St Thomas' Catholic Primary School

Mathematics Intent and Progression Map

Intent

Our Curriculum Intent

- To provide our pupils with a high quality mathematical education, through our maths mastery approach, so that children are confident and competent in using their skills in challenging contexts.

- To develop enquiry, reasoning, and inquisitive minds that are transferable through life, converting the skills they have learnt to the path they choose to follow.

- To foster a love of mathematics and develop an understanding of the importance of mathematics in their everyday life.

Number and Addition & Subtraction

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recognises numerals 1 to 5. Count up to three or four objects by saying one number name for each item. Counts actions or objects which cannot be moved. Counts objects to 10, and beginning to count beyond 10. Counts out up to six objects from a larger group. Selects the correct numeral to represent 1 to 10 objects. Counts an irregular arrangement of up to ten objects. Estimates how many objects they can see and checks by counting them. Uses the language of 'more' and 'fewer' to compare two sets of objects. Finds the total number of items in two groups by counting all of them. Says the number that is one more than a given number. Finds one more or one less from a group of up to five objects, then ten objects. In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting. Records, using marks that they can interpret and explain. Begins to identify own mathematical problems based on own interests and fascinations.

Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to | Explore the relationship between numbers and introduce children to the important concept of equivalence; focus on the correct use of comparative language, as well as use of mathematical symbols (<, = and >)

Introduce children to the concept of partitioning, which underpins many of the subsequent segments, and build towards use of the part–part–whole model.

Apply the partitioning structure to the numbers to five, and introduce children to new concepts such as subitising, ordinality and the bar model.

Extend the partitioning structure to the numbers six to ten, explore the five-and-a-bit structure of the numbers, and introduce children to the concept of odd and even numbers.

Progress to the use of abstract notation (+, − and =) as a way of representing the part–part–whole structure.

Introduce children to addition as augmentation, and | Apply the aggregation and augmentation structures of addition to three single-digit numbers, exploring commutativity and associativity, to work towards strategies for adding and subtracting across ten.

Introduce children to subtraction as difference, the third and final subtraction structure; review consecutive numbers, as well as consecutive odd/even numbers, in the context of difference.

Equip children with useful strategies for addition and subtraction of a single-digit number to/from two-digit numbers.

Explore counting on, and back, in ten from any two-digit number; apply number facts within ten to the addition and subtraction of multiples of ten.

Equip children with useful strategies for addition of two or more two-digit numbers, partitioning two-digit numbers into tens and ones before calculation. | Explore the additive and multiplicative composition of 100; draw on known strategies and number facts to calculate across the 100 boundary.

Explore the composition of three-digit numbers; use place-value and partitioning knowledge to support additive calculation, and extend known additive strategies to three-digit numbers.

Equip children with useful calculation strategies for bridging hundreds boundaries, and three-digit numbers; continue to use the partitioning structure to facilitate calculation.

Introduce children to the column algorithm for addition calculations, applying the algorithm to a variety of aggregation and augmentation contexts for two-digit and three-digit numbers; explore regrouping (column total is ten or greater) in detail.

Introduce children to the column algorithm for subtraction calculations, applying the algorithm to a | Explore the composition of 1,000 and four-digit numbers, using the partitioning structure, and make links to measures; introduce children to calculation across thousands boundaries, and extend column algorithms and rounding to four-digit numbers

Introduce children to tenths using both the partitioning structure and ideas of place value; apply additive facts and strategies, including column algorithms, and rounding to numbers with tenths.

Introduce children to hundredths (and thousandths) using both the partitioning structure and ideas of place value; apply additive facts and strategies, including column algorithms, and rounding to numbers with hundredths (and thousandths). | Explore the composition of six-digit, whole-thousand numbers, using the partitioning structure; apply knowledge and strategies from bridging 100 combined with unitising in 1,000s, as well as column methods and rounding.

Introduce children to negative numbers, making links to everyday contexts; explore addition and subtraction below zero and across zero

Extend the part–part–whole structure (three or more parts) to solve missing part/whole problems in a range of contexts; draw on number composition and additive concepts, focusing on the structural equivalence of the problems.

Explore the effect on the sum of changing the value of one or both addends; explore the effect on the difference of changing the value of | Building on composition and calculation with numbers up to 1,000,000 to explore six-digit numbers that are not whole thousands, and then extend to seven-digit numbers; apply additive facts and strategies, including column algorithms, and rounding to these numbers.

Equip children with strategies for solving problems with two unknowns, including using the bar model to represent relationships between known numbers, and working systematically |

find the answer. They solve problems, including doubling, halving and sharing.	subtraction as reduction (take away), using a '*first…, then…, now…*' story representation and abstract notation (+, − and =); explore the inverse nature of the two operations. Equip children with a range of useful strategies for addition within ten, including adding and subtracting zero and one, commutativity, adding and subtracting two to/from odd and even numbers, and doubling and halving. Explore multiples of ten, including counting in tens to 100; apply number facts within ten to addition and subtraction for multiples of ten. Build on multiples of ten, by introducing non-zero values in the ones place; apply the partitioning structure to these two-digit numbers, decomposing them into tens and ones. Explore the ten-and-a-bit nature of the numbers 11–19, using the partitioning structure; apply number facts within ten to addition and subtraction of single-digit numbers to/from the numbers 11–19.	Equip children with useful strategies for subtraction of one two-digit number from another, partitioning two-digit numbers into tens and ones before calculation.	variety of partitioning, reduction and difference contexts for two-digit and three-digit numbers; explore exchange (insufficient quantity to subtract from in a column) in detail.	Introduce children to conventions for expressing monetary value and explore the equivalence of 100 p and £1; encourage children to select column algorithms or equivalent calculations where most appropriate.	the minuend, the subtrahend or both. Apply knowledge of compensation properties and inverse operations to calculate and balance equations	

Multiplication and Division

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Explore the concept of unitising by counting in units of two, five or ten; investigate how objects can be counted efficiently by counting in units other than one; apply unitising in the context of the low-denomination coins (1 p, 2 p, 5 p and 10 p).	Explore how objects can be arranged in equal groups, and how the number of groups and the size of the groups can be described; represent equally grouped objects with addition and multiplication expressions, connecting multiplication to repeated addition Build up the two times table by combining children's experience of counting in units of two and of representing equal groups; explore how, in a multiplication equation, the factors can appear in either order and the product remains the same. Build up the ten and five times tables, combining children's experience of counting in units of five or ten and of representing equal groups; explore patterns in the ten and five times tables, and generalise about the product when one factor is zero or one. Explore how one multiplication equation can have two different grouping interpretations (e.g., an equation from the two times table can be	Build up the four/eight times table; using different structures/interpretations of multiplication and division, solve problems related to these tables; explore connections between the two, four and eight times tables Build up the three/six/nine times table; using different structures/interpretations of multiplication and division, solve problems related to these tables; explore connections between the three, six and nine times tables. Build up the seven times table and solve associated multiplication and division problems; explore times table patterns including generalising about the product in terms of odd/even factors, reviewing divisibility rules, and exploring square numbers.	Explore why multiplication is commutative while division is not. Build on understanding of the difference between adjacent multiples to explore the distributive law, and apply it to derive multiplication facts. Build up the eleven and twelve times tables using the distributive law, and solve associated multiplication and division problems. Combine known six times table facts with doubling facts and strategies to multiply by twelve. Explore how some quantities can be split into equal groups with a remainder, and express this using mathematical notation; practise interpreting the meaning of the remainder in different contexts. Use place-value knowledge to develop strategies for	Develop efficiency in calculation by using equivalence, through adjusting the factors (in multiplication) and the dividend and divisor (in division) Develop strategies for multiplying and dividing decimal fractions by whole numbers, including combining known facts with unitising, multiplying and dividing by 10 and 100, and using adjusting strategies. Use multiplication to calculate the volume of cuboids and shapes comprised of several cuboids; use division to solve associated inverse problems. Use associativity and commutativity to solve abstract multiplication problems with three factors. Identify properties of factors and multiples including square and prime numbers, composite numbers, common and prime factors, and common	Develop strategies for multiplying two numbers with two or more digits, including adjusting strategies when multiplying by a power of ten, partitioning followed by multiplication and addition of partial products, and long multiplication. Learn to divide by two-digit divisors, recording calculations using either the short or long division algorithm. Represent remainders in an appropriate way, according to the context, including using the short or long division algorithm to express remainders as decimal fractions. Learn how multiplication and division calculations are affected when one element of the calculation is multiplied or divided by a scale factor. Understand the concept of mean average and learn how to find the mean of a set of data. Use the mean to compare sets of data and learn

		interpreted in terms of groups of two, or two equal groups); make connections between the two times table, doubling and halving. Introduce the quotative and partitive structures of division; skip count using the divisor, or use known multiplication facts, to find the quotient; generalise about the quotient when dividend = 0, dividend = divisor, or divisor = 1.		multiplying/dividing by 10 and 100. Generalise about the product or quotient when a factor or the dividend is made 10 or 100 times bigger/smaller. Introduce the short multiplication algorithm, using it to multiply two-/three-digit numbers by single-digit numbers; explore regrouping where necessary. Introduce the short division algorithm, using it to divide two-/three-digit numbers by single-digit numbers; explore exchange where necessary. Use addition and multiplication to solve problems about the perimeter of irregular and regular 2D shapes, and to find the area of rectilinear and composite rectilinear shapes; use division to solve associated inverse problems Introduce the scaling structure of multiplication and division; use known multiplication and	multiples. Use factor pairs to solve problems efficiently. Learn to combine multiplication with addition or subtraction. Learn to use brackets to change the order of operations. Build on knowledge of the distributive law.	when it is appropriate to use the mean. Use bar modelling and ratio grids to reason about multiplicative relationships between two or more cardinal quantities, and explore correspondence problems. Extend understanding of scaling measures to make and interpret maps and scale/compare the dimensions of similar shapes. Use bar modelling and ratio grids to reason about multiplicative relationships between two or more cardinal quantities, and explore correspondence problems. Extend understanding of scaling measures to make and interpret maps and scale/compare the dimensions of similar shapes. Develop efficient calculation strategies, and connect knowledge of multiplying and dividing by 10/100/1,000 to understanding of place value, including application to conversion

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| | | | | division strategies to solve problems about scaling/comparison problems. | | between metric units of measure.

Build on earlier knowledge of area and perimeter. Learn to find the area of parallelograms and triangles by identifying the perpendicular height. Compare areas and perimeters and apply scale factors to side-length, perimeter and area. |

Fractions

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Recognise, find and name a half as one of two equal parts of an object, shape or quantity. Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	Recognise, find, name and write fractions 1⁄3, 1⁄4, 2⁄4, and 3⁄4 of a length, shape, set of objects or quantity. Write simple fractions *for example, ½ of 6 = 3 and recognise the equivalence of 2⁄4 and ½.*	Identify parts and wholes of areas, lengths and sets. Identify equal and unequal parts; make judgements about the relative size of a part to a whole. Find the whole when the size of a part and number of equal parts is known. Learn to name and write unit fractions. Recognise and show unit fractions of areas, lengths and quantities. Relate numerators and denominators to parts and wholes; explore how the greater the denominators, the smaller the unit fraction. Learn to name and write non-unit fractions, recognising them as multiples of unit	Meet mixed numbers and improper fractions, and learn to convert between them; compare, order and place them on a number line. Extend addition and subtraction from within a whole to numbers greater than one whole. Consider multiplication of whole numbers and proper fractions as both repeated addition and scaling. Understand that multiplication of a whole number by a proper fraction results in a smaller number.	Discover how equivalent fractions have the same proportional relationship between the numerator and denominator, and therefore have the same numerical value. Convert between equivalent fractions and simplify fractions. Learn to add and subtract fractions with different denominators by first finding a common denominator. Compare fractions using a range of methods, including converting to a common denominator.	Explore how to multiply two fractions. Learn how to divide a fraction by a whole number by first converting to an equivalent multiplication. Review how multiplying by a proper fraction makes a number smaller. Make connections between fractions and previous work on decimals. Learn common fraction and decimal equivalences. Understand that percentages tell us about the proportion being considered. Find percentages of quantities.

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	fractions. Learn that fractions are numbers that can be positioned on a number line. Compare and order fractions with the same denominator or same numerator. Explore how to add and subtract fractions within one whole where the denominators are the same. Apply prior knowledge of the inverse relationship of addition and subtraction with whole numbers, to fractions.		

Shape, Space, Measure

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2-D shapes, and mathematical terms to describe shapes. Selects a particular named shape. Can describe their relative position such as 'behind' or 'next to'. Orders two or three items by length or height and two items by weight or capacity. Uses familiar objects and common shapes to create and recreate patterns and build models. Uses everyday language related to time. Beginning to use everyday language related to money. Orders and sequences familiar events. Measures short periods of time in simple ways. Children use everyday language to talk about size, weight, capacity, position, distance, time and money						

to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.					