

Curriculum Progression (Intent)

Long Term Intent Mathematics

Students will develop conceptual understanding, mathematical fluency and the ability to reason mathematically. They will be confident in applying their knowledge to solve complex problems and the appreciate the application of mathematics in the wider world.

	Higher		Foundation	
	Knowledge and Understanding	Skill	Knowledge and Understanding	Skill
Year 11	Circle Theorems	To understand and apply the circle theorems To prove circle theorems To solve algebraic examples involving circle theorems	Fractions, Indices and Standard form	To be able to multiply and divide fractions To understand and apply the laws of indices To express ordinary numbers using standard form To be able to complete calculations with numbers expressed in standard form
	Algebra	To re-arrange formulae to change the subject To simplify algebraic fractions To understand and apply rules relating to surds To be able to rationalise the denominator To be able to prove using algebra	Similarity, Congruence and Vectors	To be able to find missing side lengths with similar shapes To identify congruent shapes and prove congruency To use vector notation and complete basic calculations
	Vectors	To understand the use of vector notation To apply vector arithmetic To be able to show two vectors are parallel To solve complex geometric problems with vectors	Algebra	To be able to plot cubic, reciprocal and other non-linear functions To solve simultaneous equations graphically To be able to re-arrange equations and formulae
	Graphs & Proportion	To solve problems involving direct proportion To solve problems involving inverse proportion To be able to draw and interpret exponential functions and other non-linear graphs	Graphs	To plot coordinates To plot linear graphs in the form $y=a$, $x=b$ and $y=mx+c$ To interpret real-life graphs To interpret distance-time graphs

		To be able to translate graphs of functions To be able to reflect and sketch graphs of functions		
Year 10		Names of units from SPARX maths		Skill
		Percentages		• Growth interest calculations • Growth and decay
		Surface Area and Volume		• Finding the surface area and volume of pyramids • Finding the surface area and volume of cones • Finding the surface area and volume of spheres • Finding the surface area and volume of frustums • Finding the surface area and volume of composite shapes
		Simultaneous Equations		• Solving simultaneous equations using elimination • Solving simultaneous equations using substitution • Solving simultaneous equations graphically • Constructing and solving simultaneous equations
		Formulae		• Changing the subjects of formulae with two or more steps • Changing the subject when the subject appears more than once
		Trigonometry		• Understanding sin, cos and tan • Finding unknown sides in right-angles triangles • Finding unknown angles in right-angled triangles • Using the exact values or trigonometric ratios • Angles of elevation and depression calculating with trigonometry and bearings
		Constructions		• Constructing loci
		Linear Graphs		• Equations of parallel lines • Finding the equation of a straight line from its gradient and a point • Finding the equation of a straight line from two points on the line • Equations of parallel and perpendicular lines (Higher only)
		Real-life graphs		• Plotting linear real-life graphs • Using and finding equations of linear real-life graphs • Sketch graphs of water flows

	Set Notation	• Venn diagrams with set notation • Using set notation
	Tree Diagrams	• Tree diagrams for independent events • Tree diagrams for dependent events
	Compound Measures	• Calculating with density • Calculating with pressure
	Ratio	• Combining ratios • Calculating with ratios and algebra • Changing ratios
	Graphs	• Velocity-time graphs • Plotting velocity-time graphs
	Sequences	• Position-to-term rules for arithmetic sequences • Position-to-term rules for sequences of patterns • Position-to-term rules for geometric sequences • Special sequences (Higher only)
	Handling Data	• Sampling and bias • Capture-recapture (Higher only)
	Proportion	• Interpreting direct proportion equations • Interpreting inverse proportion equations • Graphs of direct and inverse equations
	Transformations	• Combining transformations • Enlargement by positive or negative scale factor (Higher only)
	Rounding	• Finding error intervals • Finding error intervals for truncated numbers • Finding bounds for calculations (Higher only)
	Indices	• Index rules with positive indices • Index rules with negative indices • Simplifying expressions using index laws • Estimating roots and powers (Higher only) • Fractions indices (Higher only)
	Recurring Decimals (Higher only)	• Converting fractions to recurring decimals • Converting recurring decimals to fractions
	Brackets	• Expanding double brackets • Factorising quadratic expressions • Factorising the difference of two squares • Factorising to solve quadratic equations • Expanding triple brackets (Higher only)

			- Completing the square (Higher only) - Finding the turning point of a quadratic graph by completing the square (Higher only)
		Handling Data and Statistical Diagrams	- Interpreting frequencies tables with grouped data - Finding averages from grouped data - Drawing stem-and-leaf diagrams - Interpreting stem-and-leaf diagrams - Drawing line graphs - Interpreting line graphs - Drawing and interpreting frequency polygons - Drawing cumulative frequency graphs (Higher only) - Interpreting cumulative frequency graphs (Higher only) - Drawing and interpreting box plots (Higher only)
Year 9	Names of units from SPARX maths		Skill
Year 9	Fractions & Percentages	- Converting between fractions, decimals and percentages - Ordering fractions, decimals and percentages - Finding fractions of amounts without a calculator - Finding fractions of amounts with a calculator - Finding percentages of amounts without a calculator - Finding percentages of amounts with a calculator - Percentage change without a calculator - Percentage change with a calculator - Finding original values in percentage calculations - Finding the percentage an amount has been changed by - Simple interest calculations	
	Probability	- Expected results from repeated experiments - Calculating experimental probabilities - Frequency trees	
	Standard Form	- Multiplying and dividing numbers in standard form - Adding and subtracting numbers in standard form - Standard form with a calculator	
	Inequalities	- Solving inequalities with the unknown on both sides - Solving double inequalities - Constructing and solving inequalities	

	Quadratic Equations	- Factorising quadratic equations of the form x^2+bx+c - Factorising the difference of two squares - Factorising to solve quadratic equations of the form $x^2+bx+c=0$
	Formulae	- Changing the subjects of formulae with one step - Changing the subjects of formulae with two or more steps
	Constructions	- Constructing bisectors of angles - Constructing perpendicular bisectors and lines
	Circles	- Finding the arc length of sectors - Finding the area of sectors - Finding the surface area of cylinders - Finding the volume of cylinders
	Rounding	- Finding error intervals - Truncating decimals - Finding error intervals for truncated numbers
	3D Shapes	Plans and elevations
	Pythagoras	- Using Pythagoras' theorem in 2D - Applying Pythagoras' theorem in 2D
	Ratio and Proportion	- Writing and simplifying ratios - Sharing amounts in a given ratio - Solving direct proportion word problems - Solving inverse proportion word problems - Currency conversion
	Linear Graphs	- Plotting straight line graphs - Finding equations of straight line graphs - Interpreting equations of straight line graphs
	Compound Measures	- Calculating with speed - Calculating with rates
	Motion-time graphs	- Plotting distance-time graphs - Interpreting distance-time graphs - Calculating speed from distance-time graphs

		Plotting distance-time graphs using speeds	
	Quadratic graphs	- Plotting graphs of quadratic functions - Interpreting graphs of quadratic functions - Solving quadratic equations graphically	
	Angles and bearings	- Combining angle facts - Angles on parallel lines - Using quadrilateral properties to find angles - Angles in polygons - Measuring and drawing bearings - Calculating bearings	
	Similarity and congruence	- Understanding similarity - Finding unknown sides in similar shapes - Understanding congruence - Congruent triangles - Constructing triangles	
	Handling data and statistical diagrams	- Types of data - Presenting data and making conclusions - Comparing populations using diagrams - Choosing suitable averages and solving problems - Plotting scatter graphs - Interpreting scatter graphs - Using lines of best fit - Interpreting frequency tables with grouped data - Finding averages from grouped data - Drawing and interpreting frequency polygons	
	Vectors	- Understanding column vectors - Adding and subtracting column vectors - Multiplying column vectors by a scalar(U564) - Identifying parallel vectors	
Year 8	Names of units from SPARX maths	Knowledge and Understanding	Skill
Percentages			- Finding percentages of amounts without a calculator - Finding percentages of amounts with a calculator - Percentage change without a calculator

	Percentage change with a calculator
Money	Value for money
Indices	- Index rules with positive indices - Index rules with negative indices - Simplifying expressions using index laws - Simplifying algebraic fractions by cancelling common factors
Equations	- Solving equations of the form $(x+a)/b=c(x+a)/b=c$ - Solving linear equations involving brackets - Solving equations with the unknown in the denominator Solving equations with the unknown on both sides - Constructing and solving equations
Sequences	- Term-to-term rules for numerical sequences - Term-to-term rules for sequences of patterns - Substituting into position-to-term rules - Position-to-term rules for arithmetic sequences - Position-to-term rules for sequences of patterns
Ratio	- Writing and simplifying ratios - Writing ratios in the form $1:n1:n$ - Converting between ratios, fractions and percentages - Using equivalent ratios to find unknown amounts - Sharing amounts in a given ratio - Drawing and interpreting scale diagrams
Rounding	- Rounding integers using significant figures - Rounding decimals using significant figures - Estimating calculations
Coordinates	- Calculating midpoints - Mixed problems: Coordinates and midpoints
Area	- Finding the area of parallelograms - Finding the area of trapeziums - Converting units of area

Circles	- Finding the area of parallelograms - Finding the area of trapeziums - Converting units of area
Standard Form	- Using standard form with positive indices - Using standard form with negative indices
Venn Diagrams	- Venn diagrams - Probabilities from Venn diagrams - Finding the HCF and LCM using prime factor decomposition
3D Shapes	- Properties of 3D shapes - Nets of 3D shapes
Surface Area and Volume	- Finding the surface area from a net - Finding the surface area of cubes and cuboids - Finding the surface area of prisms - Finding the volume of cubes and cuboids - Finding the volume of prisms - Converting units of volume
Linear Graphs	- Plotting horizontal, vertical and diagonal lines - Plotting straight line graphs - Finding equations of straight line graphs
Transformations Angles	- Translation - Reflection - Finding the area of parallelograms - Finding the area of trapeziums - Converting units of area
Statistical Diagrams	Drawing pie charts

			• Interpreting pie charts • Drawing line graphs • Interpreting line graphs • Drawing stem-and-leaf diagrams • Interpreting stem-and-leaf diagrams • Finding averages from diagrams
		Inequalities	• Reading and drawing linear inequalities on number lines • Solving single inequalities
		Brackets	• Expanding double brackets
		Algebraic Fractions	• Calculating with fractions • Calculating with mixed numbers • Simplifying algebraic fractions by factorising • Adding and subtracting algebraic fractions
		Recurring Decimals	• Using recurring decimal notation • Converting fractions to recurring decimals •
Year 7	Names of units from Sparx SOL	Knowledge and Understanding	Skill
		Number Sense and Calculations	To be able to add and subtract. To be able to multiply To be able to divide To be able to calculate with negative numbers. To be able to apply the order of operations
		Expressions & Equations	To understand algebraic notation To be able to form expressions. To be able to simplify expressions. To be able to substitute with one/ multiple operations. To be able to substitute into algebraic and real-life formulae. To be able to solve 1 and 2 step equations
		Time and Measures	To be able to convert the units of time. To be able to use clocks. To be able to calculate with time. To be able to use timetables. To be able to use calendars. To be able to read and plot coordinates. To be able to solve shape problems involving coordinates. Estimating and measuring length, mass and capacity.

	Converting units of length, mass and capacity. Using appropriate units.
2D – Shapes	To be able to deduce, use and understand line properties. To be able to deduce, use and understand shape properties. To be able to understand symmetry .
Perimeter and Area	To be able to find perimeters using grids. To be able to find the perimeter of rectangles and simple shapes . To be able to find the perimeter of compound shapes. To be able to Find areas using grids. To be able to find the area of rectangles To be able to Find the area of compound shapes To be able to Find the area of triangles To be able to Find the area of compound shapes containing triangles
Coordinates	To be able to read and plot coordinates To be able to solve shape problems involving coordinates
Factors, Multiples and Primes	To be able to Find the lowest common multiple To be able to Find factors and using divisibility tests To be able to Find the highest common factor To be able to Find prime numbers To be able to do Prime factor decomposition
Fractions	To be able to Find fractions of shapes. To be able to Construct fractions To be able to Find equivalent fractions To be able to Find equivalent fractions To be able to Simplify fractions To be able to Order fractions To be able to Convert between mixed numbers and improper fractions To be able to add and subtract fractions including mixed numbers
Brackets	To be able to distributive law To be able to expand and simplify single brackets To be able to factorise into one bracket
Angles	To be able to recognise types of angles To be able to estimate, measure and draw angles
Handling data and statistical diagrams	To be able to calculate the mean, median and range. To be able to find the mode. To be able to draw and interpret frequency tables, tally charts, two way tables, pictograms, bar charts. To be able to collect and record data

	To be able to present data and make conclusions To be able to find averages from frequency tables To be able to choose suitable averages and solve problems
Proportion	To be able to solve proportion problems
Fractions, Decimals and Percentages	To be able to multiply and divide fractions including mixed numbers. To be able to find fractions of amounts with and without a calculator To be able to convert between FDP To be able to order and convert between FDP To be able to write numbers as percentages of other numbers
Probability	To be able to use probability phrases To be able to write probabilities as FDP To be able to understand mutually exclusive events To be able to create and use sample space diagrams.