Unit 1	Indices and standard form
Intention	To develop proficiency in indices, calculations, and estimations, enabling effective problem-solving and understanding of standard form in mathematical contexts.
Key words	index, indices, base, powers, exponent, exponential, raising, root
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
I can apply laws of indices to multiplication and division problems			
I can raise algebraic expressions to powers and simplify the result			
I can simplify terms with negative indices			
I can simplify terms with negative fractional indices			
I can convert large and small ordinary numbers to standard form			
I can convert standard form numbers to large and small ordinary numbers			
I can identify non-standard form numbers and convert it to standard form			

Unit sequence

1. Indices
2. Calculations and estimates
3. More indices
4. Standard form

Top career

Microbiologist

Studies microorganisms, including bacteria and viruses to understand behaviour, interactions, and impact on health, agriculture, and the environment.

Salary

£55,000 - £80,000+ per year

Useful links

https://www.sparxmaths.uk/
https://sites.google.com/langdonpark.org/maths
https://www.1stclassmaths.com/edexcelrevision
https://www.mathsgenie.co.uk/
https://corbettmaths.com/
https://mmerevise.co.uk/gcse-maths-revision/
https://www.thenational.academy/pupils/years/
https://www.maths4everyone.com/

YouTube channels

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@corbettmaths
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@DrFrostMaths

Be Inclusive

Kizzmekia Corbett (born 1986) is a prominent Black microbiologist and viral immunologist known for her pivotal role during in immunisation during the pandemic. Her achievements have inspired many in the fields of science and medicine.

Unit 2	Expressions and formulae
Intention	To develop proficiency in manipulating and solving equations, enabling effective use of index laws and expansion of double brackets in mathematical contexts.
Key words	term, expression, equation, identity, brackets, root, index, exponent
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
I can solve multiple step equations with variables on both sides			
I can solve multiple step equations fraction a fraction and bracket			
I can substitute values into algebraic expressions and simplify			
I can write and apply formulae in different contexts			
I can rearrange formulae with a fraction to make a variable the subject			
I can apply index laws to simplify expressions with brackets			
I can expand double brackets to create equivalent expressions			

Unit sequence

1. Solving equations
2. Substituting into expressions
3. Writing and using formulae
4. Using and rearranging formulae
5. Index laws and brackets
6. Expanding double brackets

Top career

Civil engineer

Designs and manages construction projects, calculating areas, volumes, and surface areas for structures.

Salary

£60,000 - £90,000+ per year

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Be Inclusive

Srinivasa Ramanujan (1887–1920) was a self-taught Indian mathematician celebrated for his groundbreaking contributions to number theory and infinite series. His work profoundly influenced mathematics, with this extraordinary journey depicted in the film *The Man Who Knew Infinity* (2015).

Unit 3	Dealing with data
Intention	To develop skills in planning and conducting surveys, collecting and calculating data, and effectively displaying and analysing results compare findings in meaningful ways.
Key words	survey, primary, secondary, qualitative, quantitative, leaf diagrams, misleading
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
I can identify primary, secondary, qualitative and quantitative data			
I can plan and design surveys to collect data in various real-life context			
I can calculate mean, median, and mode from a data set and in grouped tables			
I can evaluate best graphs and charts to use to represent data			
I can draw and present data clearly to various audiences			
I can analyse data to draw meaningful conclusions in different visual representations			
I can compare data sets to identify trends and differences			

Unit sequence

1. Planning a survey
2. Collecting data
3. Calculating averages
4. Displaying and analysing data
5. Presenting and comparing data

Top career

Information Designer

Transforms complex data into visually engaging graphics, including charts and infographics, to enhance understanding and communication.

Salary

£55,000 - £85,000+ per year

Useful links

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Be Inclusive

Florence Nightingale (1820–1910) was a pioneering nurse and statistician who used innovative data visualisation, like the polar area diagram, to highlight health issues and improve sanitation in healthcare during the Crimean War.

Unit 4	Multiplicative reasoning
Intention	To develop multiplicative reasoning across transformations, percentages, direct and inverse proportions.
Key words	terms, expressions, equations, formulae, factorise, expand, rearrange, balancing
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
I can perform enlargements using positive scale factors			
I can perform enlargements using negative and fractional scale factors			
I can describe the effects of negative and fractional scale factors on shapes			
I can calculate percentage changes, including increases and decreases			
I can solve problems involving compound measures and convert between units			
I can identify and calculate direct proportionality in real-life contexts			
I can identify and calculate inverse proportionality problems in real-life contexts			

Unit sequence	Top career
1. Enlargement (transformations) 2. Negative and fractional scale factors 3. Percentage change 4. Compound measures 5. Direct and inverse proportion	**Accountant** Uses percentages for tax calculations, financial reporting, and budgeting to ensure accurate financial statements and compliance. **Salary** £60,000 - £200,000+ per year

Useful links	YouTube channels
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Be Inclusive
Gita Gopinath (born 1971) is an influential Indian American economist who serves as the Chief Economist of the International Monetary Fund (IMF). Known for her work on international finance and macroeconomics, particularly in areas related to exchange rates and global trade.

Unit 5	Constructions
Intention	To develop skills in constructions, using compasses and protractors to accurately draw triangles and lines, enabling effective application of scale diagrams.
Key words	constructions, bisector, perpendicular, scalene, isosceles, scale
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
I can read and interpret scales accurately for various measurements			
I can perform basic constructions using a compass and straightedge confidently			
I can construct different types of triangles based on given measurements and angles			
I can apply the properties of triangles to verify my constructions			
I can create accurate scale diagrams to represent real-world objects or scenarios			
I can use scales to calculate dimensions and distances in scale drawings			
I can check my constructions for accuracy and make necessary adjustments			

Unit sequence

1. Using scales
2. Basic constructions
3. Constructing triangles
4. Using accurate scale diagrams

Top career

Cartographer

Uses compasses for navigation and orientation, along with protractors to measure angles and create accurate maps.

Salary

£30,000 - £40,000+ per year

Useful links

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Be Inclusive

Muhammad Al-Idrisi (1100-1165) was a prominent Arab geographer, cartographer, and traveller, best known for creating the *Tabula Rogeriana*, a highly detailed world map commissioned by King Roger II of Sicily. This map, completed in 1154, was one of the most accurate and comprehensive representations of the world at that time, depicting Europe, Africa, and Asia.

Unit 6	Sequences, inequalities, equations and proportions
Intention	To develop skills in identifying the nth term of arithmetic sequences, non-linear sequences, solving inequalities and equations, and proportions in different contexts.
Key words	significant figures, estimation, place value, ratios, proportions, direct
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
I can identify and derive the nth term of arithmetic sequences			
I can recognise and analyse non-linear sequences to determine patterns			
I can solve linear inequalities and represent them on number lines			
I can apply understanding of inequalities to solve real-life problems			
I can solve multi-step linear equations with fractions using the balancing method			
I can use proportions to compare quantities and solve real-life contexts			
I can apply sequences, inequalities, and proportions to real-life contexts			

Unit sequence

1. nth term of arithmetic sequences
2. Non-linear sequences
3. Inequalities
4. Solving equations
5. Proportion

Top career

Machine Learning Engineer

Develop algorithms that enable computers to learn from data patterns, improving performance over time in many computer-related fields.

Salary

£100,000 - £200,000+ per year

Useful links

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Be Inclusive

Andrew Chi-Chih Yao (born 1946) is a Chinese American computer scientist renowned for his work in computational complexity theory. He received the Turing Award in 2000 and currently serves as the Dean of the Institute for Interdisciplinary Information Sciences at Tsinghua University.

Unit 7	Circles, Pythagoras and prisms
Intention	To understand and apply formulae for circle properties, Pythagoras' theorem, prism and cylinder volumes, and manage calculations with errors and bounds.
Key words	chord, sector, segment, arc, circumference, hypotenuse, lower and upper bound
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
I can calculate the circumference and area of a circle			
I can use Pythagoras' theorem to find missing side lengths in right-angled triangles			
I can calculate the volume of prisms and cylinders			
I can use correct formulae for various 2D and 3D shapes			
I can identify lower and upper bounds of measurements			
I can determine error margins and intervals in measurements			
I can evaluate the impact of errors and bounds on real-world problems			

Unit sequence

1. Circumference of a circle
2. Area of a circle
3. Pythagoras' theorem
4. Prisms and cylinders
5. Errors and bounds

Top career

Electrical engineer

Design, develop, and test electrical systems and equipment, working on projects ranging from small-scale electronics to large power systems.

Salary

£60,000 - £90,000+ per year

Useful links

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Be Inclusive

Hedy Lamarr (1914-2000), originally a Hollywood star, was also a self-taught inventor who co-developed frequency-hopping technology during WWII, later foundational for secure Wi-Fi, GPS, and Bluetooth systems.

Langdon Park School
Mathematics

Unit 8	Graphs
Intention	To plot and interpret linear and non-linear graphs, including y = mx + c, quadratics, and simultaneous equations, using graphs to represent and solve mathematical problems.
Key words	gradient, y-intercept, linear, quadratic, simultaneous, axis, point of intersection
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
Plot straight-line graphs using y = mx + c			
Identify gradient and y-intercept from a graph or equation			
Draw and describe graphs of quadratic functions			
Recognise and interpret non-linear graphs			
Solve simultaneous equations graphically			
Understand intersections of graphs as solutions			
Use graphs to model and solve real-life problems			

Unit sequence

1. Using y = mx + c
2. More straight-line graphs
3. Simultaneous equations
4. Graphs of quadratic functions
5. More non-linear graphs

Top career

Data scientist

Uses graphs to model relationships, identify trends, and make predictions, interpreting both linear and non-linear data to support decision-making.

Salary

£30,000 - £60,000+ per year

Useful links

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@DrFrostMaths

Be Inclusive

Dr Anne-Marie Imafidon (born 1990) is a British computing and mathematics prodigy and founder of Stemettes. She champions data, coding, and graph analysis, especially in tech and STEM careers for young women.

Unit 9	Probability
Intention	To understand and calculate theoretical and experimental probability, represent outcomes using Venn diagrams, sample spaces, and two-way tables, and solve problems involving mutually exclusive events.
Key words	probability, event, sample space, mutually exclusive, Venn diagram, outcome
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
Calculate theoretical probabilities of single events			
Understand and identify mutually exclusive events			
Record and analyse results from experiments			
Use sample space diagrams to list outcomes			
Complete and interpret two-way tables			
Use Venn diagrams to represent sets and probabilities			
Compare experimental and theoretical probabilities			

Unit sequence

1. Mutually exclusive events
2. Experimental and theoretical probability
3. Sample space diagrams
4. Two-way tables
5. Venn diagrams

Top career

Insurance underwriter

Uses probability to assess risk, calculating the likelihood of events occurring to determine fair premiums for companies.

Salary

£40,000 - £100,000+ per year

Useful links

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@DrFrostMaths

Be Inclusive

Dr Talithia Williams (born 1978) is an American statistician and professor known for making probability and data accessible. She promotes the use of statistics in real-life decisions and inspires underrepresented groups in STEM.

Unit 10	Comparing shapes
Intention	To compare shapes using congruence, similarity, and trigonometric ratios, applying knowledge of triangles and angles to solve problems involving lengths and angles.
Key words	congruent, similar, ratio, sine, cosine, tangent, hypotenuse, adjacent, opposite
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-3

Success criteria	R	A	G
Identify and explain congruent and similar shapes			
Use ratios to compare side lengths in similar triangles			
Apply the tangent ratio to find sides or angles			
Use the sine ratio in right-angled triangles			
Use the cosine ratio in right-angled triangles			
Solve problems using trigonometry with correct methods			
Justify solutions using mathematical language and diagrams			

Unit sequence

1. Circumference of a circle
2. Area of a circle
3. Pythagoras' theorem
4. Prisms and cylinders
5. Errors and bounds

Top career

Surveying Technician

Uses trigonometry to measure land, heights, and distances accurately when creating maps, planning construction, or assessing property.

Salary

£30,000 - £70,000+ per year

Useful links

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@DrFrostMaths

Be Inclusive

Mae Jemison (born 1956) is an American engineer, physician, and NASA astronaut. Her STEM expertise included geometry and trigonometry, which were essential for navigation and spatial understanding in space missions.