St Paul's Academy
Maths 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

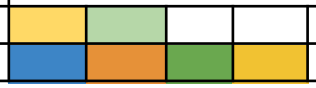
Probability

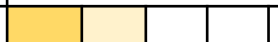
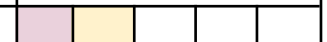
Statistics

St Paul's Academy School
Maths Key Stage 3 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 Sense and Calculations** - Working with integers, decimals and place value **End of half-term Knowledge Organiser Assessment**	**Expressions & Equations** – Identifying and manipulating algebraic expressions and solving equations **Measures** - time conversions and units of length, mass and capacity conversions **End of term Summative Assessment**	**2D Shapes** - Properties of 2D shapes **Perimeter & area**- identify properties and calculate area and perimeter of 2D Shapes **Coordinates** - reading, plotting and solving **Factors, Multiples and Primes** - including HCF and prime factor decomposition **End of half-term Knowledge Organiser Assessment**	**Fractions** - writing, simplifying, ordering, and addition and subtraction of fractions **Brackets** - expanding and factorising - single brackets **End of term Summative Assessment**	**Angles** - identify types, estimating, measuring and drawing of angles; and recalling basic angles facts **Handling data and statistical diagrams** - interpret and construct tables and charts, and the collection and presentation of data **Proportion** - solving proportion problems **End of half-term Knowledge Organiser Assessment**	**Fractions, decimals and percentages** - multiplying and dividing, finding fractions of amounts and converting between fractions, decimals and percentages **Probability** - theoretical probability, including probability from a sample space diagram **End of Year Summative Assessment**
	SK / DK	SK / DK	SK / DK	SK / DK	SK / DK	SK / DK

Year 8	**Percentages** - Work out percentages of an amount and the percentage change **Calculating with money** - Applying understanding of money **Indices** - Recall index rules and simplify ex with positive and negative indices; and simplify algebraic fractions **Equations** - solve equations including 2 step equations, equations with brackets, and equations with the variables on both sides. Construct Equations. **End of half-term Knowledge Organiser Assessment**	**Sequences** - Generate terms of sequences using term-to-term and position-to-term rules and create the nth term of sequences. **Ratio** - Write, simplify, use equivalence with ratios and convert between ratio fractions and percentages; and share an amount in a ratio. **End of term Summative Assessment**	**Rounding** - significant figures and estimation **Coordinates** - finding midpoints **Area** - finding the area of 2D shapes **Circles** - Finding area and circumference of the circle **End of half-term Knowledge Organiser Assessment**	**Standard form** - including positive and negative indices **Venn Diagrams** - including finding the HCF and LCM with prime factor decomposition **3D Shapes** - identify nets **Surface area and volume** - Find volume and surface area of 3D shapes **End of term Summative Assessment**	**Linear graphs** - plotting graphs and finding equations **Transformations** - carry out translations and reflections **Angles** - Using angle facts to find unknown and in 2D shapes **Statistical diagrams** - Drawing and interpreting statistical diagrams **End of half-term Knowledge Organiser Assessment**	**Linear Inequalities** - number line and solving **Brackets** - expanding double brackets **Algebraic fractions** - addition and subtraction **Recurring decimals** - notation and converting between recurring decimals and fractions **End of year Summative Assessment**
	SK 					
	DK					

Year 9	**Fractions and Percentages** - Convert between fractions, decimals and percentages and order them; finding fractions and percentages of amounts and percentage change with and without the calculator; working out reverse percentage and simple interest. **Probability** - working out theoretical and experimental probability **Standard form** - Add, subtract, multiply and divide numbers in standard form **Inequalities** - solving inequalities including those with the variable on both sides and double inequalities **Quadratic equations** - factorising and solving all quadratics in the forms ax2 + bx + c and the difference of two squares. **End of half-term Knowledge Organiser Assessment**	**Formulae** - rearranging formulae, including the use of two or more steps **Construction** - constructing angle and perpendicular bisectors **Circles** - Finding arc length and area of sectors, and finding surface area and volume of cylinders **End of term Summative Assessment**	**Rounding** - Error intervals and truncation **3D Shapes** - Plans and elevation **Pythagoras' theorem** - Calculating missing sides and problem solving **Ratio & Proportion** - Ratio (Simplifying & Sharing) and direct and inverse proportion **End of term Knowledge Organiser Assessment**	**Linear Graphs -** Working with straight line graphs **Compound measures** - Calculating speed and rates **Motion-time graphs** - Plotting, interpreting and calculating speed from distance time graphs. Plotting distance time graphs using speeds **End of term Summative Assessment**	**Quadratic graphs** - Plotting and interpreting quadratic graphs **Angles and bearings** - Applying angle facts, angles on parallel lines and working out missing angles in polygons. Working with bearings **Transformations** - Translation, reflection, rotation and Enlargement **Similarity and Congruence** - Developing an understanding of similarity and working with similar shapes **End of term Knowledge Organiser Assessment**	**Handling data and statistical diagrams** - Working with scatter graphs, collecting and representing data and applying my understanding of averages with grouped data **Vectors** - Column vectors **End of year Summative Assessment**
	SK 					
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St Paul's Academy School
Maths Key Stage 4 Curriculum Map – Topics by Term

SK themes and colours	Number	Algebra	Ratio & Proportion	Geometry	Probability	Statistics
DK Big Ideas and Colours	Reason mathematically	Mathematical fluency	Connections between topics in Maths	Problem solve in context		

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10 F	**Number** - Understand and work with numbers (integers, decimals, fractions), use operations and their relationships, apply number properties (like factors, multiples, primes), use powers and roots, estimate and check calculations, and work with standard units and rounding. **Algebra** -Expressions, substituting into simple formulae, expanding and factorising **Statistics** - Drawing and interpreting graphs, tables and charts	**Number** -Work confidently with numbers, including integers, decimals, fractions, and percentages. Apply operations, understand place value, use correct symbols and notation, and interpret data in charts and tables. Use standard units, estimate and solve problems involving FDP and measures. **Algebra** - Equations, Inequalities and sequences	**Geometry** - Angles, polygons and parallel lines **Statistics** - Statistics, sampling and working with averages **Geometry** - Perimeter, area (2D shapes) and volume of 3D shapes and composite solids	**Algebra** - Real life and algebraic linear graphs **Geometry** - Transformations	**Ratio** - Understand and apply ratios, proportions, and fractions in various contexts. Convert between units, use scale diagrams, and solve problems involving direct and inverse proportion. Work with standard and compound measures, and interpret graphs and equations representing proportional relationships. **Geometry** - Work with indices, surds, and rounding; simplify	**Number** - Multiplicative reasoning: more percentages, rates of change, compound measures **Geometry** - Constructions: triangles, nets, plans and elevations, loci, scale drawings and bearings

		End of term Summative Assessment		**End of term Summative Assessment**	algebraic expressions and use standard formulae. Apply geometric reasoning, including similarity, Pythagoras' Theorem, and trigonometric ratios, to solve problems and interpret exact trigonometric values.y **Probability** - Calculating probability, two events (sample space diagrams), experimental probability, Venn diagrams, tree diagrams and independent and dependent events	**End of year Summative Assessment**
	SK						
	DK						

Year 10 H	**Number** - Powers, decimals, HCF and LCM, positive and negative, roots, rounding, reciprocals, standard form, indices and surds **Algebra** - Expressions, substituting into simple formulae, expanding and factorising **Statistics** - Averages and range, collecting data, representing data	**Number** - Fractions, percentages, ratio and proportion **Geometry** - Angles, polygons, parallel lines; right angled triangles: Pythagoras and trigonometry **End of term Summative Assessment**	**Algebra** - Real- life and algebraic linear graphs **Geometry** - Perimeter, area and volume, plane shapes and prisms, circles, cylinders, spheres,cones, Accuracy and bounds **Geometry** -Transformations, Constructions: Triangles, nets, plan and elevation, loci, scale drawings and bearings	**Algebra -** Algebra: Solving quadratic equations and inequalities, solving simultaneous equations algebraically **Probability** - Combined events (product rule & sample space diagrams), Mutually exclusive events, experimental probability, Independent events and tree diagrams, conditional probability, Venn diagrams and set notation **End of term Summative Assessment**	**Ratio-** direct and inverse proportion, relating to graph form form for direct, compound measures, repeated proportional change **Geometry** - Similarity & Congruence **Geometry** - Sine and Cosine rules, ½ absinc, trigonometry & Pythagoras in 3D, trigonometric graphs, accuracy and bounds	**Statistics** - Statistics and sampling, cumulative frequency and histograms **Algebra** - Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics **End of year Summative Assessment**
	SK					
	DK					

Year 11 F	**Algebra** - Quadratic equations and graphs **Geometry** - Perimeter, area and volume 2: Circles cylinders, cones and spheres **Number** - Fractions, reciprocals, standard form, zero and negative indices	**Geometry** - Congruence, Similarity and Vectors **Algebra** - Rearranging equations, graphs of cubic and reciprocal functions and simultaneous equations **PPE 1**				
	SK					
	DK					
Year 11 H	**Geometry** - Circle theorems and circle geometry **Algebra** - Changing subject of the formula(More complex), algebraic fractions, solving equations arising from algebraic fractions, rationalising surds and proof	**Algebra** - Direct and indirect proportion: Using statements of proportionality, reciprocal and exponential graphs, rates of change in graphs, functions, transformations of graphs				

	Geometry - Understand and use vector notation and operations, represent vectors graphically, calculate vector sums and scalar multiples, and solve geometric problems using vectors.						**PPE 1**																
	SK																						
	DK																						

St Paul's Academy
Maths Curriculum Map – Disciplinary Knowledge Progression Overview

End of…	Year 7	Year 8	Year 9	Year 10	Year 11
Number	**Number Sense and Calculations** - Working with integers, decimals and place value **Factors, Multiples and Primes** - including HCF and prime factor decomposition **Fractions** - writing, simplifying, ordering, and addition and subtraction of fractions **percentages** - multiplying and dividing, finding fractions of amounts and converting between fractions, decimals and percentages	**Percentages** - Work out percentages of an amount and the percentage change **Rounding** - significant figures and estimation **Standard form** - including positive and negative indices **Recurring decimals** - notation and converting between recurring decimals and fractions	**Fractions and Percentages** - Convert between fractions, decimals and percentages and order them; finding fractions and percentages of amounts and percentage change with and without the calculator; working out reverse percentage and simple interest. **Standard form** - Add, subtract, multiply and divide numbers in standard form **Rounding** - Error intervals and truncation	**Foundation** **Number** - Understand and work with numbers (integers, decimals, fractions), use operations and their relationships, apply number properties (like factors, multiples, primes), use powers and roots, estimate and check calculations, and work with standard units and rounding. **Number** -Work confidently with numbers, including integers, decimals, fractions, and percentages. Apply operations, understand place value, use correct symbols and notation, and interpret data in charts and tables. Use standard units, estimate and solve problems involving FDP and measures.	**Foundation** **Number** - Fractions, reciprocals, standard form, zero and negative indices

				Number - Multiplicative reasoning: more percentages, rates of change, compound measures **Higher** **Number** - Powers, decimals, HCF and LCM, positive and negative, roots, rounding, reciprocals, standard form, indices and surds **Number** - Fractions, percentages, ratio and proportion	
Algebra	**Expressions & Equations** – Identifying and manipulating algebraic expressions and solving equations **Coordinates** - reading, plotting and solving	**Indices** - Recall index rules and simplify ex with positive and negative indices; and simplify algebraic fractions **Equations** - solve equations including 2 step equations, equations with brackets, and equations with the variables on both sides. Construct equations. **Sequences** - Generate terms of sequences using term-to-term and position-to-term rules and	**Inequalities** - solving inequalities including those with the variable on both sides and double inequalities **Quadratic equations** - factorising and solving all quadratics in the forms ax2 + bx + c and the difference of two squares. **Formulae** - rearranging formulae, including the use of two or more steps **Linear Graphs -** Working with straight line graphs	**Foundation** **Algebra** -Expressions, substituting into simple formulae, expanding and factorising **Algebra** - Equations, Inequalities and sequences **Algebra** - Real life and algebraic linear graphs **Higher** **Algebra** - Expressions, substituting into simple formulae, expanding and factorising	**Foundation** **Algebra** - Quadratic equations and graphs **Algebra** - Rearranging equations, graphs of cubic and reciprocal functions and simultaneous equations **Higher** **Algebra** - Changing subject of the formula(More complex), algebraic fractions, solving equations arising from algebraic fractions, rationalising surds and proof

		create the nth term of sequences. **Coordinates** - finding midpoints **Linear graphs** - plotting graphs and finding equations **Linear Inequalities** - number line and solving **Brackets** - expanding double brackets **Algebraic fractions** - addition and subtraction	**Motion-time graphs** - Plotting, interpreting and calculating speed from distance time graphs. Plotting distance time graphs using speeds **Quadratic graphs** - Plotting and interpreting quadratic graphs	**Algebra** - Real-life and algebraic linear graphs **Algebra -** Algebra: Solving quadratic equations and inequalities, solving simultaneous equations algebraically **Algebra** - Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics	**Algebra** - Direct and indirect proportion: Using statements of proportionality, reciprocal and exponential graphs, rates of change in graphs, functions, transformations of graphs
Ratio & Proportion	**Measures** - time conversions and units of length, mass and capacity conversions **Proportion** - solving proportion problems	**Calculating with money** - Applying understanding of money **Ratio** - Write, simplify, use equivalence with ratios and convert between ratio fractions and percentages; and share an amount in a ratio.	**Ratio & Proportion** - Ratio (Simplifying & Sharing) and direct and inverse proportion **Compound measures** - Calculating speed and rates	**Foundation** **Ratio** - Understand and apply ratios, proportions, and fractions in various contexts. Convert between units, use scale diagrams, and solve problems involving direct and inverse proportion. Work with standard and compound measures, and interpret graphs and equations representing proportional relationships. **Higher**	

				Ratio- direct and inverse proportion, relating to graph form form for direct, compound measures, repeated proportional change	
Geometry	**2D Shapes** - Properties of 2D shapes **Perimeter & area**- identify properties and calculate area and perimeter of 2D Shapes **Angles** - identify types, estimating, measuring and drawing of angles; and recalling basic angles facts	**Area** - finding the area of 2D shapes **Circles** - Finding area and circumference of the circle **3D Shapes** - identify nets **Surface area and volume** - Find volume and surface area of 3D shapes **Angles** - Using angle facts to find unknown and in 2D shapes	**Construction** - constructing angle and perpendicular bisectors **Circles** - Finding arc length and area of sectors, and finding surface area and volume of cylinders **3D Shapes** - Plans and elevation **Pythagoras' theorem** - Calculating missing sides and problem solving **Angles and bearings** - Applying angle facts, angles on parallel lines and working out missing angles in polygons. Working with bearings **Transformations** - Translation, reflection, rotation and Enlargement	**<u>Foundation</u>** **Geometry** - Angles, polygons and parallel lines **Geometry** - Perimeter, area (2D shapes) and volume of 3D shapes and composite solids **Geometry** - Transformations **Geometry** - Work with indices, surds, and rounding; simplify algebraic expressions and use standard formulae. Apply geometric reasoning, including similarity, Pythagoras' Theorem, and trigonometric ratios, to solve problems and interpret exact trigonometric values. **Geometry** - Constructions: triangles, nets, plans and elevations, loci, scale drawings and bearings	

			Similarity and Congruence - Developing an understanding of similarity and working with similar shapes **Vectors** - Column vectors	**Higher** **Geometry** - Angles, polygons, parallel lines; right angled triangles: Pythagoras and trigonometry **Geometry** - Perimeter, area and volume, plane shapes and prisms, circles, cylinders, spheres,cones, Accuracy and bounds **Geometry** -Transformations, Constructions: Triangles, nets, plan and elevation, loci, scale drawings and bearings **Geometry** - Similarity & Congruence **Geometry** - Sine and Cosine rules, ½ absinc, trigonometry & Pythagoras in 3D, trigonometric graphs, accuracy and bounds **Geometry** - Understand and use vector notation and operations, represent vectors graphically, calculate vector sums and scalar multiples, and solve geometric problems using vectors.	

Probability	**Probability** - theoretical probability, including probability from a sample space diagram	**Venn Diagrams** - including finding the HCF and LCM with prime factor decomposition	**Probability** - working out theoretical and experimental probability	**Foundation** **Probability** - Calculating probability, two events (sample space diagrams), experimental probability, Venn diagrams, tree diagrams and independent and dependent events **Higher** **Probability** - Combined events (product rule & sample space diagrams), Mutually exclusive events, experimental probability, Independent events and tree diagrams, conditional probability, Venn diagrams and set notation	
Statistics	**Handling data and statistical diagrams** - interpret and construct tables and charts, and the collection and presentation of data	**Statistical diagrams** - Drawing and interpreting statistical diagrams	**Handling data and statistical diagrams** - Working with scatter graphs, collecting and representing data and applying my understanding of averages with grouped data	**Foundation** **Statistics** - Drawing and interpreting graphs, tables and charts **Statistics** - Statistics, sampling and working with averages.	

				Higher **Statistics** - Averages and range, collecting data, representing data **Statistics** - Statistics and sampling, cumulative frequency and histograms	