St Wilfrid's
Church of England Academy

Key Stage 3 Curriculum

Learning Area:	Maths
Learning Area Coordinator:	Ms S J Pankhurst
What will I study?	Number, proportion, algebra, geometry, measures, probability and statistics.

SUBJECT – YEAR 7

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Focus	**Place Value** **Addition and subtraction**	**Multiplying and dividing**	**Fractions**	**Geometry: 2D shape in a 3D world**	**Negative Numbers** **Percentages** **Statistics**	**Algebra**
	Place Value: Understand and use place value for decimals, measures and integers of any size. Order positive and negative integers, use the numbers line as a model for ordering of the real numbers; use the symbols =, ≠, ≤, ≥, > and <. Round numbers and measures to an appropriate degree of accuracy (for example, to a number of decimal places or significant figures). **Addition and subtraction** Use formal written methods for addition and subtraction of integers and decimals. Recognise and use relationships between addition and subtraction including inverse operations. Calculate and solve problems involving perimeter.	Multiply and divide by 10, 100, 1000 Use formal written methods for multiplication and division of integers and decimals. Recognise and use relationships between operations including inverse operations. Understand the order of operations. Use the concepts and vocabulary of prime numbers, factors (or divisors), common factors and highest common factor (HCF). Multiples and lowest common multiple (LCM). Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations. Find the prime factor decomposition of a number. Calculate and solve problems involving area of rectangles, triangles and parallelograms. Calculate the mean average. Use approximation through rounding to estimate answers	Represent fractions using diagrams and on a number line. Express one quantity as a fraction of another. Identify and use equivalent fractions. Compare and order fractions; use the symbols =, ≠, ≤, ≥, <, > Convert between mixed numbers and improper fractions. Simplify fractions. Convert between fractions and decimals • Tenths, hundredths, thousandths • Associating a fraction with division to convert any fraction to a decimal. Add and subtract any fraction. • Fractions with the same denominator • Fractions with a different denominator that is a multiple of the other • Fractions with different denominators Find the fraction of an amount. Multiply and divide fractions	Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric. Derive and illustrate properties of triangles, quadrilaterals, circles and other plane figures (for example equal lengths and angles) using appropriate language and technologies. Use a protractor to measure and draw angles. Apply the properties of angles at a point, angles on a straight line and vertically opposite angles. Understand and use alternate and corresponding angles on parallel lines. Derive and use the sum of angles in a triangle and a quadrilateral. Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons.	**Negative Numbers** Use the four operations with negative numbers. Order of operations (although this has been covered in Autumn please recap prior to Algebra). **Percentages** Convert between percentages, fractions and decimals. Percentage of a quantity. Reverse percentages. **Statistics** Understand the data handling cycle. Understand the different types of data. Collect, organise and interpret data. • Tally charts • Two way tables • Median, mode and range • Consider outliers Draw and interpret bar charts, pictograms, line graphs and pie charts.	Introduction to algebra • Understand that a letter represents a variable. • Understand the difference between an expression, equation, formula, term, function and identity. • Form expressions from situations described in words. Pupils should be taught to use and interpret algebraic notation including: • ab in place of a x b • 3y in place of y+y+y and 3 x y • a^2 in place of a x a, a^3 in place of a x a x a; a^2b in place of a x a x b • b/a in place of b ÷ a • coefficients written as fractions rather than as decimals • brackets Substitute numerical values into formulae and expressions, including scientific formulae (including examples with negatives) Simplify and manipulate algebraic expressions to maintain equivalence by

		and calculate possible resulting errors expressed using inequality notation $a<x\leq b$						collecting like terms. Use algebraic methods to solve simple linear equations with one variable where the unknown appears on one side of the equation. Generate terms of a sequence from either a term-to-term or position-to-term rule. Recognise arithmetic sequences and find the nth term. Use and interpret coordinates in the first quadrant. Work with coordinates in all four quadrants.

SUBJECT – YEAR 8

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Focus	**Numbers and the number system Calculating Visualising and constructing**	**Understanding risk I Exploring fractions, decimals and percentages**	**Calculating fractions, decimals and percentages Algebraic proficiency**	**Proportional reasoning Pattern Investigation Investigating angles Solving equations and inequalities**	**Calculating space Algebraic proficiency: visualising**	**Understanding risk II Presentation of data Measuring data**
	Numbers and the number system • use the concepts and vocabulary of prime numbers, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation theorem • round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures) • interpret standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer **Calculating** • apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative • use conventional notation for priority of operations, including brackets, powers, roots and reciprocals **Visualising and constructing** • measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use	**Understanding risk I** • relate relative expected frequencies to theoretical probability, using appropriate language and the 0 - 1 probability scale • record describe and analyse the frequency of outcomes of probability experiments using tables • construct theoretical possibility spaces for single experiments with equally likely outcomes and use these to calculate theoretical probabilities • apply the property that the probabilities of an exhaustive set of outcomes sum to one **Exploring fractions, decimals and percentages** • work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 or 3/8)	**Calculating fractions, decimals and percentages** • interpret fractions and percentages as operators • work with percentages greater than 100% • solve problems involving percentage change, including original value problems, and simple interest including in financial mathematics • calculate exactly with fractions **Algebraic proficiency** • use and interpret algebraic notation, including: a^2b in place of $a \times a \times b$, coefficients written as fractions rather than as decimals • understand and use the concepts and vocabulary of factors • simplify and manipulate algebraic expressions by taking out common factors and simplifying expressions involving sums, products and powers, including the laws of indices • substitute numerical values into scientific formulae • rearrange formulae to change the subject	**Proportional reasoning** • express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations) • identify and work with fractions in ratio problems • understand and use proportion as equality of ratios • express a multiplicative relationship between two quantities as a ratio or a fraction • use compound units (such as speed, rates of pay, unit pricing) • change freely between compound units (e.g. speed, rates of pay, prices) in numerical contexts • relate ratios to fractions and to linear functions **Pattern Investigation** • generate terms of a sequence from either a term-to-term or a position-to-term rule • deduce expressions to calculate the nth term of linear sequences	**Calculating space** • Calculate areas of triangles, parallelograms and trapezia. • calculate perimeters of 2D shapes, including circles • identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference • know the formulae: circumference of a circle = $2\pi r = \pi d$, area of a circle = πr^2 • calculate areas of circles and composite shapes • know and apply formulae to calculate volume of right prisms (including cylinders) **Algebraic proficiency: visualising** • plot graphs of equations that correspond to straight-line graphs in the coordinate plane • identify and interpret gradients and intercepts of linear functions graphically • recognise, sketch and interpret graphs of linear functions and simple quadratic functions • plot and interpret graphs and graphs of non-standard (*piece-wise linear)* functions in real contexts, to find approximate solutions to problems such as simple	**Understanding risk II** • apply systematic listing strategies • record describe and analyse the frequency of outcomes of probability experiments using frequency trees • enumerate sets and combinations of sets systematically, using tables, grids and Venn diagrams • construct theoretical possibility spaces for combined experiments with equally likely outcomes and use these to calculate theoretical probabilities • apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments **Presentation of data** • interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete, continuous and grouped data • use and interpret scatter graphs of bivariate data • recognise correlation

	of bearings • identify, describe and construct similar shapes, including on coordinate axes, by considering enlargement • be able to transform a shape by reflecting, rotating & translating and describe transformations • interpret plans and elevations of 3D shapes • use scale factors, scale diagrams and maps				**Investigating angles** • understand and use alternate and corresponding angles on parallel lines derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons) **Solving equations and inequalities** • solve linear equations with the unknown on both sides of the equation find approximate solutions to linear equations using a graph		kinematic problems involving distance and speed	**Measuring data** • interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers) apply statistics to describe a population

ASSESSMENT

	ASSESSMENT 1	ASSESSMENT 2	ASSESSMENT 3	ASSESSMENT 4	ASSESSMENT 5	ASSESSMENT 6
YEAR 7	**October** Place Value Numbers and the number system	**November** Addition and subtraction Number and the number system	**January** Multiplication and division Addition and subtraction Number and the number system	**February** Fractions Multiplication and division Addition and subtraction Number and the number system	**April** Percentages Fractions Multiplication and division Addition and subtraction Number and the number system	**June** End of year examination
YEAR 8	**October** Numbers and the number system Calculating	**November** Visualising and constructing Understanding risk 1	**February** Exploring fractions, decimals & percentages Calculating fractions, decimals and percentages Algebraic proficiency	**March** Proportional reasoning Pattern investigation	**May** Investigating angles Solving equations & inequalities	**June** End of year examination

Where do I go to find out more information?	KS3 Mathematics Programme of Study https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239058/SECONDARY_national_curriculum_-_Mathematics.pdf