# St Paul's Academy
# Maths 5 Year Curriculum Overview

**At St Paul's Academy, we believe that students deserve a creative and ambitious mathematics curriculum, rich in skills and knowledge, which ignites curiosity and prepares them well for everyday life, future employment and inspires students to study Maths further at higher education. Our mathematics curriculum gives students the opportunity to:**

- become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and preserving in seeking solutions.
- communicate, justify, argue and prove using mathematical vocabulary.
- develop their character, including resilience, confidence and independence, so that they contribute positively to the life of the school, their local community and the wider environment.

## Disciplinary Knowledge



**Reason mathematically** - The process of applying logical and critical thinking to a mathematical problem in order to decide upon the correct strategy to use or not use. In reaching a solution.



**Build mathematical fluency**- Developing the fundamental skills within mathematics through varied forms of frequent practice. While also being able to recall key facts and information of key principles.

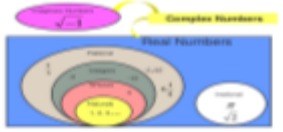


**Connections between topics in Maths -** Identify connections among mathematical ideas; understand how mathematical ideas interconnect and build on one another to produce a coherent whole



**Problem solve in context** - The ability to use and compare different mathematical principles in order to solve problems given in a variety of different contexts. Through strategies such as reflection, analysis and modelling

## Substantive Knowledge



**Number**




**Algebra**



**Ratio & Proportion**



**Geometry**



**Probability**

**Statistics**

St Paul's Academy School
Maths Curriculum Map – Topics/Units by Half Term

| *SK Themes and colours* | Number | Algebra | Ratio & Proportion | Geometry | Probability | Statistics |
|---|---|---|---|---|---|---|
| *DK Big Ideas and colour* | Reason mathematically | Mathematical fluency | Connections between topics in Maths | Problem solve in context | | |

| KS3 | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| Year 7 | **Number skills**<br>*Mental Maths, BIDMAS, Four Operations, FINANCE: Time & Money, Negative Numbers, Factors, Multiples & Primes, HCF & LCM by Listing, Square & Triangle Numbers*<br><br>**Analysing & Displaying Data**<br>*Mode, Median, Range, Displaying Data, Grouping Data, Comparing Data: Averages & Range, Line Graphs & More Bar Charts,Using Spreadsheets* | **Expressions, Functions, Formulae**<br>Functions, Simplifying Expressions, Expanding Brackets, Writing Expressions, STEM: Substituting into Formulae<br><br>**Decimals & Measures**<br>Ordering & Rounding, Length, Mass & Capacity, Scales & Measures, Working with Decimals inc. Mentally, Perimeter, Area, STEM: More Units | **Fractions & Percentages**<br>Comparing, Simplifying, Adding & Subtracting, Fractions of Amounts, Fractions & Decimals, Understanding Percentages, Percentages of Amounts<br><br>**Probability**<br>Language of Probability, Probability Scale, Outcomes, Calculating Probabilities, Experimental Probability, FINANCE: Expected Outcomes | **Ratio & Proportion**<br>Direct Proportion, Unitary Method, Writing Ratios, Simplifying Ratios, Sharing in a Given Ratio, Scale & Measures, Proportions & Fractions, Proportions & Percentages | **Lines & Angles**<br>Lines Angles & Triangles, Estimating Measuring & Drawing Angles, Drawing Triangles Accurately, STEM: Calculating Angles, Angles in Triangles, Quadrilaterals<br><br>**Sequences & Graphs**<br>Sequences, Pattern Sequences, Coordinates & Midpoints, Extending Sequences, Linear Graphs, Position-to-Term Rules | **Transformations**<br>Congruent Shapes & Enlargements, Symmetry, Reflection, Rotation, Translations & Combined Transformations |
| | SK / DK | SK / DK | SK / DK | SK / DK | SK / DK | SK / DK |
| Year 8 | **Number**<br>Calculations, Calculations with Negative Integers, Powers & Roots, Powers, Roots & Brackets, Index Notation, Prime Factor Decomposition, HCF & LCM by Prime Factors<br><br>**Area and Volume**<br>Area of Triangles, Parallelogram & Trapezia, Volume of Cubes & Cuboids, 3D Shapes: Nets and Plans & Elevations, Surface Area of Cubes & Cuboids, Problems & Measures | **Statistics, Graphs & Charts**<br>Pie Charts, Using Tables (Frequency Tables, Mean & Two-Way Tables), Stem & Leaf Diagrams, Comparing Data, Scatter Graphs, FINANCE: Misleading Graphs<br><br>**Expressions & Equations**<br>Algebraic Powers, Expressions & Brackets, Factorising Expressions, One-Step Equations, Two-Step Equations, Equations with an Unknown on Both Sides | **Real-Life Graphs**<br>Conversion Graphs, Distance-Time Graphs, Line Graphs, Complex Line Graphs, STEM: Graphs of Functions, More Real-Life Graphs: Linear & Non-Linear<br><br>**Decimals & Ratio**<br>Ordering & Rounding, Place Value Calculations, Adding, Subtracting, Multiplying & Dividing by Decimals, Ratio & Proportion | **Lines & Angles**<br>Quadrilaterals: Properties & Angles, Alternate Angles & Proof, Geometrical Problems inc. Corresponding Angles, Angles in Polygons, Solving Geometric Problems | **Calculating with Fractions**<br>Adding & Subtracting Fractions, Multiplying Fractions, Fractions, Decimals & Reciprocals, Dividing Fractions, Four Operations with Mixed Numbers<br><br>**Straight-Line Graphs**<br>Direct Proportion on Graphs, Linear Graphs & Gradient, Midpoints, y=mx+c, STEM: Direct Proportion Problems | **Fractions Decimals and Percentages**<br>Fraction & Decimals, Equivalent Proportions, Writing Percentages, Increase/Decrease by a Percentage, Simple Interest, Reverse Percentages, FINANCE: Solving Problems |

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| | | | with Decimals, STEM: Using Ratios | | | |
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| Year 9 F | **Number**<br>Calculations & Order of Operations, Round<br>Decimal Places, Multiplying & Dividing Dec<br>Numbers, Rounding to Significant Figures &<br>Estimating,<br>Factors Multiples & Primes, HCF & LCM by<br>Squares Cubes & Roots, Index Notation & I<br>Indices, Prime Factor Decomposition, HCF<br>Prime Factor | **Algebra**<br>Algebraic Notation, Writing Expressions, Simplifying Expressions, Substitution, Expanding Brackets, Factorising Expressions, Using Expressions & Formulae | **Graphs, Tables & Charts**<br>Frequency Tables, Two-Way Tables, Representing Data, Time Series, Stem & Leaf Diagrams, Pie Charts, Scatter Graphs, Line of Best Fit<br><br>**Fractions & Percentages**<br>Comparing Fractions, Fractions of Amounts, Adding & Subtracting Fractions & Mixed Numbers, Multiplying Fractions, Dividing Fractions, Fractions & Decimals, Fractions & Percentages, Calculating Percentages | **Equations, Inequalities & Sequences**<br>Solving Equations, Inequalities, Substituting into Formulae, Rearranging Formulae, Generating Sequences, Nth Term | **Angles**<br>Properties of Shapes: Similarity & Congruence, Angles in Parallel Lines, Angles in Triangles, Angles in Polygons, Geometrical Problems<br><br>**Averages & Range**<br>Mean & Range, Mode Median & Range, Types of Average, Median & Modal Class, Estimating the Mean & Range, Sampling | **Perimeter, Area & Volume 1**<br>Rectangles Parallelograms & Triangles, Trapezia & Changing Units, Area of Compound Shapes, Surface Area of Cuboids & Prisms, Volume of Prisms, More Measures |
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| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| Year 10 F | **Graphs**<br>Coordinates & Midpoints, Linear Graphs, Gradient, y=mx+c, Real-Life Graphs, Distance-Time Graphs & Rates of Change, More Real-Life Graphs<br><br>**Transformations**<br>Translation, Reflection, Rotation, Enlargement, Describing Enlargements, Combining Transformations | **Ratio & Proportion**<br>Writing Ratios, Simplifying Ratios, Ratios & Measures, Sharing in a Given Ratio, Comparing Using Ratios (Ratios & Fractions and Unit Ratios), Using Proportions (Unitary Method & Best Buys), Proportion & Graphs, Proportion Problems (Inverse Proportion) | **Right-Angled Triangles**<br>Pythagoras' Theorem, Trigonometry: Sine, Cosine & Tangent Ratios, Finding Lengths and Angles Using Trigonometry, Exact Values of Sine, Cosine & Tangent<br><br>**Probability**<br>Calculating Probability, Two Events (Sample Space Diagrams), Experimental Probability, Venn Diagrams, Tree Diagrams: Independent & Dependent Events | **Multiplicative Reasoning**<br>Reverse Percentages, Percentage Change, Compound Interest & Depreciation, Compound Measures (Speed, Density & Pressure), Direct & Inverse Proportion | **Constructions, Loci, Bearings**<br>Properties of 3D Solids, Plans & Elevations, Accurate Drawings, Scale Drawings & Maps, Constructions, Loci & Regions, Bearings<br><br>**Quadratic Equations & Graphs**<br>Expanding Double Brackets, Plotting & Using Quadratic Graphs, Factorising Quadratics, Solving Quadratic Equations Algebraically | **Perimeter, Area & Volume 2**<br>Circumference of Circles, Area of Circles Semi-Circles & Sectors, Composite 2D Shapes & Cylinders, Pyramids & Cones, Spheres & Composite Solids |
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| Year 11<br>F | **Fractions, Indices & Standard Form**<br>Multiplying & Dividing Mixed Numbers, Negative Indices, Standard Form<br><br>**Congruence, Similarity & Vectors**<br>Using Similarity, Congruent Triangles, Using Congruence, Vectors | | | | | | **More Algebra**<br>Graphs of Cubic & Reciprocal Functions, Non-Linear Graphs, Simultaneous Equations Graphically & Algebraically, Rearranging Formulae, Proof | | | | | **Bespoke sequence of lessons based on needs of the class** | | | | | **Bespoke sequence of lessons based on needs of the class** | | | | | **Bespoke sequence of lessons based on needs of the class** | | | | | **Bespoke sequence of lessons based on needs of the class** | | | | |
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