

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 make 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.

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 or task sheet, 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

Represent numbers to 100.
Partition numbers to 100.
Number line to 100. Hundreds.
Represent numbers to 1,000.
Partition numbers to 1,000.
Flexible partitioning of numbers to 1,000.
Hundreds, tens and ones. Find 1, 10 or 100 more or less.
Number line to 1,000.
Estimate on a number line to 1,000.
Compare numbers to 1,000.
Order numbers to 1,000.
Count in 50s.

Year 3 – Autumn

Addition & Subtraction

Apply number bonds within 10.
Add and subtract 1s.
Add and subtract 10s.
Add and subtract 100s.
Spot the pattern.
Add 1s across a 10.
Add 10s across a 100.
Subtract 1s across a 10.
Subtract 10s across a 100.
Make connections.
Add two numbers (no exchange).
Subtract two numbers (no exchange).
Add two numbers (across a 10).
Add two numbers (across a 100).
Subtract two numbers (across a 10).
Subtract two numbers (across a 100).

Year 3 – Autumn

Multiplication & Division A

Multiplication – equal groups.
Use arrays.
Multiples of 2.
Multiples of 5 and 10.
Sharing and grouping.
Multiply by 3.
Divide by 3.
The 3 times-table.
Multiply by 4.
Divide by 4.
The 4 times-table.
Multiply by 8.
Divide by 8.
The 8 times-table.
The 2, 4 and 8 times-tables.

<u>Year 3 – Spring</u> <u>Multiplication & Division B</u> Multiples of 10. Related calculations. 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. How many ways?	<u>Year 3 – Spring</u> <u>Length & Perimeter</u> 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. Subtract lengths. What is perimeter? Measure perimeter. Calculate perimeter.	<u>Year 3 – Spring</u> <u>Fractions A</u> 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.	<u>Year 3 – Spring</u> <u>Mass & Capacity</u> Use scales. 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.	
<u>Year 3 – Summer</u> <u>Fractions B</u> Add fractions. Subtract fractions. Partition the whole. Unit fractions of a set of objects. Non-unit fractions of a set of objects. Reasoning with fractions of an amount.	<u>Year 3 – Summer</u> <u>Money</u> Pounds and pence. Convert pounds and pence. Add money. Subtract money. Find change.	<u>Year 3 – Summer</u> <u>Time</u> Roman numerals to 12. Tell the time to 5 minutes. Tell the time to the minute. Read time on a digital clock. Use am and pm. 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. Solve problems with time.	<u>Year 3 – Summer</u> <u>Shape</u> Turns and angles. Right angles. Compare angles. 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.	<u>Year 3 – Summer</u> <u>Statistics</u> Interpret pictograms. Draw pictograms. Interpret bar charts. Draw bar charts. Collect and represent data. Two-way tables.

<u>Year 4 – Autumn</u> <u>Place Value</u> Represent numbers to 1,000. Partition numbers to 1,000. Number line to 1,000. Thousands. Represent numbers to 10,000. Partition numbers to 10,000. Flexible partitioning of numbers to 10,000. Find 1, 10, 100, 1,000 more or less. Number line to 10,000. Estimate on a number line to 10,000. Compare numbers to 10,000. Order numbers to 10,000. Roman numerals. 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.	<u>Year 4 – Autumn</u> <u>Addition & Subtraction</u> 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. 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. Estimate answers. Checking strategies.	<u>Year 4 – Autumn</u> <u>Area</u> What is area? Count squares. Make shapes. Compare areas.	<u>Year 4 – Autumn</u> <u>Multiplication & Division A</u> 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. 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.
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<u>Year 4 – Spring</u> <u>Multiplication & Division B</u> Factor pairs. Use factor pairs. Multiply by 10 Multiply by 100. Divide by 10. Divide by 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 (1). Divide a 2-digit number by a 1-digit number (2). Divide a 3-digit number by a 1-digit number. Correspondence problems. Efficient multiplication.	<u>Year 4 – Spring</u> <u>Length & Perimeter</u> Measure in kilometres and metres. Equivalent lengths (kilometres and metres). Perimeter on a grid. Perimeter of a rectangle. Perimeter of rectilinear shapes. Find missing lengths in rectilinear shapes. Calculate perimeter of rectilinear shapes. Perimeter of regular polygons. Perimeter of polygons.			<u>Year 4 – Spring</u> <u>Fractions</u> 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.	<u>Year 4 – Spring</u> <u>Decimals A</u> 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.
<u>Year 4 – Summer</u> <u>Decimals B</u> Make a whole with tenths. Make a whole with hundredths. Partition decimals. Flexibly partition decimals. Compare decimals. Order decimals. Round to the nearest whole number. Halves and quarters as decimals.	<u>Year 4 – Summer</u> <u>Money</u> Write money using decimals. Convert between pounds and pence. Compare amounts of money. Estimate with money. Calculate with money. Solve problems with money.	<u>Year 4 – Summer</u> <u>Time</u> Years, months, weeks and days. Hours, minutes and seconds. Convert between analogue and digital times. Convert to the 24-hour clock. Convert from the 24-hour clock.	<u>Year 4 – Summer</u> <u>Shape</u> Understand angles as turns. Identify angles. Compare and order angles. Triangles. Quadrilaterals. Polygons. Lines of symmetry. Complete a symmetric figure.	<u>Year 4 – Summer</u> <u>Statistics</u> Interpret charts. Comparison, sum and difference. Interpret line graphs. Draw line graphs.	<u>Year 4 – Summer</u> <u>Position & Direction</u> Describe position using coordinates. Plot coordinates. Draw 2-D shapes on a grid. Translate on a grid. Describe translation on a grid.

<u>Year 5 – Autumn</u> <u>Place Value</u> Roman numerals to 1,000. Numbers to 10,000. Numbers to 100,000. Numbers to 1,000,000. Read and write numbers to 1,000,000. Powers of 10. 10/100/1,000/10,000/100,000 more or less. Partition numbers to 1,000,000. Number line to 1,000,000. Compare and order numbers to 100,000. Compare and order numbers to 1,000,000. Round to the nearest 10, 100 or 1,000. Round within 100,000.	<u>Year 5 – Autumn</u> <u>Addition & Subtraction</u> 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. Find missing numbers.	<u>Year 5 – Autumn</u> <u>Multiplication & Division A</u> 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.	<u>Year 5 – Autumn</u> <u>Fractions A</u> Find fractions equivalent to a unit fraction. Find fractions equivalent to a non-unit fraction. Recognise equivalent fractions. Convert improper fractions to mixed numbers. Convert mixed numbers to improper fractions. Compare fractions less than 1. 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.
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<u>Year 5 – Spring</u> 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.	<u>Year 5 – Spring</u> 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.	<u>Year 5 – Spring</u> Decimals & Percentages Decimals up to 2 decimal places. Equivalent fractions and decimals (tenths). Equivalent fractions and decimals (hundredths). Equivalent fractions and decimals. Thousandths as fractions. Thousandths as 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 percentages. Percentages as fractions. Percentages as decimals. Equivalent fractions, decimals and percentages.	<u>Year 5 – Spring</u> Perimeter & Area Perimeter of rectangles. Perimeter of rectilinear shapes. Perimeter of polygons. Area of rectangles. Area of compound shapes. Estimate area.	<u>Year 5 – Spring</u> Statistics Draw line graphs. Read and interpret line graphs. Read and interpret tables. Two-way tables. Read and interpret timetables.
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<u>Year 5 – Summer Shape</u> Understand and use degrees. Classify angles. 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.	<u>Year 5 – Summer Position & Direction</u> Read and plot coordinates. Problem solving with coordinates. Translation. Translation with coordinates. Lines of symmetry. Reflection in horizontal and vertical lines.	<u>Year 5 – Summer Decimals</u> Use known facts to add and subtract decimals within 1. Complements to 1. Add and subtract decimals across 1. Add decimals with the same number of decimal places. Subtract decimals with the same number of decimal places. Add decimals with different numbers of decimal places. Subtract decimals with different numbers 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.	<u>Year 5 – Summer Negative Numbers</u> Understand negative numbers. Count through zero in 1s. Count through zero in multiples. Compare and order negative numbers. Find the difference.	<u>Year 5 – Summer Converting Units</u> Kilograms and kilometres. Millimetres and millilitres. Convert units of length. Convert between metric and imperial units. Convert units of time. Calculate with timetables.	<u>Year 5 – Summer Volume</u> Cubic centimetres. Compare volume. Estimate volume. Estimate capacity.
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<u>Year 6 – Autumn</u> <u>Place Value</u> 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.	<u>Year 6 – Autumn</u> <u>Addition, Subtraction, Multiplication & Division</u> Add and subtract integers. Common factors. Common 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. Solve problems with division. Solve multi-step problems. Order of operations. Mental calculations and estimation. Reason from known facts.	<u>Year 6 – Autumn</u> <u>Fractions A</u> Equivalent fractions and simplifying. Equivalent fractions on a number line. Compare and order (denominator). Compare and order (numerator). Add and subtract simple fractions. Add and subtract any two fractions. Add mixed numbers. Subtract mixed numbers. Multi-step problems.	<u>Year 6 – Autumn</u> <u>Fractions B</u> 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.	<u>Year 6 – Autumn</u> <u>Converting Units</u> Metric measures. Convert metric measures. Calculate with metric measures. Miles and kilometres. Imperial measures.
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<u>Year 6 – Spring</u> <u>Ratio</u> 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.	<u>Year 6 – Spring</u> <u>Algebra</u> 1-step function machines. 2-step function machines. Form expressions. Substitution. Formulae. Form equations. Solve 1-step equations. Solve 2-step equations. Find pairs of values. Solve problems with two unknowns.	<u>Year 6 – Spring</u> <u>Decimals</u> Place value within 1. Place value – integers and decimals. Round decimals. Add and subtract decimals. Multiply by 10, 100 and 1,000. Divide by 10, 100 and 1,000. Multiply decimals by integers. Divide decimals by integers. Multiply and divide decimals in context.	<u>Year 6 – Spring</u> <u>Fractions, Decimals & Percentages</u> 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.	<u>Year 6 – Spring</u> <u>Area, Perimeter & Volume</u> 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.	<u>Year 6 – Spring</u> <u>Statistics</u> Line graphs. Dual bar charts. Read and interpret pie charts. Pie charts with percentages. Draw pie charts. The mean.
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<u>Year 6 – Summer Shape</u> Measure and classify angles. Calculate angles. Vertically opposite angles. Angles in a triangle. Angles in a triangle – special cases. Angles in a triangle – missing angles. Angles in a quadrilateral. Angles in polygons. Circles. Draw shapes accurately. Nets of 3-D shapes.	<u>Year 6 – Summer Position & Direction</u> The first quadrant. Read and plot points in four quadrants. Solve problems with coordinates. Translations. Reflections.	<u>Year 6 – Summer Algebra (Consolidation)</u> Use 2- step function machines Use simple formulae Generate expressions Use simple formulae. Generate expressions and equations. Solve simple equations	<u>Year 6 – Summer Shape (Consolidation)</u> 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.	<u>Year 6 – Summer Area and Perimeter (Consolidation)</u> 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.	<u>Year 6 – Summer Ratio and Proportion (Consolidation)</u> 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.
<u>Consolidation (revision)</u> Teachers will use the remainder of the school year to carry out projects, consolidation (revision) and problem solving. Where appropriate and necessary, at the teacher's discretion, they will date former learning objectives if it provides further evidence for a child working at a particular SJS level.					