West Kirby Grammar School

Curriculum Map – Year 8 - Mathematics (2023-24)

Number	Geometry	Ratio & proportion	Algebra	Statistics

Topic name	Term	Skills developed*	Link to NC subject content	Prior learning	Next link in curriculum
RATIO AND SCALE	Autumn	• Make connections between number relationships, and their algebraic and graphical representations	• Use scale factors, scale diagrams and maps • Divide a given quantity into two parts in a given ratio • Solve problems involving direct or inverse proportion	• Y6 NC link - solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • Y6 NC link - solve problems involving similar shapes where the scale factor is known or can be found	• Year 8 Spring - Multiplicative Change
MULTIPLICATIVE CHANGE	Autumn	• Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically	• Solve problems involving direct or inverse proportion, including graphical and algebraic representations	• Y6 NC link - solve problems involving similar shapes where the scale factor is known or can be found • Y6 NC link - compare and classify geometric shapes based on their properties and	• Year 9 Summer - Solving ratio and proportion problems

				sizes and find unknown angles in any triangles, quadrilaterals, and regular polygon	
MULTIPLYING AND DIVIDING FRACTIONS	Autumn	• Extend their understanding of the number system and place value to include decimals, fractions, powers and roots	• Find the product of any pair of fractions • Understand and use the reciprocal • Divide any pair of fractions • Multiply and divide improper fractions and mixed numbers	• Y7 Spring – Fractions and percentages of amounts	• Year 8 Spring - Fractions and Percentages
WORKING IN THE CARTESIAN PLANE	Autumn	• Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]	• Identify and draw lines that are parallel to the axes • Recognise and use lines of the forms y=ka, y=x+a • Plot graphs of the form y=mx+c	• Y6 NC link - describe positions on the full coordinate grid (all four quadrants)	• Year 9 Autumn - Straight line graphs
REPRESENTING DATA	Autumn	• Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data	• Draw and interpret scatter graphs • Identify different types of data and work with frequency tables (ungrouped and grouped) • Represent data in two-way tables	• Y6 NC link - describe positions on the full coordinate grid (all four quadrants)	• Year 8 Autumn - Tables and Probability

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SETS AND PROBABILITY	Autumn	• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems	• Understand that the probabilities of all possible outcomes sum to 1 • Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams	• Pupils have not met probability before but can draw upon their understanding of fractions to simplify answers.	• Year 8 Autumn - Tables and Probability
TABLES AND PROBABILITY	Autumn	• Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics	• Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale • Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams	• Y8 Autumn – Sets and Probability	• Year 9 Summer - Probability
PRIME NUMBERS AND PROOF	Autumn	• Begin to reason deductively in geometry, number and algebra, including using geometrical constructions	• Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4 and 5 • Make and test conjectures about patterns and relationships; look for proofs or counterexamples	• Y7 Autumn term and Spring term – understanding of constructions and using algebra to generalise findings.	• Year 8 Spring - Number Sense
BRACKETS, EQUATIONS AND INEQUALITIES	Spring	• Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions	• Simplify and manipulate algebraic expressions to maintain equivalence by: - collecting like terms - multiplying a single term over a bracket - taking out common factors - expanding products of two or more binomials	• Y7 Autumn – Equality and Equivalence	• Year 9 Autumn - Forming and Solving Equations

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SEQUENCES	Spring	• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems	• Recognise arithmetic sequences and find the nth term • Recognise geometric sequences and appreciate other sequences which may arise	• Y7 Autumn - Sequences	• Year 9 Autumn - Straight line graphs
INDICES	Spring	• Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics	• Simplifying expressions by multiplying and dividing indices • Use the addition and subtraction law for indices	• Y7 Autumn – Algebraic notation	• Year 9 Summer - Algebraic representation
FRACTIONS AND PERCENTAGES	Spring	• Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics	• Calculate percentage increase and decrease using a multiplier • Work with percentage change • Choose the most appropriate method to solve problems	• Y7 Spring – Fractions and percentages of amounts • Y7 Spring – Fractional Thinking	• Year 9 Spring - Using Percentages
STANDARD INDEX FORM	Spring	• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems	• Interpret and compare numbers in standard form A x 10n $1 \leq A < 10$, where n is a positive or negative integer or zero	• Y7 Autumn – Place Value and Ordering Integers and Decimals	• Year 9 Spring - Numbers
NUMBER SENSE	Spring	• Select appropriate concepts, methods and techniques to apply to unfamiliar and nonroutine problems	• Solving problems in a wide variety of contexts, including with the calendar and time.	• Y7 Summer – Developing Number Sense	• Year 9 Spring - Numbers

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ANGLES IN PARALLEL LINES AND POLYGONS	Summer	• Begin to reason deductively in geometry, number and algebra, including using geometrical constructions	• Identify and calculate with alternate, corresponding and co-interior angles • Solve complex problems with parallel line angles • Calculate missing interior and exterior angles in polygons	• Y7 Summer - Geometric Reasoning	• Year 9 Autumn - Constructions and Congruency
AREA OF TRAPEZIA AND CIRCLES	Summer `	• Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics	• Calculate the area of a trapezium • Investigate the area of a circle • Calculate the area of a circle and parts of a circle with/without a calculator	• Y7 Summer - Geometric Reasoning	• Year 9 Autumn - Three dimensional shapes
LINE SYMMETRY AND REFLECTION	Summer	• Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics	• 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	• Y7 Summer - Geometric Reasoning	• Year 9 Spring - Rotation and Translation
THE DATA HANDLING CYCLE	Summer	• Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally	• Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data	• Y8 Autumn – Representing Data	• KS4/GCSE
MEASURES OF LOCATION	Summer	• Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally	• Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)	• Y8 Autumn – Representing Data	• KS4/GCSE

* Throughout the entire curriculum, content and skills are revisited and reused continuously. The colour code refers to the main strand each topic falls under.