# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 1 | Number |
|---|---|
| Intention | To develop proficiency in calculations, divisibility, negative integers, and powers, enabling effective problem-solving with factors, roots, and mathematical expressions. |
| Key words | divisibility, positive, negative, integers, powers, roots, factors, multiples |
| Study | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| I can perform calculations involving integers, fractions, and decimals accurately | | | |
| I can identify and apply divisibility rules for different numbers | | | |
| I can calculate with negative integers in various mathematical operations | | | |
| I can understand and use powers and roots effectively in calculations | | | |
| I can simplify expressions that involve powers, roots, and brackets | | | |
| I can identify factors and multiples of given numbers confidently | | | |
| I can solve problems that involve divisibility and the use of negative integers | | | |

## Unit sequence

1. Calculations
2. Divisibility and division
3. Calculating with negative integers
4. Powers and roots
5. Powers, roots and brackets
6. More powers, multiples and factors

## Top career

**AI Research Scientist**

Develops algorithms and models using advanced mathematical concepts, including calculations, powers, and statistical analysis

**Salary**

£90,000 - £150,000+ 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
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@mathsgenie7808
@corbettmaths
@mathsmadeeasy123
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@DrFrostMaths

## Be Inclusive

Jensen Huang (born 1963) is the co-founder and CEO of NVIDIA, a leading AI technology company. Under his leadership, NVIDIA has become a pioneer in AI computing and deep learning innovations.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 2 | **Area and volume** |
|---|---|
| **Intention** | To develop understanding of area, volume, and surface area calculations, enabling effective measurement and representation of 2D and 3D shapes. |
| **Key words** | area, volume, surface area, parallelogram, trapezium, cubes, cuboids, vertex, edge |
| **Study** | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| I can calculate the area of triangles accurately | | | |
| I can calculate the area of parallelograms and trapeziums | | | |
| I can calculate the volume of cubes and cuboids | | | |
| I can represent 3D solids using 2D diagrams | | | |
| I can calculate the surface area of cubes and cuboids | | | |
| I can apply measures to solve real-world problems involving area and volume | | | |
| I can use appropriate formulas to find areas and volumes of various shapes | | | |

## Unit sequence

1. Mental maths
2. Addition and subtraction
3. Multiplication
4. Division
5. Money and time
6. Negative numbers
7. Factors, multiples and primes
8. Square numbers

## 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

Zaha Hadid (1950–2016) was a pioneering Iraqi British architect known for her innovative designs, including the London Aquatics Centre, winning the prestigious Pritzker Architecture Prize in 2004.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 3 | Statistics, graphs and charts |
|---|---|
| **Intention** | To develop skills in data representation, enabling effective interpretation and comparison of information, avoiding misleading representations. |
| **Key words** | pie charts, stem and leaf diagrams, scatter graphs, misleading, axes, coordinates |
| **Study** | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| I can create and interpret pie charts to represent data accurately | | | |
| I can organise and present data using tables effectively | | | |
| I can construct and analyse stem and leaf diagrams | | | |
| I can compare data sets using various graphical methods | | | |
| I can create and interpret scatter graphs to identify trends | | | |
| I can recognise and explain misleading graphs and their implications | | | |
| I can analyse data to draw meaningful conclusions from graphical representation | | | |

## Unit sequence

1. Pie charts
2. Using tables
3. Stem and leaf diagrams
4. Comparing data
5. Scatter graphs
6. Misleading graphs

## 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

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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.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 4 | Expressions and equations |
|---|---|
| Intention | To develop proficiency in algebraic powers, expressions, and equations, enabling effective problem-solving with one-step and two-step equations. |
| 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 multiply, divide and manipulate algebraic powers | | | |
| I can expand and simply single brackets involving multiples variables | | | |
| I can factorise and simplify algebraic expressions | | | |
| I can solve one-step equations using the balancing method | | | |
| I can solve two-step equations confidently | | | |
| I can solve multi-step equations involving fractions | | | |
| I can check my solutions by substitution in equations | | | |

## Unit sequence

1. Algebraic powers
2. Expressions and brackets
3. Factorising expressions
4. One-step equations
5. Two-step equations
6. The balancing method

## Top career

**Game Mathematician**

Applies algebraic concepts to develop algorithms for game mechanics, ensuring balanced gameplay and creating realistic physics simulations.

**Salary**

£50,000 - £70,000+ per year

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## Be Inclusive

Maryam Mirzakhani (1977–2017) was an esteemed Iranian mathematician who became the first woman and Iranian to win the Fields Medal in 2014 for her contributions to Riemann surfaces and geometry.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 5 | Real-life graphs |
|---|---|
| Intention | To develop skills in interpreting, analysing, and creating various types of graphs, including conversion, distance-time, and curved graphs, in real-life situations. |
| Key words | conversion, distance-time, data analysis, interpretation, representation |
| Study | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| I can create conversion graphs for different units | | | |
| I can interpret and predict trends using conversion graphs | | | |
| I can analyse distance-time graphs to determine speed, distance and times | | | |
| I can construct and interpret line graphs to assess data trends | | | |
| I can identify the graphs for rates of flow in different contexts | | | |
| I can use real-life graphs to solve practical problems and make predictions | | | |
| I can draw conclusions from graphical data and communicate my findings effectively | | | |

## Unit sequence

1. Conversion graphs
2. Distance-time graphs
3. Line graphs
4. More line graphs
5. Real-life graphs
6. Curved graphs

## Top career

**Data Visualisation Specialist**

Designs and creates visual representations of complex data sets, enhance understanding and support data-driven decision-making.

**Salary**

£60,000 - £90,000+ per year

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## Be Inclusive

Nancy Duarte (born 1961), is a prominent American data visualiser and communication expert known for her innovative presentation techniques and impactful storytelling, helping organisations effectively communicate complex data through visuals.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 6 | Decimals and ratio |
|---|---|
| Intention | To develop proficiency in ordering, rounding, and calculating with decimals, as well as understanding ratios and proportions involving decimals. |
| 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 order decimals accurately from smallest to largest | | | |
| I can round decimals by places, significant figures, nearest integers, 10, 100s, etc. | | | |
| I can perform calculations with decimals across all four operations | | | |
| I can identify and use place value in decimal numbers | | | |
| I can solve problems involving ratios with decimal values | | | |
| I can express proportions using decimals in various contexts | | | |
| I can apply my understanding of decimals to real-life situations and problems | | | |

## Unit sequence

1. Ordering decimals and rounding
2. Place value calculations
3. Calculations with decimals
4. Ratio and proportion with decimals

## Top career

**Financial analyst**

Evaluates financial data, using calculations with decimals and ratios to forecast trends and provide insights for investment decisions.

**Salary**

£70,000 - £500,000+ per year

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@DrFrostMaths

## Be Inclusive

Chris Gardner (born 1954) is an American who faced homelessness while raising his son, enduring immense challenges. Through determination and resilience, he secured an internship at a brokerage firm, becoming a successful stockbroker.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 7 | Lines and angles |
|---|---|
| **Intention** | To develop understanding of quadrilaterals, angle relationships, and geometric proofs, enabling effective problem-solving with interior and exterior angles in various contexts. |
| **Key words** | alternate, corresponding, co-interior, vertically opposite, proof, show |
| **Study** | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| I can identify and classify different types of quadrilaterals | | | |
| I can understand and apply the properties of alternate angles | | | |
| I can determine angle facts in parallel lines using angle relationships | | | |
| I can identify and calculate interior and exterior angles of polygons | | | |
| I can solve geometric problems involving angles and quadrilaterals | | | |
| I can construct geometric proofs to demonstrate angle relationships | | | |
| I can apply my knowledge of angles to real-world situations and problems | | | |

## Unit sequence

1. Quadrilaterals
2. Alternate angles and proof
3. Angles in parallel lines
4. Exterior and interior angles
5. Solving geometric problems

## Top career

**Architect**

Designs buildings and structures, applying principles of geometry and angles to create functional and aesthetically pleasing spaces.

**Salary**

£60,000 - £100,000+ per year

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## Be Inclusive

David Adjaye (born 1966) is a renowned Ghanaian British architect celebrated for his innovative designs, including the Smithsonian National Museum of African American History, and is committed to social justice through architecture and community engagement.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 8 | Calculating with fractions |
|---|---|
| Intention | To add, subtract, multiply, and divide fractions and mixed numbers, including ordering and simplifying, applying fraction calculations to real-life and problem-solving contexts. |
| Key words | numerator, denominator, simplify, improper, mixed number, reciprocal |
| Study | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| Order fractions by converting to common denominators or decimals | | | |
| Add and subtract fractions with different denominators | | | |
| Multiply proper and improper fractions | | | |
| Divide fractions using reciprocals | | | |
| Convert between mixed numbers and improper fractions | | | |
| Perform calculations with mixed numbers | | | |
| Simplify answers and explain methods clearly | | | |

## Unit sequence

1. Ordering fractions
2. Adding and subtracting fractions
3. Multiplying fractions
4. Dividing fractions
5. Calculating with mixed numbers

## Top career

**Chef**

Regularly uses fractions when adjusting recipes, dividing ingredients, or converting measurements, requiring accuracy in practical, real-world situations.

**Salary**

£25,000 - £45,000+ per year

## Useful links

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https://corbettmaths.com/
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@DrFrostMaths

## Be Inclusive

Nadiya Hussain (born 1984) is a British chef, baker, and TV presenter. She often uses maths, including fractions, when creating and scaling recipes, making her an inspiring role model who combines creativity and precision.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 9 | **Straight line graphs** |
|---|---|
| **Intention** | To understand and interpret straight-line graphs, including direct proportion, gradient, and y-intercept, and to use equations to represent linear relationships in real-life. |
| **Key words** | gradient, y-intercept, rise, run, linear, proportion, axis, coordinates |
| **Study** | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| Plot straight-line graphs from a table of values | | | |
| Recognise and describe direct proportion graphs | | | |
| Calculate the gradient of a straight line | | | |
| Identify the y-intercept from a graph and equation | | | |
| Use the equation y = mx + c to represent straight lines | | | |
| Interpret gradient and intercept in real-world contexts | | | |
| Draw and describe linear relationships using appropriate vocabulary | | | |

## Unit sequence

1. Direct proportion on graphs
2. Gradients
3. Equations of straight lines

## Top career

**Architect**

Uses straight-line graphs to model and analyse relationships such as speed, pressure, and load over distance or time, helping design safe and efficient structures.

**Salary**

£60,000 - £100,000+ per year

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@DrFrostMaths

## Be Inclusive

Yasmin Green (born 1981) is a British Iranian tech leader and former director at Google Jigsaw. With a background in engineering and data, she has promoted the use of data modelling and linear analysis to solve complex global problems.

# Langdon Park School
Mathematics

# Year 8
Unit Overview

| Unit 10 | **Percentages, decimals and fractions** |
|---|---|
| **Intention** | To convert between fractions, decimals, and percentages, recognise equivalent values, and calculate percentages of amounts in real-life contexts with clear methods. |
| **Key words** | fraction, decimal, percentage, equivalent, proportion, convert |
| **Study** | https://sites.google.com/langdonpark.org/maths/study/key-stage-3 |

| Success criteria | R | A | G |
|---|---|---|---|
| Convert between fractions and decimals | | | |
| Convert between fractions and percentages | | | |
| Convert between decimals and percentages | | | |
| Identify and use equivalent fractions, decimals, and percentages | | | |
| Write percentages as parts of a whole | | | |
| Calculate percentages of amounts using efficient methods | | | |
| Solve problems involving real-life percentage contexts | | | |

## Unit sequence

1. Fractions and decimals
2. Equivalent proportions
3. Writing percentages
4. Percentages of amounts

## Top career

**Retail manager**

Uses percentages and conversions to work out discounts, markups, and profit margins, relying on accurate numeracy skills

**Salary**

£30,000 - £60,000+ per year

## Useful links

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@DrFrostMaths

## Be Inclusive

Mary Portas (born 1960) is a British retail expert and businesswoman. She has used mathematical understanding, including percentages and profit calculations, to transform failing shops and advise businesses.