Bretherton Endowed Maths Fluency document 2024 2025

To maximise impact on number fluency across the school, practise needs to be daily and expectations high. Children need to be able to use their year group strategies by the end of the year and interventions should be used to fill any gaps. Teaching staff may need to look back at previous years to begin with until the strategies are embedded.

Children only need a couple of questions of this type a day and it should be extremely quick and mental by definition. Each class should have a fluency grid and a times tables grid and should keep a note of children that have mastered that strategy/table and those who have not.

What is fluency?

The first thing to say is that fluency is not only about number – there are other areas of the curriculum where fluency is important. However it's probably sensible to acknowledge that number is by far the largest part of the primary curriculum, so in this article we'll concentrate on that.

Russell (2000) spells this out in more detail and suggests that fluency consists of three elements:

Efficiency - this implies that children do not get bogged down in too many steps or lose track of the logic of the strategy. An efficient strategy is one that the student can carry out easily, keeping track of sub-problems and making use of intermediate results to solve the problem.

Accuracy depends on several aspects of the problem-solving process, among them careful recording, knowledge of number facts and other important number relationships, and double-checking results.

Flexibility requires the knowledge of more than one approach to solving a particular kind of problem, such as two-digit multiplication. Students need to be flexible in order to choose an appropriate strategy for the numbers involved, and also be able to use one method to solve a problem and another method to check the results.

Rather than mechanical repetition, fluency promotes mental agility and intelligent practice: this can be achieved through varying activities and utilising questioning that requires children to think more deeply and so develop their understanding.

This builds children's confidence and equips them with the tools necessary to access more challenging maths problems. Rather than relying heavily on remembering a specific procedure, children are able to draw on a wider set of tools to solve a problem. This creates a web of connected mathematical relationships which are more likely to remain in a child's long-term memory than procedural processes.

How can we support children in becoming fluent?

As with much of mathematics, the key to fluency is in making connections, and making them at the right time in a child's learning.

Manipulatives We learn by moving from the concrete to the abstract and structured apparatus such as Dienes can be helpful for learning about place value or number bonds. However the meaning isn't in the manipulatives themselves – it has to be constructed by children over a period of time, through playing around with them and connecting them directly to mental and recorded calculation.

Talking about their work The quality of the talk is important. It is not simply children sharing how they did a particular calculation, but describing why and how it worked, and how their method is the same or different to those of others. In other words, giving children opportunities to use those higher-level skills of comparing, explaining and justifying. Russell says 'The reason that one problem can be solved in multiple ways is that mathematics does not consist of isolated rules, but connected ideas. Being able to solve a problem in more than one way, therefore, reveals the ability and the predilection to make connections between and among mathematical areas and topics'.

Consolidation in meaningful contexts By offering children practice in context we help them to make links between the types of situations that a particular strategy might suit. Russell calls this mathematical memory, which is different from just memorising. So that important mathematical procedures cannot be "forgotten over the summer" because they are based in a web of connected ideas about fundamental mathematical relationships.

Maths Fluency Reception		
Counting	**Rapid recall**	**Exploring number**
- Count forwards and backwards within 10 - Count forwards and backwards within 20 and then beyond - Subitise upto 5	- Automatic recall number bonds up to 5 (inc subtraction facts) and then some bonds to 10 - Doubles upto 5	- 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 , doubles facts, and how quantities can be distributed differently - Begin to use names of 2D and 3D shapes eg squares, circles , cubes, spheres - Begin to recognise half of object, shape

Maths Fluency Year 1		
Counting	**Rapid recall**	**Addition and Subtraction (mental calculations)**
• Count to and across 100,forwards and backwards , beginning with 0,1 or any give number • Count read, write numbers to 100 in numerals • Count in multiples of two, fives and tens • Given a number , identify one more or one less • Read and write numbers from 1-20 in numerals and words • Recognise odd and even numbers • 10 more or 10 less	• 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	**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) **Other** • Days of the week • Months of the year • Subitising up to 5 accurate • Name 2D and 3D shapes • To know half and quarter of shape, object or quantity • Tell the time to the hour and half past Recognise and know the value of all coins and notes

Maths Fluency Year 2		
Counting and place value	**Rapid recall**	**Addition and Subtraction (mental calculations)**
- Counting in steps of 2, 3, 5 and 10 forwards and backwards - Counting forwards and backwards in 10's from any number - 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 - Read and write numbers to at least 100 in numerals and in words	- 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	- Adding 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 (doubling diamond) - Add and subtract 7, 8, 9, 17, 18, 19 etc by rounding and adjusting **Other** • Metric conversions – 1m = 100cm 60 mins = 1 hour 24 hours = 1 day - Number of minutes in an hour and hours in a day - Tell the time to 5 minutes, quarter to and quarter past on an analogue clock - Know ¼, ½, ¾ turns, clockwise and anti-clockwise Shape - Describe properties of 2D and 3D shapes eg how many sides, edges, vertices and faces? - Find and recognise 1/3 and 1/4, 2/4, 3/4 of an object, shape or quantity - Create bar charts

Maths Fluency Year 3				
Counting and place value	**Rapid recall**	**Mental Calculations**		
• Find 1, 10 or 100 more or less than a given number • Count from 0 in multiples of 4, 8, 50 and 100 • Count on or back in tens or ones • Count up and down in tenths • Read and write numbers upto 1000 in words and numerals	• 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 ;10mm = 1cm ;1000g = 1kg 500g = ½ kg ; 1000ml = 1 litre ; 500ml = ½ litre • Number of seconds in a minute • Read time to the nearest minute using both analogue and digital clocks including • Roman numerals (begin) • Number of days in each month, year and leap year • Identify right angles and their relationship to turns • Identify angles that are greater (obtuse)or smaller(acute) than a right angle • Identify horizontal, vertical, perpendicular and parallel lines • Measure the perimeter of simple 2D shapes • Create tables and read and complete bar charts	**Addition and subtraction** • Find pairs of numbers that total 100 • Add a three-digit number and ones (not crossing 10) • Add a three digit number and one digit numbers (crossing 10) • 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 • 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 boundary (exchange)	**Multiplication and Division** • 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	**Fractions** • Add and subtract fractions with the same denominator within one whole • Compare and order unit fractions and fractions with the same denominators • Find a third and a quarter using knowledge of times tables • Know all fractions with denominators up to tenths • Count up and down in tenths • Connect tenths to their decimal equivalents

Maths Fluency Year 4				
Counting and place value	**Rapid recall**	**Mental Calculations**		
• Count in multiples of 6, 7, 9, 25 and 1000 • Count backwards through zero to include negative numbers • Count up and down in hundredths • Find 0.1, 1, 10, 100 or 1000 more or less than a given number • Read Roman numerals to 100 • Recognise and use factor pairs of numbers to 100	• 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 • Number of days in each month of the year • Convert km to m. Convert pounds to pence • Convert hours to minutes, minutes to seconds, years to months and weeks to days • Convert between analogue and digital 12 and 24hr clocks • Identify lines of symmetry in 2D shapes • Measure and calculate perimeter rectilinear shapes • Find the area of rectilinear shape by counting squares • Compare and classify geometric shapes including different triangles and quadrilaterals • Compare angles • Describe and plot positions as co-ordinates in first quadrant	**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 (See mental calculations policy)	**Multiplication and Division** • Multiplying by 0 and 1 and divide by 1 • Multiply by 10 and 100 Divide three or four-digit numbers (multiples of 10) by 10 • Divide three or four-digit numbers (multiples of 100) by 10 • Multiply together three single digit numbers • Recognise and use factor pairs and commutativity in mental calculations • 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	**Fractions and decimals** • 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

Maths Fluency Year 5				
Counting and all previous years	**Rapid recall and all previous years**	**Mental Calculations**		
• 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 • 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	• 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 • Read and write numbers to 1,000,000 • Round numbers up to 1,000,000 to nearest 10,100,1000,10,000,100,000 • Read Roman numerals to 1000 and recognise years in Roman Numerals • Convert between km/m/cm/mm, g/kg and l/ml • Use approximate equivalents between metric and imperial units • Measure perimeter of composite rectangular shapes	**Addition and subtraction** Addition and subtraction strategies from previous years and: • Round numbers to estimate and approximate calculations • Add and subtract multiples of thousands, hundreds, tens and 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	**Multiplication and Division** • 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	**Fractions and decimals and percentages** • 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

powers of 10 more or less than a given number	• Measure area of rectangles using square centimetres and metres • Estimate volume and capacity Measure an angle in degrees using a protractor • Know how many degrees in a whole, half, ¼ and ¾ turn • Understand reflection and translation		• Multiply and divide numbers mentally drawing upon known facts	• Find 50%, 25%, 10% of small whole numbers or quantities, e.g. 25% of £8 • Use thousandths • Know decimal equivalents of tenths, hundredths and thousandths

Maths Fluency Year 6				
Counting and all previous years	**Rapid recall and all previous years**	**Mental Calculations from all previous years**		
• Practise counting from ALL previous years up to 10 million 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	• 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 • Convert between km/m/cm/mm, g/kg and l/ml to 3 decimal places • Convert between miles and kilometres • Calculate the mean • Link percentages to degrees in pie charts • Understand scale factor • Calculate the area of triangles and parallelograms • Understand units of speed eg mph • Identify parts of a circle: diameter, radius and circumference • Calculate volume of cuboids in cubic cm/m/mm/km	**Addition and subtraction** Addition and subtraction strategies from previous years and: • 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 • Read, write and order numbers to 10,000,000 • Round all numbers to a required degree of accuracy • Calculate across zero • BIDMAS • Use simple formulae using symbols and letters	**Multiplication and Division** • 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)	**Fractions and decimals and percentages** • 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% Add and subtract fractions with different denominators • Multiply pairs of proper fractions • Divide proper fractions by whole numbers • Find common denominators to help solve problems • Compare and order fraction including fractions bigger than 1 • Multiply fractions and express answer in simplest form • Divide proper fractions by whole numbers • Find and use simple fraction, decimal and percentage equivalent

	• Draw 2D shapes using given angles and dimensions • Build simple 3D shapes using nets • Compare and classify all geometric shapes • Use co-ordinates in all quadrants • Translate and reflect shapes			

Examples of ways to teach fluency

An example of a 'Number of the Week' activity sheet to develop and embed Mathematical fluency in KS2 primary pupils

Approaches to Fluency 4: Targeted Fluency Focus

During each half term, teachers provide fluency activities on a daily or weekly basis and ensure there are visual reminders around the classroom to bring it to the forefront of the children's minds. Every half term children take home a 'Fluency in Maths: Key Facts' sheet with one area of Maths to focus on, enabling parents to become involved in learning and have a greater understanding of the expectations in

Maths for their child. By the end of the half term, children should know these facts and the aim is for them to achieve true automaticity so they can recall them instantly.

Fluent In Five Daily Arithmetic Practice – Third Space Learning

You can download weeks 1-6 for free here.

This free arithmetic resource is designed around the teaching for mastery approach, and the daily activities really do only take five minutes. They also have an amazing video CPD library in their online Maths Hub which is my 'go to' when I'm introducing a new area of Maths or if I have a pupil or group of pupils who can't grasp a concept.