effectively and to analyse data. These are just some of the transcendent skills that students will take forward into their lives after studying Maths at Fitzharrys.</p> <p>Understanding: Students will leave Fitzharrys Maths lessons with a sense of achievement, and a clear understanding of their progress. They will have a confidence with numbers, which is essential to all walks of life. Students will be able to communicate and analyse data effectively and have the versatility to apply their Mathematical skills to varied future contents. They will have an understanding of our number system, shapes, proportionality, algebra and statistics; most importantly they will know how all these amazing elements connect and intertwine.</p>
<p>Opportunity</p>	<p>Within the classroom: In Maths lessons, students will regularly check their understanding both at the beginning and end of topics. This not only allows us to provide the optimum balance of challenge and scaffold as teachers, but it also encourages students to be strong independent learners. Our curriculum spirals through the different areas of Maths - Geometry and Measures, Number, Algebra, Statistics, Ratio & Proportion. There is a strong focus on knowledge (Maths Memory) and skills to ensure strong foundations which enable application to new contexts.</p> <p>Beyond the classroom: Alongside the curriculum students can participate in:</p> <ul style="list-style-type: none"> • National Maths Challenges • Girls in Maths days • Mathematical lectures • Further Maths GCSE • Mathematical Student mentoring or leadership opportunities
<p>Integrity</p>	<p>Knowledge: Students will have the Mathematical knowledge to empower them to see statistics and finances clearly, understanding how people can use them to influence and even manipulate others.</p> <p>Skills: The skills of modelling, visualising and presenting numerical arguments will allow students to express themselves, explore complex ideas and understand others' ideas and perspectives.</p> <p>Understanding: The world is full of Maths, a firm understanding of what you are consuming helps you to craft intelligent and measured opinions. Students will not be taken in by questionable statistics or duped by dubious deals. They will have an understanding of finances and statistics that will support them to be active, knowledgeable citizens who can make measured decisions in their future.</p>

SUBJECT CURRICULUM MAP: KS4



Further study

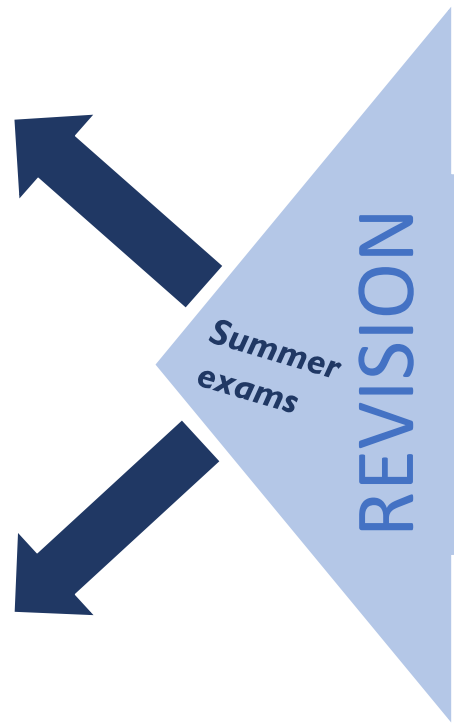
Maths
Further Maths
Sciences
Art & Design
Computer Science

All A-Levels and many college courses require grade 4 and above. Without a grade 4 at GCSE you will need to continue to study Maths GCSE until you are 18.

Career pathways

Teacher
Computer Scientist
Economics
Banking
Architecture
Engineering
Design
Marketing

...most jobs require some element of Maths!



27. Further Trigonometry

- Know how and when to use the sine and cosine rules
- Draw quadratic graphs

26. Vectors

- Understand and use vectors

25. Surds

- Arithmetic with surds
- Rationalise surds

24. Proportions

- Direct proportion
- Inverse proportion

23. Circle Theorems

- Know and use circle theorems to solve angle problems

22. Functions & Further Graphs

- Non linear graphs
- Function notation
- Iteration

March Mock Exams

Foundation tier students begin revision after topic 22.

Year 11

17. Data

- Work with averages
- Statistical diagrams
- Statistical analysis

18. Scale & Constructions

- Scales
- Constructions
- Compound measurements

19. Measures & Applied graphs

- Kinematics graphs
- Compound measures

20. Quadratics

- Drawing quadratics
- Solving quadratics
- Using quadratics

21. Simultaneous equations

- Solve simultaneous equations

Mock exams & final tier decisions made

November Mock Exams

16. Transformations

- Reflect
- Rotate
- Translate
- Enlarge

15. Probability

- Calculating probabilities
- Probability diagrams
- Experimental probability

For each topic you will complete a diagnostic and progress test. The progress test results will be sent to parents who are signed up to the Mini Test website.

Trips and visits;

- Senior Maths team challenge
- Year 10 Maths Feast
- Royal Institution Mathematical masterclasses
- Online enrichment events

Year 10

14. Similarity & congruence

- Congruent shapes
- Similar shapes

13. Sequences & Graphs

- Types of sequence
- Sequence formulae
- Drawing sequences as diagrams and graphs

12. 3D shapes

- Volume of shapes
- Surface areas of shapes

11. Algebra

- Identities
- Formulae
- Quadratics

10. Angles

- Angles facts
- Solve complex angle problems
- Plan drawings
- Isometric drawing

9. Pythagoras & Trigonometry

- Use Pythagoras theorem
- Use Trigonometry with right angles triangles

SUBJECT CURRICULUM MAP: KS3



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4**

6. Area & Perimeter

- Areas of key shapes
- Compound areas
- Perimeters of shapes including circles & sectors

7. Percentages

- Understand percentage conversions
- Use multipliers to calculate percentages
- Calculate percentage change
- Confidently problem solve with percentages

8. Ratio & Proportion

- Understanding ratios
- Sharing amounts into ratio
- Solving ratio problems

5. Fractions & Decimals

- Arithmetic with fractions
- Arithmetic with decimals

4. Equations

- Solve equations
- Solve more complex equations
- Solve inequalities

For each topic you will complete a diagnostic and progress test. The progress test results will be sent to parents who are signed up to the Mini Test website.

Trips and visits

- Girls conference
- Team Maths Challenge @ Oxford University
- Assisting with Primary Maths Team Challenge
- Royal Institution Mathematical Masterclasses

3. The Language of Algebra

- Writing in algebra
- Algebraic manipulation
- Collecting like terms
- Expand
- Factorise

2. Rounding & Accuracy

- Rounding to decimal places
- Rounding to significant figures
- Error bounds

1. Types of number

- Types of numbers
- Arithmetic
- Inequalities

Start of tiered GCSE Maths classes

Year 9

Foundations of GCSE Revision

Revision of the Year 7 and Year 8 course.

End of year assessment

11. Transformations, Shape & Constructions

Symmetry, Translation, Rotation, Reflection and Enlargement, Constructions and Loci, Pythagoras and Trigonometry.

Trips and visits

- Team Maths Challenge at Oxford University

For each topic you will complete a diagnostic and progress test. The progress test results will be sent to parents who are signed up to the Mini Test website.

10. Probability

Probability scale and basic probability, tree diagrams, frequency trees, sample spaces, experimental vs theoretical probability, venn diagrams.

End of year assessment

6. Statistics

Frequency Tables and Pictograms, Surveys, Line Graphs, Averages (including Grouped Frequency Tables), Pie Charts, Scatter Graphs, Bar Charts

Year 8

7. Fractions, Decimals, Percentages & Ratio

FDP conversion, finding percentages/fractions of amounts, percentage increase/decrease, four operations with fractions and decimals, sharing ratios.

8. Length, Area & Volume

Area and Perimeter of 2D shapes (including circles), working in terms of π . Finding volume and surface area of 3D shapes.

9. Sequences, Functions and Graphs

Exploring linear and quadratic sequences, understanding linear and quadratic graphs. Using $y=mx+c$.

5. Angles

Finding Missing Angles, working with Regular Polygons, Parallel & Perpendicular Lines, Bearings

For each topic you will complete a diagnostic and progress test. The progress test results will be sent to parents who are signed up to the Mini Test website.

Trips and visits

- Team Maths Challenge

4. Integers, Powers & Roots

Square and Cube numbers and roots. Factors, Multiples & Primes, Laws of Indices and Standard Form

3. Algebra

Understanding algebra, manipulating letters in maths, substitution, solving equations, forming and solving equations, expanding and factorising brackets

2. Place Value, Ordering & Rounding

Rounding to significant figures and decimals, ordering all number, estimating solutions.

1. Number Operations

Four Operations, Manipulating negatives, BIDMAS, basic calculator skills

Year 7



25 **Further Trigonometry**

Why this?	Following from trigonometry in right angled triangles this topic allows you to find angles and sides in any triangles
Why now?	Higher level topics prepare students for A-Levels

26 **Vectors**

Why this?	Vectors are quantities with magnitude and direction. This is an important construct for A-Level problems
Why now?	Higher level topics prepare students for A-Levels

27 **Surds**

Why this?	Surds are exact values. This is something that you need to be confident working in. Using surds in calculations increases accuracy greatly.
Why now?	Surds are visited briefly in the first topic. Time to recap and advance to harder skills essential for A-Level Maths



24 Proportions

Why this? Another essential Mathematical concept that is woven through all that we do.

Why now? Understanding proportion will allow students to refresh and stretch their number skills.

19 Measures & Applied Graphs

Why this? Graphs allow us to understand and share maths more easily.

Why now? This covers the last section of the foundation tier. After this topic Foundation tier students will begin revision

18 Scale & Constructions

Why this? Compound measures will help you to solve problems in the Sciences. Whereas constructions can help with design and art.

Why now? This topic uses specialist equipment such as compasses.

13 Sequences & Graphs

Why this? Understanding the patters that we see in the world is an integral part of understanding the world around is.

Why now? Understanding sequences allows us to draw graphs

12 3D Shapes

Why this? Many Scientific problems require an understanding of volume. It is also essential for construction.

Why now? Back to shape for a change following our forays into algebra.

7 Percentages

Why this? Another essential Maths skill. Potentially the most visible for all of our daily lives.

Why now? You will use percentages in other GCSE subjects

23 Circle Theorems

Why this? Angles trapped in circles have specific properties that we need to learn about.

Why now? Using students understanding of proportion and applying it to geometry

20 Quadratics

Why this? Another essential Mathematical concept looking at higher order equations

Why now? This an integral skill for further Mathematical study

17 Data

Why this? Statistical diagrams are an important part of our everyday lives and essential to all future studies/jobs.

Why now? As we come to then end of the foundation tier content we will complete the statistics content

14 Similarity & Congruence

Why this? Another element of art, design and engineering. How shapes can vary is an interesting part of geometry.

Why now? Similar shapes are a prequal to proportion.

11 Algebra

Why this? Accessing quadratic equations allows you to solve more complex Mathematical problems.

Why now? Time to re-visit algebra in year 10 and look at working with more complex equations

8 Ratio

Why this? The most assessed question in GCSE Maths. Ratio is very common in real life problem solving.

Why now? Ratio is another very versatile topic that links to many others.

22 Further Equations & Graphs

Why this? Graphs are images of equations, this topic allows us to look at more complex ones and re-visit linear graphs.

Why now? Foundation tiers last element of equations and graphs is completed

21 Simultaneous Equations

Why this? Solving linked equations once again allows us to solve a different kind of Mathematical puzzle.

Why now? An extension of solving equations that doesn't appear much in foundation tier, but is an essential skill for A-Level study.

16 Transformations

Why this? How shapes can changes shapes and size is an integral part of design in all forms.

Why now? A fairly straightforward topic. Placed towards the end of year 10 to finish off Foundation tier.

15 Probability

Why this? Students can understand the probabilities of things happening and how to display those in a number of ways.

Why now? We aim to fit this in before the end of year 10 mocks so that

10 Angles

Why this? Angles and plan drawings are important for a plethora of jobs. They are also useful for home DIY!

Why now? This topic is key to geometry problems

9 Pythagoras & Trigonometry

Why this? Finding sides and angles in right angles triangles is used in many areas, including architecture and design.

Why now? After a lot of number topics is it nice to delve into some geometry!

Year 10

Year 9

