Maths Curriculum Offer

I can do all things through Christ who strengthens me

Our School Vision

St Mary's Catholic Infant and Junior Academies work together to create a caring, friendly and faith-centred community, where we seek to realise the full potential of all our family through the living love of Christ. All our work with children and their families, staff, governors, parishioners and the wider community is influenced by our core values:

Compassion, Respect and Resilience.

Across both schools, our **maths** curriculum places an important emphasis on mastery in mathematics, particularly real-life maths, making it as meaningful as possible for our children. We provide a high-quality education within a creative, stimulating, encouraging and mutually supportive environment where children are enabled to develop the skills that they require to become successful in maths. Mathematics, a universal language that enables understanding of the world, is an integral part of the curriculum. Attainment in the subject is also the key to opening new doors to further study and employment.

Intent

The purpose of our Arches Curriculum is to ensure that our children are **successful** in life and learning. The 'Nine Arches' Sankey Viaduct in Newton-le-Willows has been the inspiration for our curriculum. The viaduct was built by George Stephenson between 1828 and 1830 and the bridge, built to let trains cross above the Sankey Canal, has international significance as the world's earliest major railway viaduct still in use.

Our Maths curriculum is based on the objectives from the National Curriculum, with the principle focus of ensuring pupils develop confidence and mental fluency with whole numbers, counting and place value. In Key Stage 1, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.

From this, we teach to the Arches Principles –

Ambitious – Resilience – Christ at the Heart – Health and Wellbeing – Excellence – Success

Ambitious

Our curriculum is designed to show our children that our **ambitious** curriculum will offer them rewards for the future. Our Maths curriculum is designed to ensure all of our children are **ambitious** and challenge themselves, to improve their fluency and develop their problem-solving skills.

Resilience

With high expectations and a challenging curriculum, we support our children in developing **resilience** and self-motivation, to overcome barriers in their pursuit of learning and enrichment. In Maths lessons, all children are given the opportunity to meet each small step, to help them build skills and never give up, no matter the challenge.

Christ at the heart

Christ at the heart along with our Mission Statement, "I can do all things through Christ who strengthens me," we provide a high-quality education within a creative, stimulating, encouraging and mutually supportive environment where children are enabled to develop the skills they require to become successful in maths, knowing God is with them, to celebrate their successes and support their setbacks.

Health and Wellbeing

The Mental **Health and Wellbeing** of our children is paramount in both schools and we seek to ensure all of our lessons have enrichment and enjoyment, allowing children to find satisfaction and fun in the challenge. In Maths, the opportunity to succeed and try, try again, is always there with support and encouragement from all staff, to use the skills the children have built in their fluency to develop their reasoning and problem solving, with concrete and pictorial resources available to scaffold.

Excellence

In all things, we strive for **excellence** both from and for our children, providing them with the best opportunities, with a curriculum sets high expectations for each and every child. In Maths, we aim for high levels of fluency to support our children, building skills and strategies they can use in more complex questions and problems.

Successful

We work to help our children to be **successful** in all areas of school life, developing children who achieve whatever they put their mind to, and developing skills to help them to continue to be successful in the future. Our Maths curriculum uses the small steps approach, to ensure children experience small wins and build on each success as they develop their strategies and reasoning.

Our Arches Principles -

Rationale for our Maths Curriculum

	Fluency, Problem Solving and Reasoning embedded in our curriculum Mastery Curriculum Concrete, Pictorial and Abstract approach embedded
	Every lesson has a 'focus on feedback' section. Children are expected to access this in daily lessons and fix any misconceptions or challenge themselves further. Small steps planned helps to build confidence and resilience Talk time is embedded to build children's use of mathematical language High expectations in all areas of Maths
	As a Catholic school, our Gospel values and the teachings of Jesus **Christ** are at the **centre** of all our learning in maths. With **Christ**'s love at the **centre** of all that we do, students learn core knowledge, which can be applied to solving a wide variety of practical problems.
	We want all our children to be confident and happy mathematicians Work is adapted to meet the needs of all learners allowing children to feel confident, building self-esteem.
	Knowledge is built on the key component parts of the Maths Curriculum Knowledge is progressive, sequential, and part of a schemata
	All our children can see themselves as successful mathematicians Effective planning allows all children to succeed in mathematics regardless of their starting point.

Being a St Mary's Mathematician

Mathematics at both St Mary's Infant Academy and St Mary's Junior Academy has its foundations set in the three strands of the Primary National Curriculum: fluency, reasoning and problem solving.

We have an emphasis on revisiting prior learning and deepening knowledge with a focus on a mastery approach to deepen understanding. Our lesson structure, our methodical curriculum planning and our teachers use of precise questions enables our children to have a firm grasp of:

- Declarative knowledge (facts and figures -I know that)

- Procedural knowledge (methods-I know how)
- Conditional knowledge (reasoning and problem solving – I know when)
- This knowledge will then lead to Conceptual Understanding (making mathematical connections – I know why…)

Within the wider curriculum, subject leaders have worked to ensure that maths links in other subjects are exploited wherever possible and there are definite links to real life maths.

Our progression documents use the White Rose Maths progression to ensure clear granular detail in terms of sequencing in maths. This is progress within a lesson and across a learning sequence.
Sequences of learning allow pupils to practice and become proficient with the facts and methods they need in order to develop their understanding to reason and to develop skills in problem-solving activities. Our maths long term plan shows progression is based on the three strands from the Primary National Curriculum: **fluency, reasoning** and **problem solving**. There is a clear emphasis on revisiting prior learning and deepening knowledge throughout the year with a focus on a mastery approach to deepen understanding. Our maths curriculum is designed to help pupils to gain increasing mathematical automaticity, build confidence in their ability. An example of our long-term plan is shown below.
It is important to note, that based on the needs of a particular cohort, the topics maybe taught in a different order than shown on this plan.

Implementation

Both our staff and children are enthusiastic about maths. Through ongoing quality CPD, we strive to ensure our teachers have expert knowledge of the maths that they teach. Our pedagogy is firmly based upon our curriculum intent of embedding concepts into long-term memory so that they are able to be recalled, to ensure substantive and disciplinary knowledge and skills can be applied fluently. Recap sessions within our 5-part lesson structure is designed to 'interrupt the forgetting'.
Our 'St Mary's Quality First Teaching' model ensures that lessons are effectively sequenced so that new knowledge and skills build on what has been taught before and towards defined end points. Pre-assessments are planned with the lesson structure to support staff when planning for learning.

Maths Long Term Plan

St Mary's 'Arches Curriculum' - all our planning is based on our key principles and intent for our curriculum

Year Groups	Autumn	Spring	Summer
Nursery	Colour Matching Sorting Number 1 Number 2 subitising Number 2 Pattern 1 Pattern 2	Number 3 subitising Number 3 Number 4 Number 4 composition Number 5 Number 5 composition Number 6 Height and length Mass Capacity	Sequencing Positional language More than/fewer 2D shapes 3D shapes Number composition What comes after? Numbers to 5
Reception	Getting to know you Match, sort and compare Talk about measure and patterns It's me 1,2,3 Circles and triangles 1,2,3,4,5 Shapes with 4 sides	Alive in 5 Mass and capacity Growing 6,7,8 Length, height and time Building 9 and 10 Explore 3-D shapes	To 20 and beyond How many now? Manipulate, compose and decompose Sharing and grouping Visualise, build and map Make connections
Year One	Place value within 10 Addition and subtraction within 10 Shape	Place value within 20 Addition and subtraction within 20 Place value within 20 Length and height Mass and volume	Multiplication and division Fractions Position and direction Place value to 100 Money Time
	Active Maths – measurements, time and shape		
Year Two	Place value Addition and subtraction Properties of Shape	Money Multiplication and division Length and height Mass, capacity and temperature	Fractions Time Statistics Position and direction
	Active Maths – measurements, time and shape, length, height and temperature		
Year Three	Place value Addition and subtraction Multiplication and division A	Multiplication and division B Length and perimeter Fractions A Mass and capacity	Fractions B Money Time Shape Statistics
Year Four	Place value Addition and subtraction Area Multiplication and division A	Multiplication and division B Length and perimeter Fractions Decimals A	Decimals B Money Time Shape Statistics Position and direction

Year Five	Place value Addition and subtraction Multiplication and division Fractions A	Multiplication and division B Fractions B Decimals and percentages Perimeter and area Statistics	Shape Position and direction Decimals Negative numbers Converting units Volume
Year Six	Place value Addition, subtraction, multiplication and division Fractions A and B Converting units	Ratio Algebra Decimals Fractions, decimals and percentages Measuring: Converting units Perimeter, area and volume Statistics	Shape Position and direction Problem solving Maths investigations

Active Maths Long Term Plan

	Year 1	Year 2
Autumn Term	<u>Shape</u> • 3D Match • Cubing Cuboids • Global Shape Investigation • Shape Search (3D) • Shape Shopping (3D) • Three-dimensional Construction Co • A Shape of Shapes • Making Shapes • Shape Search (2D) • Shape Shop (2D) • Shape Sorters <u>Length and height</u> • How far can you jump or throw? • Long and short of it! • Lying down on the job • Horizontal heights • Measuring up	<u>Properties of shape</u> • Draw-cut-fold • Every side counts • Group shapes • Can you make me • Everyday 2D-3D • Shape sorting • Global shape investigation • What am I? <u>Money</u> • Cash into pounds • Make it count • Bullseye • How many ways? • We're making money • Change please • Money pairs
Spring Term	<u>Mass and volume</u> • Heavier or lighter? • Mass sort • Compare the weight • Fruit match	<u>Length and height</u> • Give me a hand • How long? • Nature match • How far can you jump and throw?

	• How much is 100g? • Weight size • Collect and compare • Half full or half empty? • More or less? • How many cups? • How much is 100ml? • Labelling capacity • Volume size	• How does it measure up? <u>Mass, capacity and temperature</u> • Compare capacity • Order please • Symbol run • Mass symbol run • Weight in order, Please! • Matching temperatures • Raising the temperature
Summer Term	<u>Position and direction</u> • Blind obstacle course • Compass turn • Time turns <u>Money</u> • Feel the money • Hidden money • Making money • Match the cash <u>Time</u> • Time please! • Before, after or next? • Draw the time • Tell me • Yesterday, Today and Tomorrow	<u>Time</u> • Interval time • Matching time • Tell me the time • Telling the time to 5 minutes • Seconds and minutes and hours • True or false? <u>Statistics</u> • Relay tally • Cube count • Zoo data <u>Position and direction</u> • Human sequences • Coded movement game • Robot walks

Progression Documents

Planning shows a clear sequential progression from concrete to pictorial to abstract so that our pupils gain a secure and deep learning of all concepts in maths. Progression in the teaching of calculation is displayed within our Calculation Policy, which has been carefully planned to ensure sequential learning is embedded across year groups so that children always build on prior knowledge when learning a new concept. Calculation methods are taught across the school by linking manipulatives with formal and informal methods, e.g., use of ten grids leading to pictorial methods then to formal addition and subtraction: number lines leading to mental methods.

The progression documents show key knowledge and skills from EYFS – Year 6.

EYFS Mathematics				
Number	**Number facts**	**Numerical Patterns**	**Measure, Shape and Space**	**Vital Vocabulary**
• **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; • **Explore and represent** patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	• Safely **use** and **explore** a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; including measuring. • **Recognise** a range of shapes and link items that have the same shape.	**Use** enriching and widening children's vocabulary that will support later reading comprehension
• Count • Read and write • Identify • Represent	• Recall • Count • Add • Subtract	• Count • Compare • Explore • Represent	• Use • Explore • Recognise	• Use • Explore

Progression of knowledge and skills – Number and place value						
Strand	**1**	**2**	**3**	**4**	**5**	**6**
Number and place value	• **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; **count** in multiples of 2s, 5s and 10s • given a number**, identify** 1 more and 1 less • **identify and represent** numbers **using** objects and pictorial representations including the number line, and **use** the language of: equal to, more than, less than (fewer), most, least • **read and write** numbers from 1 to 20 in numerals and words	• **count** in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward • **recognise** the place value of each digit in a two-digit number (10s, 1s) • **identify, represent and estimate** numbers using different representations, including the number line • **compare and order** numbers from 0 up to 100; use <, > and = signs • **read and write** numbers to at least 100 in numerals and in words • **use** place value and number facts to solve problems	• **count** from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. • **recognise** the place value of each digit in a 3-digit number (100s, 10s, 1s) • **compare and order** numbers up to 1,000 • **identify, represent and estimate** numbers using different representations • **read and write** numbers up to 1,000 in numerals and in words • **solve** number problems and practical problems involving these ideas	• **count** in multiples of 6, 7, 9, 25 and 1,000 • **identify** 1,000 more or less than a given number • **count backwards** through 0 to include negative numbers • **recognise** the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) • **order and compare** numbers beyond 1,000 • **identify, represent and estimate** numbers using different representations • **round** any number to the nearest 10, 100 or 1,000 • **solve** number and practical problems that involve all of the above and with increasingly large positive numbers • **read** Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value	• **read, write, order and compare** numbers to at least 1,000,000 and **determine the value** of each digit • **count forwards or backwards** in steps of powers of 10 for any given number up to 1,000,000 • **interpret** negative numbers in context, **count forwards and backwards** with positive and negative whole numbers, including through 0 • **round** any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • **solve** number problems and practical problems that involve all of the above • **read** Roman numerals to 1,000 (M) and recognise years written in Roman numerals	• **read, write, order and compare** numbers up to 10,000,000 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 0 • **solve** number and practical problems that involve all of the above
Skills	○ Count ○ Read and write ○ Identify ○ Represent ○ Use ○ Solve	○ Count ○ Read and write ○ Identify ○ Recognise ○ Represent ○ Use ○ Compare and order ○ Solve	○ Count ○ Read and write ○ Identify ○ Recognise ○ Represent ○ Use ○ Compare and order ○ Estimate ○ Solve	○ Count ○ Read and write ○ Identify ○ Recognise ○ Represent ○ Compare and order ○ Estimate ○ Solve ○ Round	○ Count ○ Read and write ○ Identify ○ Recognise ○ Represent ○ Compare and order ○ Estimate ○ Solve ○ Round ○ Determine ○ Interpret	○ Read and write ○ Identify ○ Recognise ○ Calculate ○ Compare and order ○ Estimate ○ Solve ○ Round ○ Determine ○ Use

Progression of knowledge and skills – Addition and Subtraction						
Strand	**1**	**2**	**3**	**4**	**5**	**6**
Addition and Sutraction	• **read, write and interpret** mathematical statements involving addition (+), subtraction (–) and equals (=) signs • **represent** and **use** number bonds and related subtraction facts within 20 • **add** and **subtract** one-digit and two-digit numbers to 20, including 0 • **solve** one-step problems that involve **addition** and **subtraction**, **using** concrete objects and pictorial **representations**, and missing number problems such as 7 = ? – 9	• **solve** problems with **addition** and **subtraction**: ● **using** concrete objects and pictorial **representations**, including those involving numbers, quantities and measures ● **applying** their increasing knowledge of **mental** and **written** methods • **recall** and **use addition** and **subtraction** facts to 20 **fluently**, and **derive** and **use** related facts up to 100 • **add** and **subtract** numbers using concrete objects, pictorial **representations**, and **mentally**, including: • a two-digit number and 1s • a two-digit number and 10s • 2 two-digit numbers • adding 3 one-digit numbers • **show** that **addition** of 2 numbers can be done in any order (commutative) and **subtraction** of 1 number from another cannot • **recognise** and **use** the **inverse** relationship between **addition** and **subtraction** and use this to **check** calculations and **solve** missing number problems	• add and subtract numbers mentally, including: • a three-digit number and 1s • a three-digit number and 10s • a three-digit number and 100s • **add** and **subtract** numbers with up to 3 digits**, using formal written** methods of columnar addition and **subtraction** • **estimate** the answer to a **calculation** and **use inverse** operations to **check** answers • **solve** problems, including missing number problems, **using** number facts, place value, and more complex **addition** and **subtraction**	• **add** and **subtract** numbers with up to 4 digits **using** the **formal written** methods of columnar **addition** and **subtraction** where appropriate • **estimate** and **use inverse** operations to **check** answers to a **calculation** • **solve addition** and **subtraction** two-step problems in contexts, **deciding** which operations and methods to **use** and why	• **add** and **subtract** whole numbers with more than 4 digits, including **using** formal written methods (columnar **addition** and **subtraction**) • **add** and **subtract** numbers **mentally** with increasingly large numbers • **use rounding** to **check** answers to **calculations** and **determine**, in the context of a **problem**, levels of accuracy • **solve addition** and **subtraction multi-step problems** in contexts, **deciding** which operations and methods to **use** and why	• **perform mental calculations**, including with mixed operations and large numbers • **use** their knowledge of the **order of operations** to carry out **calculations** involving the 4 operations • **solve addition and subtraction** multi-step problems in contexts, **deciding** which operations and methods to **use** and why • **solve** problems involving **addition and subtraction** • **use estimation** to **check** answers to **calculations** and **determine**, in the context of a problem, an appropriate degree of accuracy
Skills	○ Read and write ○ Interpret ○ Represent ○ Use ○ Add ○ Subtract ○ Solve	○ Recall ○ Check ○ Represent ○ Use ○ Add ○ Subtract ○ Solve ○ Apply ○ Mental methods ○ Prove (show) ○ Inverse	○ Add ○ Subtract ○ Use ○ Solve ○ Apply ○ Mental methods ○ Formal methods ○ Prove (show) ○ Inverse ○ Estimate ○ Calculate	○ Add ○ Subtract ○ Use ○ Solve ○ Apply ○ Mental methods ○ Formal methods ○ Prove/explain (why) ○ Inverse ○ Estimate ○ Calculate ○ Determine/decide	○ Add ○ Subtract ○ Use ○ Solve ○ Apply ○ Mental methods ○ Formal methods ○ Prove/explain (why) ○ Inverse ○ Estimate ○ Calculate ○ Determine/decide	○ Add ○ Subtract ○ Use ○ Solve ○ Apply ○ Mental methods ○ Formal methods ○ Prove/explain (why) ○ Inverse ○ Estimate ○ Calculate ○ Determine/decide

Progression of knowledge and skills – Multiplication and Division						
Strand	**1**	**2**	**3**	**4**	**5**	**6**
Multiplication and Division	**solve** one-step problems involving **multiplication** and **division**, by **calculating** the answer **using** concrete objects, pictorial **representations** and **arrays** with the support of the teacher	• **recall** and **use multiplication** and **division** facts for the 2, 5 and 10 **multiplication** tables, including **recognising** odd and even numbers • **calculate** mathematical statements for **multiplication** and **division** within the **multiplication** tables and **write** them using the **multiplication** (×), **division** (÷) and equals (=) signs • **show** that **multiplication** of 2 numbers can be done in any order (commutative) and **division** of 1 number by another cannot • **solve** problems involving **multiplication** and **division**, **using** materials, **arrays**, **repeated addition**, **mental methods**, and **multiplication** and **division** facts, including **problems** in contexts	• **recall** and use **multiplication** and **division** facts for the 3, 4 and 8 **multiplication** tables • **write** and **calculate** mathematical statements for **multiplication** and **division using** the **multiplication tables** that they know, including for two-digit numbers times one-digit numbers, **using mental** and progressing to **formal written methods** • **solve** problems, including missing number problems, involving **multiplication** and **division**, including positive integer **scaling** problems and correspondence problems in which n objects are connected to m objects	• **recall multiplication and division** facts for **multiplication tables** up to 12 × 12 • **use** place value, known and **derived facts** to **multiply and divide mentally**, including: **multiplying** by 0 and 1; **dividing** by 1; **multiplying** together 3 numbers • **recognise** and **use** factor pairs and commutativity in **mental calculations** • **multiply** two-digit and three-digit numbers by a one-digit number **using formal written layout** • **solve** problems involving **multiplying** and **adding**, including using the distributive law to **multiply** two-digit numbers by 1 digit, integer **scaling** problems and harder correspondence problems such as n objects are connected to m objects	• **identify multiples and factors**, including **finding** all factor pairs of a number, and **common factors** of 2 numbers • **know** and **use** the vocabulary of **prime numbers**, **prime factors** and **composite (non-prime) numbers** • **establish** whether a number up to 100 is prime and **recall** prime numbers up to 19 • **multiply** numbers up to 4 digits by a one- or two-digit number **using a formal written method**, including **long multiplication** for two-digit numbers • **multiply** and **divide** numbers **mentally**, drawing upon known facts • **divide** numbers up to 4 digits by a one-digit number using the **formal written method** of **short division** and **interpret** remainders appropriately for the context • **multiply and divide** whole numbers and those involving decimals by 10, 100 and 1,000 • **recognise and use square numbers and cube numbers**, and the notation for squared (^{2}) and cubed (^{3}) • **solve** problems involving the four operations, including **using** their knowledge of factors and multiples, squares and cubes; including **scaling** by simple fractions and problems involving simple rates	• **multiply** multi-digit numbers up to 4 digits by a two-digit whole number **using the formal written method** of **long multiplication** • **divide** numbers up to 4 digits by a two-digit whole number **using the formal written method** of **long division**, and **interpret** remainders as whole number remainders, **fractions**, or by **rounding,** as appropriate for the context • **divide** numbers up to 4 digits by a two-digit number using the **formal written method** of **short division** where appropriate, i**nterpreting** remainders according to the context • **perform mental calculations**, including with mixed operations and large numbers • **identify** common factors, common multiples and prime numbers • **use** their knowledge of the **order of operations** to carry out **calculations** involving the 4 operations • **solve** problems involving **multiplication and division** • **use estimation** to **check** answers to **calculations** and **determine**, in the context of a problem, an appropriate degree of accuracy

Skills	○ Solve ○ Represent ○ Multiplication ○ Division ○ Calculate	○ Recall ○ Use ○ Multiplication ○ Division ○ Recognise ○ Write ○ Show ○ Solve	○ Recall ○ Multiplication ○ Division ○ Recognise ○ Write ○ Formal/mental methods ○ Scaling ○ Solve ○ Calculate	○ Recall ○ Multiplication ○ Division ○ Recognise ○ Write ○ Formal/mental methods ○ Scaling ○ Solve ○ Calculate	○ Identify ○ Multiplication ○ Division ○ Recognise ○ Know and use ○ Formal/mental methods ○ Scaling ○ Solve ○ Calculate	○ Identify ○ Multiplication ○ Division ○ Recognise ○ Know and use ○ Formal/mental methods ○ Scaling ○ Solve ○ Estimate/calculate/check

Progression of Knowledge and Skills – Fractions, Decimals and Percentages

Strand	1	2	3	4	5	6
FDP	• **recognise, find and name** a half as 1 of 2 equal parts of an object, shape or quantity • **recognise, find and name** a quarter as 1 of 4 equal parts of an object, shape or quantity	• **recognise, find, name and write** fractions third, quarter, two-quarters and three-quarters of a length, shape, set of objects or quantity • **write** simple fractions	• **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 • **recognise, find and write** fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • **recognise and use** fractions as numbers: unit fractions and non-unit fractions with small denominators • **recognise and show**, **using diagrams**, equivalent fractions with small denominators • **add and subtract fractions** with the same denominator within one whole • **compare and order** unit fractions, and fractions with the same denominators • **solve** problems that involve all of the above	• **recognise and show, using** diagrams, families of common equivalent fractions • **count** up and down in hundredths; **recognise** that hundredths arise when **dividing** an object by 100 and dividing tenths by 10 • **solve** problems involving increasingly harder fractions to **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 • **recognise and write** decimal equivalents of any number of tenths or hundreds • **recognise and write** decimal equivalents to quarter, half and three-quarters • **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 • **round** decimals with 1 decimal place to the nearest whole number • **compare** numbers with the same number of decimal places up to 2 decimal places • **solve** simple measure and money problems involving fractions and decimals to 2 decimal places	• **compare and order** fractions whose denominators are all multiples of the same number • **identify, name and write** equivalent fractions of a given fraction, represented visually, including tenths and hundredths • **recognise** mixed numbers and improper fractions and **convert** from one form to the other and write mathematical statements > 1 as a mixed number • **add and subtract fractions** with the same denominator, and denominators that are multiples of the same number • **multiply** proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • **read and write** decimal numbers as fractions • **recognise and use** thousandths and relate them to tenths, hundredths and decimal equivalents • **round** decimals with 2 decimal places to the nearest whole number and to 1 decimal place • **read, write, order and compare** numbers with up to 3 decimal places • **solve** problems involving number up to 3 decimal places • **recognise** the per cent symbol (%) and **understand** that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction • **solve** problems which require knowing percentage and decimal equivalents of half, quarter, fifth, two-fifths, four-fifths and those fractions with denominators of multiples of 10 or 25.	• **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 3 decimal places and **multiply and divide** numbers by 10, 100 and 1,000 giving answers up to 3 decimal places • **multiply** one-digit numbers with up to 2 decimal places by whole numbers • **use written division** methods in cases where the answer has up to 2 decimal places • **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
Skills	○ **Recognise** ○ **Find** ○ **Name**	○ **Recognise** ○ **Find** ○ **Name**	○ **Count** ○ **Find/Recognise** ○ **Division**	○ **Count** ○ **Recognise/identify** ○ **Division**	○ **Count** ○ **Recognise/identify** ○ **Division**	○ **Count** ○ **Recognise/identify/recall** ○ **Division**

		○ **Write**	○ **Find** ○ **Write** ○ **Use/solve** ○ **Show** ○ **Add/subtract fractions** ○ **Compare and order**	○ **Find** ○ **Write** ○ **Use (including diagrams)** ○ **Show** ○ **Add/subtract fractions** ○ **Solve/calculate** ○ **Compare**	○ **Find** ○ **Write** ○ **Use (including diagrams)** ○ **Show** ○ **Add/subtract fractions** ○ **Solve/calculate** ○ **Compare/order**	○ **Find** ○ **Write** ○ **Use (including diagrams)** ○ **Show** ○ **Add/subtract fractions** ○ **Solve/calculate** ○ **Compare/order**

Progression of Knowledge and Skills – Measurement

Strand	1	2	3	4	5	6
Measurement	• **compare, describe and solve** practical problems for: length and heights, mass/weight, capacity and volume, time. • **measure** and begin to **record** the following: length and heights, mass/weight, capacity and volume, time. • **recognise and know** the value of different denominations of coins and notes • **sequence** events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • **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	• **choose and use** appropriate standard units to **estimate** and **measure** length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • **compare and order** lengths, mass, volume/capacity and record the results using >, < and = • **recognise and use** symbols for pounds (£) and pence (p); combine amounts to make a particular value • **find** different combinations of coins that equal the same amounts of money • **solve** simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • **tell and write** the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • **know** the number of minutes in an hour and the number of hours in a day	• **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, using both £ and p in practical contexts • **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 vocabulary** such as o'clock, am/pm, morning, afternoon, noon and midnight • **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 • **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	• **convert** between different units of metric measure • **understand and use** approximate equivalences between metric units and common imperial units • **measure and calculate** the perimeter of composite rectilinear shapes in centimetres and metres • **calculate and compare** the area of rectangles (including squares), including **using** standard units, square centimetres (cm^2) and square metres (m^2), and **estimate** the area of irregular shapes • **estimate** volume and capacity • **solve** problems involving converting between units of time • **use** all four operations to **solve** problems involving measure [for example, length, mass, volume, money] using decimal notation, including **scaling**	• **solve** problems involving the calculation and **conversion** of units of measure, **using** decimal notation up to 3 decimal places where appropriate • **use, read, write and convert** between standard units, **converting** measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, **using** decimal notation to up to 3 decimal places • **convert** between miles and kilometres • **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, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units
Skills	○ **Compare and describe** ○ **Solve** ○ **Measure** ○ **Recognise** ○ **Know** ○ **Use** ○ **Sequence** ○ **Tell the time**	○ **Choose and use** ○ **Estimate and measure** ○ **Compare and order** ○ **Recognise** ○ **Find and know** ○ **Solve** ○ **Compare and sequence** ○ **Tell the time and write times**	○ **Measure** ○ **Compare** ○ **Tell and write the time** ○ **Estimate** ○ **Know**	○ **Measure** ○ **Compare** ○ **Read, tell and write the time** ○ **Estimate** ○ **Convert** ○ **Solve** ○ **Calculate**	○ **Measure** ○ **Compare** ○ **Read, tell and write the time** ○ **Estimate** ○ **Convert** ○ **Solve** ○ **Calculate**	○ **Use, read and write** ○ **Compare** ○ **Convert** ○ **Estimate** ○ **Convert** ○ **Solve** ○ **Recognise** ○ **Calculate**

Progression of Knowledge and Skills – Geometry

Strand	1	2	3	4	5	6
Geometry – Properties of shapes	• **recognise and name** common 2-D and 3-D shapes, including: ○ 2-D shapes [for example, rectangles (including squares), circles and triangles] ○ 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	• **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, [for example, a circle on a cylinder and a triangle on a pyramid] • **compare and sort** common 2-D and 3-D shapes and everyday objects	• **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 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 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 • **identify** acute and obtuse angles and **compare and order** angles up to 2 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	• **identify** 3-D shapes, including cubes and other cuboids, from 2-D representations • **know** angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • **draw** given angles, and measure them in degrees (°) • **identify:** ○ angles at a point and 1 whole turn (total 360°) ○ angles at a point on a straight line and half a turn (total 180°) ○ other multiples of 90° • **use** the properties of rectangles to deduce related facts and find missing lengths and angles • **distinguish** between regular and irregular polygons based on **reasoning** about equal sides and angles	• **draw** 2-D shapes using given dimensions and angles • **recognise, describe and build** simple 3-D shapes, including making nets • **compare and classify** geometric shapes based on their properties and sizes and **find** unknown angles in any triangles, quadrilaterals, and regular polygons • **illustrate and name** parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • **recognise** angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Geometry – Position and direction	• **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)	• Pupils connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts. (Non-statutory)	• **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	• **identify, describe and represent** the position of a shape following a reflection or translation, **using** the appropriate language, and **know** that the shape has not changed	• **describe** positions on the full coordinate grid (all 4 quadrants) • **draw and translate** simple shapes on the coordinate plane, and reflect them in the axes
Skills	○ **Recognise** ○ **Name** ○ **Describe**	○ **Identify** ○ **Describe** ○ **Compare** ○ **Sort** ○ **Order and arrange** ○ **Use** ○ **Distinguish**	○ **Draw** ○ **Recognise** ○ **Identify** ○ **Connect**	○ **Classify** ○ **Compare** ○ **Identify** ○ **Complete symmetry** ○ **Describe** ○ **Plot**	○ **Draw and know** ○ **Recognise and describe** ○ **Build** ○ **Compare and classify** ○ **Illustrate and name** ○ **Distinguish** ○ **Represent**	○ **Draw** ○ **Recognise and describe** ○ **Build** ○ **Compare and classify** ○ **Illustrate and name** ○ **Translate**

Progression of Knowledge and Skills – Statistics (Y2-6) Ratio and Proportion (Y6) Algebra (Y6)

Strand	1	2	3	4	5	6
Statistics (Y2, 3, 4, 5 and 6) **Ratio and proportion – Y6 ONLY** **Algebra – Year 6 ONLY**	**N/A**	• **interpret and construct** simple pictograms, tally charts, block diagrams and tables • **ask and answer** simple questions by counting the number of objects in each category and sorting the categories by quantity • **ask-and-answer** questions about totalling and comparing categorical data	• **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 and pictograms and tables	• **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	• **solve** comparison, sum and difference problems **using** information presented in a line graph • **complete, read and interpret** information in tables, including timetables	**Statistics** • **interpret and construct** pie charts and line graphs and **use** these to solve problems • **calculate and interpret** the mean as an average **Algebra** • **use** simple formulae • **generate and describe** linear number sequences • **express** missing number problems algebraically • **find** pairs of numbers that satisfy an equation with 2 unknowns • **enumerate** possibilities of combinations of 2 variables **Ratio and Proportion** • **solve** problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts • **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 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
Skills		○ **Interpret** ○ **Construct** ○ **Ask and answer**	○ **Interpret** ○ **Present** ○ **Solve**	○ **Interpret** ○ **Present** ○ **Solve**	○ **Complete** ○ **Read** ○ **Interpret** ○ **Solve**	○ **Interpret** ○ **Construct** ○ **Use** ○ **Generate and describe** ○ **Express** ○ **Find** ○ **Enumerate** ○ **Solve**

Vocabulary is VITAL

Valued	We value vocabulary in maths and it underpins everything we do.
Identified	Mathematical vocabulary is identified by the teacher in every maths lesson and is explicitly planned for. It has also been highlighted with the Calculations Policy by the maths lead.
Taught	Vocabulary is explicitly taught in every lesson. It is an integral part of our seven-part lesson structure. Vocabulary is displayed on our working walls.
Applied	Once vocabulary is taught, it is applied. Children apply their vocabulary in their talk tasks and by using and identifying it with their independent tasks. Mathematical vocabulary will be used in reasoning and problems solving tasks, to further embed children's understanding and within assessment outcomes in maths.
Learned	Vocabulary is revisited and relearned. Vocabulary sticks in the children's long-term memory. Lesson by lesson, year by year, children revisit and relearn key mathematical vocabulary.

EYFS

Through an **'explosion of experiences',** our youngest mathematicians are exposed to the foundations of their maths learning. Carefully planned maths experiences are provided for our children. High quality lessons, stories and rhymes and continuous provision in EYFS provides the building blocks for our St Mary's mathematicians. Maths vocabulary is planned for, and staff ensure children are exposed to the correct terminology when exploring experiences that have mathematical links. Staff are role models in demonstrating mathematical vocabulary and this is further enhanced in our excellent provision. The foundations of maths learning in EYFS is linked to Year 1 and beyond.

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Lesson Structure

The sequence of lessons across maths follows the same structure:

St Mary's Catholic Academies

Maths lesson

5-part lesson structure

Lesson Part 1: Focus on Feedback - 1 minutes

When possible, any fix it with an adult should be a quick fix or it should be completed in a mop up session.

- Fix it with an adult linked to a specific focus (these children will be checked and supported as appropriate through the lesson)
- Next step and challenge to be completed independently by the children e.g. true or false or spot the mistake.

Fix it work.

Any mop up maths and pre teach sessions should also be recorded in the children's books so they can refer to this in subsequent lessons.

(Informed by DFE Maths Recovery, EEF Improving Maths in Key Stage 2)

Lesson part 2: Flashback – 7 minutes

Review prior learning either from previous year group or from earlier lessons.

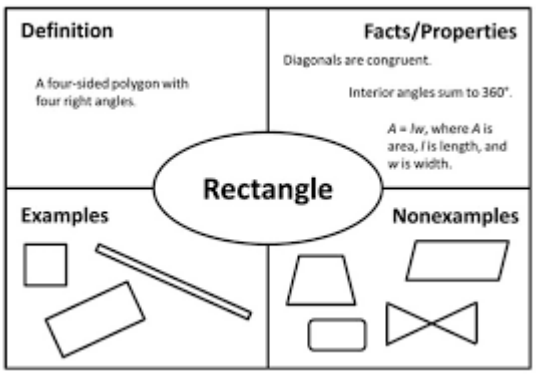
This section will include:

- If necessary, a recap on any misconceptions from the previous lesson that need more time outside of the 'Focus on Feedback' section (this could be when the whole class have struggled with a concept etc)
- Prior learning/small steps that feed into that days lesson.

(Informed by DFE Maths Recovery, EEF Improving Maths in Early Years and Key Stage 1, Rosenshine Principles)

Lesson Part 3: My turn, your turn with reasoning and problem solving -15/20 minutes

Maths vocabulary introduced-this could be on a separate slide following the Frayer model to promote deeper understanding:



In the my turn, your turn:

- The aim in this part of the lesson is to introduce the learning for today through a question/problem. The children solve this problem in pairs/groups using Maths talk, the use of manipulatives and adult guidance to investigate the problem. Also,

	include how children could solve this problem if recording e.g. picture, words, numbers and symbols. This can be completed in books and will lead you as a school to journalling as a future action point. • Teachers should ensure that pupils use the correct language. Children to use full sentences (sentence frames should be shared with children and ensure staff know the difference between a sentence frame and sentence stems) and the correct mathematical vocabulary as part of the mastery approach. • My turn, your turn and problem solving and reasoning is a crucial opportunity for assessment; all adults need to circulate so that a clear picture of pupils' understanding emerges and can impact on the subsequent segments as required. After a short amount of time the children all come back together to share their learning as a whole class. This is a time to discuss different methods and misconceptions. This should be reactive and provide opportunities to explore methods/content that children have discussed/recorded as appropriate. • Teachers to model the new and planned learning. Explicitly share what you are doing/thinking. • Provide an opportunity for children through guided practice to complete an example and checking that children are confident or require further support or another example. • Leading on from this the teacher may need to work in more depth through the new learning to explicitly teach the concepts. You may need several slides to introduce this new learning, when appropriate. • Model and encourage children to name and label methods e.g. number line method, compact method, partitioning method (this will later support journalling approach). *(Informed by EEF Improving Maths in Early Years and Key Stage 1, EEF Improving Maths in Key Stage 2 and Rosenshine Principles)*
	**Lesson Part 4: Independent Task – 25/30 minutes** The Independent Task is another vital opportunity for assessment and adults must be deployed carefully so that a clear picture of pupils' understanding emerges. The Independent Task should link to the content of the explicit teach – sometimes White Rose materials encourages you to become too varied and using different core representations and methods. Ensure you go back to the big ideas of this topic. *(Informed by EEF Improving Maths in Early Years and Key Stage 1, EEF Improving Maths in Key Stage 2 and Rosenshine Principles)*
	**Lesson Part 5: Plenary – 5 minutes** The plenary is an essential opportunity to gauge levels of understanding and develop pupils' skills in explaining, reasoning and justifying. *(Informed by EEF Improving Maths in Early Years and Key Stage 1, EEF Improving Maths in Key Stage 2 and Rosenshine Principles)*

Impact

We understand that we may not see the true impact of our maths curriculum on our children as our maths curriculum is just the beginning of a lifetime of learning.

Our well-constructed and well-taught maths curriculum leads to great outcomes. At St Mary's, our philosophy is that broad and balanced leads to great outcomes and meeting end points at the end of each key stage. National assessments are useful indicators of the outcomes our children achieve.

We ensure all groups of children are given the knowledge and cultural capital they need to succeed in life. We strive to ensure that our children are equipped with the skills (through a growth mindset approach) to fluently be able to retrieve key facts from their semantic memory.

The quality of our children's work, at every stage, is of a high standard. All learning is built towards an end point and at each stage of their education, we prepare our children for the next stage.

We ensure all our children are fluent in maths to a stage appropriate level.

The impact of St Mary's maths curriculum is measured through the following:

- Assessment
- National test data
- Pupil voice
- Progress evident in children's books and record of experiences
- Seeking views of parents where appropriate.