What is fluency in mathematics?

Fluency in mathematics is about developing number sense and being able to find the most appropriate method for the task at hand; to be able to apply a skill to multiple contexts.
The National Curriculum states that pupils should become fluent in the fundamentals of mathematics through varied and frequent practice.
Until children know key mathematical facts and can recall them efficiently, they will not be able to delve deeper into their learning.

Fluency Sessions

Our fluency sessions will be to fun, varied and fast paced. We want ALL our children to be 'mathematically active' for the whole session.
In our sessions we need to make sure that we are teaching the specific facts set out in the tables below. Each year group has specific facts to focus on in each half term.

Resources

We have a range of resources to use in our sessions including:

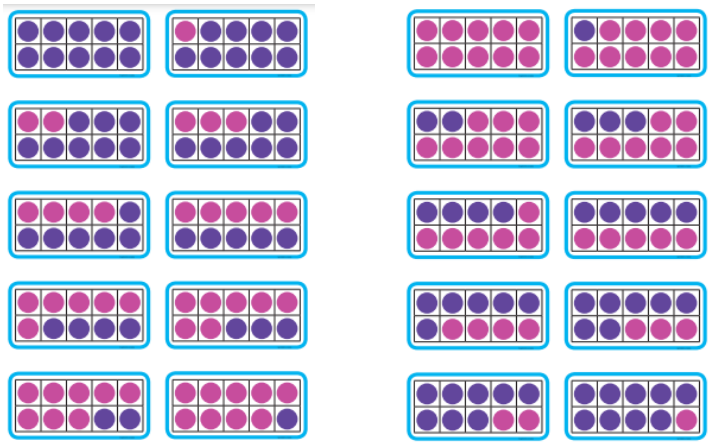
- Rapid Recall Boards
- Fast Maths
- Counting sticks/ circles
- Times Table Rock Stars
- Pixl therapies
- Interactive games – Primary Games, Hit the Button, topmarks
- Concrete equipment – 10's frames, place value charts, two sided-counters, cubes etc.

Guidance and principles

We need to use a variety of **concrete manipulatives** to introduce facts for example: counters, straws, base 10 etc.
We also need to use **pictorial representations** so that the children can visualise 'numbers' including:

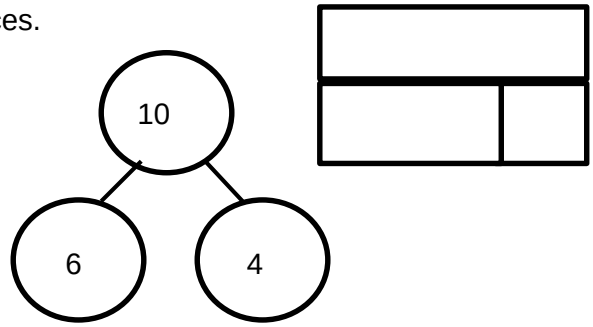
10's frames

These should be used to embed the concepts of addition and subtraction for example, number bonds - children can use different coloured counters to show different ways to make numbers. Numerals should be introduced alongside these images.



Part-part whole model and bar model

These representations should be used interchangeably and also alongside writing straightforward number sentences.



4 + 6 = 10
6 + 4 = 10
10 – 4 = 6
10 – 6 = 4

All classes should:

- Introduce the basic facts and teach strategies for calculating and remembering them.
- Use a variety of models and images so that the facts are not just abstract.
- Allow time for children to practice and memorise facts.
- Make parents aware of the half termly focus and facts their children are expected to learn.

Assessment

At the end of a half term assess the children's attainment against fluency focus.

- Working below – unable to recall any facts or use any strategies
- Working towards – can recall most basic / root facts
- Working at – can recall basic facts, related number facts and missing number problems
- Working at greater depth – can use facts fluently

Any children deemed working below or towards the standard in relation to the fluency objective should be targeted through intervention.

Year 1

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Addition facts *Adding 0/1*	**Addition facts** *Number bonds to 10*	**Subtraction facts** *Number bonds to 10*	**Addition and linked subtraction facts** *Adding 10*	**Addition and linked subtraction facts** *Adding 2/3*	**Addition and linked subtraction facts** *Using doubles*
0 + 0 0 + 0 1 + 0 0 + 1 2 + 0 0 + 2 3 + 0 0 + 3 4 + 0 0 + 4 5 + 0 0 + 5 6 + 0 0 + 6 7 + 0 0 + 7 8 + 0 0 + 8 9 + 0 0 + 9 10 + 0 0 + 10	0 + 10 1 + 9 2 + 8 3 + 7 4 + 6 5 + 5 6 + 4 7 + 3 8 + 2 9 + 1 10 + 0	10 - 0 10 - 1 10 - 2 10 - 3 10 - 4 10 - 5 10 - 6 10 - 7 10 - 8 10 - 9 10 - 10	10 + 0 0 + 10 10 + 1 1 + 10 10 + 2 2 + 10 10 + 3 3 + 10 10 + 4 4 + 10 10 + 5 5 + 10 10 + 6 6 + 10 10 + 7 7 + 10 10 + 8 8 + 10 10 + 9 9 + 10 10 + 10 10 + 10	2 + 2 2 + 2 2 + 3 3 + 2 2 + 4 4 + 2 2 + 5 5 + 2 2 + 6 6 + 2 2 + 7 7 + 2 2 + 8 8 + 2 2 + 9 9 + 2 2 + 10 10 + 2 3 + 3 3 + 3 3 + 4 4 + 3 3 + 5 5 + 3 3 + 6 6 + 3 3 + 7 7 + 3 3 + 8 8 + 3 3 + 9 9 + 3 3 + 10 10 + 3	0 + 0 1 + 1 2 + 2 3 + 3 4 + 4 5 + 5 6 + 6 7 + 7 8 + 8 9 + 9 10 + 10

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Year 2					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Addition and linked subtraction facts *Using near doubles*	**Multiplication Facts** *x2 x5 x10*	**Division Facts** *x2 x5 x10*	**Addition and linked subtraction facts** *Bridging / compensating*	**Addition and linked subtraction facts** *Number bonds to 20*	**Addition and linked subtraction facts** *Number bonds to 100*
Revise Y1 number facts and 3 + 4 4 + 3 4 + 5 5 + 4 5 + 6 6 + 5 6 + 7 7 + 6 7 + 8 8 + 7 8 + 9 9 + 8	With x2 also refer to doubles	With ÷2 also refer to halves	7 + 4 4 + 7 7 + 5 5 + 7 8 + 3 3 + 8 8 + 4 4 + 8 8 + 5 5 + 8 8 + 6 6 + 8 9 + 3 3 + 9 9 + 4 4 + 9 9 + 5 5 + 9 9 + 6 6 + 9 9 + 7 7 + 9	0 + 20 20 + 0 1 + 19 19 + 1 2 + 18 18 + 2 3 + 17 17 + 3 4 + 16 16 + 4 5 + 15 15 + 5 6 + 14 14 + 6 7 + 13 13 + 7 8 + 12 12 + 8 9 + 11 11 + 9 10 + 10 10 + 10	Pairs of multiples of 10 and pairs of multiples of 5 0 + 100 5 + 95 10 + 90 15 + 85 20 + 80 25 + 75 30 + 70 35 + 65 40 + 60 45 + 55 50 + 50 55 + 45 60 + 40 65 + 35 70 + 30 75 + 35 80 + 20 85 + 15 90 + 10 95 + 5 100 + 0

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Year 3					
Autumn 1	***Autumn 2***	***Spring 1***	***Spring 2***	***Summer 1***	***Summer 2***
Addition and linked subtraction facts *Number bonds to 100*	**Multiplication Facts** *x3 x4 x8*	**Division Facts** *x3 x4 x8*	**Addition and linked subtraction facts** *Number bonds to 1000*	**Doubling / halving** *Also refer to as addition facts (a number plus itself)*	**Doubling / halving** *Also refer to as addition facts (a number plus itself)*
Pairs of numbers that total 100 (There are many so focus on understanding and use of bonds learnt in Y2) Egs. 100 - 6 = 94 100 - 14 = 86 100 - 23 = 77 100 - 33 = 67 100 - 42 = 58 100 - 55 = 45 100 - 61 = 39 100 - 78 = 22 100 - 89 = 11 100 - 67 = 3	Also learn commutative fact 1 x 3 2 x 3 3 x 3 4 x 3 5 x 3 6 x 3 7 x 3 8 x 3 9 x 3 10 x 3 11 x 3 12 x 3 1 x 4 1 x 8 2 x 4 2 x 8 3 x 4 3 x 8 4 x 4 4 x 8 5 x 4 5 x 8 6 x 4 6 x 8 7 x 4 7 x 8 8 x 4 8 x 8 9 x 4 9 x 8 10 x 4 10 x 8 11 x 4 11 x 8 12 x 4 12 x 8	All linked division facts for x3 x4 x8 Will have been being developed alongside learning of multiplication facts but spend time embedding.	Pairs of multiples of 50 that total 1000 50 + 950 150 + 850 250 + 750 350 + 650 450 + 550 550 + 450 650 + 350 750 + 250 850 + 150 950 + 50	Doubles to 20 and corresponding halves 11 x 2 12 x 2 13 x 2 14 x 2 15 x 2 16 x 2 17 x 2 18 x 2 19 x 2 20 x 2	Doubles of multiples of 5 up to 100 15 x 2 25 x 2 35 x 2 45 x 2 55 x 2 65 x 2 75 x 2 85 x 2 95 x 2

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<table>
<tr><th colspan="6">Year 4</th></tr>
<tr><th>Autumn 1</th><th>Autumn 2</th><th>Spring 1</th><th>Spring 2</th><th>Summer 1</th><th>Summer 2</th></tr>
<tr><td>Addition and linked subtraction facts

Number bonds to 200</td><td>Multiplication facts

x6 x7 x9 x11 x12</td><td>Division facts

x6 x7 x9 x11 x12</td><td>Doubling / halving

Also refer to as addition facts (a number plus itself)</td><td>Multiplication facts

x10 x100 x1000</td><td>Division facts

÷10 ÷100 ÷1000</td></tr>
<tr><td>Pairs of numbers that total 200 (There are many so focus on understanding and use of bonds)

Egs.
200 - 6 = 194
200 - 14 = 186
200 - 23 = 177
200 - 33 = 167
200 - 42 = 158
200 - 55 = 145
200 - 61 = 139
200 - 78 = 122
200 - 89 = 111
200 - 67 = 133</td><td>Although you will revise and test all facts in each of these times tables these are the only new facts to learn, if chn are on track and have achieved fluency of multiplication facts in previous years.

<table><tr><td>6x6</td><td>9x9</td></tr><tr><td>7x6</td><td>11x9</td></tr><tr><td>9x6</td><td>12x9</td></tr><tr><td>11x6</td><td>11x11</td></tr><tr><td>12x6</td><td>12x11</td></tr><tr><td>7x7</td><td>12x12</td></tr><tr><td>9x7</td><td></td></tr><tr><td>11x7</td><td></td></tr><tr><td>12x7</td><td></td></tr></table></td><td>All linked division facts for x6 x7 x9 x11 x12

Will have been being developed alongside learning of multiplication facts but spend time embedding.</td><td>Doubles and halves of 20-50

21 x 2 31 x 2
22 x 2 32 x 2
23 x 2 33 x 2
24 x 2 34 x 2
25 x 2 35 x 2
26 x 2 36 x 2
27 x 2 37 x 2
28 x 2 38 x 2
29 x 2 39 x 2
30 x 3 40 x 2

41 x 2
42 x 2
43 x 2
44 x 2
45 x 2
46 x 2
47 x 2
48 x 2
49 x 2
50 x 2</td><td>Multiplying single digit numbers by 10, 100 and 1000</td><td>Dividing up to 4 digit numbers by 10, 100, 1000</td></tr>
</table>

Year 5					
Autumn 1	***Autumn 2***	***Spring 1***	***Spring 2***	***Summer 1***	***Summer 2***
Multiplication and division facts	**Multiplication and division facts** *Squared numbers and square roots*	**Addition and linked subtraction facts** *Decimal number bonds to 1/2*	**Addition and linked subtraction facts** *Decimal number bonds to 10/20*	**Doubling / halving** *Also refer to as addition facts (a number plus itself)*	**Multiplication and division facts**
Revision of all x tables; mixed up, using related multiples of 10/100/1000 Eg. 20 x 4 4 x 600 70 x 50	Chn should already know facts when shown as 2x2 or 9÷3 etc. Focus on language and symbol for squared and square root Include; 13^2 14^2 15^2 Introduce cube numbers.	0.1+0.9 0.2+0.8 0.3+0.7 0.4+0.6 0.5+0.5 And commutative fact 0.1 + 1.9 0.2 + 1.8 0.3 + 1.7 0.4 + 1.6 0.5 + 1.5 0.6 + 1.4 0.7 + 1.3 0.8 + 1.2 0.9 + 1.1 And commutative fact	There are many, use the strategies and number bonds to practice and embed this objective.	Doubles and halves of 50-100 There are many so relate back to strategies and already known doubles facts.	Revision of all x tables; mixed up, using decimals e.g. tenths, hundredths, thousandths E.g. 3 x 0.7 0.08 x 2 0.4 x 0.6

Year 6					
Autumn 1	***Autumn 2***	***Spring 1***	***Spring 2***	***Summer 1***	***Summer 2***
Multiplication and division facts *Cubed numbers and cube roots*	**Doubling / halving** *Also refer to as addition facts (a number plus itself)*	*Revision / drill and skill of all Maths Fluency Objectives*			
$1^3 = 1$ $2^3 = 8$ $3^3 = 27$ $4^3 = 64$ $5^3 = 125$ $6^3 = 216$ $7^3 = 343$ $8^3 = 512$ $9^3 = 729$ $10^3 = 1000$ Ensure children are aware that cubed numbers are a number times itself, times itself.	Doubles and halves of decimal numbers using doubling of whole number facts already learnt 3.5 x 3 4.6 x 7 7.5 ÷ 5 6.4 ÷ 8				