Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage C	AUTUMN TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 1 – Quadratic expressions	- Expand and simplify double brackets - Factorise simple quadratic expressions where all the terms are positive - Factorise simple quadratic expressions with positive and negative terms - Use calculators to produce coordinate tables for quadratic functions - Accurately draw quadratic functions - Understand how the sign of the coefficient of x^2 relates to its graph	Quadratic expression Coefficient Parabola	Blocks 1-2 will be assessed before the Autumn half term holiday
Block 2 – Simultaneous equations	Draw graphs of linear functions using the gradient and y-intercept Solve simultaneous equations graphically Use information to form simultaneous equations Solve simultaneous equations with matching coefficients by elimination Solve simultaneous equations with differing coefficients by elimination Solve simultaneous equations using a substitution method	Intersection Simultaneous equation Elimination method Substitution method Gradient Graphically	
Block 3 – Positive and negative indices and standard form	- Know the laws of indices - Simplify expressions using the laws of indices - Understand the meaning of negative indices - Write numbers in standard form and take numbers out of standard form - Add and subtract numbers given in standard form - Multiply and divide numbers given in standard form	Coefficient Index/Indices Standard form	Blocks 3-5 will be assessed before the Christmas holiday
Block 4 – Linear inequalities	- Write inequalities to represent given information - Represent inequalities on number lines - List the integer values that satisfy an inequality - Solve linear inequalities - Solve inequalities that require multiplying or dividing by a negative - Solve compound linear inequalities	Inequality Integer Linear Compound	
Block 5 – Quadratic equations	- Solve quadratic equations of the form $x^2 + bx + c = 0$ graphically - Solve quadratic equations where one side does not equal zero graphically - Solve quadratic equations by factorising - Simplify and/or rearrange quadratic equations before solving by factorising - Know the quadratic formula - Solve quadratic equations using the quadratic formula	Quadratic equation Factorise Graphically	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage C	SPRING TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 6 – Direct and inverse proportion	• Solve inverse proportion questions • Formulate equations for directly proportional relationships • Solve problems involving direct proportion algebraically • Formulate equations for inversely proportional relationships • Solve problems involving inverse proportion algebraically • Identify graphs showing direct and inverse proportion	Direct proportion Inverse proportion	Blocks 6-8 will be assessed before the Spring half term holiday
Block 7 – Enlargement and similarity	• Enlarge shapes using integer and fractional scale factors • Enlarge shapes using negative scale factors • Fully describe enlargements • Prove similarity of shapes • Solve problems involving similar shapes by finding scale factors • Understand the different ways of proving triangles are congruent	Enlargement Centre of Enlargement Scale Factor Similarity Congruent	
Block 8 - Trigonometry	• Know the three trigonometric ratios • Identify which trigonometric ratio is required to find a missing side • Use trigonometric ratios to find missing lengths in right angled triangles • Identify which trigonometric ratio is required to find a missing angle • Use trigonometric ratios to find missing angles in right angled triangles • Solve trigonometry questions involving multiple triangles	Trigonometry Hypotenuse Opposite Adjacent	
Block 9 – Arithmetic, geometric and quadratic sequences	• Remember how to find position to term rules for arithmetic sequences • Understand the difference between arithmetic and geometric sequences • Generate geometric sequences from position to term rules • Find position to term rules for geometric sequences • Generate quadratic sequences from position to term rules • Find nth term rules for basic quadratic sequences	Sequence Arithmetic Geometric Linear Quadratic nth term	Blocks 9-10 will be assessed before the Easter holiday
Block 10 – Set notation and probability	• Know the notation associated with sets • Find probabilities written in set notation from Venn diagrams • List outcomes systematically to help find probabilities • Use sample space diagrams to find probabilities • Construct tree diagrams to show how events can be combined • Calculate probabilities of independent events using tree diagrams	Set Intersection Compliment Dependent Independent Union	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage C	SUMMER TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 11 - Proof	• Use identity notation correctly • Disprove statements using counter examples • Express odd and even numbers algebraically and use these in proofs • Use algebra to show that an expression is a particular multiple • Express consecutive numbers algebraically and use this in proofs • Express two-digit numbers algebraically and use this in proofs	Identity Prove/Proof Disprove Consecutive Counter-example Multiple	Blocks 11-12 will be assessed before the Summer half term holiday
Block 12 – Cumulative frequency and box plots	• Calculate medians and quartiles for lists of discrete data • Find the interquartile range for lists of data and use to compare data sets • Calculate cumulative frequencies from a frequency table • Plot and draw cumulative frequency curves • Find the median and interquartile range from cumulative frequency graphs • Draw box plots and use them to compare data sets	Lower quartile Upper quartile Inter-quartile range Cumulative frequency Box plot Median	
Block 13 – Volume and surface area	• Remember how to find the volume of cuboids, prisms and cylinders • Find the volume of cones and pyramids • Find the volume of spheres • Remember how to find the surface area of cuboids, prisms and cylinders • Find the surface area of cones, pyramids and spheres • Define a frustum and calculate its volume and surface area	Volume Surface area Pyramid Frustum Sphere Cone	Assessment based on previous knowledge and new learning from current curriculum year
Block 14 - Vectors	• Describe vectors using a column vector • Identify if two vectors are parallel • Add and subtract column vectors • Add and subtract vectors represented algebraically • Identify if two vectors represented algebraically are parallel • Find the midpoint of a vector	Column vector Midpoint Colinear Parallel Scalar Ratio	

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 – Allex 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.