West Kirby Grammar School

Curriculum Map – Year 9 – Mathematics

Number	Geometry	Ratio & proportion	Algebra	Statistics

Topic name	Term	Skills developed*	Link to NC subject content	Prior learning	Next link in curriculum
STRAIGHT LINE GRAPHS	Autumn	• Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions	• Reduce a given linear equation to the form y=mx+c • Calculate and interpret gradients and intercepts of graphs • Use linear and quadratic graphs to find values of y for given values of x	• Y8 Autumn – Working in the Cartesian Plane	• KS4/GCSE
FORMING AND SOLVING EQUATIONS	Autumn	• Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]	• Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement) • Rearrange formulae to change the subject • Model situations or procedures by translating them into algebraic expressions, or formulae and graphs	• Y8 Spring – Brackets, Equations and Inequalities	• KS4/GCSE
TESTING CONJECTURES	Autumn	• Make and test conjectures about patterns and relationships; look for proofs or counterexamples	• Find LCM and HCF of two numbers • Forming and testing conjectures	• Y8 Spring – Number Sense	• KS4/GCSE
THREE DIMENSIONAL SHAPES	Autumn	• Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders	• Find the surface area of cubes, cuboids, triangular prisms and cylinders • Find the volume of cubes, cuboids, prisms and cylinders	• Y8 Summer – Area of Trapezia and Circles	• KS4/GCSE

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CONSTRUCTIONS AND CONGRUENCY	Autumn	• Begin to reason deductively in geometry, number and algebra, including using geometrical constructions	• Construct and interpret scale drawings • Construct angle and line bisectors, as well as locus • Identify and explore congruent figures	• Y8 Autumn – Ratio and Scale • Y8 Summer – Line Symmetry and Reflection	• KS4/GCSE
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	• Y8 Spring – Fractions and Percentages	• Year 9 Spring - Using Percentages
NUMBER	Spring	• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems	• Solve problems with integers, decimals, fractions and standard form	• Y8 Spring – Number Sense	• KS4/GCSE
USING PERCENTAGES	Spring	• Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics	• Solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics	• Y9 Spring – Fractions and Percentages	• KS4/GCSE
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	• Y8 Spring – Standard Index Form	• Year 9 Spring - Numbers

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MATHS AND MONEY	Spring	• Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics	• Calculate with simple and compound interest • Solve problems with Value Added Tax • Solve problems with exchange rates	• Y9 Spring – Using Percentages • Y8 Autumn – Ratio and Scale	• KS4/GCSE
AREA OF TRAPEZIA AND CIRCLES	Spring`	• 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
DEDUCTION	Spring	• Begin to reason deductively in geometry, number and algebra, including using geometrical constructions	• Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles • Interpret mathematical relationships both algebraically and geometrically	• Y8 Summer – Angles in Parallel Lines and Polygons	• KS4/GCSE
LINE SYMMETRY AND REFLECTION	Spring	• 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
ROTATION AND TRANSLATION	Spring	• Begin to reason deductively in geometry, number and algebra, including using geometrical construction	• Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures • Find the results of a series of transformations	• Y7 Summer – Geometric Reasoning	• KS4/GCSE

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PYTHAGORAS THEOREM	Spring	• Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems	• Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs	• Y7 Summer – Geometric Reasoning	• KS4/GCSE
ENLARGEMENT AND SIMILARITY	Summer	• Select appropriate concepts, methods and techniques to apply to unfamiliar and nonroutine problems.	• Construct similar shapes by enlargement, with and without coordinate grid • Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs	• Y9 Spring – Rotation and Translation • Y7 Summer – Geometric Reasoning	• KS4/GCSE
SOLVING RATIO AND PROPORTION PROBLEMS	Summer	• Select appropriate concepts, methods and techniques to apply to unfamiliar and nonroutine problems.	• Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction • Solve problems involving direct and inverse proportion, including graphical and algebraic representations • Use compound units such as speed, unit pricing and density to solve problems	• Y8 Autumn – Ratio and Scale	• KS4/GCSE
RATES	Summer `	• Select appropriate concepts, methods and techniques to apply to unfamiliar and nonroutine problems	• Use compound units such as speed, unit pricing and density to solve problems • change freely between related standard units [for example time, length, area, volume/capacity, mass]	• Y8 Spring – Number Sense	• KS4/GCSE

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PROBABILITY	Summer	● Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally	● Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams ● Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities	● Y8 Autumn – Sets and Probability ● Y8 Autumn – Tables and Probability	● KS4/GCSE
ALGEBRAIC REPRESENTATION	Summer	● Identify variables and express relations between variables algebraically and graphically	● Recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane ● Find approximate solutions to contextual problems from given graphs of a variety of functions, including piecewise linear, exponential and reciprocal graphs	● Y9 Autumn – Forming and Solving Equations	● 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.