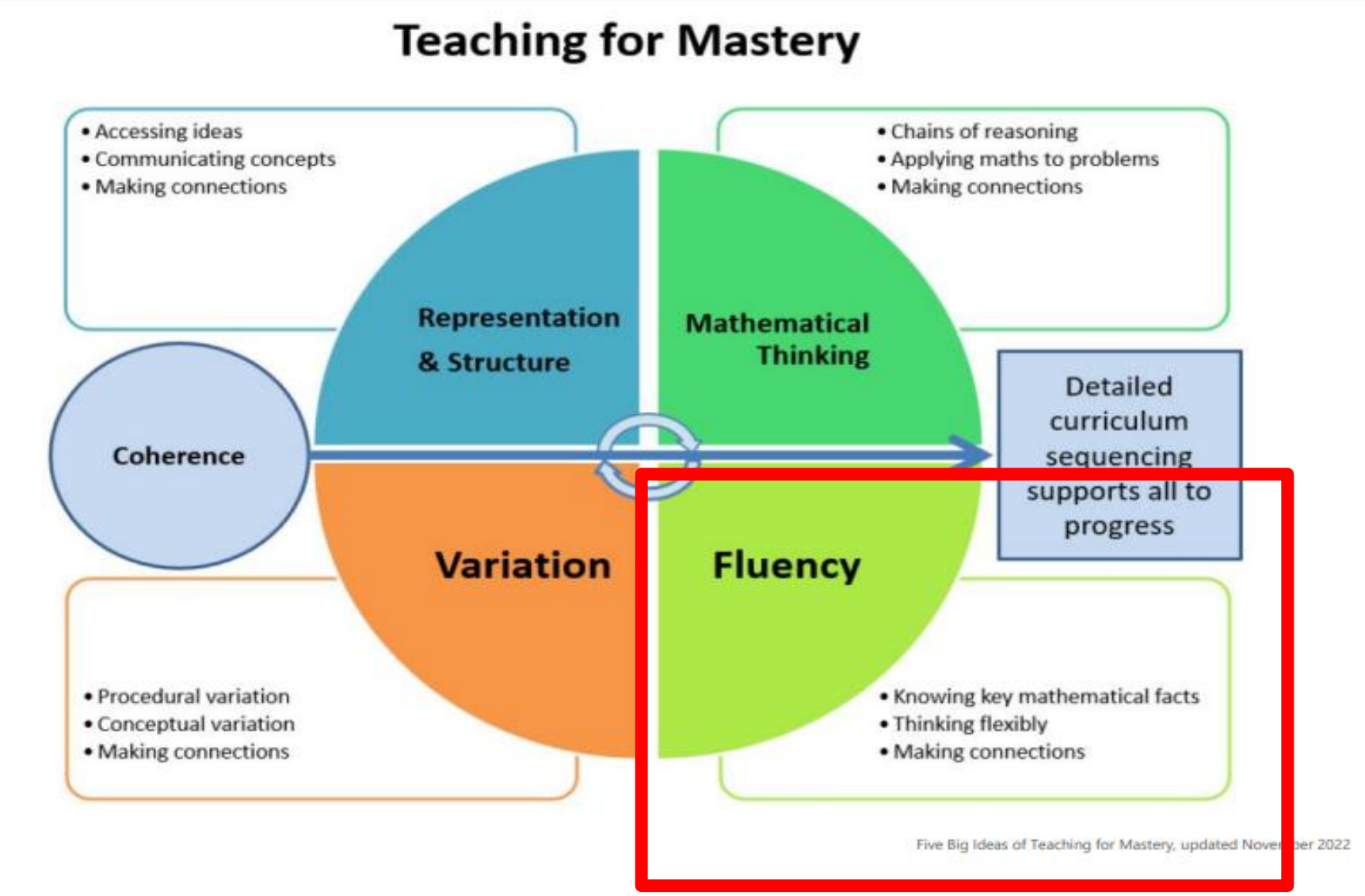
Maths Fluency Progression



The Importance of Fluency in Mathematics

Mathematical fluency is one of the 5 Big Ideas in teaching for mastery (NCETM) and is an essential component of children's mathematical attainment. Having mathematical fluency is the ability to perform mathematical procedures quickly, accurately, and with understanding. This foundation allows learners to access more complex problem-solving tasks and mathematical reasoning with confidence and flexibility.

Fluency encompasses three key components:

✓ Efficiency – choosing and using appropriate methods to solve problems without wasting time or resources.

✓ Accuracy – ensuring solutions are correct by minimizing errors in calculation and reasoning.

✓ Flexibility – applying a range of strategies to approach and solve problems, adapting as needed to new situations or challenges.

Fluency is explicitly highlighted in the National Curriculum for England (2014) as a fundamental aim:

"Pupils should become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately."

Without fluency, pupils may struggle to engage with deeper mathematical concepts, as cognitive resources are consumed by basic calculation. Developing fluency frees mental capacity, enabling children to focus on reasoning and problem-solving as well as building upon prior learning.

Why Fluency Needs to Be Taught: Fluency is not an innate skill but one that all children can master. It must be systematically developed through explicit teaching, practice, and reinforcement. Research highlights several reasons why fluency should be a key component in primary maths:

✓***Facilitates Conceptual Understanding:*** Fluency in number facts underpins a child's ability to understand place value, relationships between numbers, and operations.

Studies by Askew et al. (1997) emphasize that effective mathematics teaching integrates procedural fluency with conceptual understanding.

✓***Reduces Cognitive Load:*** According to Sweller's Cognitive Load Theory (1988), working memory has limited capacity. Automatic recall of key facts reduces strain, allowing pupils to tackle complex tasks.

Gersten et al. (2009) also found that fluency supports students with learning difficulties by making multi-step processes more manageable.

✓***Enhances Problem-Solving Skills:*** Pupils with strong fluency can access and explore higher-order questions more effectively.

Research by Rittle-Johnson and Schneider (2015) suggests a bidirectional relationship between fluency and reasoning, with gains in one domain fostering improvements in the other.

✓***Builds Confidence and Engagement:*** Rapid recall and accurate calculation foster self-efficacy, a critical element for sustained engagement in mathematics (Bandura, 1997).

✓***Prepares for Lifelong Mathematical Literacy:*** Fluency equips children with essential skills for real-life scenarios, including financial literacy and problem-solving in diverse contexts (National Mathematics Advisory Panel, 2008).

Developing Fluency at Four Swannes

Children will attain fluency in a number of different ways:

Mastering Number (NCETM)

All children from Reception to Year 2 will have Mastering Number sessions, where possible, at least 4 times a week.

All children from Year 3 to Year 6 will have EssentialMaths Fluency sessions, where possible, at least 4 times a week.

Fluency will also be taught within lessons by:

✓ Explicit teaching of key facts and strategies aligned with our calculation policy (e.g., number bonds, times tables).

✓ Frequent, varied and intelligent practice to build speed and accuracy.

✓ Real-world applications to demonstrate relevance and foster deeper understanding.

✓ Assessment and intervention to support all learners and address gaps in fluency.

Our Key Instant Recall Facts have been arrived at using the 2014 National Curriculum for maths, the Early Years Foundation Stage Statutory Framework 2024 and White Rose maths schemes.

Key Instant Recall Facts Progression Map

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	Recite numbers in order to 5 and then to 10 Count objects, actions, and sounds to 5 and then to 10. Count forwards and backwards to 5 and then to 10. Subitise (recognise quantities without counting) up to 5. Develop a deep understanding of numbers to 10, including composition (e.g., 7 = 3 + 4). Recite numbers in order to 20 Count verbally to 20 and beyond, understanding the cardinality of numbers. Count forwards and backwards within 20 and then beyond	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number Recognise and use ordinal numbers (1st, 2nd, etc.). Count, read and write numbers to 100 in numerals Count in multiples of twos, fives and tens Read and write numbers from 1 to 20 in numerals and words.	Begin counting in 10s from any number. Count in steps of 2, 3, 5 and 10 forwards and backwards Count forwards and backwards in 10's from any number Read and write numbers to at least 100 in numerals and in words	Begin counting forwards and backwards in steps of ones, 10, 50, and 100. Find 1, 10 or 100 more or less than a given number Count from 0 in multiples of 4, 8, 50 and 100 Count up and down in tenths	Count in multiples of 6, 7, 9, 25 and 1000 Count backwards through zero, including negative numbers. Count up and down in hundredths Find 0.1, 1, 10, 100 or 1000 more or less than a given number	-Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 -Count forwards and backwards with positive and negative whole numbers including through zero -Work with decimals in steps of 0.1 and 0.01. -Count forwards or backwards in fraction steps and place missing values on a number line -Count forwards or backwards in decimal steps and place missing values on a number line -Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number	-Count in steps of powers of 10 up to 10,000,000. -Consolidate learning from year 5 work: -Count forwards and back through zero (negative numbers) -Count forwards or backwards in fraction steps and place missing values on a number line -Count forwards or backwards in decimal steps and place missing values on a number line -Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number

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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number Patterns	Compare quantities using vocabulary such as more, fewer, equal to. Understanding the concept of "one more" and "one less" Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; Recognise and understand the relationship between numbers (e.g., one more than 4 is 5, one less than 7 is 6). Explore doubles (e.g., 2 + 2). Share and group objects in simple ways. Begin to count in 2s using practical objects. Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	Learn simple doubles up to 10. Recognise odd and even numbers	Recall doubles up to 20 Understand the concept of odd and even numbers. Recognise patterns in the 2, 5, and 10 times tables	Introduce doubling and halving strategies for larger numbers. Recognise patterns in the 3, 4, and 8 times tables.	Develop strategies for doubling and halving any number	Apply known facts to solve problems (e.g., 7 × 6 = 42, so 0.7 × 6 = 4.2	

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Number Bonds	Recognise numbers to 5 and their composition (e.g., 2 and 3 make 5).	Know number bonds to 10 fluently and begin to derive related facts (e.g., 7 + 3 = 10, so 17 + 3 = 20).	Know number bonds to 20 fluently. Understand and use related facts up to 100 (e.g., 30 + 70 = 100).	Know bonds to 100 (e.g., 72 + 28 = 100).	Recall number bonds to 1,000 (e.g., 320 + 680 = 1,000).		

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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value		Partition numbers into tens and ones using concrete materials. Given a number, identify one more and one less	Partition numbers within 100 and understand place value in two-digit numbers. Recognise the place value of each digit in a two-digit number (tens, ones) Compare and order numbers from 0 up to 100; use <, > and = signs	Understand three-digit numbers as hundreds, tens, and ones. Build fluency in partitioning and recombining numbers.	Recognise the value of each digit in a four-digit number. Find 1,000 more or less than a given number.	Understand numbers up to 1,000,000.	Identify the place value properties of numbers up to 10,000,000 Round any whole number or decimal to a required degree of accuracy.

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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition and Subtraction	Use objects or fingers to demonstrate simple addition and subtraction (e.g., 3 + 2 = 5, 6 - 2 = 4).	**Add and Subtract numbers to 10** • Add together • Add more •Finding a part (missing number) •Subtract by taking away •Subtract by partitioning • Subtract by counting back • Find the difference **Add and Subtract numbers to 20** • Add by counting on • Find and make number bonds • Add by making 10 • Subtraction not crossing 10 • Subtraction crossing 10 (taking away, partitioning, difference)	Show that addition can be done in any order, but subtraction cannot (law of commutativity). Add 2 single digit numbers (bridging through ten) e.g. 8 + 7 A 2-digit number and ones (no bridging +/-) e.g. 24 + 5, 38 – 6 A 2-digit number and ten (+ / -) e.g. 34 + 10, 68 - 10 A 2-digit number and a multiple of ten (+/-) e.g. 18 + 30, 56 - 40 A 2-digit number add a single digit – with bridging e.g. 18 + 7, 35 + 7 A 2-digit number subtract a single digit number – with bridging e.g. 24 – 6, 33 – 8, A 2-digit number add a 2-digit number without bridging – e.g. 23 + 16 A 2-digit number subtract a 2-digit number without bridging – e.g. 47 - 25 Number bonds to 100 (tens and ones) Add 3 single digit numbers (bonds to 10, doubles and near doubles) Double and halve 2 digit numbers by partitioning Add and subtract 7, 8, 9, 17, 18, 19 etc by rounding and adjusting	-Add and subtract numbers mentally, including: A three-digit number & ones A three-digit number and tens A three-digit number and hundreds Subtract a one digit number from a three-digit number (not crossing 10) Subtract a one digit number from a three-digit number (crossing 10) -Add a three-digit number and a multiple of 10 not crossing 100 boundary (exchange) -Add a three-digit number and a multiple of 10 crossing 100 boundary (exchange) -Subtract a multiple of 10 from a three-digit number not crossing 100 boundary (exchange) -Subtract a multiple of 10 from a three-digit number crossing 100 boundary (exchange) -Add a three-digit number and a multiple of 100 -Subtract a multiple of 100 from a three-digit number -Find pairs of numbers that total 100 -Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	-Add or subtract 1s 10s, 100s 1000s to or from any number up to 10,000 -Add or subtract any pair of two-digit numbers, e.g. 38 + 85, 92 – 47 -Find out what must be added to/subtracted from any two- or three-digit number to make the next higher/lower multiple of 10 or 100, e.g. 374 + ? = 400, 826 - ? = 800 -Add a three-digit number to a two or three-digit number not crossing the tens or hundreds boundary -Subtract a three-digit number from a two or three-digit number not crossing the tens or hundreds boundary -Add two four-digit numbers with no exchange -Subtract two four-digit numbers with no exchange -Know which method to use to efficiently) add or subtract whole numbers with up to four digits	**Addition and subtraction strategies from previous years and:** -Adding and subtracting decimals: Recall and use number facts for addition and subtraction of decimals to two places. -Round numbers to estimate and approximate calculations -Add and subtract multiples of thousands, hundreds, tens & ones -Add or subtract any pair of three-digit multiples of 10, e.g. 570 + 250, 620 – 380 -Add and subtract a four digit number and a near multiple of 1000 by rounding and adjusting e.g. 5001-1997	Use knowledge of the order of operations to carry out calculations using the four operations Add or subtract the nearest multiple of 10 or 100, 1000 10,000, then adjust Add or subtract a multiple of 1 or 10 and adjust Calculate with negative numbers efficiently. Solve multi-step problems involving mixed operations.

Key Instant Recall Facts Progression Map

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and Division		Begin to skip count in 2s, 5s, and 10s.	Count in 2s, 3s, 5s, and 10s. Recall multiplication and division facts for the 2, 5, and 10 times tables.	Recall multiplication and division facts for the 3, 4, and 8 times tables. Recognise multiples of 2, 5, and 10. Double two-digit numbers Halve even numbers to 100 Multiply a two-digit number by a one-digit number, e.g. 34 x 5 Divide a two-digit number by a one-digit number by partitioning	-Recall multiplication and division facts up to 12 × 12. -Understand factor pairs (e.g., 12 = 3 × 4 and 2 × 6) & simple prime numbers. -Know square numbers up to 12 x 12 -Apply place value to scale numbers up and down (e.g., 5 × 10 = 50, so 50 × 10 = 500) -Multiply by 10 & 100 -Divide three or four-digit numbers (multiples of 10 & 100) by 10 -Multiply together three single-digit numbers -Use efficient mental calculations to multiply two-digit numbers by one-digit numbers -Double and halve any two-digit number -Double any multiple of 10 to 500, e.g. 380 x 2, and find all the corresponding halves, e.g. 760 ÷ 2, 130 ÷ 2	-Consolidate fluency in all multiplication tables up to 12 X 12 -Recall related tables facts for multiples of 10, e.g. 30 x 4 = 120, using the related fact 3 x 4 = 12 OR 7200 ÷ 9 related to 72 ÷ 9 -Multiply and divide whole numbers up to 1 million and decimals by 10, 100 and 1000 -Identify and use: Multiples Factors Common factors Prime numbers Cube numbers Double or halve numbers with up to 3-digits including those with two decimal places -Multiply and divide numbers mentally drawing upon known facts.	Use long multiplication and division fluently. Identify common factors, multiples, and prime numbers. Know what a cubed number is and how to cube numbers Consolidate using known and related facts to multiply and divide Multiply or divide whole numbers up to 10 million and decimals to three decimal places by 10, 100 or 1000 To double or halve 3 digit numbers including decimals to 3 d.p. Use factors to divide Use known facts to multiply a number up to 3 decimals places by a whole number, (e.g. 0.08 x 7 = 0.56)

Key Instant Recall Facts Progression Map

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions, Decimals and Percentages		I can recognise half of an object or shape I can recognise quarter of an object or shape I can recognise a third of an object or shape	I can find half of an amount I can find a quarter of an amount I can find three quarters of an amount	Add and subtract fractions with the same denominator within one whole Compare and order unit fractions and fractions with the same denominators Count forwards and backwards in given fractions (tenths etc) Find a third and a quarter using knowledge of times tables	Recognise and use equivalent fractions. Divide a one or two-digit number by 10 and 100 Add and subtract fractions with the same denominator Round decimals with one decimal place to the nearest whole number	-Convert fractions to decimals and percentages. -Add and subtract fractions with different denominators. -Count in fractions with mixed numbers (e.g., 1 1/5, 1 2/5, 1 3/5) -Simplify fractions -Find complements that sum to make 1, with numbers to **three** decimal places, and e.g. 0.45 + __ = 1 -Find complements that sum to make 10, with numbers to **two** decimal places: 4.36 + __ = 10 -Add or subtract any pair of decimal number each with units and tenths, or each with tenths and hundredths, e.g. 5.7 + 2.5, 0.63 – 0.48 -Add and subtract fractions with the same denominator and denominators that are multiples of the same number -Round decimals with two decimal places to the nearest whole number and to one decimal place -Find 50%, 25%, 10% of small whole numbers or quantities, e.g. 25% of £8	Add and subtract mixed number fractions with different denominators. Multiply pairs of proper fractions Divide proper fractions by whole numbers Multiply an integer by a fraction Find any multiple of 10% of a whole number or quantity e.g. 70% of £20, 30% of 5 kg, 40% of 2 metres Use doubling and halving to find 5% and 20%

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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry	Recognise and name simple 2D shapes (e.g., circle, square, triangle) Recognise and name simple 3D shapes (e.g., cube, sphere).	Identify, name and describe basic 2D shapes (e.g., circle, square, triangle, rectangle) using sides, corners etc. Identify, name and describe basic 3D shapes	Identify and describe the properties of 3D shapes (faces, edges, vertices). Understand single-line symmetry in 2D shapes Use language of clockwise and anticlockwise.	Identify right angles and use them to classify 2D shapes Identify horizontal, vertical and perpendicular lines	Classify 2D shapes based on their properties (quadrilaterals, triangles) Identify lines of symmetry in 2D shapes Understand how to read co-ordinates	Use knowledge of angles to classify shapes Identify regular and irregular polygons Understand and use the terms reflection and translation of 2D shapes Plot co-ordinates on one and two quadrant grids	Use co-ordinates in 4-quadrants

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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ratio and Proportion							Solve problems involving relative sizes and scaling.

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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measures	Recognise key times of day (e.g., morning, afternoon, evening) Use everyday language to compare length, heights, weight and capacity (longer, heavier, full, empty etc)	Know and recite the days of the week in order Know and recite the months of the year in order Recognise o'clock and half past times on an analogue clock (e.g., 3:00, 6:30) Use the language of measurement (cm, m, ml, l, g, kg etc)	Understand the difference between AM and PM Tell and write the times quarter past and quarter to Tell the time to 5 minutes Read a measurement from a scale correctly Metric conversions – 1m = 100cm 60 mins = 1 hour 24 hours = 1 day	Tell the time using 12-hour and 24-hour clocks	Convert times between analogue and digital clocks Convert between different units of measurement (cm to m, kg to g etc) Be able to explain how to find perimeter Be able to explain how to find area	Read and understand a timetable Convert time between hours and minutes	Convert between metric and imperial units of measurements Explain and use the formula for volume

Key Instant Recall Facts Progression Map

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Rapid Recall	Automatically recall number bonds up to 5 (including subtraction facts) and then some bonds to 10 Doubles up to double 5	Represent and use number bonds and related subtraction facts within 10 e.g. What is 6 + 3 = Recall number bonds for all numbers to 10 Represent and use number bonds and related subtraction facts within 20 e.g. What is 9 + 7 = Begin to recall number bonds for all numbers to 20 Doubles of all numbers to double 10 Halves of even numbers up to 20	Recall and use addition and subtraction facts for all numbers to 20 fluently, and derive and use related facts up to 100 Doubles to double 10 and simple 2-digit numbers by partitioning Halves of even numbers up to 20 Find ¼ by halving and halving again Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	Recall addition and subtraction facts for 100 (multiples of 5 and 10) Derive and use addition and subtraction facts for multiples of 100 that total 1000 Recall and use multiplication division facts for the 3, 4 and 8 multiplication tables. Metric conversions – 100 = 1m Metric conversions – 10mm = 1cm Metric conversions – 1000g = 1kg Metric conversions 500g = ½ kg Metric conversions – 1000ml = 1 litre Metric conversions 500ml = ½ litre	Revision of all facts learnt before from YR to Y3 Recall multiplication and division facts for multiplication tables up to 12 x 12 Decimal equivalents to ¼, ½ and ¾ or any tenths or hundredths Metric conversions Number of days in each month of the year	Know decimal and percentage equivalents for 1/2, 1/4, 1/5, 2/5 and 4/4 Recall prime numbers up to 19 Recall square (²) numbers up to 12 x 12 Recall percentages as fractions with denominators of 100, e.g. 71% = 71/100 Recall decimal numbers as fractions, e.g. 0.71 = 71/100 Metric conversions	Know by heart all the squares and square roots of numbers to 12 x 12 Recall related facts that link to tables Recognise and recall factors of numbers up to 144 Recall fraction, decimal and percentage equivalents of halves, quarters, thirds, fifths, tenths and hundredths Recall and use equivalences between simple fractions, decimals and percentages Metric conversions