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?	

SUBJECT – YEAR 7

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Focus	**Counting and comparing Visualising and constructing Algebraic proficiency Numbers and the number system**	**Calculating Investigating properties of shapes Pattern investigation Measuring space**	**Measuring data Exploring fractions, decimals & percentages**	**Proportional reasoning Calculating fractions, decimals & percentages Investigating angles**	**Calculating space Solving equations & inequalities Probability**	**Mathematical movement Presentation of data**
	Counting and comparing • order positive and negative integers, decimals and fractions • use the symbols =, ≠, <, >, ≤, ≥ • Understand and use decimal notation and place value; multiply and divide integers and decimals by 10, 100, 1000, 0.1, 0.01 and explain the effect. Visualising and constructing • use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries • use the standard conventions for labelling and referring to the sides and angles of triangles Algebraic proficiency • understand and use the concepts and vocabulary	Calculating • Apply understanding of place value • Explore written methods of calculation • Calculate with decimals • Know and apply the correct order of operations Investigating properties of shapes • Investigate the properties of 3D shapes • Explore quadrilaterals • Explore triangles Pattern investigation • generate terms of a sequence from a term-to-term rule • recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions Measuring space • Choose and use units of measurement to measure, estimate, calculate and solve problems in everyday contexts.	Measuring data • Calculate statistics for small sets of discrete data. Find the mode, mean, median and range, and the modal class for grouped data. • Calculate the mean, including from a simple frequency table, using a calculator for a larger number of items. • Compare two simple distributions using the range and one of the mode, median or mean. Exploring fractions, decimals & percentages • Express a smaller whole number as a fraction of a larger one • Simplify fractions by cancelling all common factors and identify equivalent fractions. (p49 Ex 4A) • Order fractions by convert terminating decimals to fractions, for example, 0.23 = $^{23}/_{100}$ and equivalent fractions. (p51 Ex 4B)	Proportional reasoning • use ratio notation, including reduction to simplest form • divide a given quantity into two parts in a given part : part or part : whole ratio Calculating fractions, decimals & percentages • Add and subtract fractions by finding a common denominator • Calculate simple fractions of quantities • Multiply a fraction by an integer. • Calculate percentages with & without a calculator and use percentages to compare simple proportions. Investigating angles • Know the sum of angles at a point, on a straight line and in a triangle; recognise vertically opposite angles	Calculating space • use standard units of measure and related concepts (length, area, volume/capacity) • calculate perimeters of 2D shapes • know and apply formulae to calculate area of triangles, parallelograms, trapezia • calculate surface area of cuboids • know and apply formulae to calculate volume of cuboids Solving equations & inequalities • Use letter symbols to represent unknown numbers or variables. Know the meanings of the words term, expression and equation. • Solve linear equations with the unknown on one side using the balance method.	Mathematical movement • work with coordinates in four quadrants • *understand and use lines parallel to the axes, y = x and y = -x* • solve geometrical proble on coordinate axes • identify, describe and construct congruent shap including on coordinate axes, by considering rotation, reflection and translation • describe translations as 2 vectors Presentation of data • interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertica line charts for ungroupe discrete numerical data and know their appropriate use.

	of expressions, equations, formulae and terms • use and interpret algebraic notation, including: ab in place of a × b, 3y in place of y + y + y and 3 × y, a^2 in place of a × a, a^3 in place of a × a × a, a/b in place of a ÷ b, brackets • simplify and manipulate algebraic expressions by collecting like terms and multiplying a single term over a bracket • substitute numerical values into formulae and expressions <u>Numbers and the number system</u> • use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor and lowest common multiple • Recognise the squares of numbers to at least 12 × 12 and the corresponding roots	• Convert one metric unit to another (for example grams to kilograms); read and interpret scales on a range of measuring instruments.		• Recognise the equivalence of percentages, fractions and decimals.			<u>Probability</u> • Understand and use the probability scale from 0 to 1. • Find and justify probabilities based on equally likely outcomes in simple contexts. • Identify all the possible mutually exclusive outcomes of a single event and two successive events. • Estimate probabilities by collecting data from a simple experiment and recording it in a frequency table. • Interpret the results of an experiment using the language of probability to compare experimental and theoretical probability.	

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 analy the frequency of outcome of probability experiment using frequency trees • enumerate sets and combinations of sets systematically, using table grids and Venn diagrams • construct theoretical possibility spaces for combined experiments w equally likely outcomes a use these to calculate theoretical probabilities • apply ideas of randomnes 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 univaria 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 univaria empirical distributions through appropriate measures of central tendency (median, mean, mode and modal class) ar spread (range, including consideration of outliers) apply statistics to describ a population

ASSESSMENT

Any summative assessments with approximate dates – links to data capture series for each year group.

	ASSESSMENT 1	ASSESSMENT 2	ASSESSMENT 3	ASSESSMENT 4	ASSESSMENT 5	ASSESSMENT 6	ASSESSMENT 7	ASSESSMENT 8
YEAR 7	**October** Counting and comparing Algebraic proficiency	**November** Calculating Numbers and the number system	**January** Pattern investigation Exploring fractions, decimals & percentages	**February** Measuring space Measuring data	**April** Calculating fractions, decimals and percentages	**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