

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics		Subject Leader: Mr S Card	Stage D	AUTUMN TERM
Topic	Key Learning Points		Key Vocabulary	Assessments
Block 1 – Rounding and approximation	<ul style="list-style-type: none"> Round numbers to decimal places, integers and 10s, 100s, and 1000s Understand the meaning of significant figures Round both large and small numbers to a given number of significant figures Find the bounds of rounded numbers Approximate calculations by rounding numbers to 1 significant figure Use approximation to solve problems 		Round Integer Significant figure Leading zero Bound	Blocks 1-2 will be assessed before the Autumn half term holiday
Block 2 – Formulae	<ul style="list-style-type: none"> Write formulae to represent the link between different variables Substitute values into formulae to find the subject Substitute values into formulae to find other values Change the subject of formulae Understand the importance in the order of operations when rearranging Use trial and improvement as a method for solving equations 		Rearrange Formulae Variable Subject Trial and improvement	
Block 3 – 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 Metric Imperial	Blocks 3-5 will be assessed before the Christmas holiday
Block 4 – Compound measures	<ul style="list-style-type: none"> Convert between different units of time Know the formula for speed and understand its different units Find distance travelled and time taken when given a speed Draw distance time graphs to represent journeys Know the formula for density and use it to solve problems Know the formula for pressure and use it to solve problems 		Compound measure Speed Density Pressure Population density Force	
Block 5 – Straight line graphs	<ul style="list-style-type: none"> Calculate x and y values for linear functions 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 Find gradients of line segments and lines Identify the equation of a line from its graph 		Linear Intersection Gradient Line segment Intercept Equation of line	

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Block 6 – Geometry and angles	<ul style="list-style-type: none"> Identify corresponding, alternate and co-interior angles Know angle facts relating to corresponding, alternate and co-interior angles Calculate internal and external angles of regular polygons Find the number of sides of regular polygons using its angles Solve problems involving internal and external angles of irregular polygons Understand the conditions that must be met for a shape to tessellate 		Supplementary Internal External Tessellate Regular polygon Irregular polygon	Blocks 6-8 will be assessed before the Spring half term holiday
Block 7 – Perimeter of shapes	<ul style="list-style-type: none"> Know the names of parts of a circle Know the formula and calculate the circumference of circles Find the radius or circumference of a circle from its circumference Know the formula for arc length and use it to solve problems Calculate the perimeter of sectors Find perimeter of compound shapes involving circles and sectors 		Circumference Radius Perimeter Sector Arc Compound shape	
Block 8 – Percentage change	<ul style="list-style-type: none"> Use a multiplicative method to calculate percentages Solve reverse percentage problems Use multipliers to solve percentage change problems Solve repeat and compound percentage problems Solve reverse percentage change problems Know and use the formula for percentage change 		Multiplier Simple interest Compound interest Percentage change	
Block 9 – Maps, bearings, constructions 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	Blocks 9-10 will be assessed before the Easter holiday
Block 10 – Pythagoras theorem	<ul style="list-style-type: none"> Know Pythagoras theorem and how it relates sides in right angled triangles Use Pythagoras theorem to find the length of hypotenuses Use Pythagoras theorem to find shorter sides of triangles Calculate areas of non-right-angled triangles using Pythagoras Solve problems involving multiple triangles using Pythagoras Identify whether a triangle is right angled using Pythagoras 		Hypotenuse Pythagoras' theorem	

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Block 11 – Area of shapes	<ul style="list-style-type: none"> Know and use the area formula for a parallelogram Know and use the area formula for a trapezium Know and use the formula for the area of a circle Calculate the area of quadrants and semi circles Know the formula for sector area and use it to solve problems Find area of compound shapes involving circles and sectors 		Parallelogram Trapezium Quadrant Sector Compound shape	Blocks 11-12 will be assessed before the Summer half term holiday
Block 12 – Volume and surface area of prisms	<ul style="list-style-type: none"> Know the formula for the volume of a cuboid and be able to apply it Know the formula for the volume of a prism and be able to apply it Know the formula for the volume of a cylinder and be able to apply it Find the surface area of cuboids Find the surface area of basic prisms Find the surface area of cylinders 		Prism Volume Cylinder Surface area	
Block 13 – Probability	<ul style="list-style-type: none"> Calculate the theoretical probability of events occurring Compare probabilities using equivalent fractions or decimals Calculate probabilities from two-way tables Draw and calculate probabilities from frequency trees Understand the term relative frequency and calculate it from given data Calculate the expected number of times an event will occur 		Theoretical Probability Mutually exclusive Frequency Relative Expectation	Assessment based on previous knowledge and new learning from current curriculum year
Block 14 – Grouped and bivariate data	<ul style="list-style-type: none"> Record discrete and continuous data in a grouped frequency table Calculate an estimate of the mean from grouped frequency tables Estimate medians from grouped frequency tables Draw frequency diagrams and frequency polygons Accurately draw scatter graphs and lines of best fit Describe correlation between two variables 		Discrete Continuous Mean Median Line of best fit Correlation Variables	

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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

Murderous Maths Series – Poskitt Kjartan
Look into my eyes (Ruby Redfort) – Lauren Child
The number devil: A Mathematical adventure – Hans Magnus Enzensberger
Alex's adventures in Numberland – Alex Bellos
Can you solve my problems? – Alex Bellos
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.