Unit 1	Number
Intention	To develop skills in performing calculations, understanding place value, working with factors, multiples, and prime factors, and using powers and roots effectively.
Key words	prime factorisation, highest common factor, lowest common multiple, indices, standard form, surds, and estimation
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can perform calculations involving addition, subtraction, multiplication, and division			
I can calculate using decimal numbers in various contexts			
I can understand and apply place value to order and compare numbers			
I can identify and use factors and multiples in problem-solving			
I can calculate squares, cubes, and roots of numbers			
I can use index notation to express powers and simplify calculations			
I can find the prime factors of numbers and apply them in calculations			

Unit sequence

1. Calculations
2. Decimal numbers
3. Place value
4. Factors and multiples
5. Squares, cubes and roots
6. Index notation
7. Prime factors

Top career

Quantitative Data Analyst

Apply prime number theory and factor analysis to optimise algorithms for data modelling and computational tasks

Salary

£40,000 - £65,000+ 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

@ExamSolutions_Maths
@1stClassMaths
@mathsgenie7808
@corbettmaths
@mathsmadeeasy123
@TheGCSEMathsTutor
@Cognitoedu
@DrFrostMaths

Be Inclusive

Cathy O'Neil (born 1972) is a renowned mathematician and data scientist, celebrated for critiquing the ethical impacts of big data and algorithmic decision-making in society, advocating responsible technology use and transparency.

Unit 2	Algebra
Intention	To develop skills in algebra by simplifying, substituting values, expanding brackets, factorising, and effectively using formulae in problem-solving contexts.
Key words	term, expression, equation, identity, root, index, formulae, factorise, expand
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can simplify algebraic expressions by collecting like terms, including with powers			
I can substitute values into expressions and simplify			
I can understand and use formulae in various contexts			
I can expand single and double brackets and apply in geometry			
I can factorise expressions by identifying common factors			
I can rearrange formula to make a variable the subject, including with fractions			
I can use expressions and formulae in real-life problems			

Unit sequence

1. Algebraic expressions
2. Simplifying expressions
3. Substitution
4. Formulae
5. Expanding brackets
6. Factorising
7. Using expressions and formulae

Top career

Actuary

Applies algebra and statistics to assess financial risk and forecast outcomes for insurance and finance industries

Salary

£55,000 - £80,000+ per year

Useful links

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@corbettmaths
@mathsmadeeasy123
@TheGCSEMathsTutor
@Cognitoedu
@DrFrostMaths

Be Inclusive

Mary Hardy (born 1958) is a renowned actuary and professor at the University of Waterloo. She is celebrated for her expertise in financial mathematics, particularly in risk management, insurance, and pensions, influencing actuarial science globally.

Langdon Park School
Mathematics

Unit 3	Graphs, tables and charts
Intention	To develop skills in representing data using frequency tables, two-way tables, time series, and graphs, including interpreting trends and relationships.
Key words	survey, primary, secondary, qualitative, quantitative, line of best fit, interpolation
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can organise data into frequency tables and interpret the results			
I can read and complete two-way tables to analyse categorical data			
I can represent data using various graphs and charts			
I can interpret trends in time series data and predict future values			
I can create and interpret stem and leaf diagrams for data analysis			
I can construct and analyse pie charts to represent parts of a whole			
I can plot scatter graphs and draw a line of best fit to explore relationships			

Unit sequence

1. Frequency tables
2. Two-way tables
3. Representing data
4. Time series
5. Stem and leaf diagrams
6. Pie charts
7. Scatter graphs
8. Line of best fit

Top career

Statistical graphic designer

Specialises in transforming complex data into visually engaging graphics that clearly communicate statistical findings.

Salary

£30,000 - £50,000+ per year

Useful links

https://www.sparxmaths.uk/
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https://www.mathsgenie.co.uk/
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Be Inclusive

Florence Nightingale (1820–1910), a pioneering nurse and statistician, revolutionised healthcare by using statistical data to advocate for sanitary reforms, introducing evidence-based practices and transforming modern nursing and public health policy.

Unit 4	Fractions and percentages
Intention	To develop proficiency in working with fractions, performing operations, converting between fractions, decimals, and percentages, and accurately calculating percentages.
Key words	denominator, numerator, ratio, multiplier, reverse percentage
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can simplify fractions and convert between mixed numbers and improper fractions			
I can add and subtract fractions with different denominators			
I can multiply and divide mixed numbers and proper fractions			
I can calculate fractions of amounts and apply to real-life contexts			
I can express fractions as percentages and vice versa			
I can calculate percentages of amounts			
I can calculate percentage increase and decrease problems			

Unit sequence	Top career
1. Fractions 2. Ratios 3. Ratio and proportion 4. Percentages 5. Fractions, decimals and percentage	**Insurance Underwriter** Assesses risk and premium rates using percentages for policy pricing. **Salary** £40,000 - £60,000+ per year

Useful links	YouTube channels
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Be Inclusive

Dame Sharon White (born 1967) is a distinguished British businesswoman who studies Economics at Cambridge. She has held significant roles, including Chief Executive of Ofcom and Chair of the John Lewis Partnership, the parent company of Waitrose.

Unit 5	Equations, inequalities and sequences
Intention	To develop skills in solving equations, working with inequalities, using formulae, and generating sequences, including finding and applying the nth term.
Key words	inequalities, less than, more than, identity, region, represent, number line
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can solve one and two step equations using the balancing method			
I can solve more complex equations, including those with variables on both sides			
I can solve equations that involve brackets on one and both sides			
I can solve linear inequalities and represent solutions on a number line			
I can form expressions and equations in real-life contexts			
I can rearrange formulae with fractions to make a variable the subject			
I can generate sequences and find the nth term for linear patterns			

Unit sequence	Top career
1. Solving equations 1 2. Solving equation 2 3. Solving equations with brackets 4. Introducing inequalities 5. More inequalities 6. Using formulae 7. Generating sequences 8. Using the Nth term of a sequence	**Civil engineer** Designs, constructs, and maintains infrastructure projects, ensuring safety, functionality, and sustainability. **Salary** £70,000 - £100,000+ per year

Useful links	YouTube channels
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/	@ExamSolutions_Maths @1stClassMaths @mathsgenie7808 @corbettmaths @mathsmadeeasy123 @TheGCSEMathsTutor @Cognitoedu @DrFrostMaths

Be Inclusive

Anusha Shah (born 1975) is a civil engineer who became the 159th President of the Institution of Civil Engineers in 2023. She is renowned for her expertise in sustainable development, climate adaptation, and promoting diversity in engineering.

Langdon Park School
Mathematics

Year 10F
Unit Overview

Unit 6	Angles
Intention	To apply properties of shapes, calculate angles in polygons, and solve geometrical problems involving parallel lines and polygons' interior and exterior angles.
Key words	interior, exterior, parallel, alternate, corresponding, vertically opposite, co-interior
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can identify and describe properties of 2D shapes			
I can calculate missing angles in triangle related problems			
I can calculate angles formed by parallel and transversals lines			
I can find and use angles within triangles accurately			
I can calculate the sum of interior angles in different polygons			
I can calculate interior and exterior angles of polygons			
I can apply angle facts to complex geometrical problems			

Unit sequence	Top career
1. Linear graphs 2. More linear graphs 3. Graphing rates of change 4. Real-life graphs 5. Line segments 6. Quadratic graphs 7. Cubic and reciprocal graphs 8. More graphs	**Civil engineer** Uses angles and shapes to design and construct buildings and bridges. **Salary** £75,000 - £100,000+ per year

Useful links	YouTube channels
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Emily Warren Roebling (1843–1903) was a pioneering civil engineer who oversaw the completion of the Brooklyn Bridge, applying engineering skills and managing construction when her husband, the chief engineer, became ill.

Unit 7	Averages and range
Intention	To develop understanding of range and averages, including mean, median, mode, and learn to estimate the mean and apply sampling techniques.
Key words	mean, median, mode, range, modal, sampling, representative, primary and secondary
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can calculate the mean and range of a data set			
I can find the mode and median for different types of data			
I can evaluate and determine the best averages to use in different contexts			
I can estimate the mean from grouped data			
I can interpret the range to determine consistency in different contexts			
I can identify and evaluate primary and secondary sources of data			
I can apply sampling methods to collect and interpret representative data			

Unit sequence	Top career
1. Mean and range 2. Mode, median and range 3. Types of average 4. Estimating the mean 5. Sampling	**Economist** Theses averages to understand real world issues, such as unemployment and economic growth. **Salary** £50,000 - £200,000+ per year

Useful links	YouTube channels
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/	@ExamSolutions_Maths @1stClassMaths @mathsgenie7808 @corbettmaths @mathsmadeeasy123 @TheGCSEMathsTutor @Cognitoedu @DrFrostMaths

Be Inclusive

Esther Duflo (born 1972) is a Nobel Prize-winning economist known for her groundbreaking work in developmental economics, focusing on poverty alleviation. She co-founded J-PAL, advancing effective poverty-reduction policies globally.

Langdon Park School
Mathematics

Unit 8	Perimeter, area and volume 1
Intention	To understand and calculate areas of various shapes, surface areas of 3D solids, and volumes of prisms, applying unit conversions in various mathematical contexts.
Key words	trapezium, compound, prism, cross-section, surface area, volume
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can calculate the area of rectangles, parallelograms, and triangles			
I can find the area of trapeziums			
I can calculate the area and perimeter of compound shapes			
I can calculate the surface area of 3D shapes, including cubes and cuboids			
I can calculate the volume of different prisms using its cross-section			
I can calculate volume and surface area in different real-life contexts			
I can calculate area and volume by converting between different units			

Unit sequence

1. Rectangles, parallelograms and triangles
2. Trapezia and changing units
3. Area of compound shapes
4. Surface area of 3D solids
5. Volume of prisms
6. More volume and surface area

Top career

CAD technician

Use software to create detailed 2D and 3D models for engineering, architecture, or manufacturing projects.

Salary

£35,000 - £50,000+ per year

Useful links

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@DrFrostMaths

Be Inclusive

Carol Bartz (born 1948) is a pioneering technology executive, known for transforming Autodesk into a global leader in CAD software, expanding the use of AutoCAD in architecture, engineering, and digital modelling.

Unit 9	Graphs
Intention	To develop skills in plotting coordinates, interpreting linear graphs, calculating gradients, and analysing equations, real-life graphs, and distance-time graphs.
Key words	gradient, y-intercept, linear, speed, distance, time
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can plot and interpret coordinates on a grid with positive and negative axes			
I can calculate the gradient of a line using the gradient formula			
I can calculate the y-intercept using the $y = mx + c$ equation			
I can interpret real-life graphs to in different contexts and make calculations			
I can analyse distance-time graphs to calculate speed, distance and time			
I can plot and label distance-time graphs to represent real-life journeys accurately			
I can apply my understanding of graphs to solve practical, real-world problems			

Unit sequence

1. Coordinates
2. Linear graphs
3. Gradient
4. $y = mx + c$
5. Real-life graphs
6. Distance-time graphs
7. More real-life graphs

Top career

Computer Programmer

Uses algebra to optimise logistics, resource management, and decision-making

Salary

£70,000 - £100,000+ per year

Useful links

https://www.sparxmaths.uk/
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Be Inclusive

Ada Lovelace (1815–1852) was a pioneering mathematician and the first computer programmer, known for her algorithm for Charles Babbage's Analytical Engine, envisioning computers' potential beyond calculations.

Unit 10	Transformations
Intention	To understand and perform translations, reflections, rotations, and enlargements, and to describe and combine transformations in various contexts.
Key words	expected frequency, theoretical, experimental, dependent, conditional, independent
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can translate shapes on a grid and describe the movement accurately			
I can reflect shapes across different lines and draw the new images			
I can rotate shapes around a point and describe the angle and direction of rotation			
I can enlarge shapes by a given scale factor and identify the centre of enlargement			
I can describe the properties of enlargements, including effects on size and orientation			
I can combine transformations and describe the overall effect on shapes			
I can apply transformations in problem-solving and in real-life contexts			

Unit sequence

1. Translations
2. Reflection
3. Rotation
4. Enlargement
5. Describing enlargements
6. Combining transformations

Top career

Epidemiologist

Uses probability to study disease spread and assess health risks.

Salary

£80,000 - £120,000+ per year

Useful links

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https://www.mathsgenie.co.uk/
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@DrFrostMaths

Be Inclusive

Dr. Anne Schuchat (born 1960) is a renowned epidemiologist who served as Principal Deputy Director of the U.S. Centers for Disease Control and Prevention (CDC). She played pivotal roles in managing public health responses to SARS, H1N1, and COVID-19 outbreaks.

Unit 11	Ratio and proportion
Intention	To use ratios and proportions in a variety of contexts, including measures and graphs, solving real-life problems and making comparisons through accurate calculation and mathematical reasoning.
Key words	ratio, proportion, equivalent, scale, comparison, graphical representation
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
Write ratios in the simplest form and solve ratio problems			
Use ratios to compare quantities and scale measures			
Convert between ratios and fractions or percentages			
Solve problems involving direct and inverse proportion			
Interpret and use proportional relationships in graphs			
Apply ratios in real-life contexts including recipes and maps			
Compare quantities effectively using proportional reasoning			

Unit sequence

1. Writing ratios
2. Using ratios 1
3. Ratio and measures
4. Using ratios 2
5. Comparing using rations
6. Using proportion
7. Proportion and graphs
8. Proportion problems

Top career

Nutritionist

Uses ratios and proportions to calculate balanced diets, comparing nutrient values and portion sizes to meet individual health needs and guidelines.

Salary

£30,000 - £50,000+ per year

Useful links

https://www.sparxmaths.uk/
https://sites.google.com/langdonpark.org/maths
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Be Inclusive

Mae Jemison (born 1956), the first African American woman in space, used ratio and proportion extensively in her work as a NASA astronaut, physician, and engineer.

Unit 12	Right-angled trigonometry
Intention	To apply Pythagoras' theorem and trigonometric ratios to find missing sides and angles in right-angled triangles, solving both mathematical and real-life problems.
Key words	Pythagoras, sine, cosine, tangent, hypotenuse, opposite, adjacent, right angle
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
Use Pythagoras' theorem to calculate missing sides in right-angled triangles			
Identify when to apply Pythagoras' theorem or trigonometric ratios			
Use the sine ratio to find missing sides and angles			
Use the cosine ratio to solve right-angled triangle problems			
Apply the tangent ratio to find lengths and angles			
Interpret real-life problems using right-angled trigonometry			
Solve multi-step problems involving two trigonometric ratios and Pythagoras			

Unit sequence	Top career
1. Translations 2. Reflection 3. Rotation 4. Enlargement 5. Describing enlargements 6. Combining transformations	**Structural engineer** Uses trigonometry and Pythagoras' theorem to calculate forces, lengths, and angles, ensuring structures are safely designed. **Salary** £30,000 - £50,000+ per year

Useful links	YouTube channels
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/	@ExamSolutions_Maths @1stClassMaths @mathsgenie7808 @corbettmaths @mathsmadeeasy123 @TheGCSEMathsTutor @Cognitoedu @DrFrostMaths

Be Inclusive
Ellen Ochoa (born 1958), an American engineer and astronaut, applied trigonometry in aerospace engineering and during space missions, becoming the first Hispanic woman in space.

Unit 13	Probability
Intention	To calculate and represent probabilities of single and combined events using diagrams and formulas, and to interpret experimental results through a range of methods including Venn and tree diagrams.
Key words	expected frequency, theoretical, experimental, dependent, conditional, independent
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
Calculate the probability of single and combined events			
Understand and use the probability scale from 0 to 1			
Represent and solve problems using Venn diagrams			
Draw and interpret probability tree diagrams			
Work with independent and dependent events			
Calculate probabilities from experimental data			
Compare experimental and theoretical probabilities			

Unit sequence	Top career
1. Calculating probability 2. Two events 3. Experimental probability 4. Venn diagram 5. Tree diagrams 6. More tree diagrams	**Epidemiologist** Uses probability to study disease spread and assess health risks. **Salary** £80,000 - £120,000+ per year

Useful links	YouTube channels
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/	@ExamSolutions_Maths @1stClassMaths @mathsgenie7808 @corbettmaths @mathsmadeeasy123 @TheGCSEMathsTutor @Cognitoedu @DrFrostMaths

Be Inclusive

Dr. Anne Schuchat (born 1960) is a renowned epidemiologist who served as Principal Deputy Director of the U.S. Centers for Disease Control and Prevention (CDC). She played pivotal roles in managing public health responses to SARS, H1N1, and COVID-19 outbreaks.

Unit 14	Multiplicative reasoning
Intention	To understand and perform translations, reflections, rotations, and enlargements, and to describe and combine transformations in various contexts.
Key words	percentage, growth, decay, speed, proportion, compound measures, scale factor
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
Calculate percentage increase and decrease, including reverse percentages			
Solve problems involving compound interest and depreciation			
Use the formula triangle for speed, distance, and time			
Apply compound measures such as speed, density, and pressure			
Understand and use direct and inverse proportion			
Interpret and solve real-life problems using multiplicative reasoning			
Convert between units accurately in compound measure problems			

Unit sequence

1. Translations
2. Reflection
3. Rotation
4. Enlargement
5. Describing enlargements
6. Combining transformations

Top career

Epidemiologist

Uses multiplicative reasoning to calculate delivery times, fuel usage, costs, and scheduling based on speed, time, and proportional quantities.

Salary

£40,000 - £80,000+ per year

Useful links

https://www.sparxmaths.uk/
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Be Inclusive

Gladys West (born 1930) is an African American mathematician whose work on satellite data and proportional modelling was crucial to the development of GPS technology.

Unit 15	Constructions, loci and bearings
Intention	To create accurate drawings, scale diagrams, constructions, and to use loci, plans, elevations, and bearings to solve geometric problems in two and three dimensions.
Key words	construction, locus, bearing, elevation, scale, region
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
Interpret and draw plans and elevations of 3D solids			
Produce accurate scale drawings using given measurements			
Construct perpendicular bisectors and angle bisectors using a compass and ruler			
Solve problems involving bearings measured from the north line			
Draw and describe loci from geometric conditions			
Represent and interpret regions satisfying multiple loci			
Apply constructions and loci in practical, real-world scenarios			

Unit sequence

1. 3D Solids
2. Plan and elevations
3. Accurate drawings 1
4. Scale drawing and maps
5. Accurate drawings 2
6. Constructions
7. Loci and regions

Top career

Land Surveyor

Uses scale drawings, bearings, and constructions to map out land and property boundaries with precision for construction and planning purposes.

Salary

£30,000 - £50,000+ per year

Useful links

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Elisa Leonida Zamfirescu (1887–1973) was one of the world's first female engineers, known for her work in civil engineering, using construction and spatial reasoning in her projects across Europe.