



**A level Maths** – (Need **Grade 7** and above)



**Core Maths** – Supports Geography, Science, psychology along with many other subjects that use maths understanding (Need **Grade 5** and above)



**Other post 16 options** – Apprenticeships, other A level subjects, other BTEC subjects, other training, College? Most courses require a **Grade 4** and above in Maths otherwise a Maths re-sit will be necessary.

**GCSE Exam**

**Easter**

32H Probability

25F Statistical Measures

26F Transformations

27F Vectors

24F Collecting and Representing Data

27H Collecting and Representing Data

28H Statistical Measures

29H Transformations

30H Vectors

31H Transforming Functions

26H Iteration

25H 3D Representation: Volume and Congruency

24H Further Graphs and Equations of a Circle

23H Area Under a Curve

**Christmas**

22F Quadratic Equations and Graphs

21F Rearranging Formula

20F Congruency and Similarity

**Mock Exam**

16F Constructions and Loci

17F Measures

18F Real Life Graphs

19F 3D Representation: n: Volume

22H Gradient and Rates of Change

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18H Advanced Trigonometry

19H Construction and Loci

20H Measures

21H Real Life Graphs

17H Pythagoras Theorem and Basic Trigonometry

16H Algebra: Rearranging + Fractions

15H Algebra: Quadratics

14H Circle Theorems

13H Scale Drawing, Bearings and Polygons

**Mock Exam**

**Easter**

15F Trigonometry

14F Pythagoras Theorem

13F Probability

12F Angles, Polygons and Bearings

12H Perimeter and Area (inc Circles)

7F Inequalities

8F Sequences

9F Percentages + Growth and Decay

10F Ratio and Proportion

11F Perimeter and Area (inc Circles)

**Christmas**

8H Simultaneous Equations

9H Percentages + Growth and Decay

10H Ratio and Proportion

11H Direct and Inverse Proportion

7H Sequences

6H Inequalities

5H Linear Graphs

4H Basic Algebra & Linear Equations

3H Surds

2H Indices and Standard Form

1H Factors, Multiples, Fractions and Rounding

6F Algebra and Linear Graphs

5F Equations

4F Basic Algebra

3F Indices and Standard Form

2F Basic Decimals & Basic Fractions

1F Number, Rounding, Factors and Multiples

**Higher Foundation**

**YEAR 10**



welcome

# KS4 Be ambitious in Maths

Opportunities that raise the academic status of maths, support high attainers without acceleration, and provide strong cultural capital.

UK Mathematics Trust (UKMT)	NRICH (University of Cambridge)	MEI – Mathematics Education Innovation	Underground Mathematics (Cambridge)
Focuses on problem solving, reasoning and perseverance Encourages students to select strategies, not follow routines High national recognition.	Promotes mathematical structure, conjecture and proof Encourages multiple representations and discussion Ideal for developing mathematical language and justification	Shows maths as a tool for understanding the world Particularly strong for: Graphs, Proportion, Rates of change Statistics	Develops fluency with multiple representations
<a href="https://www.ukmt.org.uk">https://www.ukmt.org.uk</a>	<a href="#">Home   NRICH</a>	<a href="#">Mathematics in Education and Industry (MEI) – Home</a>	<a href="#">A level maths teaching resources   Underground Mathematics</a>

- Reaching a **high** performance:
- Consistently applies maths skills to **challenging and non-routine problems**.
  - Uses **strong algebraic manipulation and multi-step reasoning**.
  - Explains methods** clearly and **justifies answers**.
  - Makes **links between topics** to solve problems efficiently

**High Spring 2:** Find and interpret inverse and composite functions; apply, describe and justify combined transformations using correct notation; link algebraic rules to graphical transformations; use vectors to construct geometric proofs; and solve complex probability problems by selecting and justifying efficient models for conditional and dependent events.



Film or TV: *The Imitation Game* – A historical drama film depicting the life of mathematician and codebreaker Alan Turing during World War. Strong conceptual links to: Functions as processes (input → output → reverse), Transformations and mappings and Logical structure and proof-based reasoning  
<https://www.youtube.com/watch?v=nuPZUUED5uk> (trailer) (rent on Amazon video)

Book or article: *The Signal and the Noise*: nonfiction book by statistician and writer Nate Silver. It explores how to distinguish meaningful information (“signal”) from misleading or irrelevant data (“noise”) when making forecasts. The book became widely known for its accessible treatment of probability, uncertainty, and data-driven prediction.



**High Spring 1:** Apply iteration using recursive formulae derived from equations, identify convergence and justify stopping criteria; construct and interpret cumulative frequency graphs and histograms with unequal class widths; calculate quartiles and interquartile range; compare data sets using centre and spread; and critically evaluate sampling methods and data validity when making inferences about populations.



Film or TV: *Hidden Figures* (PG) – Highlights how math (including calculations with numbers, trajectories, and engineering) is used in real-world NASA missions, making numeracy inspiring and relevant.  
<https://www.youtube.com/watch?v=5wfrDhgUMGI> (trailer) (available on Disney+)

Book or article: *How Not to Be Wrong*: Explores how data, averages, spread and modelling shape real-world decisions.

Film or TV: **Apollo 13**  
Real-world use of trigonometry beyond right-angled triangles. Links to bounds, tolerances, compound units and precision and shows why approximation methods. The film portrays the astronauts’ struggle to survive after an onboard explosion cripples their spacecraft, and the heroic efforts on Earth to bring them home safely.  
<https://www.youtube.com/watch?v=KtEIMC58sZo> (Trailer) (rent on Amazon video)



Visit: **Science Museum London**. Visual links to: Curves, trajectories and optimisation. Geometry in engineering design. Scale, similarity and volume. One of the world’s leading institutions dedicated to science, technology, and medicine.



**High Autumn 2:** Solve linear and quadratic equations algebraically and graphically using factorising, completing the square and the quadratic formula; interpret roots, intersections and turning points; sketch and analyse function graphs; model geometry using circle equations and tangents; apply congruence, similarity and scale factors; and calculate volumes of complex solids and frustums using exact values.

**High Autumn 1:** Apply sine and cosine rules in multi-step non-right-angled triangle problems, including ambiguous cases; interpret non-linear, exponential and reciprocal graphs; calculate gradients, tangents and instantaneous rates; estimate area under curves using the trapezium rule; and solve real-world measurement problems involving bounds, compound units and geometric constructions.

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Film or TV: **A Beautiful Mind**  
Highlights pattern recognition, abstraction and connecting ideas. Reinforces the mindset behind: Completing the square, algebraic structure and generalisation. A Beautiful Mind follows John Nash’s journey from a socially awkward graduate student at Princeton University to a groundbreaking mathematician whose career is derailed by paranoid schizophrenia.  
<https://www.youtube.com/watch?v=yC2VpkVMtXY> (Trailer) (rent on Amazon video)



**High Summer 1:** Deduce unknown angles using parallel line rules, polygon angle sums and circle theorems; construct formal geometric proofs; expand, factorise and complete the square for quadratics; solve quadratic equations algebraically and graphically; and rearrange complex formulae involving powers and multiple variables.

Podcast: **More or Less**  
A BBC Radio 4 podcast that explores the truth behind numbers in the news and public debate. It examines statistics used by politicians, journalists, and organizations, aiming to promote better understanding of data and evidence in everyday life. Regularly challenges how graphs and models are interpreted and strong real-world links to **misreading intersections, trends and constraints**  
[BBC Radio 4 - More or Less - Available now](#)



**High Summer 2:** Identify intersections of linear and quadratic graphs; solve quadratic inequalities and linear–quadratic simultaneous equations algebraically and graphically; simplify algebraic fractions; apply Pythagoras’ Theorem and trigonometry in 2D and 3D; use exact trigonometric values, similarity and algebraic proof to justify results.

Visit: **Bank of England Museum London**. Promote financial literacy and transparency about the Bank’s modern responsibilities, including managing inflation and ensuring monetary stability in the United Kingdom.



Book or article: *The Art of More*: Explores exponential growth, scaling and compounding in real contexts. Makes compound interest and growth feel inevitable. Supports conceptual understanding of why repeated multiplication matters

**High Spring 2:** Write and manipulate equations for direct and inverse proportion, including  $y = kx$  and  $y = k/x$ ; identify proportional relationships algebraically; interpret graphs; and solve multi-step geometry problems involving sectors, curved surfaces, scale, arc length and surface area using exact values.

**High Spring 1:** Use multipliers and inverse multipliers to calculate and reverse percentage change, solve multi-step financial problems involving successive changes, model compound interest and growth algebraically, solve complex ratio and best-value problems, and link ratio, proportion and linear relationships to justify rates of change.

Visit: **Royal Observatory Greenwich London**. Real-world use of: **Proportional relationships**, circular geometry measurement, scale and precision. the observatory is part of Royal Museums Greenwich alongside the National Maritime Museum and the Queen’s House. Visitors can stand astride the Prime Meridian line, explore interactive astronomy galleries, and view planetarium shows highlighting space science and navigation heritage.



**High Autumn 2:** Solve simultaneous linear equations using substitution or elimination, including contextual problems; find equations of straight lines from graphs, two points or point–gradient form; rearrange algebraic expressions confidently; represent compound inequalities graphically; and determine quadratic nth terms using second differences.

Film or TV: **Moneyball**  
Demonstrates optimisation under constraints (budget, performance, rules)  
Mirrors the logic of: Simultaneous equations, Inequalities, Best-fit models  
<https://www.youtube.com/watch?v=odfK3GiBb6k> (Trailer) (rent on Amazon video)



Podcast: **The Curious Cases of Rutherford & Fry**  
Episodes regularly tackle scale, very large/small numbers, powers of ten and approximation  
Reinforces standard form, indices and estimation conceptually  
[BBC Radio 4 - Curious Cases - Available now](#)



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**10**



Book or article: *Humble Pi*: Explores real-world errors caused by rounding, approximation and limits of accuracy. Makes upper and lower bounds meaningful, not procedural. Shows why exact values matter in engineering, finance and science  
<https://uk.accessit.online/alt01/#/resources/searchresult>



**High Autumn 1:** Apply index laws with integer and fractional powers, manipulate and rationalise surds, use fractional indices for exact values, and apply upper and lower bounds to solve multi-step contextual problems, justifying rounding decisions and determining maximum and minimum values accurately clearly.

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