Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage E	AUTUMN TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 1 – Mental Methods	• Use mental addition and subtraction strategies for integer calculations • Use mental multiplication strategies for integer calculations • Use mental division strategies for integer calculations • Use mental arithmetic strategies for decimal and fraction calculations • Understand how factors can be used to simplify calculations • Understand how estimation can be used to check calculations	Commutative Associative Compensation Adjustment Partitioning	Blocks 1-2 will be assessed before the Autumn half term holiday
Block 2 – Powers and order of operations	• Multiply 2-digit numbers by 2- and 3-digit numbers using long multiplication • Find square and cube numbers using multiplication • Find other powers using multiplication • Division of any size number by single digits • Division by double digit numbers using repeated division • Know and use the order of operations within calculations	Square number Cube number Power Operation Order of operations	
Block 3 – Directed numbers	• Perform calculations that cross zero including finding differences • Add directed numbers • Subtract directed numbers • Multiply and divide directed numbers • Calculate powers involving negatives including through use of calculator • Know and use the order of operations with positive and negative numbers	Negative number Order of operations Directed	Blocks 3-5 will be assessed before the Christmas holiday
Block 4 – Fractions, decimals and percentages	• Convert between fractions and decimals involving $^{1}/_{10}$s, $^{1}/_{100}$s and $^{1}/_{1000}$s • Convert between fractions and decimals where the denominators are factors of 100 • Compare fractions to decimals using division • Convert percentages to fractions and decimals and vice versa • Calculate fractions of amounts • Find percentages of amounts including percentages over 100	Numerator Denominator Equivalent	
Block 5 – Place value	• Compare and order integers and decimals including when given in words • Position integers and decimals onto number lines • Round numbers to nearest power of 10 • Round numbers to decimal places • Multiply by integer multiples of tens, hundreds and thousands • Divide by integer multiples of tens, hundreds and thousands	Integer Round Decimal places	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage E	SPRING TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 6 – Money	• Solve problems with bills • Understand and solve problems involving bank statements • Calculate simple interest • Solve problems with VAT • Calculate wages and associated income taxes • Solve unit pricing problems	Debit Credit Balance Withdrawal VAT Net pay	Blocks 6-8 will be assessed before the Spring half term holiday
Block 7 – Algebraic manipulation	• Know the meaning of expression, term and equation • Use letters to represent variables and basic algebraic notation • Identify like terms and simplify expressions by collecting like terms • Simplify expressions by multiplying or dividing algebraic terms • Know how to multiply a single term by a bracket • Substitute numbers into expressions and formulae	Expression Variable Coefficient Like terms Expand Substitute	
Block 8 – Lines and angles	• Use notation for parallel lines and identify perpendicular lines • Know the meaning of 'regular' polygons and solve associated problems • Identify line and rotational symmetry in polygons • Use AB notation for describing lengths and ABCDE notation for polygons • Use <ABC notation for describing angles • Use ruler and protractor or ruler and compasses to construct triangles	Regular Irregular Polygon Parallel Perpendicular Construct	
Block 9 – Fractions	• Convert mixed numbers to improper fractions • Convert improper fractions to mixed numbers • Add proper fractions, improper fractions and mixed numbers • Subtract proper fractions, improper fractions and mixed numbers • Multiply proper fractions, improper fractions and mixed numbers • Divide proper fractions, improper fractions and mixed numbers	Proper fraction Improper fraction Mixed number Reciprocal Cross-cancel	Blocks 9-10 will be assessed before the Easter holiday
Block 10 – Solving equations	• Use the bar model to represent and solve basic equations • Introduce formal written method for solving one and two step equations • Solve two step equations when solution is a fraction • Solve equations involving brackets • Solve three step equations with any type of solution • Check solutions to equations using substitution	Equation Variable Substitute Expand Solve	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Stage E	SUMMER TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 11 – Sequences	• Use a term-to-term rule to generate linear and nonlinear sequences • Describe number sequences and find term to term rules • Use position-to-terms rules (nth term) and use to generate sequences • Find the position-to-term rule (nth term) for a given sequence • Use position to term rules to create formulae for patterns • Identify the position of a term in a sequence • Generate sequences using a spreadsheet	Sequence Term-to-term rule Position-to-term rule Nth term Generate	Blocks 11-12 will be assessed before the Summer half term holiday
Block 12 – Transformations	• 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	
Block 13 – Representation of solids	• Identify and define solids using vertices, edges and sides • Use isometric paper to draw 2 dimensional representations of solids • Use isometric drawings to draw nets of solids • Draw plan and elevations to represent solids from different viewpoints • Use plan and elevational drawings to construct a solid • Develop links between different representations of solids	Isometric Net Viewpoints Plan Elevations	Assessment based on previous knowledge and new learning from current curriculum year
Block 14 – Averages and measures of spread	• Identify mean, medians and modes for sets of data. • Use mean, median and mode to find missing data within sets. • Identify scenarios where different averages could be used and limitations • Understand the range as a measure of spread (or consistency) • Calculate means from frequency tables and bar charts • Calculate modes, median and range from frequency tables and bar charts	Range Mean Median Mode Spread Frequency table	

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

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? – Allex 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.