Maths Curriculum Scheme of Work – Reviewed 2024

Shottermill Junior School

Curriculum Intent and Vision Statement:

At Shottermill Junior School we aim to provide a high-quality mathematics education to give the children a foundation for understanding the world and the ability to reason mathematically. We foster a sense of enjoyment and curiosity about the subject. Mathematics is essential to everyday life, critical to science, technology and engineering and necessary for financial literacy and most forms of employment.

The national curriculum for Mathematics aims to ensure that all pupils:

- **Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately;**
- **Reason mathematically by following a line of enquiry, noticing relationships and generalisations, and developing an argument, justification or proof using mathematical language;**
- **Can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.**

Through our whole school use of the White Rose Maths Scheme, we break the curriculum down into small manageable steps to help children better secure key concepts. Differentiated tasks (based on 'Classroom Secrets' and White Rose activities) ensure that all children are supported and challenged. Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are organised into domains (e.g. measurement, algebra, place value), but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in problem solving. Children also have opportunities within our curriculum to apply their mathematical knowledge to Science and other subject areas.

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by using the following approaches: -

Concrete – to use concrete objects and manipulatives to help the children fully understand what they are doing
Pictorial – alongside this, children should use pictorial representations. These representations can then be used to help reason and solve problems.
Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Implementation of Maths at our school:

All children will be taught at least 1 hour of Maths each day. Cross-curricular links will be made in Science (e.g. data collection in an investigation), Computing (excel spreadsheets or Probots), Music (notation and beats in a bar), Design and Technology (Measuring with accuracy), Geography and History (Statistics or time lines). Teachers use focus groups within lesson times to ensure all children are receiving high quality-first teaching so they can made good progress and gaps can be addressed.

At Shottermill Junior School, we also focus on using the correct mathematical vocabulary relevant to each year group. New vocabulary for that particular topic is introduced, discussed and displayed for the children throughout the sequence of lessons.

There is a high focus on learning times tables and associated division facts, as this greatly supports learning in other areas of Maths (e.g. fractions, calculating area, etc). All children are told what times table fact they need to learn on a weekly basis (whole class), as well as the multiplication times table they are currently working on (individual – e.g. 4 x-table). Children are tested each week on the times table they have been set by their teacher.

Year 3 and 4 take part in a Karate times tables scheme, earning keyring tags for each level passed. They are also given the opportunity to practise the compulsory national times table test, which they will take at the end of Year 4. The whole school also have access to TTRockstars and the weekly results of challenges are read out in assembly / displayed on the TTRockstars display.

Homework is set on a weekly basis and consists of:

- **Weekly 2 facts related to multiplication times tables (taken from progression grid)**
- **TTRockstars which is personalised for each child's knowledge and skills;**
- **A Maths Homework book, which also corresponds to the maths taught in that week.**

Parents are invited to attend and take part in Maths challenges led by the children during the parent workshops in all year groups. This gives them the opportunity to learn the strategies and methods taught to the children.

The following educational trips and special activities will enhance the teaching and learning in this subject:

Year 3: More Able Maths Day **Year 4: More Able Maths Day**	**Year 5: More Able Maths Challenge** **Year 6: More Able Maths Challenge** **Year 6 Business Enterprise Project**

Scheme of work to be taught:

White Rose Maths Primary Schemes of Learning

Year 3		
Autumn - Place Value	**Autumn – Addition & Subtraction**	**Autumn – Multiplication & Division A**
Represent numbers to 100	Apply number bonds within 10	Multiplication - equal groups
Partition numbers to 100	Add and subtract 1s, 10s, 100s	Use arrays
Number line to 100	Spot the pattern	Multiples of 2, multiples of 5 and 10
Hundreds	Add 1s across a 10	Sharing and grouping
Represent numbers to 1,000	Add 10s across a 100	Multiply by 3
Partition numbers to 1,000	Subtract 1s across a 10	Divide by 3
Flexible partitioning of numbers to 1,000	Subtract 10s across a 100	The 3 times-table
Hundreds, tens and ones	Make connections	Multiply by 4
Find 1, 10 or 100 more or less	Add two numbers (no exchange)	Divide by 4
Number line to 1,000	Subtract two numbers (no exchange)	The 4 times-table
Estimate on a number line to 1,000	Add two numbers (across a 10, then across a 100)	Multiply by 8
Compare numbers to 1,000	Subtract two numbers (across a 10, then across a 100)	Divide by 8
Order numbers to 1,000	Add 2-digit and 3-digit numbers	The 8 times-table
Count in 50s	Subtract a 2-digit number from a 3-digit number	The 2, 4 and 8 times-tables
	Complements to 100	
	Estimate answers	
	Inverse operations	
	Make decisions	

Year 3 **Spring - Multiplication & Division B** Multiples of 10 Related calculations (relationship between facts) Reasoning about multiplication Multiply a 2-digit number by a 1-digit number - no exchange Multiply a 2-digit number by a 1-digit number - with exchange Link multiplication and division Divide a 2-digit number by a 1-digit number - no exchange Divide a 2-digit number by a 1-digit number - flexible partitioning Divide a 2-digit number by a 1-digit number - with remainders Scaling (times as many/times the size of/times as long as)	**Spring – Length & Perimeter** Measure in metres and centimetres Measure in millimetres Measure in centimetres and millimetres Metres, centimetres and millimetres Equivalent lengths (metres and centimetres) Equivalent lengths (centimetres and millimetres) Compare lengths Add lengths (m/cm/mm) Subtract lengths (m/cm/mm) What is perimeter? Measure perimeter (all shapes) Calculate perimeter (all shapes)	**Spring – Fractions A** Understand the denominators of unit fractions Compare and order unit fractions Understand the numerators of non-unit fractions Understand the whole Compare and order non-unit fractions Fractions and scales Fractions on a number line Count in fractions on a number line Equivalent fractions on a number line Equivalent fractions as bar models	**Spring – Mass & Capacity** Use scales (number lines) Measure mass in grams Measure mass in kilograms and grams Equivalent masses (kilograms and grams) Compare mass Add and subtract mass Measure capacity and volume in millilitres Measure capacity and volume in litres and millilitres Equivalent capacities and volumes (litres and millilitres) Compare capacity and volume Add and subtract capacity and volume	
Year 3 **Summer – Fractions B** Add and subtract simple fractions with the same denominator (e.g. quarters or halves) Partition the whole Unit fractions of a set of objects Non-unit fractions of a set of objects Reasoning with fractions of an amount	**Summer – Money** Pounds and pence Add and subtract money (notes/coins) Find change to £10	**Summer – Time** Roman numerals to 12 Tell the time to 5 minutes Tell the time to the minute Read time on a digital clock Use a.m. and p.m. Years, months and days Days and hours Hours and minutes - use start and end times Hours and minutes - use durations Minutes and seconds Units of time (seconds/minutes/hours) Solve problems with time	**Summer – Shape** Turns and angles Right angles Compare angles (acute, right and obtuse) Measure and draw accurately Horizontal and vertical Parallel and perpendicular Recognise and describe 2-D shapes Draw polygons Recognise and describe 3-D shapes Make 3-D shapes	**Summer – Statistics** Interpret and draw pictograms Interpret and draw bar charts Collect and represent data Two-way tables (showing more than one piece of information in rows and columns)
Year 4 **Autumn - Number: Place Value** Represent and partition numbers to 1,000 Number line to 1,000 and 10,000 Represent numbers to 10,000 Partition numbers to 10,000	**Autumn – Addition & Subtraction** Add and subtract 1s, 10s, 100s and 1,000s Add up to two 4-digit numbers - no exchange Add two 4-digit numbers - one exchange Add two 4-digit numbers - more than one exchange	**Autumn – Measurement & Area** What is area? Count squares inside a shape to find its area Make shapes using a given amount of squares	**Autumn – Multiplication & Division A** Multiples of 3 Multiply and divide by 6 6 times-table and division facts Multiply and divide by 9 9 times-table and division facts	

Find 1, 10, 100, 1,000 more or less Estimate on a number line to 10,000 Compare numbers to 10,000 Order numbers to 10,000 Roman numerals to 100 Round to the nearest 10 Round to the nearest 100 Round to the nearest 1,000 Round to the nearest 10, 100 or 1,000	Subtract two 4-digit numbers - no exchange Subtract two 4-digit numbers - one exchange Subtract two 4-digit numbers - more than one exchange Efficient subtraction, estimating and checking strategies		Compare areas when using the same size square		The 3, 6 and 9 times-tables Multiply and divide by 7 7 times-table and division facts 11 times-table and division facts 12 times-table and division facts Multiply by 1 and 0 Divide a number by 1 and itself Multiply three numbers
Year 4 **Spring – Multiplication & Division B** Factor pairs Multiply and Divide by 10, 100 Related facts – multiplication and division Informal written methods for multiplication Multiply a 2-digit number by a 1-digit number Multiply a 3-digit number by a 1-digit number Divide a 2-digit number by a 1-digit number Divide a 2-digit number by a 1-digit number Divide a 3-digit number by a 1-digit number Correspondence problems Efficient multiplication	**Spring – Length & Perimeter** Measure in kilometres and metres Equivalent lengths (kilometres and metres) Perimeter on a grid Perimeter of a rectangle in cm and mm Perimeter of rectilinear shapes Find missing lengths in rectilinear shapes Calculate the perimeter of rectilinear shapes Perimeter of regular polygons Perimeter of polygons		**Spring – Fractions** Understand the whole Count beyond 1 Partition a mixed number Number lines with mixed numbers Compare and order mixed numbers Understand improper fractions Convert mixed numbers to improper fractions Convert improper fractions to mixed numbers Equivalent fractions on a number line Equivalent fraction families Add two or more fractions Add fractions and mixed numbers Subtract two fractions Subtract from whole amounts Subtract from mixed numbers		**Spring - Decimals A** Tenths as fractions Tenths as decimals Tenths on a place value chart Tenths on a number line Divide a 1-digit number by 10 Divide a 2-digit number by 10 Hundredths as fractions Hundredths as decimals Hundredths on a place value chart Divide a 1- or 2-digit number by 100
Year 4 **Summer - Decimals B** Make a whole with tenths Make a whole with hundredths Make a whole with hundredths Flexibly partition decimals Compare and order decimals to two decimal places Round to the nearest whole number Halves and quarters as decimals	**Summer – Money** Write money using decimals Convert between pounds and pence Compare amounts of money Estimate with money Calculate with money Solve problems with money	**Summer – Time** Years, months, weeks and days Hours, minutes and seconds Convert between analogue and digital times Convert to and from the 24 hour clock	**Summer – Shape** Understand angles as turns Identify angles Compare and order angles Triangles Quadrilaterals Polygons Lines of symmetry Complete a symmetric figure	**Summer – Statistics** Interpret charts Comparison, sum and difference Interpret line graphs Draw line graphs to represent continuous data	**Summer – Position & Direction** Describe position using coordinates Plot coordinates Draw 2-D shapes on a grid Translate on a grid Describe translation on a grid

Year 5 **Autumn – Place Value** Roman numerals to 1,000 Numbers to 10,000, 100,000, 1,000,000 Read, write, compare, order and partition numbers to 1,000,000 Powers of 10 10/100/1,000/10,000/100,000 more or less Number lines to 1,000,000 Round to the nearest 10, 100 or 1,000 Round within 100,000 Round within 1,000,000	**Autumn – Addition & Subtraction** Mental strategies Add whole numbers with more than four digits Subtract whole numbers with more than four digits Round to check answers Inverse operations (addition and subtraction) Multi-step addition and subtraction problems Compare calculations (exploring the structure what is the same and what is different) Find missing numbers (use inverse/increasing numbers by the same amount/related concepts)	**Autumn – Multiplication & Division A** Multiples Common multiples Factors Common factors Prime numbers Square numbers Cube numbers Multiply by 10, 100 and 1,000 Divide by 10, 100 and 1,000 Multiples of 10, 100 and 1,000	**Autumn – Fractions A** Find fractions equivalent to a unit fraction as well as a non-unit fraction Recognise equivalent fractions Convert improper fractions to mixed numbers and vice versa Compare and order fractions less than 1 Compare and order fractions greater than 1 Add and subtract fractions with the same denominator Add fractions within 1 Add fractions with total greater than 1 Add to a mixed number Add two mixed numbers Subtract fractions Subtract from a mixed number Subtract from a mixed number - breaking the whole Subtract two mixed numbers	

Year 5 **Spring - Multiplication & Division B** Multiply up to a 4-digit number by a 1-digit number Multiply a 2-digit number by a 2-digit number (area model) Multiply a 2-digit number by a 2-digit number Multiply a 3-digit number by a 2-digit number Multiply a 4-digit number by a 2-digit number Solve problems with multiplication Short division Divide a 4-digit number by a 1-digit number Divide with remainders Efficient division Solve problems with multiplication and division	**Spring - Fractions B** Multiply a unit fraction by an integer Multiply a non-unit fraction by an integer Multiply a mixed number by an integer Calculate a fraction of a quantity Fraction of an amount Find the whole Use fractions as operators	**Spring – Decimals & Percentages** Decimals up to 2 decimal places Equivalent fractions and decimals (tenths) Equivalent fractions and decimals (hundredths) Thousandths as fractions and decimals Thousandths on a place value chart Order and compare decimals (same number of decimal places) Order and compare any decimals with up to 3 decimal places Round to the nearest whole number Round to 1 decimal place Understand equivalent fractions, decimals and percentages	**Spring – Perimeter & Area** Perimeter of rectangles Perimeter of rectilinear shapes Perimeter of polygons Area of rectangles Area of compound shapes Estimate area	**Spring – Statistics** Draw line graphs (conversion graphs) Read and interpret line graphs to solve problems Read and interpret tables (retrieval, comparing and inferring reasons) Two-way tables (showing more than one piece of information in rows and columns - generate own questions and identify the meaning of each cell) Read and interpret timetables – a special type of two-way table relevant to the children's lives e.g. a school day.

Year 5 **Summer – Shape** Understand and use degrees Classify and estimate angles Measure angles up to 180 Draw lines and angles accurately Calculate angles around a point Calculate angles on a straight line Lengths and angles in shapes Regular and irregular polygons 3-D shapes	**Summer – Position & Direction** Read and plot coordinates Problem solving with coordinates Translation Translation with coordinates Lines of symmetry Reflection in horizontal and vertical lines	**Summer – Decimals** Use known facts to add and subtract decimals within 1 Complements to 1 Add and subtract decimals across 1 Add and subtract decimals with the same number of decimal places Add and subtract decimals with different number of decimal places Efficient strategies for adding and subtracting decimals Decimal sequences Multiply by 10, 100 and 1,000 Divide by 10, 100 and 1,000 Multiply and divide decimals - missing values	**Summer – Negative Numbers** Understand negative numbers Count through zero in 1s Count through zero in multiples Compare and order negative numbers Find the difference	**Summer – Measurement / Converting Units** Kilograms and kilometres Millimetres and millilitres Convert units of length (mm/cm/m – appropriate units of measure) Convert between metric and imperial units Convert units of time Calculate with timetables	**Summer – Measurement / Volume** Cubic Centimetres Compare volume Estimate volume and capacity

Year 6 **Autumn – Place Value** Numbers to 1,000,000 Numbers to 10,000,000 Read and write numbers to 10,000,000 Powers of 10 Number line to 10,000,000 Compare and order any integers Round any integer Negative numbers	**Autumn – Addition, Subtraction, Multiplication & Division** Add and subtract integers Common factors and multiples Rules of divisibility Primes to 100 Square and cube numbers Multiply up to a 4-digit number by a 2-digit number Solve problems with multiplication Short division Division using factors Introduction to long division Long division with remainders	**Autumn – Fractions A** Equivalent fractions and simplifying Equivalent fractions on a number line Compare and order (numerator) Compare and order (denominator) Add and subtract simple fractions Add and subtract any two fractions Add mixed numbers Subtract mixed numbers Multi-step problems	**Autumn – Fractions B** Multiply fractions by integers Multiply fractions by fractions Divide a fraction by an integer Divide any fraction by an integer Mixed questions with fractions Fraction of an amount Fraction of an amount - find the whole	**Autumn – Measurement converting units** Metric measures Convert metric measures Calculate with metric measures Miles and kilometres Imperial measures

	Solve problems with division Solve multi-step problems Order of operations Mental calculations and estimation Reason from known facts				
Year 6 **Spring – Ratio** Add or multiply? Use ratio language Introduction to the ratio symbol Ratio and fractions Scale drawing Use scale factors Similar shapes Ratio problems Proportion problems Recipes	**Spring – Algebra** 1-step function machines 2-step function machines Form expressions Substitution Formulae Form equations Solve 1-step and then 2-step equations Find pairs of values Solve problems with two unknowns	**Spring – Decimals** Place value within 1 Place value – integers and decimals Round decimals Add and subtract decimals Multiply and Divide by 10, 100 and 1,000 Multiply and Divide decimals by integers Multiply and divide decimals in context	**Spring – Fractions, decimals & percentages** Decimal and fraction equivalents Fractions as division Understand percentages Fractions to percentages Equivalent fractions, decimals and percentages Order fractions, decimals and percentages Percentage of an amount – one step Percentage of an amount – multi-step Percentages – missing values	**Spring – Area, Perimeter & volume** Shapes - same area Area and perimeter Area of a triangle – counting squares Area of a right-angled triangle Area of any triangle Area of a parallelogram Volume - counting cubes Volume of a cuboid	**Spring – Statistics** Line graphs Dual bar charts Read and interpret pie charts Pie charts with percentages Draw pie charts The mean
Year 6 **Summer – Shape** Measure and classify angles (four types of angle, degrees in an angle and use a protractor to measure an angle) Calculate angles (without a protractor using known facts) Vertically opposite angles Angles in a triangle Angles in a triangle – special cases Angles in a triangle – missing angles Angles in quadrilaterals Angles in polygons Draw shapes accurately Nets of 3-D shape	**Summer – Geometry: position & direction** The first quadrant (x and y coordinates are positive) Read and plot points in four quadrants (x and y coordinates can be extended through zero into negative numbers) Solve problems with coordinates (all four quadrants) Translations (points and shapes) Reflections across all four quadrants.	**Summer – Algebra (Consolidation)** Use 2- step function machines Use simple formulae Generate expressions Use simple formulae. Generate expressions and equations. Solve simple equations	**Summer – Shape (Consolidation)** Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons. Draw 2-D shapes using given dimensions and angles. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. **Statistics (Consolidation)**	**Summer – Area and Perimeter (Consolidation)** Recognise that shapes with the same areas can have different perimeters and vice versa. Recognise when it is possible to use formulae for area of shapes. Calculate the area of triangles.	**Summer – Ratio and Proportion (Consolidation)** Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Solve problems involving similar shapes where the scale factor is known or can be found. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. Solve problems involving unequal sharing.

			Read and interpret pie charts Draw pie charts		Solve problems involving similar shapes where the scale factor is known or can be found.