Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage A	AUTUMN TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 1 – Further quadratic and simultaneous equations	• Write expressions of the form $ax^2 + bx + c$ in completed square form • Solve equations of the form $ax^2 + bx + c = 0$ by completing the square • Find the discriminant to identify the most efficient method for solving • Solve linear simultaneous equations using a substitution method • Solve quadratic simultaneous equations using a substitution method • Solve quadratic simultaneous equations graphically	Complete the square Discriminant Simultaneous equations Substitution Linear Quadratic	Blocks 1-2 will be assessed in the week beginning 17th October
Block 2 – Vectors and similarity	• Solve geometric vector problems • Solve vector problems involving ratio • Prove whether or not two vectors are collinear • Solve difficult similarity questions including proofs • Understand the link between scale factors for length, area and volume • Convert between different units for area and volume	Column vector Colinear Scalar Ratio Similar Scale factor	
Block 3 – Coordinate geometry	• Know the formula for the equation of a line • Find the equation of a line passing through two points • Know how the gradients of perpendicular lines are linked • Know the equation of a circle centred on the origin with radius r • Find the equations of tangents to circles • Apply circle theorems to solve coordinate geometry problems	Line equation Gradient Perpendicular Origin Tangent	Blocks 3-4 will be assessed in the week beginning 12th December
November mock exams	• Preparation for mock exams including learning of key knowledge and formulae • Students sit a full set of GCSE papers at higher level • Feedback and evaluation		
Block 4 – Complex sequences and iteration	• Understand notation used for infinite series of numbers • Find nth term rules for quadratic sequences of the form $an^2 + bn + c$ • Find positions of terms in quadratic sequences • Find nth term rules of fractional sequences • Understand and use recurrence relations • Use iterative methods to solve equations	Infinite series Nth term Quadratic sequence Fractional sequence Recurrence relations iterative	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage A	SPRING TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 5 – Rates of change and area under curves	• Calculate displacements and distances from velocity/time graphs • Approximate areas under curves • Approximate displacements and distances with variable acceleration • Find rates of change of linear functions • Use graphical methods to approximate the rate of change of non linear functions	Displacement Velocity Acceleration Rate of change	Blocks 5-6 will be assessed in the week beginning 13th February
Block 6 – Trigonometric graphs and equations	• Understand the proofs for the exact trig values for 30, 45 and 60 degrees • Know the exact trig values of sin, cos and tan for 30, 60 and 90 degrees • Know and use the period of the trigonometric functions to solve problems • Draw the graphs of sine, cosine and tangent functions • Apply reflections and translations to trigonometric functions • Solve basic trigonometric equations within a given interval	Trigonometric functions Reflection Translation	
Mock exams	• Preparation for mock exams including learning of key knowledge and formulae • Students sit a full set of GCSE paper at higher level • Feedback and evaluation		
GCSE exam preparation	Using analysis from both recent and November mock exams class teachers of individual classes will identify topics required to study in further detail.	.	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage A	SUMMER TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
GCSE exam preparation	Using analysis from both recent and November mock exams class teachers of individual classes will identify topics required to study in further detail.		Summer 2023 GCSE exam dates Paper 1 – Non-calculator TBC Paper 2 – Calculator TBC Paper 3 – Calculator TBC

Subject Curriculum Overview for Academic Year 2022/2023

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.