

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics		Subject Leader: Mr S Card	Year 10 Foundation	AUTUMN TERM
Topic	Key Learning Points		Key Vocabulary	Assessments
Block 1 – Expressions and equations	<ul style="list-style-type: none"> Simplify expressions by collecting like terms Simplify expressions by multiplying terms Simplify expressions by dividing terms Substitute values into algebraic expressions Solve one and two step linear equations Form and solve linear equations from given facts 		Expression Variable Coefficient Like terms Expand Substitute	Blocks 1-2 will be assessed before the Autumn half term holiday
Block 2 – Fractions, decimals and percentages	<ul style="list-style-type: none"> Identify and use equivalent fractions to solve problems Simplify fractions Convert fractions to decimals and vice versa Convert fractions to percentages and vice versa Calculate percentages of amounts without a calculator Increase and decrease quantities by percentages 		Numerator Denominator Equivalent	
Block 3 – Angles	<ul style="list-style-type: none"> Know the names of different angles Know and apply angle rules for straight lines and at angles at a point Know and apply angle rules for triangles and quadrilaterals Know and apply rules for corresponding, alternate and co-interior angles Calculate interior and exterior angles in regular polygons Find the number of sides of regular polygons from given angles 		Regular polygon Irregular polygon Parallel Corresponding angles Alternate angles Co-interior angles	Blocks 3-5 will be assessed before the Christmas holiday
Block 4 – Rounding, estimation and negative numbers	<ul style="list-style-type: none"> Round numbers to powers of 10 Round numbers to decimal places Round large numbers to significant figures Approximate calculations by rounding Solve problems involving adding and subtracting negative numbers Solve problems involving multiplying and dividing negative numbers 		Decimal place Significant figure Leading zero Approximate Negative number Distributive	
Block 5 – Fractions	<ul style="list-style-type: none"> Convert between mixed numbers and improper fractions and vice versa Calculate fractions of quantities Solve reverse fraction problems Add and subtract fractions Multiply fractions with fractions and fractions and integers Divide fractions with fractions and fractions and integers 		Proper fraction Improper fraction Mixed number Reciprocal Cross-cancel	

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Block 6 – Algebraic graphs	<ul style="list-style-type: none"> Calculate x and y values for a linear function Draw the graph of a linear function Find the point of intersection of two straight lines Understand the link between an equation of the form $y=mx + c$ and its graph Calculate x and y values for a quadratic function Draw the graph of a quadratic function 		Intersection Gradient Line segment Intercept Equation of line	Blocks 6-8 will be assessed before the Spring half term holiday
Block 7 – Ratio and proportion	<ul style="list-style-type: none"> Write and simplify ratios including those containing different units Split a quantity into a given ratio and solve associated problems Solve problems involving two or more ratios Use a unitary method to solve direct proportion questions Solve conversion problems including currency and metric/imperial Use direct proportion to solve 'best buy' problems 		Unitary method Ratio Direct proportion Convert	
Block 8 – Area and perimeter	<ul style="list-style-type: none"> Find the perimeter of shapes and problems involving missing lengths Find areas of rectangles and triangles Calculate areas of compound shapes Know and use the formula for the area of a parallelogram Know and use the formula for area of a trapezium Find surface area of cuboids and basic prisms 		Perimeter Area Compound shape Surface area	
Block 9 – Averages and data	<ul style="list-style-type: none"> Know how to find the mean, median and mode from lists of data Calculate the range of a set of data and understand its meaning Find missing pieces of data from a given average or range Draw and interpret comparative bar charts Draw and interpret pie charts Draw scatter graphs and describe correlation 		Mean Median Mode Range Line of best fit Correlation	Blocks 9-10 will be assessed before the Easter holiday
Block 10 – Expanding, factorising and sequences	<ul style="list-style-type: none"> Expand single brackets Expand brackets and simplify expressions Factorise linear expressions Find term to term rules and generate sequence using them Generate a sequence from a term to term rule Find the nth term rule for a sequence 		Expand Factorise Sequence Term-to-term rule Position-to-term rule nth term	

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Block 11 – Formulae	<ul style="list-style-type: none"> Understand the difference between expressions, equations and formulae Write formulae for given information Substitute values into formula to find the subject Calculate values which are not the subject Rearrange a formula requiring one step Rearrange formula requiring two steps 		Expression Equation Rearrange Formulae Variable Subject	Blocks 11-12 will be assessed before the Summer half term holiday
Block 12 – Probability	<ul style="list-style-type: none"> Calculate the theoretical probability of events occurring Find probabilities involving mutually exclusive events Calculate probabilities from two-way tables Draw and calculate probabilities from frequency trees Draw and calculate probabilities from Venn diagrams Understand the term relative frequency and calculate it from given data 		Theoretical probability Mutually exclusive Frequency Relative frequency Expectation	
Block 13 – Transformations	<ul style="list-style-type: none"> Write equations of, identify and draw lines parallel to x and y axis Identify and draw the lines $y = x$ and $y = -x$ Reflect shapes in horizontal, vertical and 45° mirror lines Use vectors to translate shapes Carry out a rotation using a given angle, direction and centre Describe rotations using mathematical language 		Transformation Origin Reflection Translation Rotation Combined transformation	Assessment based on previous knowledge and new learning from current curriculum year
Block 14 – Maps, bearings and loci	<ul style="list-style-type: none"> Make scale drawings of objects or pictures Use bearings to describe the relative position between two points Identify the position of a point based on its bearing from two points Solve problems involving bearings and scale drawings Know the methods for bisecting lines/angles and drawing perpendiculars Solve loci problems using construction techniques 		Scale drawing Bearing Bisect Perpendicular Construct Locus/loci	

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How parents can support learning in the subject this academic year

At the beginning of each new block of work, students will stick a **Knowledge Checklist** into their orange book. This contains a list of the learning objectives for the block (given above), key vocabulary which has been carefully defined and important facts that the students need to know. Helping students to learn the vocabulary and key knowledge will be hugely beneficial to their progress. The objectives are referenced to a Mathswatch video clip which will explain the work, give examples and practise questions. These can be used for pre-learning to gain an insight into what is coming up, consolidation of understanding or catching up on work missed.

Practice is important so please encourage students to complete homework on a weekly basis, suggest they attend Maths Club (Monday after school) which allows them to work on any aspect of their maths with support from several teachers or develop their interest in other areas of maths. Talking and using maths at home is a great way to link maths to everyday situations, for instance scaling up or down ingredients for a recipe, discussing time or money, estimating costs, looking at best value products in the supermarket, converting between units of measure etc.

Due to the hierarchical structure of Mathematics, it is vital that students catch up on any work missed through absences. If a student is absent they are expected to use their Knowledge Checklist to locate a video clip which will explain the work. Students should copy down the examples and work through the questions given. When they return they will need to copy up the missed notes from another student. If they need support with the work then please encourage them to attend Maths Club where staff will be there to help and support.

Recommended Reading

Humble Pi – A comedy of maths errors – Matt Parker
The man who knew infinity – Robert Kanigel
Flatterland – Ian Stewart
Can you solve my problems – Alex Bellos
The number Mysteries – Marcus du Sautoy
Math with bad drawings: Illuminating the ideas that shape our reality – Ben Orlin

Points to note

Students are expected to bring a scientific calculator to every maths lesson. The model we currently recommend is the Casio Classwiz FX-83GTX-S. This calculator can be purchased through the school via parentpay.