

Mathematics Curriculum

Intent

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

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, conjecturing 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.

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, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

At St Aelred's children have a daily mathematics lesson covering a broad and balanced mathematical curriculum including elements of number, calculation, geometry, measures and statistics. Alongside daily maths sessions, Big Maths is used and opportunities for maths in other subjects.

EYFS – mastery approach

In Early Years, Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measure.

Key Stage 1

The National Curriculum (2014) states that:

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower Key Stage 2

The National Curriculum (2014) states that:

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2

The National Curriculum (2014) states that:

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

Implementation

Maths at St Aelreds:

- Daily maths lesson
- Pre-assessment is used to ensure accurate pitch and to ensure gaps are covered
- Activation of prior knowledge
- Greater focus on Ready to Progress Criteria
- Encourage positive mindset and confidence in maths:
 - Everyone can learn maths to the high level they want to, with hard work
 - Mistakes are an important part of learning
 - Pupils and teachers, ask and answer questions
 - Deeper understanding is important, which may take time.
- Work on mathematics tasks with a low entry point but a very high ceiling – so that students are constantly challenged and working at the highest and most appropriate level for them. Work on mathematics tasks that are complex, ‘maths rich’ - involve more than one method or area of mathematics, and that often, but not always, represent real world problems and applications.
- Use of mixed achievement grouping
- Big Maths Y1/2/5/6 Times Tables focus Y3/4
- Enough time to practise new learning and embed – varied activities
- Focus on accurate use of mathematical vocabulary
- Live marking and feedback to address misconceptions in the lesson
- Strong focus on reaching milestones for learning key number facts.

- Use appropriate representations – models and images – to enable children to understand the concept; with the aim that children move on to do the maths without having to use the representation.

Curriculum Impact

Throughout each lesson formative assessment takes place and feedback is given to the children through marking and next step tasks to ensure they are meeting the specific learning objective. Teacher's then use this assessment to influence their planning and ensure they are providing a mathematics curriculum that will allow each child to progress. The teaching of maths is also monitored through work scrutiny, learning walks and lesson observations. Each term children from Year 2 and above complete summative assessment activities to demonstrate their understanding of the topics covered. Key Stage 1 use a combination of White Rose assessments, previous SATs papers (Year 2) whilst Key Stage 2 use White Rose assessments, NFER tests and previous SATs papers (Year 6.) The results from both the teacher assessment and summative assessment is then used to determine children's progress and attainment. Classroom Monitor is used to record pupils attainment and progress in relation to mastering the content of the curriculum.

The expectation is that the majority of pupils will move through the curriculum at broadly the same pace but decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Overviews for each Year Group 2021/22:

(Note, greater detail regarding the curriculum objectives in each unit, is set out in the White Rose scheme of work used by the school.)

Year 1	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
AUTUMN (14 weeks)	Baseline Assessment	Number: Place Value (within 10)			Number: Addition & Subtraction			Measurement: Length and Height (recap 2D shape)	Number: Place Value (within 20)		Geometry: position and direction	Number: Fractions (1/2)		Measurement: Time
	Number: Place Value (within 50)		Number: Addition & Subtraction (within 20)		Number: Multiplication and Division		Geometry : shape (3D)	Number: Fractions (1/4)		Measurement: Time		Measurement: Money		
SUMMER (12 weeks)	Number: Place Value (within 100)		Number: Multiplication and Division		Measurement: Weight and Volume		Number: Fractions (ALL)	Measurement: Money	Number: Addition & Subtraction (within 20)		Measurement: Time	Revision		

Year 2	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
AUTUMN (14 weeks)	Number: Place Value			Number: Addition/ Subtraction			Measurement: Money	Number: Counting counting in 2s, 5s, 10s & use to solve problems and reading scales in 1s, 2s, 5s and 10s	Number: Addition/subtraction		Number: Multiply/ Divide		Measurement: Money	Consolidation/Activity week	
	Number: Multiply/ Divide			Statistics	Geometry: Shape			Number: Addition/ Subtraction	Number: Fractions		Measurement: Time				
SUMMER (12 weeks)	Evidence gathering through revision & SAT papers 3 days a week across half term SAT papers wk beg 24 th May ?	Measurement: Length /Height 2 days week 1	Measurement: Mass/ Capacity 2 days week 2		Geometry: Position and Direction 2 days week 3			Number: Place value and 4 operations							
		Revision and preparation prior to Y3													

Year 3	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
AUTUMN	Number: Place Value (x3)			Number: Addition and Subtraction (x4 of 5)				Measurement: Money (x2)	Number: Multiplication and Division (1) x4)				Consolidation		
	Geometry: Properties of Shape (1)(x1)	Number: Multiplication and Division (2)(x3)		Statistics: Data Handling (x2)	Number: Addition and Subtraction (2) (x5 of 5)	Measurement: Length and Perimeter (x3)		Number: Fractions (1)(x2)		Consolidation					
SUMMER	Number: Place Value (x1)	Number: Fractions (2) (x3)		Measurement: Time (x3)		Measurement: Mass and Capacity (x3)		Geometry: Properties of Shape (2)(x1)	Consolidation						

Year 4	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
AUTUMN	Number: Place Value Read and writing numbers Counting Ordering numbers Partitioning Rounding			Measurement: Time	Number: Addition and Subtraction Add two 4 digit numbers Subtract two 4 digit numbers Addition and subtraction word problems				Number: Written multiplication Number: Written Division				Assessment		
	Wednesdays with BW:	Measurement: Length & Perimeter (10 sessions)								Number: Roman Numerals					
SPRING	Number: Multiplication & Division Cont.		Number: Multiplying and Dividing by 10 and 100		Number: Fractions Recognising Fractions Comparing Fractions Fraction Calculations Fraction Problems			Number: Decimals				Assessment			
	Wednesdays with BW:	Geometry: Properties of shapes and angles; position and direction									Measurement: Length & Area				
SUMMER	Number: Fractions Finding Fractions of quantities Fraction Problems General Fractions			Statistics: Interpreting data	Measurement: Time	Number Recap: Place value; Addition and Subtraction			Number Recap: Multiplication and Division		Assessment				
	Wednesdays with BW:	Geometry: Position & Direction				Number: Place Value Recap									

Year 5	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Autumn	Number: Place Value Representing numbers (squares, cubes, primes) Number facts multiples and factors			Addition and Subtraction Calculations Written +/- Mental x/÷			Statistics Data Interpreting data (tables) timetables		Fractions/ Decimals Comparing fractions Decimals as fractional amounts			Shape Properties of 2d shapes Position and direction		Measures Area and perimeter
	Spring	Number: Place Value Counting Negative numbers	Multiplication and Division Calculations Mental +/- Written x/÷				Measures Converting measures Time Money		Fractions/ Decimals Fraction calculations (+/-)	Shape Position and direction		Number: Place Value Counting Negative numbers		
Summer			Number: Place Value Representing number – Roman numerals		Multiplication and Division Calculations Mental +/- Written x/÷		Fractions/ Decimals Fraction calculations (x) Percentages		Measures Imperial Volume		Shape Properties of 3d shapes		Number: Place Value Representing number – Roman numerals	

Year 6	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
AUTUMN	Place Value including decimals read, write, order and compare numbers up to 1000 000 and determine the value of each digit round any whole number to a required degree of accuracy use negative numbers in context, and calculate intervals across zero multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places			Four Rules inc number facts: multiples and factors identify common factors, common multiples and prime numbers use their knowledge of the order of operations to carry out calculations involving the four operations solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why solve problems involving addition, subtraction, multiplication and division use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy identify common factors, common multiples and prime numbers perform mental calculations, including with mixed operations and large numbers			Fractions use common factors to simplify fractions use common multiples to express fractions in the same denomination compare and order fractions, including fractions > 1 add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions multiply simple pairs of proper fractions, writing the answer in its simplest form divide proper fractions by whole numbers associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction identify the value of each digit in numbers given to three decimal places			Decimals and Percentages solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison solve problems which require answers to be rounded to specified degrees of accuracy recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. Four Rules - revisit				
	Shape – taught on Fridays <ul style="list-style-type: none"> Recap Y5 measuring and drawing angles accurately find unknown angles in any triangles, quadrilaterals, and regular polygons recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles draw 2-D shapes using given dimensions and angles compare and classify geometric shapes based on their properties and sizes recognise, describe and build simple 3-D shapes, including making nets 													
SPRING	Position and Direction - Fridays describe positions on the full coordinate grid (all four quadrants) draw and translate simple shapes on the coordinate plane, and reflect them in the axes.		Interpreting Data interpret and construct pie charts and line graphs calculate and interpret the mean as an average use pie charts and line graphs to solve problems		Measures recognise that shapes with the same areas can have different perimeters and vice versa recognise when it is possible to use formulae for area and volume of shapes calculate the area of parallelograms and triangles calculate, estimate and compare volume of cubes and cuboids using standard units,			Ratio + Proportion 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		Algebra use simple formulae generate and describe linear number sequences express missing number problems algebraically find pairs of numbers that satisfy an equation with two unknowns enumerate possibilities of		Revision and Test Practice		

	Revisit properties of 2D shape		including cubic centimetres (cm ³) and cubic metres (m ³), and extending to other units.	using knowledge of fractions and multiples.	combinations of two variables.	
SUMMER	SATs Revision	SATs	FRACTIONS, DECIMALS AND PERCENTAGES Reasoning and Problem Solving	INTERPRETING DATA	YEAR SEVEN TRANSITION MATHS PROJECTS	
Fridays	SHAPE POSITION AND DIRECTION					