



MATHS

Intent

At Acomb First School, we recognise that mathematics is essential to everyday life and almost all forms of employment. Therefore, a high quality mathematics education is an essential foundation for understanding the world. We understand that success in mathematics is underpinned by the acquisition of proficiency and automaticity. As children acquire these skills, they will begin to calculate with ease and accuracy experiencing success and as an outcome of this will develop a love of Maths. At Acomb First School we have designed a curriculum that engineers success and fosters a love of mathematics.

Implementation

Maths is taught on a daily basis. We teach Maths using the White Rose Maths scheme. Our Maths lessons follow the lesson structure of;

- Arithmetic or flashback 4
- Retrieval
- Teacher modelling (I do)
- Practice opportunities AfL (We do)
- independent tasks of fluency, problem solving and reasoning (You do)

Problem solving and reasoning is embedded in lessons (although not all lessons) and is not taught discreetly at the end of a unit.

Mathematical talk is embedded in all lessons and is a key element of our maths teaching. Children are provided with sentence stems and these are modelled by the teacher. There are regular opportunities to talk to partners to explain and justify their thinking and answers in full sentences e.g. "I know it is true because..."

Effective questioning is used to ensure children make the most progress possible from their individual starting points. Assessment for learning is used within lessons to adapt the lesson/pace to the learners needs. At the end of each lesson children who require further support are identified for same day intervention to ensure they come to the next lesson having had further practice, misconceptions addressed and have increased confidence.

End points are monitored through the use of End of Unit assessments. These assessments inform intervention plans. All children retrieve and revisit key information from prior learning at the beginning of every lesson. Pupil progress meetings are used to ensure all children stay on track from the previous year and key stage attainment levels.

THRESHOLD CONCEPTS

Add and subtract

This concept involves understanding both the concepts and processes of addition and subtraction.

Multiply and divide

This concept involves understanding both the concepts and processes of multiplication and division.

Use fractions

This concept involves understanding the concept of part and whole and ways of calculating using it.

Understand the properties of shapes

This concept involves recognising the names and properties of geometric shapes and angles.

Describe position, direction and movement

This concept involves recognising various types of mathematical movements.

Use measures

This concept involves becoming familiar with a range of measures, devices used for measuring and calculations.

Use statistics

This concept involves interpreting, manipulating and presenting data in various ways.

Use algebra

This concept involves recognising mathematical properties and relationships using symbolic representations.

Threshold Concept	Foundation	Milestone 1	Milestone 2
Know and use numbers This concept involves understanding the number system and how they are used in a wide variety of mathematical ways.	<ul style="list-style-type: none">• Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5.• Verbally count beyond 20, recognising the pattern of the counting system.	<ul style="list-style-type: none">• Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.• Count, read and write numbers to 100 in numerals.• Given a number, identify one more and one less.	<ul style="list-style-type: none">• Count in multiples of 2 to 9, 25, 50, 100 and 1000.• Find 1000 more or less than a given number.• Count backwards through zero to include negative numbers.

		<ul style="list-style-type: none"> Count in steps of 2, 3, 5 and 10 from 0 or 1 and in tens from any number, forward and backward. 	
	<ul style="list-style-type: none"> Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. 	<ul style="list-style-type: none"> Identify, represent and estimate numbers using different representations, including the number line. Read and write numbers initially from 1 to 20 and then to at least 100 in numerals and in words. 	<ul style="list-style-type: none"> Identify, represent and estimate numbers using different representations. Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.
		<ul style="list-style-type: none"> Use the language of: equal to, more than, less than (fewer), most and least. Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs. 	<ul style="list-style-type: none"> Order and compare numbers beyond 1000.
		<ul style="list-style-type: none"> Recognise the place value of each digit in a two-digit number (tens, ones). 	<ul style="list-style-type: none"> Recognise the place value of each digit in a four-digit number. (thousands, hundreds, tens, and ones) Round any number to the nearest 10, 100 or 1000.
	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally	<ul style="list-style-type: none"> Use place value and number facts to solve problems. 	<ul style="list-style-type: none"> Solve number and practical problems with increasingly large positive numbers.
<p>Add and subtract This concept involves understanding both the concepts and processes of addition and subtraction.</p>	Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	<ul style="list-style-type: none"> Solve one-step problems with addition and subtraction: <ul style="list-style-type: none"> Using concrete objects and pictorial representations including those involving numbers, quantities and measures. Using the addition (+), subtraction (-) and equals (=) signs. 	<ul style="list-style-type: none"> Solve two-step addition and subtraction problems in contexts, deciding which operations and methods to use and why.

		<ul style="list-style-type: none"> • Applying their increasing knowledge of mental and written methods. 	
		<ul style="list-style-type: none"> • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> • One-digit and two-digit numbers to 20, including zero. • A two-digit number and ones. • A two-digit number and tens. • Two two-digit numbers. • Adding three one-digit numbers. • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. 	<ul style="list-style-type: none"> • Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. • Add and subtract numbers mentally, including: <ul style="list-style-type: none"> • A three-digit number and ones. • A three-digit number and tens. • A three-digit number and hundreds.
		<ul style="list-style-type: none"> • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. 	<ul style="list-style-type: none"> • Estimate and use inverse operations to check answers to a calculation.
		<ul style="list-style-type: none"> • Represent and use number bonds and related subtraction facts within 20. • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. 	<ul style="list-style-type: none"> • Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.

<p>Multiply and divide This concept involves understanding both the concepts and processes of multiplication and division.</p>	<ul style="list-style-type: none"> • Solve one-step (two-step at greater depth) problems involving multiplication and division. 	<ul style="list-style-type: none"> • Solve problems involving multiplying and dividing, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems (such as n objects are connected to m objects).
	<ul style="list-style-type: none"> • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (\div) and equals (=) signs. • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. • Solve problems involving multiplication and division using mental methods. 	<ul style="list-style-type: none"> • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. • Recognise and use factor pairs and commutativity in mental calculations.
	<ul style="list-style-type: none"> • Use known multiplication facts to check the accuracy of calculations. 	<ul style="list-style-type: none"> • Recognise and use the inverse relationship between multiplication and division and use this to check calculations and solve missing number problems.
	<ul style="list-style-type: none"> • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables. • Recognise odd and even numbers. • Use multiplication and division facts to solve problems. 	<ul style="list-style-type: none"> • Recall multiplication and division facts for multiplication tables up to 12×12.
<p>Fractions This concept involves understanding the concept of part and</p>	<ul style="list-style-type: none"> • Recognise, find and name a half as one of two equal parts of an object, shape or quantity. 	<ul style="list-style-type: none"> • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

<p>whole and ways of calculating using it.</p>		<ul style="list-style-type: none"> • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. • Recognise, find, name and write fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity. 	<ul style="list-style-type: none"> • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. • Round decimals with one decimal place to the nearest whole number. • Compare numbers with the same number of decimal places up to two decimal places. • Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. • Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. • Compare and order unit fractions and fractions with the same denominators.
		<ul style="list-style-type: none"> • Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$. 	<ul style="list-style-type: none"> • Recognise and show, using diagrams, families of common equivalent fractions. • Recognise and write decimal equivalents of any number of tenths or hundredths. • Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$.
		<ul style="list-style-type: none"> • Write simple fractions for example, $\frac{1}{2}$ of 6 = 3. 	<ul style="list-style-type: none"> • Add and subtract fractions with the same denominator within one whole. • Solve problems involving increasingly harder fractions.

			<ul style="list-style-type: none"> • Calculate quantities and fractions to divide quantities (including non-unit fractions where the answer is a whole number). • Add and subtract fractions with the same denominator. • Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths. • Solve simple measure and money problems involving fractions and decimals to two decimal places.
<p>Understand the properties of shapes This concept involves recognising the names and properties of geometric shapes and angles.</p>	<ul style="list-style-type: none"> • Copy and create repeating patterns • Select, rotate and manipulate shapes in order to develop spatial reasoning skill • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can 	<ul style="list-style-type: none"> • Recognise and name common 2D and 3D shapes. • Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line. • Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces. • Identify 2-D shapes on the surface of 3-D shapes. • Compare and sort common 2-D and 3-D shapes and everyday objects. 	<ul style="list-style-type: none"> • Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. • Recognise angles as a property of shape or a description of a turn. • Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle. • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. • Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

			<ul style="list-style-type: none"> • Identify acute and obtuse angles and compare and order angles up to two right angles by size. • Identify lines of symmetry in 2-D shapes presented in different orientations. • Complete a simple symmetric figure with respect to a specific line of symmetry.
<p>Describe position, direction and movement This concept involves recognising various types of mathematical movements.</p>	<p>Age 3-4 Years</p> <ul style="list-style-type: none"> • Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...' • Discuss routes and locations, using words like 'in front of' and 'behind'. 	<ul style="list-style-type: none"> • Describe position, direction and movement, including whole, half, quarter and three-quarter turns. • Order and arrange combinations of mathematical objects in patterns and sequences. • Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). 	<ul style="list-style-type: none"> • Recognise angles as a property of shape and as an amount of rotation. • Identify right angles, recognise that 2 right angles make a half turn and 4 make a whole turn. • Identify angles that are greater than a right angle. • Describe positions on a 2-D grid as coordinates in the first quadrant. • Describe movements between positions as translations of a given unit to the left/right and up/down. • Plot specified points and draw sides to complete a given polygon.
<p>Use measures This concept involves becoming familiar with a range of measures, devices used for measuring and calculations.</p>	<ul style="list-style-type: none"> • Compare length, weight and capacity 	<ul style="list-style-type: none"> • Compare, describe and solve practical problems for: <ul style="list-style-type: none"> • lengths and heights • mass/weight • capacity and volume 	<ul style="list-style-type: none"> • Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). • Measure the perimeter of simple 2-D shapes. • Add and subtract amounts of money to give change. (£ and p)

		<ul style="list-style-type: none"> •time. • Measure and begin to record: •lengths and heights •mass/weight •capacity and volume •time (hours, minutes, seconds). • Recognise and know the value of different denominations of coins and notes. • Sequence events in chronological order using language. • Recognise and use language relating to dates, including days of the week, weeks, months and years. • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. • Use standard units to estimate and measure length/height (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. 	<ul style="list-style-type: none"> • Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. • Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use appropriate vocabulary. • Know the number of seconds in a minute and the number of days in each month, year and leap year. • Compare durations of events. • Convert between different units of measure. (for example, kilometre to metre; hour to minute) • Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. • Find the area of rectilinear shapes by counting squares. • Estimate, compare and calculate different measures, including money in pounds and pence. • Read, write and convert time between analogue and digital 12- and 24-hour clocks. • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.
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<p>Use statistics This concept involves interpreting, manipulating and presenting data in various ways.</p>		<ul style="list-style-type: none"> • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. • Ask and answer simple questions by counting the number of objects in 	<ul style="list-style-type: none"> • Interpret and present data using bar charts, pictograms and tables. • Solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts, pictograms and tables.

		<p>each category and sorting the categories by quantity.</p> <ul style="list-style-type: none"> • Ask and answer questions about totalling and comparing categorical data. 	<ul style="list-style-type: none"> • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
<p>Use algebra This concept involves recognising mathematical properties and relationships using symbolic representations.</p>		<ul style="list-style-type: none"> • Solve addition and subtraction problems involving missing numbers. 	<ul style="list-style-type: none"> • Solve addition and subtraction, multiplication and division problems that involve missing numbers.

BREADTH OF STUDY

EYFS	KEY STAGE 1	KEY STAGE 2
<ul style="list-style-type: none"> • Have a deep understanding of number to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5. • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. • Verbally count beyond 20, recognising the pattern of the counting system. • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. 	<ul style="list-style-type: none"> • Count and calculate in a range of practical contexts. • Use and apply mathematics in everyday activities and across the curriculum. • Repeat key concepts in many different practical ways to secure retention. • Explore numbers and place value up to at least 100. • Add and subtract using mental and formal written methods in practical contexts. • Multiply and divide using mental and formal written methods in practical contexts. • Explore the properties of shapes. • Use language to describe position, direction and movement. • Use and apply in practical contexts a range of measures, including time. 	<ul style="list-style-type: none"> • Count and calculate in increasingly complex contexts, including those that cannot be experienced first hand. • Rigorously apply mathematical knowledge across the curriculum, in particular in science, technology and computing. • Deepen conceptual understanding of mathematics by frequent repetition and extension of key concepts in a range of engaging and purposeful contexts. • Explore numbers and place value so as to read and

<ul style="list-style-type: none"> • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally 	<ul style="list-style-type: none"> • Handle data in practical contexts. 	<p>understand the value of all numbers.</p> <ul style="list-style-type: none"> • Add and subtract using efficient mental and formal written methods. • Multiply and divide using efficient mental and formal written methods. • Use the properties of shapes and angles in increasingly complex and practical contexts, including in construction and engineering contexts. • Describe position, direction and movement in increasingly precise ways. • Use and apply measures to increasingly complex contexts. • Gather, organise and interrogate data. • Understand the practical value of using algebra.
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Impact

Our learners will use their taught knowledge to access problem solving and reasoning activities, not only in maths lessons but across the curriculum. Acomb mathematics teaching provides pupils with many opportunities to develop their understanding of a wide range of mathematics and apply them to different contexts. Teachers ensure that pupils revisit and consolidate important knowledge and concepts. As a result, pupils are confident in using mathematics to solve problems and explain their reasoning. They will foster a love of learning mathematics, evident by their enthusiasm to take part in Maths lessons. Our learners are given fluent skills

and knowledge to support them to increase their mathematical automaticity to become confident citizens with an understanding of their own economic wellbeing and a life-long love of maths.