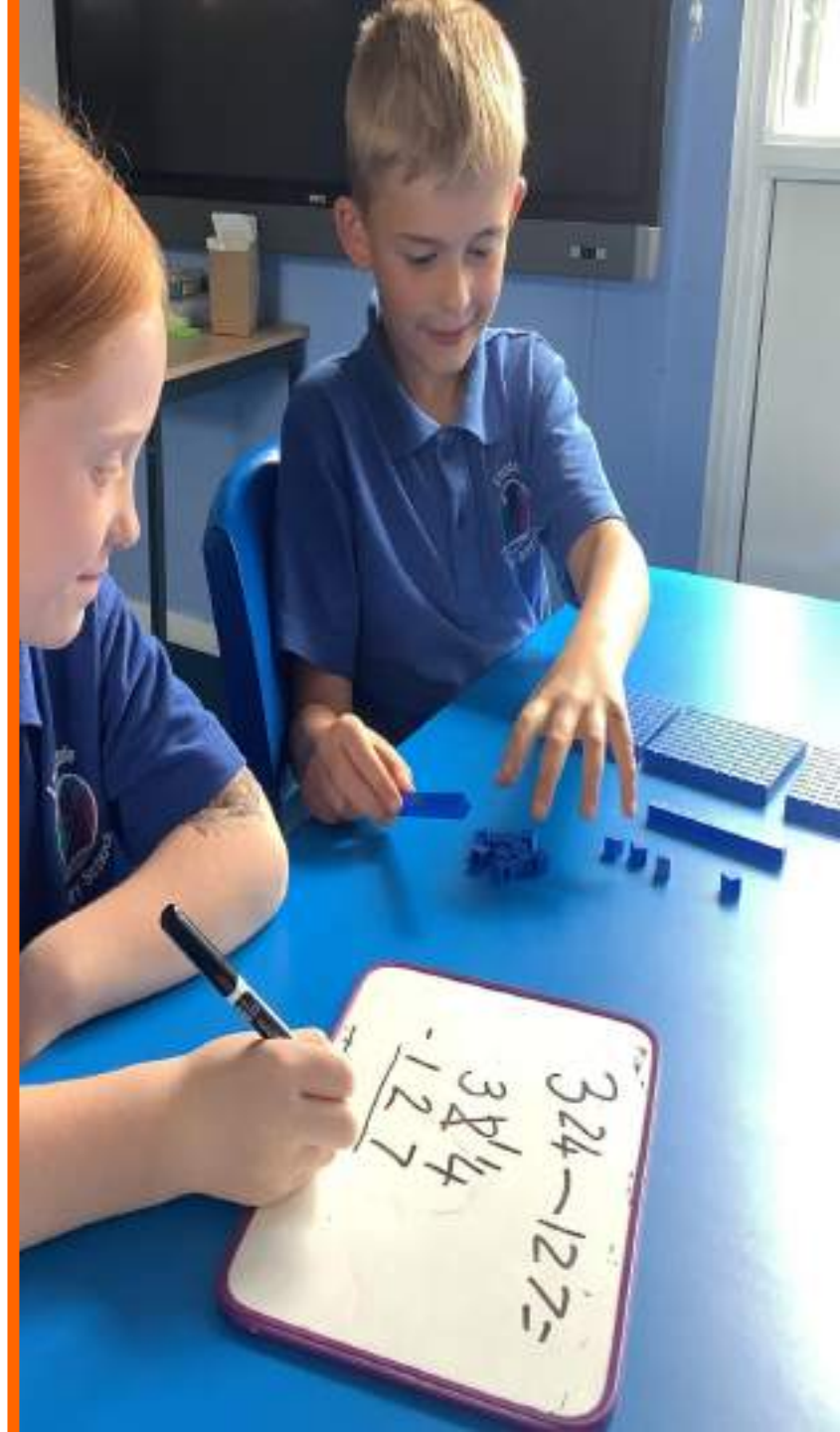


# Maths Curriculum

A whole school approach to maths culture, curriculum, assessment, pedagogy and CPD... *all of our children can be mathematicians!*



# Culture

*All of our children can be mathematicians!*

# *All of our children can be mathematicians!*

At Lingfield Education Trust (LET), our maths **culture**, that underpins and informs all that we do, is based around our shared belief that ***all of our children can be mathematicians*** – and enjoy the journey of getting there! Our culture is one of **all** staff members being the best prepared possible to ensure **all** children can master **all** of maths. At LET, mastery means every stakeholder moving together to improve their maths – not just children.

This culture informs the **intent** of our maths **curriculum**: all children to factually fluent, procedurally fluent and flexibly fluent so that they can reason to solve problems. We know this intent will give them the best possible chance to master maths at secondary school and have confidence in the workplace and everyday life situations. We intend for our children to be life-long lovers of maths. Our curriculum is designed so that **all** children learn content in the right order and for the right amount of time.

To **implement** our curriculum, we base our **pedagogy** around a consistent lesson delivery model (LDM) that fuses together the best of cognitive science approaches and the mastery approach to maths. Our robust LDM has several benefits:

- It acts as daily CPD for our staff about the most effective way to help children learn mathematical content
- Allows predictability and consistency for children, especially those with SEND needs
- Acts as a daily induction model for new staff

To ensure that our curriculum has the desired impact, we have a robust assessment, monitoring and **CPD** model:

- End of unit and end of term assessments allow staff to plan for appropriate interventions and next steps, while allowing our maths lead to know what is working and what needs improving.
- Regular monitoring activities also highlight where the curriculum and pedagogical approach are working and where improvements are needed.
- From this evidence base, whole-school and targeted **CPD** can be planned for and delivered to ensure that **all** of our staff can help ***all of our children can be mathematicians***.

# Curriculum

*All of our children can be mathematicians!*

# Main Maths Curriculum

Our curriculum is one aimed at ensuring our shared belief, that *all of our children can be mathematicians*, becomes a reality.

We believe strongly that all children can learn their intended curriculum if it is sequenced correctly and affords children enough time to learn mathematical content. For that reason we have based our curriculum around the following materials:

- White Rose Maths
- NCETM Curriculum Prioritisation
- Oak National Academy
- NCETM Mastering Number EYFS
- Number Sense Fact Fluency
- DfE Teaching Children to Calculate Mentally

Where possible, statistics and measures are applied in the wider curriculum to give them a meaningful context and purpose. Skills learned in these areas are then built into our systematic spaced retrieval sessions. In order for connections to be built up between mathematical concepts and representations, maths other than the focus content is built into the varied fluency of maths lessons.

To ensure all children can access mathematical content, we apply the science of cognitive load theory to our curriculum so that children have the prerequisite knowledge for a unit. For example, formal written multiplication is only taught when multiplication table facts have been secured; column addition is only taught when addition/subtraction table facts have been secured.

Each year group's curriculum finishes with a *springboard* unit that gives children the chance to practice key skills before the summer recess thus reducing the summer learning loss.

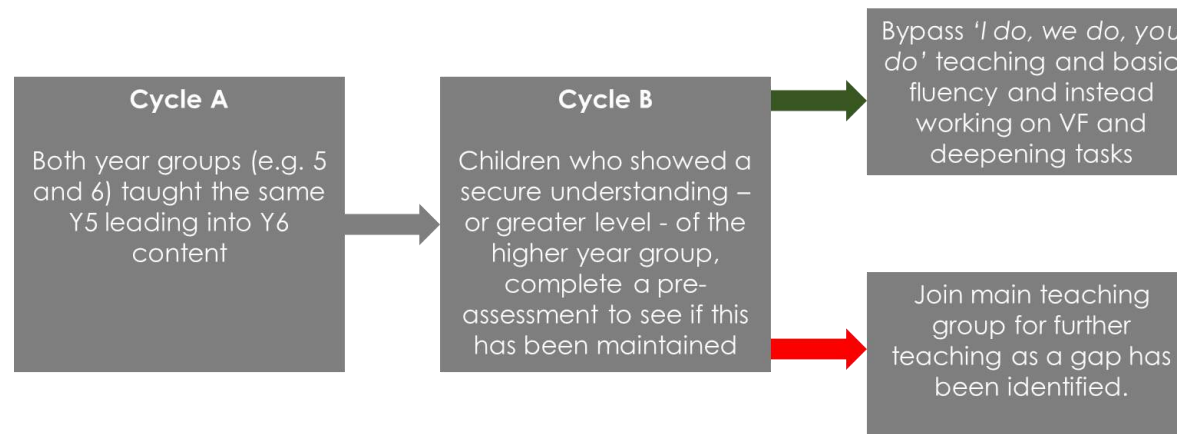
Learning sequences identify linked mental maths/fact fluency starters; where a dedicated practical lesson is required; where a problem-solving lesson fits; when assessment/pause/stretch should take place; and when a practice lesson is required to allow children to simply consolidate what they have learnt.

Main maths lessons are one hour daily.

# Mixed-Age Classes

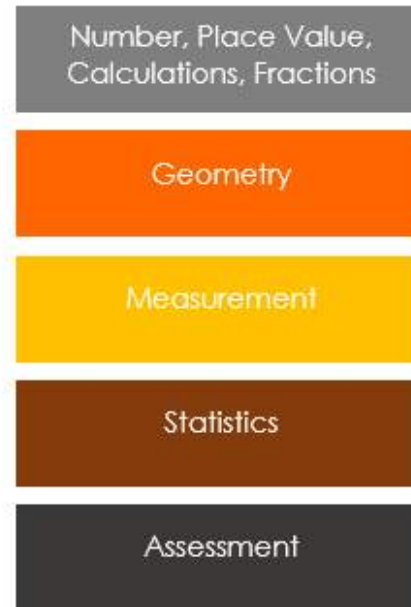
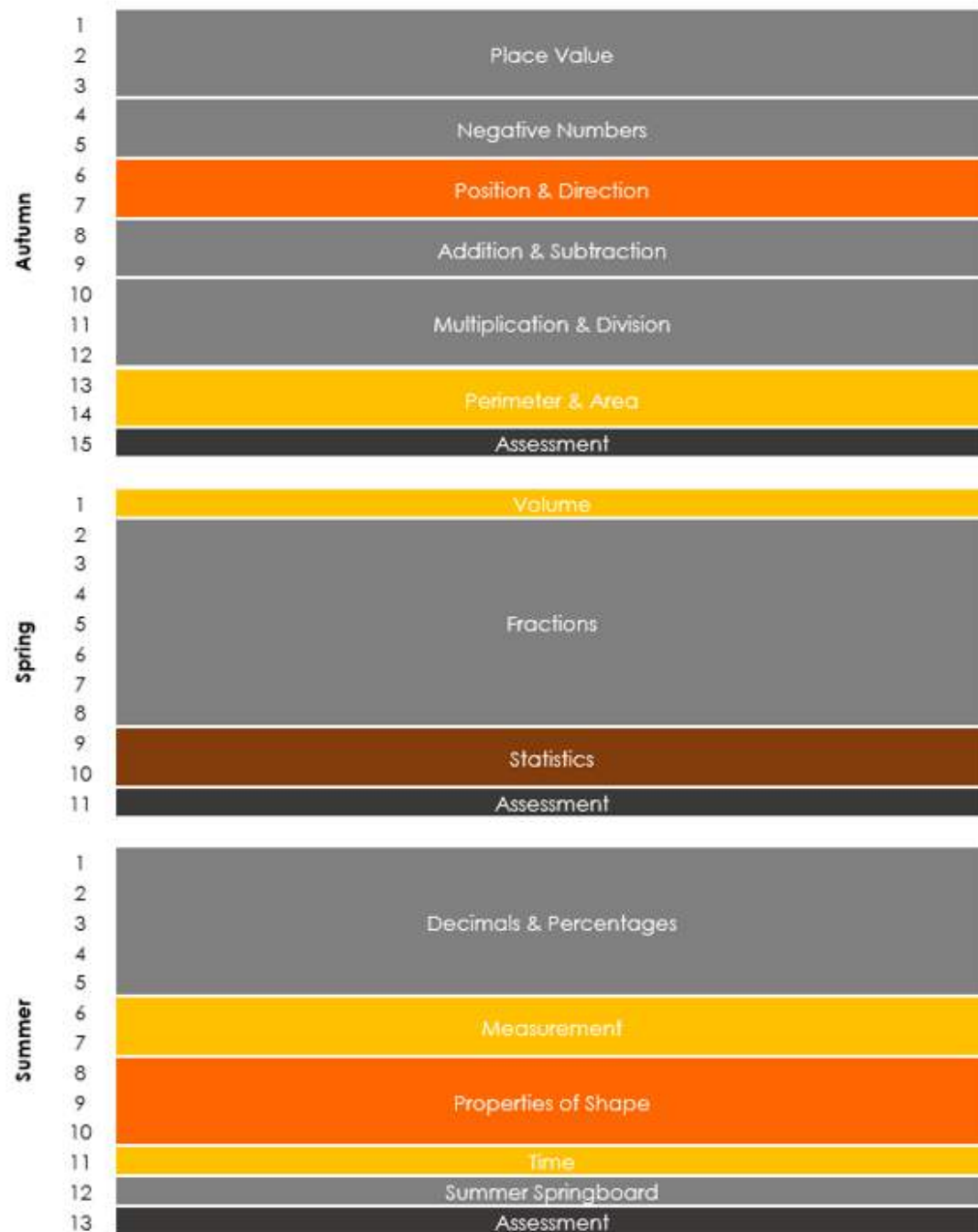
Our approach to mixed-age planning:

- Only one input which moves from the lower year group content to the higher – for all.
- Year A and Year B cycle to allow for longer units to cover key skills from both year groups – where necessary.
- Anchor units of place value, addition & subtraction, multiplication & division and fractions are in both Year A and Year B.
- Other units are spaced over Year A and Year B with only one input which moves from the lower year group content to the higher – for all.
- In the second cycle, children who showed greater depth in the first cycle for anchor units, will complete a pre-assessment to identify if this level of understanding has been maintained.
- If it has they will bypass teacher input and basic fluency (our everyone on the bus task), and instead independently – or in a collaborative group – work on varied fluency and rich, sophisticated reasoning tasks.
- If the pre-assessment reveals, they have not maintained the earlier level of understanding they will join the main teaching to reinforce their earlier learning.
- NCETM CP sequencing have been used for these year groups, as it better caters for the younger year group.



# Maths Long-Term Plan

## Year 5





Lingfield Education Trust  
 Maths Medium-Term Plan: Year 5  
 Autumn Term

	Place Value	Negative Numbers	Position & Direction	Addition & Subtraction	Multiplication & Division	Perimeter & Area	Assessment
	3 weeks	2 weeks	2 weeks	2 weeks	3 weeks	2 weeks	1 week
National Curriculum	<ul style="list-style-type: none"> <li>Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit</li> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000</li> <li>Solve number problems and practical problems involving the above</li> </ul>	<ul style="list-style-type: none"> <li>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</li> </ul>	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction)</li> <li>Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why</li> <li>Use rounding to check answers to calculations and determine, in the context of a problem, level of accuracy</li> </ul>	<ul style="list-style-type: none"> <li>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000</li> <li>Multiply numbers up to four digits by a 1- or 2-digit number using a formal written method, involving long multiplication for 2-digit numbers</li> <li>Divide up to four digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context</li> <li>Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes</li> </ul>	<ul style="list-style-type: none"> <li>Measure and compare the perimeter of composite rectilinear shapes in centimetres and metres</li> <li>Calculate and compare the area of rectangles (including squares), involving using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>), and estimate the area of irregular shapes</li> </ul>	<ul style="list-style-type: none"> <li>Test to be made by Maths lead to match what has been taught – do <a href="#">and</a> just use WR end of Term Test</li> <li>Day 1 do arithmetic test</li> <li>Day 2 go over and unpick the arithmetic test with loads of discussion – this <a href="#">and</a> be given proper time</li> <li>Day 3 do reasoning test</li> <li>Day 4 go over and unpick the reasoning test with loads of discussion – this <a href="#">and</a> be given proper time</li> </ul>
Small Steps	<ul style="list-style-type: none"> <li>Represent and show value of digits to 7-digit</li> <li>Partition numbers to 7-digit</li> <li>1, 10, 100, 1000, 10,000, 100,000 more</li> <li>1, 10, 100, 1000, 10,000, 100,000 more</li> <li>Compare two numbers using &lt; &gt; = to 7-digit</li> <li>Order sets of numbers to 7-digit</li> <li>Round 4-digit number to nearest 10, 100, 1000</li> <li>Round to nearest 10, 100, 1000 within 7-digit</li> </ul>	<ul style="list-style-type: none"> <li>Understand through ordering negative numbers including number line</li> <li>Count through zero in ones and other multiples</li> <li>Increase and decrease through zero</li> <li>Find the difference</li> </ul>	<ul style="list-style-type: none"> <li>Read and plot coordinates in the first quadrant</li> <li>Translate a shape including coordinates</li> <li>Describe a translation including coordinates</li> <li>Lines of symmetry</li> <li>Reflections including coordinates</li> </ul>	<p><a href="#">From Calculation Policy (P 40)</a>  <a href="#">WR &amp; Do 2/3 lessons</a></p> <ul style="list-style-type: none"> <li>Column addition of 4-digit numbers no bridging then bridging including VF</li> <li>Column addition of 5-digit or more numbers with bridging including VF</li> <li>Column addition of mixed PV numbers with bridging including VF</li> <li>Column subtract of 4-digit numbers no exchanging including VF</li> <li>Column subtract of 5-digit or more numbers with exchanging including VF</li> <li>Column subtract of mixed PV numbers with exchanging including VF</li> <li>Estimate/approximate to check</li> <li>Invert to check</li> </ul>	<p><a href="#">From Calculation Policy (P 40)</a>  <a href="#">WR &amp; Do 2/3 lessons</a></p> <ul style="list-style-type: none"> <li>Multiply by 10, 100, 1000</li> <li>Divide by 10, 100, 1000</li> <li>Mixed multiply and divide by 10, 100, 1000</li> <li>Multiply 4 x 1 short</li> <li>Multiply 2 x 2 long</li> <li>Multiply 2 x 3 long</li> <li>Multiply 4 x 2 long</li> <li>Divide 4 by 1 using short no remainders or all including within</li> <li>Divide 4 by 1 using short remainder only at end</li> <li>Divide 4 by 1 using short remainder throughout</li> </ul>	<ul style="list-style-type: none"> <li>Perimeter of rectangles</li> <li>Perimeter of compound rectilinear shapes</li> <li>Perimeter of polygons</li> <li>Area of rectangles</li> <li>Area of compound shapes</li> </ul>	
Enrichment	Block Opener/Assembly on Careers linked to unit	Block Opener/Assembly on Careers linked to unit	Block Opener/Assembly on Careers linked to unit  Lingfield Education Trust TRS Competition (16-20.10.23)	Block Opener/Assembly on Careers linked to unit  World Statistics Day (20.10.23)	Block Opener/Assembly on Careers linked to unit  WR November (November)	Block Opener/Assembly on Careers linked to unit  Lingfield Education Trust TRS Competition (11-15.12.23)	LET Christmas Problems & Puzzles



## Y5 Maths Plan

### Perimeter & Area

Learning Steps	
Block Intro	
1	Perimeter of rectangles
2	Perimeter of compound rectilinear shapes
3	Perimeter of polygons
4	<b>PS Lesson: perimeter</b>
5	Area of rectangles
6	Area of compound shapes
7	<b>PS Lesson: area</b>
8	<b>Assessment</b>
9	<b>Pause &amp; Stretch</b>
10	<b>PS Skills Lesson: working systematically</b>

#### Key Principles

- Number formation must be every day in Year 1.
- Bar modelling to be used in all units where possible.
- Block Intro sessions replace mental maths/retrieval on the first day of a unit and give a reason to the learning or children.
- Lessons follow agreed school LDM with reasoning throughout and as a set task to finish.
- **Proper problem-solving is dealt with in dedicated lessons.**
- **Assessments will be given proper time and be immediately after the unit.**
- **Pause will be led by teacher and 'stretch' will be independent GD problems with afternoon follow-up by teacher.**
- A learning step does not necessarily equate to a lesson – it could be lesson; it could be more; it could be less. *Slow down to speed up* – it takes as long as it needs for all to have learnt – not just be taught. If some need more, trim others.

# Spaced Retrieval Sessions

To ensure the content learnt in maths lessons is retained, all learning is built into our systematic, spaced retrieval plans.

This ensures that all key knowledge is regularly retrieved and that nothing is left out.

This also means maths lessons can focus on that year group's new content.

These sessions are daily for 15 minutes.

**See appendices for full retrieval plans.**

Week	Addition / PV	Subtraction / PV	Multiplication	Division	Fractions	GMS
1	PV: value of digits, partition, compare, order (Y3-4)		Multiplying with 1 and zero (Y2)	Dividing by 1 and itself (Y2)	Tenths – fractions & decimals (Y5)	Vertical, Horizontal, Parallel, Perpendicular (Y3-4)
2	PV: rounding (Y3-4)		Short Multiplication (Y5)	Short Division (Y5)	Hundredths – fract & decimals (Y5)	Mass & Capacity (Y3,4,5)
3	Decimal Place Value (Y5)		Moving Digits (Y3,4,5)	Moving Digits (Y3,4,5)	Multiply fractions (Y5)	2D-3D shape + symmetry (KS1+Y3-4)
4	Negative Numbers including temperature (Y3-4,5)		Scaled Facts (Y3-4)	Scaled Facts (Y3-4)	Multiply mixed numbers (Y5)	Length (Y3,4,5)
5	Mental Methods (Y3-4)	Mental Methods (Y3-4)	Multiplying with 1 and zero (Y2)	Dividing by 1 and itself (Y2)	Non-unit fractions of amounts (Y5)	2D & 3D shape + regular/ir (KS1+Y3-4)
6	Written Methods (Y3-4)	Written Methods (Y3-4)	Short Multiplication (Y5)	Short Division (Y5)	Equivalent fractions (Y5)	Pictograms & Bar/Line Charts (Y6)
7	Mental Methods inc decimals (Y5)	Mental Methods inc decimals (Y5)	Moving Digits (Y3,4,5)	Moving Digits (Y3,4,5)	Fraction-decimal basic equ (Y5)	Coordinates (Y5)
8	Written Methods inc decimals (Y5)	Written Methods inc decimals (Y5)	Scaled Facts (Y3-4)	Scaled Facts (Y3-4)	ID/compare/order unit/non-unit (Y3-4)	Pie Charts & Circles (Y6)
9	PV: value of digits, partition, compare, order (Y6)		Long Multiplication (Y6)	Short Division (Y5)	Mixed into improper & vice-versa (Y3-4)	Translations & Reflections (Y5)
10	PV: rounding (Y6)		Short Multiplication (Y5)	Short Division (Y5)	Fractions of amounts (Y5)	Reading Time (Y3-4)
11	Decimal Place Value (Y5)		Moving Digits (Y3,4,5)	Moving Digits (Y3,4,5)	Add/take fractions (Y3-4)	Angles (Y5)
12	Negative Numbers including temperature (Y3-4,5)		Scaled Facts (Y3-4)	Scaled Facts (Y3-4)	FDP Equivalence (Y5)	Area & Perimeter (Y3,4,5,6)
13	Mental Methods (Y3-4)	Mental Methods (Y3-4)	Long Multiplication (Y6)	Short Division (Y5)	Multiply fraction & WN (Y5)	Translations (Y5)
14	Written Methods (Y3-4)	Written Methods (Y3-4)	Moving Digits (Y3,4,5)	Moving Digits (Y3,4,5)	FDP Equivalence (Y5)	Volume (Y5,6)
15	Mental Methods inc decimals (Y5)	Mental Methods inc decimals (Y5)	Scaled Facts (Y3-4)	Scaled Facts (Y3-4)	Multiply mixed numbers (Y5)	Triangles (area, angles) Y6

# Fact Fluency Sessions

Fact fluency – what we call *fingertip knowledge* – is what makes maths accessible for all. We know that without this children cannot access and enjoy the wider maths curriculum.

To ensure fact fluency is not a barrier for any child, we have dedicated daily fact fluency sessions that ensure children gain a deep conceptual understanding of these facts, which leads to automaticity.

These sessions are daily and last for 15 minutes in each year group.

KS1 focus on addition/subtraction tables.  
LKS2 focus on multiplication/division tables.

UKS2 focus on applying these facts to wider mental strategies, thus retrieving the basic facts to working memory.

**See appendices for full plans.**

Year 2		Yearly Overview						
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	
Return 1	Stage 1 & 2 (review)	Stage 3 Books 1 – 3 (review)	Stage 3 Books 4 – 6 (review)	Stage 3 Books 7 & 8 (review)	Stage 3 Book 9 (review)	Stage 4	Stage 3 Stage 4	
	Subitising and partitioning	-One More, One Less -Two More, Two Less -Number 10 Fact Families	-Five and A Bit -Know About Zero -Doubles and Near Doubles	-Number Neighbours -7 Tree 9 Square	Strategy Selection	Ten and A Bit	Gap teaching and consolidation	
Return 2	Stage 5 Make Ten and Then: Addition	Stage 5 Make Ten and Then: Addition	Stage 5 Make Ten and Then: Addition	Stage 5 Make Ten and Then: Subtraction	Stage 5 Make Ten and Then: Subtraction	Stage 5 Make Ten and Then: Subtraction		
Spring 1	Stage 5 More Doubles and Near Doubles	Stage 5 More Doubles and Near Doubles	Stage 5 More Doubles and Near Doubles	Stage 5 Adjusting	Stage 5 Adjusting	Stage 5 Adjusting		
Spring 2	Stage 5 Strategy Selection	Stage 5 Strategy Selection	Stage 5 Strategy Selection	Stage 6 Calculating with Multiples of 10	Stage 6 Two-Digit Numbers: Calculating with Ones	Stage 6 Two-Digit Numbers: Calculating with Tens		
Summer 1	Stage 6 Make the Next Ten and Then	Stage 6 Make the Previous Ten and Then	Teacher decision on use of sessions over period of KS1 SATs					
Summer 2	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	
	Small group gap teaching and consolidation	Whole class gap teaching and consolidation	Small group gap teaching and consolidation	Whole class gap teaching and consolidation	Small group gap teaching and consolidation	Whole class gap teaching and consolidation	Small group gap teaching and consolidation	

■ Number  
■ Sense  
■ Maths

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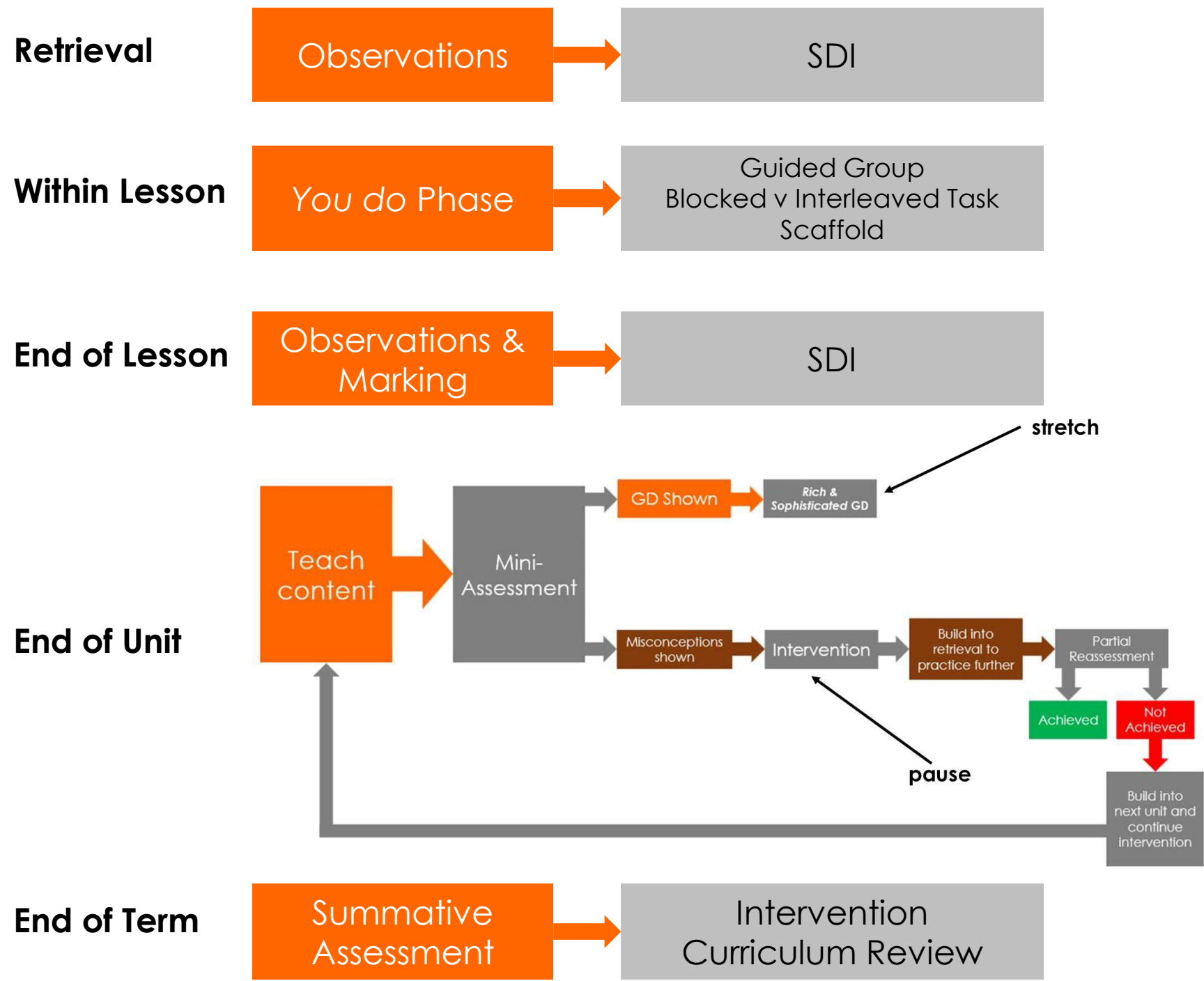
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	Revision of +/- facts	x2, x10, x5	x4, x8	x3	x6	x12
Year 4	Revision x2, x10, x5, x4, x8, x3, x6, x12	x9	x7, x11	Consolidation	Consolidation	Tables Check
UKS2	Multiplication Facts Division Facts Mental Strategies					



# Assessment

*All of our children can be mathematicians!*

# 5 Layers of Assessment



# Within Lesson Assessment

Find the fraction of the amount

$\frac{1}{4}$  of 24

You do

Observe > Form Your Guided Group > Block or Interleaved

1. 

30				
6	6	6	6	6

$\frac{1}{5}$  of 30 = \_\_\_

2. 

24		
8	8	8

$\frac{1}{3}$  of 24 = \_\_\_

3. 

28			

$\frac{1}{4}$  of 28 = \_\_\_

$\frac{1}{3}$  of 12  
 $\frac{1}{3}$  of 24  
 $\frac{2}{5} + \frac{2}{5}$   
 \_\_\_ =  $\frac{1}{4}$  of 16  
 \_\_\_ =  $\frac{1}{8}$  of 16  
 \_\_\_ =  $\frac{6}{7} - \frac{5}{7}$   
 \_\_\_ =  $\frac{1}{8}$  of 80  
 $\frac{7}{10} + \frac{3}{10}$   
 $\frac{1}{6}$  of 42 =  
 \_\_\_ =  $\frac{4}{5} = \frac{4}{5}$

**Basic Fluency**  
Interleaved

1. 

30				
6	6	6	6	6

$\frac{1}{5}$  of 30 = \_\_\_

2. 

24		
8	8	8

$\frac{1}{3}$  of 24 = \_\_\_

3. 

28			

$\frac{1}{4}$  of 28 = \_\_\_

$\frac{1}{3}$  of 12  
 $\frac{1}{3}$  of 24  
 \_\_\_ =  $\frac{1}{4}$  of 16  
 \_\_\_ =  $\frac{1}{8}$  of 16  
 \_\_\_ =  $\frac{1}{8}$  of 80  
 $\frac{1}{6}$  of 42 =

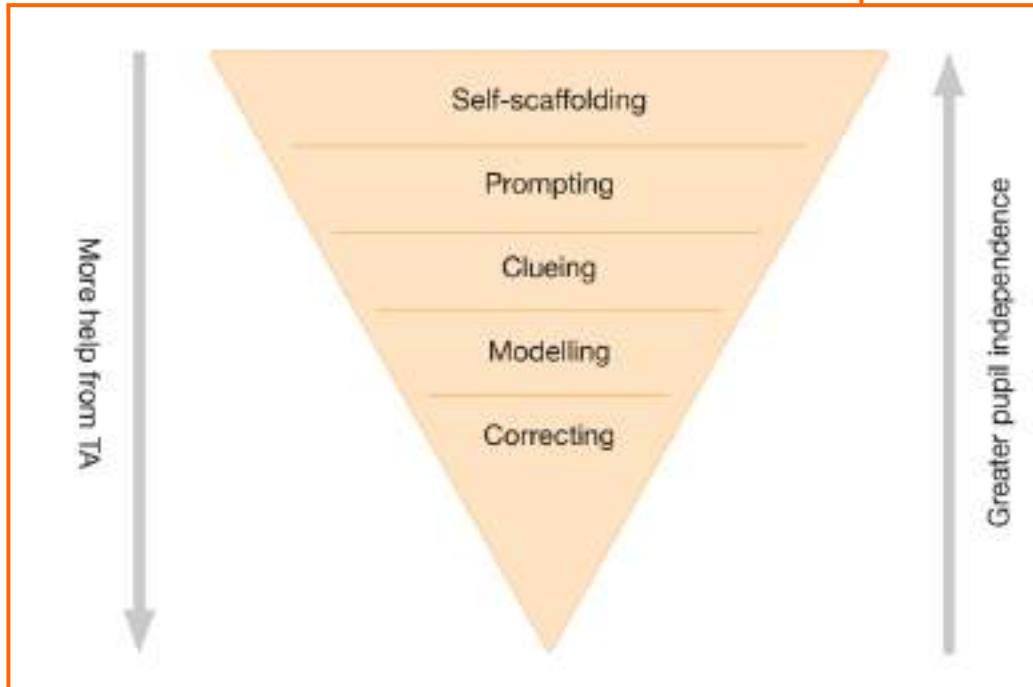
**Basic Fluency**  
Blocked

- After the teaching and modelling process, a 'you do' question - completed independently and matching the full difficulty of the first task - is used to signpost which children will work on the interleaved task and which will work on the blocked task (with support where required).
- This ensures all of the more confident mathematicians are stretched even in their basic fluency.
- This is all based on assessment in the lesson based on 'checks for understanding.'



# End of Lesson Assessment

- Marking that identifies precise misconceptions to create a positive feeling for maths – *lots of what I did was correct!*
- Marking informs **same day intervention (SDI)** so all new learning is built on a secure understanding of previous learning.



Misconceptions matter but don't signpost everything as a misconception!

$$\begin{array}{r} 4 \quad 2 \quad 5 \quad 7 \\ - 3 \quad 1 \quad 5 \quad 4 \\ \hline 7 \quad 1 \quad 0 \quad 3 \end{array}$$

You get maths all wrong!



Draw children's attention to  $\frac{3}{4}$  correct and only  $\frac{1}{4}$  not.

$$\begin{array}{r} 4 \quad 2 \quad 5 \quad 7 \\ - 3 \quad 1 \quad 5 \quad 4 \\ \hline 7 \quad 1 \quad 0 \quad 3 \end{array}$$


- SDI that fosters independence.
- Not just correcting but intervention to secure understanding before the next new learning.

# End of Unit Assessments

**Lingfield**  
Area

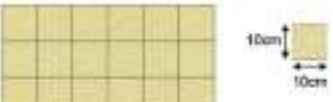
Q16 1: 1 mark  
Q16 2: 1 mark  
Q16 3: 2 marks (including Q16)

1 Match each shape to its area.



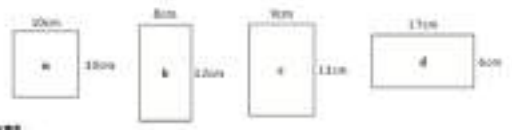
5 squares    8 squares    9 squares

2 Lella is tiling her bathroom. This is what she has tiled so far.



If she adds one more row, how much will she have tiled in  $\text{cm}^2$ ?

3 Order these areas.



smallest    largest


4 Draw two different rectangles with an area of  $12\text{cm}^2$ .

- Allows teachers to identify what children have and have not learnt.
- GDS question to signpost confident mathematicians for 'stretch' lessons decided per unit.
- Informs intervention and 'pause' lessons for those needing further consolidation.
- Allows maths lead to evaluate the effectiveness of the curriculum.

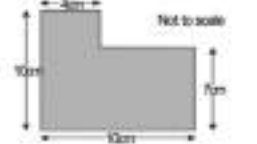
**Lingfield**  
Area

Q17 1: 1 mark  
Q17 2: 1 mark  
Q17 3: 2 marks (including Q17)

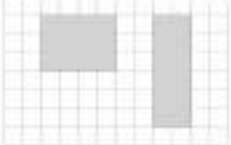
5 Calculate the area in  $\text{m}^2$ .



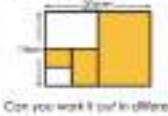
6 Calculate the area in  $\text{cm}^2$ .



7 Sam says these have the same area and perimeter. Explain if he is correct.



8 What area is orange?  
Can you work it out in different ways?



# End of Term Assessments

Lingfield  
Education Trust

Spring Progress Check

Year 4

**Mathematics**

Paper 1: arithmetic

First Name	
Last Name	
Date of Birth	
Year Group	
Teacher	

1  $5609 + 1000 =$

2  $\underline{\quad} = 6072 - 100$

Lingfield  
Education Trust

Page 1

Page 2

Lingfield  
Education Trust

Spring Progress Check

Year 4

**Mathematics**

Paper 2: reasoning

First Name	
Last Name	
Date of Birth	
Year Group	
Teacher	

1

2

Complete the number track.

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Education Trust

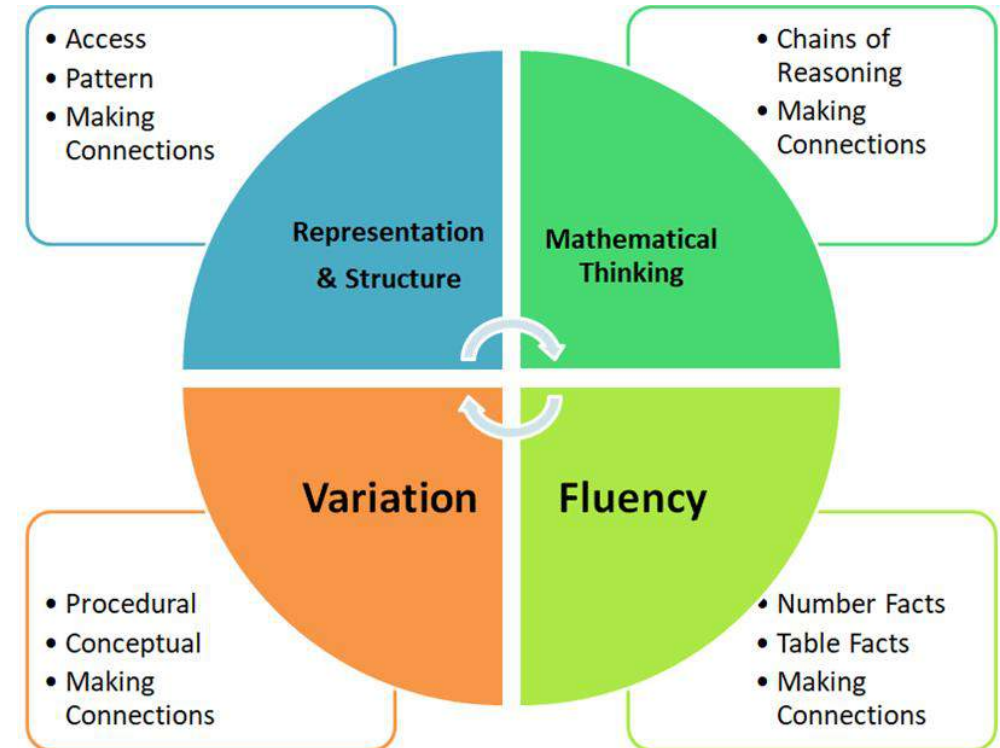
Page 3

- Allows teachers to find out if children: can work on different maths concepts at the same time; can link their maths learning together and solve multi-step and multi-domain problems.
- Allows maths lead to evaluate the effectiveness of the curriculum.

# Pedagogy

*All of our children can be mathematicians!*

# A fusion of the best of the mastery & cognitive science approaches



# Cognitive Load Theory

Cognitive Load Theory is central to our curriculum and lesson design: we know that for our cultural belief - **all of our children can be mathematicians** - to be a lived reality requires that their working memory is not overloaded. Our approach to maths addresses this in several ways:

- Extraneous visual and auditory stimuli are removed where at all possible, for example lesson slides and tasks have only what is required on them and teachers say just what is needed.
- The curriculum is built around small steps.
- Our lesson delivery model (LDM) ensures children are taught key vocabulary and fact fluency before it becomes a barrier in the lesson.
- The LDM is built around a robust *I do, We do, You do* model so children are instructed in small steps.
- Varied fluency and variations are built in once the core concept has been secured using our chosen accessible representations and procedures.
- We never want fact fluency to be a barrier to wider maths competence and therefore we have daily, dedicated fluency sessions for all year groups.
- Likewise, we never want a lack of time to rush fluency or prevent problem-solving, therefore we have dedicated problem-solving lessons to ensure all children can be taught problem-solving, practise problem-solving and independently solve problems – once fluency in an area has been secured.





# Interleaving

To ensure our children are presented with the optimal amount of desirable difficulties our basic fluency tasks are designed with the principle of interleaving in mind.

As children regularly have to come off the lesson content question and attend to some interleaved content, they are constantly having to 'reload memories' of the lesson input – they can't just drop into routine.

For children, who may need further scaffold with the lesson content, we use our *You Do* lesson component to decide which children work on the 'interleaved' task and which work on the 'blocked' task until secure.

Based on research, interleaving is only used in KS2.

## Basic Fluency: long multiplication

- a)  $1111 \times 11 =$
- b)  $\_\_ = 2222 \times 22$
- c)  $3233 \times 23 =$
- d)  $\_\_ = 2233 \times 32$
- e)  $\_\_ = 3234 \times 34$
- f)  $\_\_ = 6806 \times 42$
- g)  $\_\_ = 8786 \times 67$
- h)  $9039 \times 42 =$
- i)  $5678 \times 49 =$

## Basic Fluency: long multiplication

- a)  $1111 \times 11 =$
- b)  $\_\_ = 2222 \times 22$
- c)  $9 \times 4 =$
- d)  $3233 \times 23 =$
- e)  $\_\_ = 2233 \times 32$
- f)  $43 \times 8 =$
- g)  $4315 \times 6 =$
- h)  $40 \times 80 =$
- i)  $\_\_ = 3234 \times 34$
- j)  $\_\_ = 6806 \times 42$
- k)  $3451 \times 10 =$
- l)  $\_\_ = 8786 \times 67$
- m)  $9039 \times 42 =$
- n)  $45.2 \times 20 =$
- o)  $\frac{2}{5} \times 4 =$
- p)  $5678 \times 49$

## Basic Fluency: long multiplication

- a)  $1111 \times 11 =$
- b)  $\_\_ = 2222 \times 22$
- c) A rhombus has  $\_\_$  right angles
- d)  $3233 \times 23 =$
- e)  $\_\_ = 2233 \times 32$
- f)  $4307\text{m} = \_\_ \text{km}$
- g)  $4315 \times 6 =$
- h)  $3.52\text{pm}$  in 24hr time =  $\_\_$
- i)  $\_\_ = 3234 \times 34$
- j)  $\_\_ = 6806 \times 42$
- k) A rectangle measure 24m by 6m what is its perimeter?
- l)  $\_\_ = 8786 \times 67$
- m)  $9039 \times 42 =$
- n)  $\_\_ = 456.2 + 3.986$
- o)  $\frac{2}{5} \times 4 =$
- p)  $5678 \times 49$



# Spaced Retrieval Practice

The simple view of memory tells us that in order for learning stored in the long-term memory to be retained and not decay, it needs to be regularly retrieved from this storage.

To ensure that all of the key learning from our curriculum is retained, we have a systematic plan for spaced retrieval. This means that key knowledge/skills are retrieved on a planned cycle.

We have also allowed research to guide us in terms of who does retrieval, when and how:

- In order for us to know what every child knows, children complete retrieval tasks individually.
- It is the act of thinking that causes retrieval and so children complete retrieval independently – retrieval is more effective than a reminder.
- Our retrieval sessions are separate to our main maths lessons to ensure the narrative flow of lessons is not disturbed as this can increase cognitive load. This also allows us to unpick any misconceptions as the main maths lesson time is not affected.
- Each time a piece of knowledge/skill is retrieved on the cycle, it is brought back using a slightly different prompt thus further strengthening the memory.

To help manage cognitive load with younger children, KS1 are presented with one retrieval question at a time, that they do individually and independently.



Retrieval	
Addition	Fractions, Decimals, Percentages
Subtraction	
Multiplication	Geometry, Measures, Statistics
Division	

# Spaced Learning

Addition/subtraction and multiplication/division table facts are crucial to children enjoying maths and being successful at it. We recognize that typical approaches, which are based around a one-off two-week block of work, are not effective in ensuring all children learn all of these facts to automaticity. The cognitive load is too high.

We have applied the concept of spaced learning to our fact fluency with children developing a deep conceptual understanding that leads to automaticity over a greater amount of time.



Year 2 Yearly Overview								
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	
Autumn 1	Stage 1 & 2 (review)	Stage 3 Books 1 - 3 (review)	Stage 3 Books 4 - 6 (review)	Stage 3 Books 7 & 8 (review)	Stage 3 Book 9 (review)	Stage 4	Stage 3 Stage 4	
	Subitising and partitioning	-One More, One Less -Two More, Two Less -Number 10 Fact Families	-Five and A Bit -Know About Zero -Doubles and Near Doubles	-Number Neighbours -7 Tree 9 Square	Strategy Selection	Ten and A Bit	Gap teaching and consolidation	
Autumn 2	Stage 5 Make Ten and Then: Addition	Stage 5 Make Ten and Then: Addition	Stage 5 Make Ten and Then: Addition	Stage 5 Make Ten and Then: Subtraction	Stage 5 Make Ten and Then: Subtraction	Stage 5 Make Ten and Then: Subtraction		
Spring 1	Stage 5 More Doubles and Near Doubles	Stage 5 More Doubles and Near Doubles	Stage 5 More Doubles and Near Doubles	Stage 5 Adjusting	Stage 5 Adjusting	Stage 5 Adjusting		
Spring 2	Stage 5 Strategy Selection	Stage 5 Strategy Selection	Stage 5 Strategy Selection	Stage 6 Calculating with Multiples of 10	Stage 6 Two-Digit Numbers: Calculating with Ones	Stage 6 Two-Digit Numbers: Calculating with Tens		
Summer 1	Stage 6 Make the Next Ten and Then	Stage 6 Make the Previous Ten and Then	Teacher decision on use of sessions over period of KS1 SATs					
Summer 2	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	Stage 5 Stage 6	
	Small group gap teaching and consolidation	Whole class gap teaching and consolidation	Small group gap teaching and consolidation	Whole class gap teaching and consolidation	Small group gap teaching and consolidation	Whole class gap teaching and consolidation	Small group gap teaching and consolidation	

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	Revision of +/- facts	x2, x10, x5	x4, x8	x3	x6	x12
Year 4	Revision x2, x10, x5, x4, x8, x3, x6, x12	x9	x7, x11	Consolidation	Consolidation	Tables Check
UKS2	Multiplication Facts Division Facts Mental Strategies					

# Direct Instruction & Enquiry

**Direct instruction** using an *I do, We do, You do* model lies at the heart of our system of the transfer of expertise.

New content is delivered through direct modelling in the *I do* phase.

Further expertise is then transferred through the **We do** phase, where teachers and children work together in a scaffolded way on a concept or skills. Rich reasoning questions lie at the heart of this teacher-child phase.

Following this children work collaboratively on the learning with guidelines and roles so that both participants are active learners.

To ensure that staff know whether their teaching has been received by all, or which children may need further support in a guided-group, the **You do** phase is completed before children work independently. We want them to practice and encode success not misconceptions. This is our check.

Based on research we have a discussion component early on in our lesson deliver model (LDM) that allows children to **enquire** and discover – through a clever prompt - what the new learning for the day is and why it is important – we find that children alighting on this themselves is really effective at engaging all learners as they have found their own purpose – something they do not yet know.



*I do*

**We do**

**You do**

# Our Mastery Approach To Maths

## Coherence

- The precise ordering of content in our curriculum, acts as scaffolding for our children in itself.

## Fluency

- Fact fluency is developed within maths lessons but also within additional, daily fluency sessions. In these sessions, a deep conceptual understanding is developed using a range of manipulatives and visual representations. To ensure this leads to automaticity, daily automaticity practice is built into maths lessons and automatic recall is assessed every half-term.
- To ensure our children are truly fluent, our maths lessons are structured in a way that children have to apply their fluency to a range of variations and varied fluency prompts.

## Variation

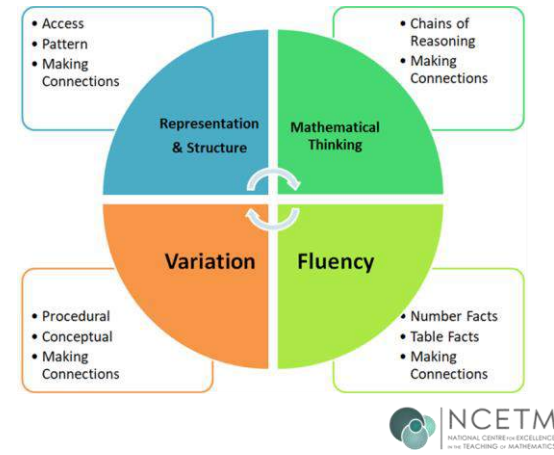
- In order to ensure too much variation early on does not lead to cognitive overload, our lessons are structured in a way that children work on what we decide is the most accessible representation/procedure to initially learn a concept/skill. Immediately after this, children work on a range of variations to strengthen their understanding. This initial 'basic fluency' phase tightly matches the direct instruction and working wall scaffold. The 'varied fluency' phase also allows us to pair this new learning with other areas of maths to build connections, for example comparison questions presented on a bar chart.

## Representation & Structure

- Concrete resources are used to introduce new concepts in each year group of school, as they help children expose the structure of maths, for example our children use a tens frame to see how  $7 + 4$  can be represented as  $7 + 3$  to make a new ten leaving the 1 as a bit for ten and a bit as 11. When manipulatives are first introduced, specific lessons are planned to teach how to actually use the, before they are paired with mathematical content. We also know that for each piece of learning 'concreteness fading' needs to be applied so children can ultimately work without scaffold.

## Mathematical Thinking

- We view reasoning as 'reasoning throughout' not as an end of lesson task. Children are asked to reason throughout maths lessons, including how new learning links to old, reasoning with the precise mathematical vocabulary taught and about how to tackle problems. To ensure all children are taught how to be problem-solvers, practice being problem-solvers and acts as independent problem-solvers, we have dedicated problem-solving lessons when a concept/skill has been secured.

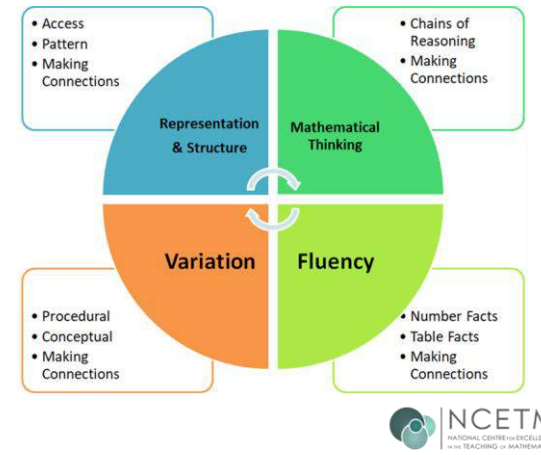




# Fact Fluency – Never A Barrier!

As a school we run a dedicated fact fluency program to support our main maths curriculum to ensure that fact fluency is never a barrier to our children's wider maths development.

These sessions run for 15 minutes daily and embed a deep conceptual understanding of these facts though the use of manipulatives. This is then turned into automaticity using our mental maths/fact fluency starters and half-termly fluency checks. The data from these fluency checks is then used to inform precise, targeted intervention.



## Whole-School Fact Fluency Program

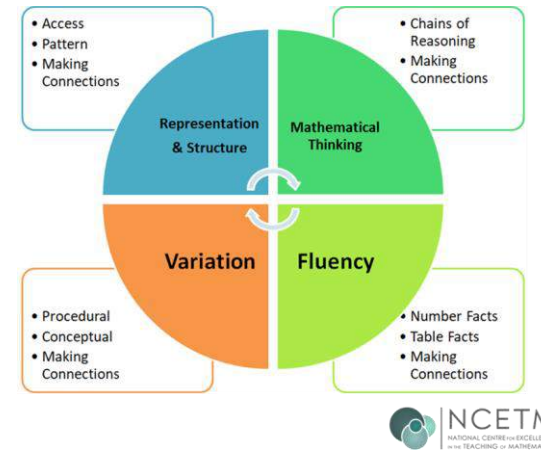
EYFS	KS1		LKS2		UPKS2
Subitising & Number Composition	Addition & Subtraction Tables		Multiplication & Division Tables		All Tables, Scaled Tables, Mental Calculations
Number Sense Mastering Number White Rose FB	Not Bridging 10	Bridging 10	x2 x10 x5 x4 x8 x3 x6 x12	x9 x7 x11	LET Mental Maths Program



# Systematic Teaching of Reasoning

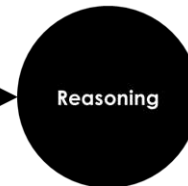
To ensure that our children are proficient in reasoning about mathematics, we have a rigorous, systematic approach:

- Precise mathematical vocabulary is directly taught, practised and applied
- Reasoning prompts are introduced one-at-a-time so children master each before learning new structures. When each is secure, variation in prompts is added.
- Over the course of a week during this learning phase, initial days are build around verbal responses to ensure children can speak it before writing it and then later in the week written responses are worked on.
- The aim is that this systematic approach allows all children to be able to reason effectively in verbal and written form using a range of reasoning structures.



Describing	Explaining	Justifying & Proving	Improving
<ul style="list-style-type: none"> <li>• What do you notice?</li> <li>• What' the same; what's different?</li> <li>• Why is this question harder than that one?</li> </ul>	<ul style="list-style-type: none"> <li>• Odd one out?</li> <li>• Always, sometimes, never?</li> <li>• Explain how to...</li> <li>• What went wrong?</li> </ul>	<ul style="list-style-type: none"> <li>• True or false?</li> <li>• Prove they are right/wrong</li> <li>• Convince me that</li> <li>• Does that rule always hold true?</li> </ul>	<ul style="list-style-type: none"> <li>• Improve given explanation</li> <li>• Improve peers explanation</li> </ul>

Our key reasoning prompts are used to frame discussions in other subjects too. The rationale is that as our children develop comfort and competency with the reasoning sentence frames in other contexts, when they are asked them apply them to novel maths ideas, they only have to use working memory on the maths.

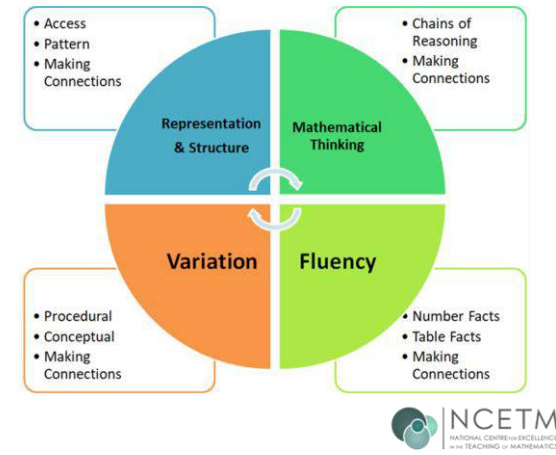


# Systematic Teaching of Reasoning

Monday	Tuesday	Wednesday	Thursday	Friday	Discussion Opener
What's the same? What's different?	What's the same? What's different?	What's the same? What's different?	What's the same? What's different?	What's the same? What's different?	Previously taught and practised reasoning structures are kept fresh and revisited through use in <i>discussion starters</i> . For example, in week 2 what's the same/different can be used.
Odd one out?	Odd one out?	Odd one out?	Odd one out?	Odd one out?	
Always, sometimes, never?	Always, sometimes, never?	Always, sometimes, never?	Always, sometimes, never?	Always, sometimes, never?	
What went wrong?	What went wrong?	What went wrong?	What went wrong?	What went wrong?	
Convince me... is correct/not	Convince me... is correct/not	Convince me... is correct/not	Convince me... is correct/not	Convince me... is correct/not	
Prove that...	Prove that...	Prove that...	Prove that...	Prove that...	
Improve...	Improve...	Improve...	Improve...	Improve...	

Structured **verbal** practice

Structured **written** practice



In the first Autumn Term, we remove variation so we can add it at the right time. Each week a new reasoning structure is taught and practised moving from structured verbal work to structured written work. The next week a new structure is introduced.

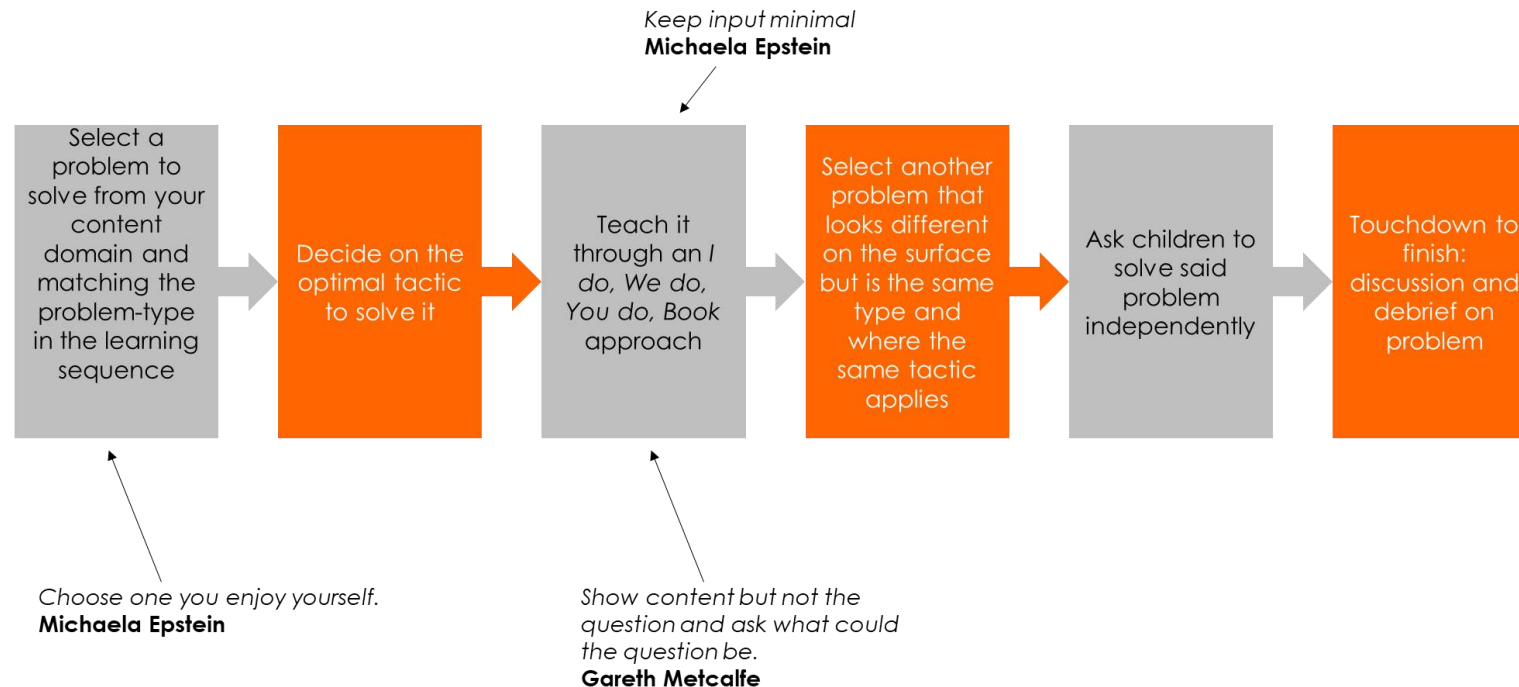
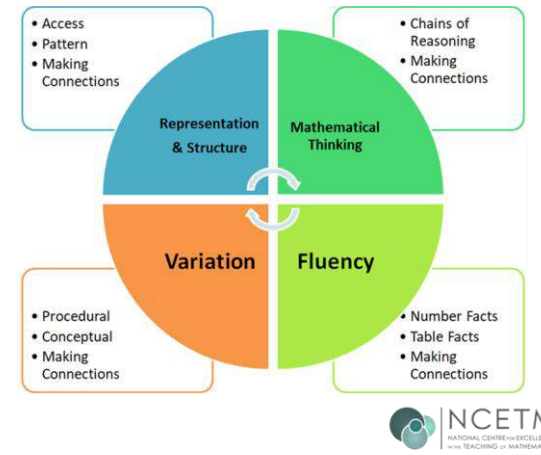
Structures learnt in previous weeks are kept fresh and revisited in the discussion opener of each lesson.

After Autumn Term 1, variation in structures can be introduced at the right time so **all** can do it.

We know a mixed bag from day one will exclude some children who can actually do it!

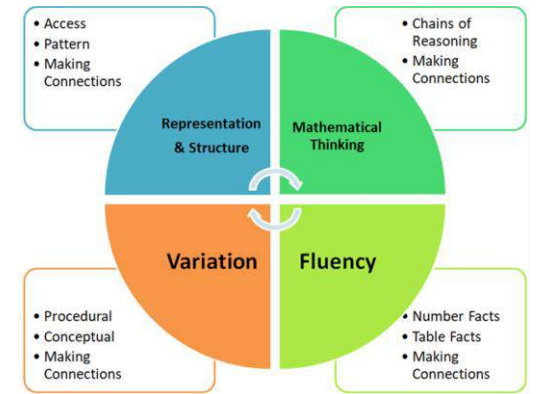
# Direct Teaching of Problem-Solving

- All children are taught a full range of problem-solving skills; all are exposed to a range of problem-types; all practice a range of skills; and all independently apply learnt skills.
- Problem-solving is taught when underlying content is secure.
- We have a specific LDM for our dedicated problem-solving lessons that ensures it is a problem-solving approach for all.
- Problem types are built into learning sequences to ensure children are systematically taught each skill, each year.
- Based on National Curriculum guidance, KS1 children do less problem-solving. Year 1 are introduced to it in Spring and then just one lesson per block is planned for in KS1 to ensure fluency takes precedent.
- As children progress through school they are exposed to a wider range of problem types linked to units of work.
- Alongside this, each year group has one half-termly generic problem-solving skills lessons with the aim being that these skills can then be further applied in content-based problem-solving lessons.



# Direct Teaching of Problem-Solving

Open-ended problems	Real-life word problems	Working backwards	More than one possibility
Problems with multiple steps	All possibilities	Problems with multiple domain content	Investigations
Spotting patterns and rules	Visual Problems	Logic	As a general rule of thumb, a numerical value or values will be the desired outcome.



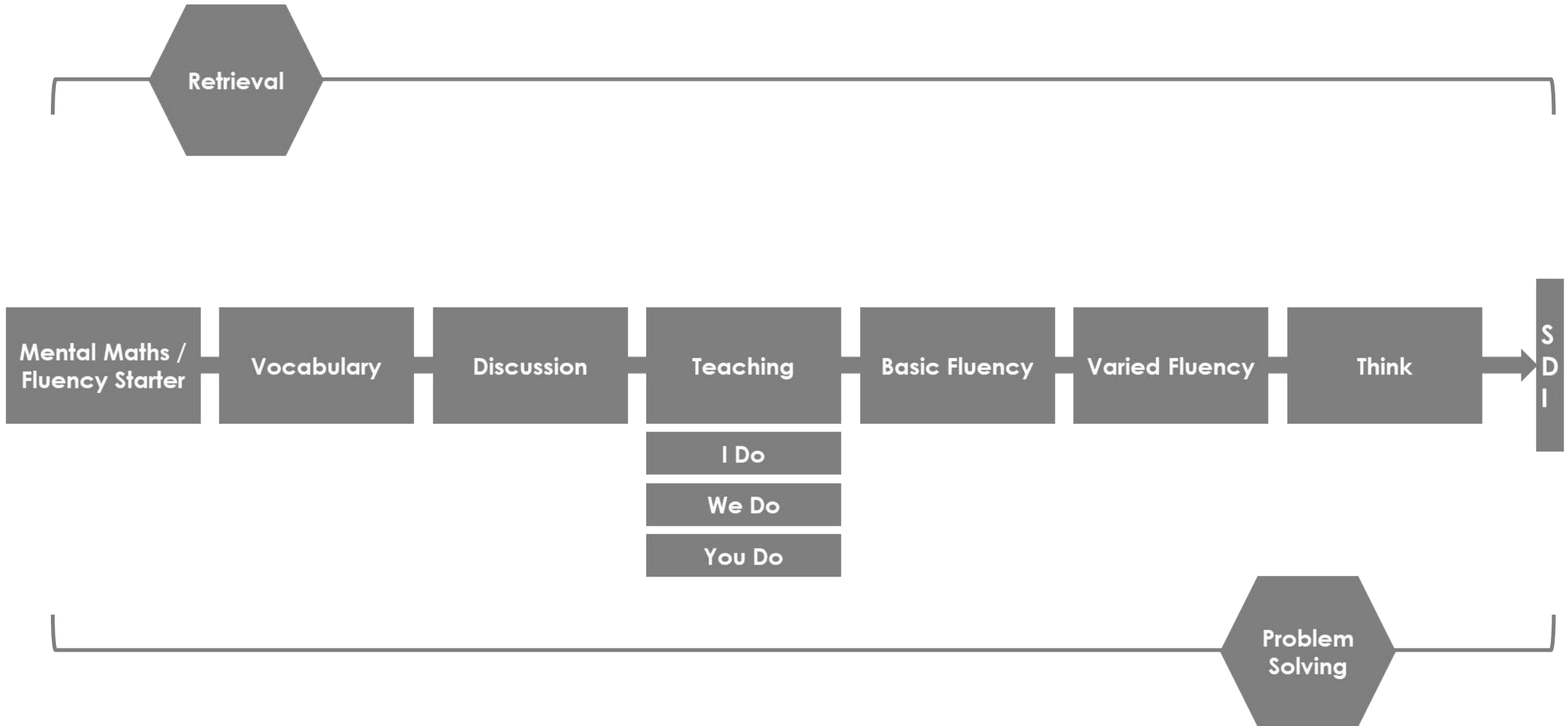
## Problem-Solving Skills

The underlying problem-solving skills to teach are:

- **Term 1:** Trial and Improvement... Resilience
- **Term 2:** Systematic approach
- **Term 3:** Working collaboratively
- **Term 4:** Finding starting points
- **Term 5:** Visualising
- **Term 6:** Conjecturing & Generalising

Y1	Rules & Patterns	More than 1 Possibility	Visual problems	Logic	Real-life Word							
Y2	Rules & Patterns	More than 1 Possibility	Visual problems	Logic	Real-life Word	Working Backwards						
Y3	Rules & Patterns	More than 1 Possibility	Visual problems	Logic	Real-life Word	Working Backwards	Open Ended					
Y4	Rules & Patterns	More than 1 Possibility	Visual problems	Logic	Real-life Word	Working Backwards	Open Ended	Multi-Step				
Y5	Rules & Patterns	More than 1 Possibility	Visual problems	Logic	Real-life Word	Working Backwards	Open Ended	Multi-Step	All Possibilities	Multi-Domain	Investigation	
Y6	Rules & Patterns	More than 1 Possibility	Visual problems	Logic	Real-life Word	Working Backwards	Open Ended	Multi-Step	All Possibilities	Multi-Domain	Investigation	

# Our Lesson Delivery Model That Brings It Together





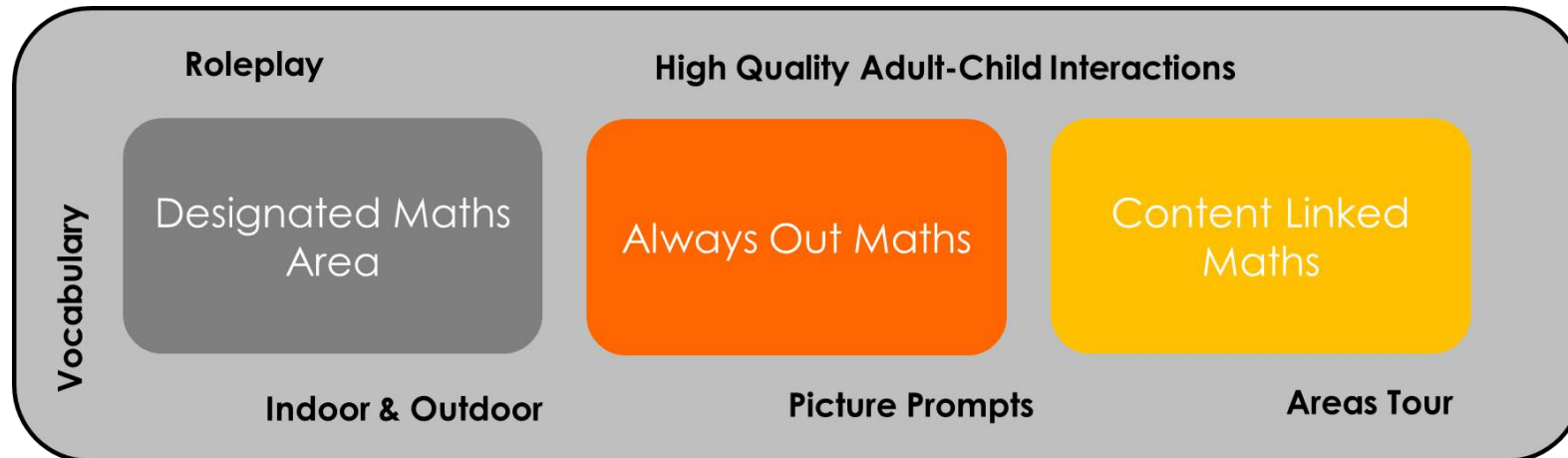
# EYFS

*All of our children can be mathematicians!*

# Maths in EYFS

- Direct mathematical teaching
- Play-based consolidation, intervention and stretch in areas

Mathematical Routines	Mathematical Input	Maths Through Provision (in and out)		Assessment
		Content Linked	Always Out Maths	
<ul style="list-style-type: none"> <li>• Register on five frames</li> <li>• Snacks from 5 frames</li> <li>• Paying for snacks</li> <li>• Tidying up through shadowing</li> <li>• Count in lines</li> </ul>	<ul style="list-style-type: none"> <li>• Subitising starter</li> <li>• Sat in circle</li> <li>• Direct teaching</li> <li>• Discussion</li> <li>• Reasoning</li> <li>• Choral recital</li> <li>• No opt out</li> <li>• Relatively short</li> <li>• <b>Teach how to use areas</b></li> <li>• <i>Master the Curriculum with a daily NS key skills starter in YN</i></li> <li>• <i>WR Maths with a daily NS key skills starter in YR</i></li> </ul>	<ul style="list-style-type: none"> <li>• Defined areas</li> <li>• Engaging, lovely, enticing areas</li> <li>• Activities directly linked to the input some via adult some independent as you have taught the play</li> <li>• Vocabulary on boards for adults</li> <li>• Maths area used for further focus group teaching <b>while others play maths</b></li> <li>• Tracking of areas</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Spatial awareness</i></li> <li>• <i>Sorting</i></li> <li>• <i>Matching</i></li> <li>• <i>Ordering</i></li> <li>• <i>Comparing</i></li> <li>• <i>Patterning</i></li> <li>• <i>Subitising</i></li> <li>• <i>Counting</i></li> <li>• <i>Number composition</i></li> <li>• Picture prompts</li> </ul>	<ul style="list-style-type: none"> <li>• Shared SDI board</li> <li>• Areas Tracking</li> <li>• LET Trust Ready Documents</li> </ul>



- Mathematical play based on unit of work
- Patterning and spatial awareness play always provided



## Mathematics

### Early Years Expectations: *Trust Ready*

#### **Educational Programme:**

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.



***“The learning process is something you can incite, literally incite, like a riot.”***

Audre Lorde



### Early Learning Goal: **Mathematics | Number**

Children at the expected level of development will:

- 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.

### Progression towards the Early Learning Goal

### Progress in other areas of mathematics curriculum – *Trust Ready*

**R+** **By the end of the Summer term children should be able to...** *(Children who are achieving 'Above and Beyond' the summer term expectations would be recorded as **RM**)*

*At all stages of EY development, planned opportunities for 'incidental' learning (deliberately 'dropping in' previous teaching and vocabulary) will support retention of facts and concepts. The focus should be on going wider and deeper (hence there is no 'exceeding' judgement) Where possible, links should be made (Inc. Through 'continuous provision to other prime and specific areas of the EYFS Framework – and to the environment and world in general (some - but not all – links are highlighted in grey below). Number lines/tracks, real-life objects and manipulatives should be used routinely to support scaffolding and modelling. Vocabulary should be consistent and reinforced.*

- Recognise and read numbers to 10 – including when not in order and show that they understand the relationship between them
- Display a deep understanding of the composition of numbers up to 10, (e.g make 10 in different ways and combinations using manipulatives/objects)
- Display accurate 1:1 correspondence to 10 using concrete apparatus - then visually
- Confidently count to 10
- Match numeral to quantity up to 10 – inc. out of sequence
- Subitise to 5 (conceptually and perceptually)
- **To understand 1 more and 1 less for numbers to 10 (A)**
- Mentally recall number bonds up to 5 without apparatus and up to 10 (with apparatus if needed)
- Calculate addition bonds and subtraction facts to/within 10 using apparatus and/or number track if needed (i.e. by using 2 sets of objects) – link to 1:1 correspondence
- **Know that addition and subtraction are related (practically through the language of parts and wholes)**
- **Mentally, quickly recall all doubles to 5 (i.e. double 1, 2, 3, 4, 5) (C)**

- Make sensible estimates within 10 and beyond using subitising if possible or counting to check
- **Use the vocabulary (link to C&L) of addition and subtraction in practical contexts and in discussion – part, whole, altogether, take away, more than, less than to 10 including the comparison of quantities (E)**
- Recognise numerals of personal significance (i.e. age, number in family, numerals on clocks, door numbers, etc),
- Know which month/day comes before/ after a given month/day **(F)**
- Understand largest, most, smallest, least, fewest and numbers beyond 10—'**Order and compare 3 objects according to length, height, mass (G)** link to SSM
- Form the digits 0-9 accurately
- Introduce writing the digits 0 – 9 in squares (Year 1 ready)
- **Recognise the verbal abbreviation for ordinal numbers and relate this to date of own birthday (e.g 9<sup>th</sup> of May), months of year 1<sup>st</sup>, 2<sup>nd</sup>- and finishing positions in a race. Link to SSM)**
- **Link ordinal numbers to months/days of week - 1<sup>st</sup> 2<sup>nd</sup> (K) ...link to SSM**
- Subitise beyond 5 (conceptually and perceptually) – dots on a dice, numicom piece, ten-frame, pebbles, etc,

**R= By the end of the Spring term children should be able to...**

- Recognise and read numbers to 8 including when not in order with the aid of a number track, picture clues
- Accurately use 1:1 correspondence with concrete and visual resources to 8
- Know that anything can be counted eg. claps, drum beats... to 8
- Count an irregular arrangement to 8
- Match numeral to quantity to 8
- Display a deep understanding of the composition of numbers up to 8 e.g make 8 in different ways (with concrete aids) (use manipulatives e.g 10 frames and double sided counters, numicom (including over lapping), unifix, part whole model
- Become more confident with the part whole model for numbers to 8
- Find 1 more and 1 less using numbers to 8 (A) – compare using manipulatives and number tracks (links to 'Number Patterns – compare quantities up to 10) (E)
- Mentally recall addition bonds up to 5 through the language of part whole
- Mentally recall subtraction facts up to 5 through the language of part whole
- Find number bonds up and including 6, 7 and 8 (using concrete aids to help)
- Explore that addition and subtraction are related (practically through the language of part whole) (D)
- Subitise (perceptual) to 5- dots on a die, numicom piece, ten-frame, real objects
- Recognise doubles up to 4 (double 1, 2, 3, 4) concrete aid or fingers (within composition) (C)

- Make sensible estimates using subitising within estimating number of pebbles, conkers, (link to UtW), etc.)
- Begin to use the vocabulary (link to C&L) of addition and subtraction in practical contexts and in discussion – part, whole, altogether, take away, more than, less than to 8 inc. comparison of quantities (E)
- Begin to use ordinal numbers first, second ... tenth in real life situations (eg. race results/ days of the month) (K) (SSM)
- Understand largest, smallest & number in-between up to 8 no. track
- Form the digits 0-8 accurately
- Say number sequences within 10 - forwards and backwards eg 4,5,6,?? 7,6,5 ??
- Explore the language of halves e.g cut the fruit,

**R- By the end of the Autumn Term children should be able to...**

- Recognise and name numbers 0 to 5 – when not in order
- Counting: 1:1 correspondence to 5 - how many?
- Counting: 1:1 correspondence to 5 – give me?
- Know that anything can be counted (to 5) claps, drum beats...
- Count an irregular arrangement to 5
- Understand that zero means nothing
- Match numeral to quantity to 5 – concrete and visual
- Display a deep understanding of the composition of numbers up to 5 (use manipulatives e.g 5 frames and double sided counters, numicom (including over lapping), unifix, part whole model
- Explore the concept of wholes and parts using objects, quantities and numbers within numbers
- Find 1 more and 1 less numbers to 5 (A) – using concrete and number track (not no. line at this point)
- Find number bonds to 2, 3 and 4 (using concrete aids to help)
- Subitise (perceptual) to 4 - dots on a die, numicom piece, ten-frame, real objects
- Recognise doubles 1 and 2 concrete aid or fingers (within composition)

- Begin to understand and use ordinal numbers first, second – in real life situations (eg. race results/position in queue) (K)
- Know that a pair means two
- Understand and find pairs of socks, gloves, legs ... (practically using the vocabulary same/ different) UtW
- Order and compare sets of numbers and quantities/objects up to 5 (UtW)(E)
- Understand largest and smallest numbers within 5 using practical/visual aids e.g no. track
- Form the digits 0 to 5 accurately
- Understand and use directional language - forwards, backwards, turn around, on top, underneath, next to. Drip Feed





## Early Years Expectations: *Trust Ready*

### Mathematics | Numerical Patterns



#### Early Learning Goal: **Mathematics** | Numerical Patterns

Children at the expected level of development will:

- Be able to verbally count beyond 20, recognising the patterns 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 odd and even numbers, double facts and how quantities can be distributed equally

#### Progression towards the Early Learning Goal

#### Progress in other areas of mathematics curriculum – *Trust Ready*

**R+** By the end of the Summer term children should be able to... *(Children who are achieving 'Above and Beyond' the summer term expectations would be recorded as RM)*

- Count by rote from 0 forwards to 20 and beyond
- Count by rote forwards in 1s from any number to 20 and beyond
- Compare and order a variety of quantities up to 10 recognising greater than, less than and the same as in practical context (inc. quantities) (E)
- Understand and use the vocabulary more, most, fewer, less than and equals, the same as with quantities up to 10 (E)
- Instant recognition of odd and even numbers to 10 represented by structures e.g dots, even numbers always have a partner/pairs (made visible)

- Count to/back in 1s from 20 – count people onto/off a queue/ add/take away single objects
- Pronounce teen numbers correctly – sixteen not sixty

#### SSM

- Chant the months of the year by heart (J)
- Begin to link ordinal numbers to each month (K)
- Know which day and month comes before/ after a given day and month (F)
- Name the four seasons
- Becoming aware of the analogue clock counting around the clock to 12 and recognise and read o'clock times
- Becoming aware of the language associated with time (long hand, short hand, hour, minutes, clock, watch)
- Compose and decompose shapes. children recognise a shape can have other shapes within it, just as numbers can
- Classify and sort objects according to a criteria and begin to sort objects using own criteria (H)
- Continue given repeating patterns (sound, colour, shape, objects) link to UtW
- Create own repeating patterns using UtW
- Order and compare 3 objects according to length, mass, capacity (G)
- Understand and use the vocabulary longer, taller, wider, shorter, narrower, heavier, lighter, deep, shallow (UtW)
- Recognise and calculate using coins – 1p, 2p, 5p, 10p, 20p

#### Both Number and Numerical Patterns ELG

- Know that addition and subtraction are related to 5
- Automatic recall of doubles to 5 (double 1,2,3,4 & 5)(C)

**R=** By the end of the Spring term children should be able to...

- Count in 1s forwards to 20 – visual aid
- Count forwards in 1s from any number (to 20) – visual aid
- Count back in 1s from 20– visual aid
- Say the number before and after to 10 - visual aid
- Compare a variety of quantities up to 5 recognising more/greater than, fewer/less than and the same as (E)
- Understand and use the vocabulary more, most, greater than, fewer, less than and equals, the same as with quantities up to 5 (E)

- Instant recall +1 -1 numbers to 20 – visual aid (A)
- Pronounce numbers correctly with support – copy me

#### SSM

- Chant the days of the week
- Know there are 7 days in a week
- Know which day comes before/ after a given day
- Know which days are the weekend
- Know what day it is today, yesterday, tomorrow
- Chant the months of the year with support (J)

- Explore odd and even numbers to 8 (represented by structures) recognising and discussing the patterns e.g odd numbers there's always one left out and even numbers always have a partner

#### Both Number and Numerical Patterns ELG

- [Explore that addition and subtraction are related \(practically through the language of part whole\) \(D\)](#)
- [Doubles to 5 concrete aid or fingers \(C\)](#)

- Know which month your birthday is in
- Understand general time of day and chronology of day in school and at home (develop vocab: *morning, lunch, tea, hometime, bed* etc)
- Understand position through words – eg. “The bag is under the table,” – with no pointing (under, on top, next to, behind, in front) (PDev – PE – move under)
- Name and describe common solid shapes cube, cuboid, Use the language solid, face, edges
- Sort objects using two criteria e.g Sort solid shapes straight edges, curved edges
- Find something bigger than, smaller than, taller than, shorter than, heavier, lighter, deeper...[link to UtW](#)
- Find something the same size, equal to (length, weight, capacity) [link to UtW](#)
- Continue a simple repeating pattern e.g red, blue, red ... apple, banana, apple ...
- Notice and correct an error in a repeating pattern
- To talk about money using the terms, pennies, pence, change, amount
- To read price tags in role play shop up 1p, 2p, 5p,10p

#### R- By the end of the Autumn Term children should be able to...

- Count by rote forwards and backwards to 10 – visual aid
- Hold fingers up correctly for each number to 10
- Count on and back in 1s from any number to 10 – visual aid and fingers
- Know by heart the number before and after numbers to 5
- Chant rhymes involving numbers e.g 1,2 buckle my shoe...

#### SSM

- Chant the days of the week with support
- Begin to know what day it is today
- Begin to know what day it is tomorrow
- Sort objects using a given criteria e.g big, small, heavy, light ([link to UtW](#))
- Name and describe common flat shapes circle, square, rectangle, triangle
- Use the language flat, sides and corners
- Classify and sort objects into sets according to given criteria, areas in classroom with labels, block area, pencils into colours, buttons e.g colour, shape, holes in centre,
- Copy a given pattern (sound, colour, shape, objects - ) e.g clap, clap, click... red, blue, red ... apple, grape, orange... square, triangle, square ... ([link to UtW](#))
- Use templates/ stencils as patterns to produce an identical image e.g draw around stencils and templates
- Copy given pictures/patterns from resources (both natural and manmade e.g conkers, twigs, leaves, inset shape patterns, block area make a model from given picture([link to UtW](#))
- Understand position through words and real scenarios, pictures – for example, “The bag is under the table,” (under, on top, next to, behind, in front) [link to PD](#) (PE – ‘[under the bench/on top of the mat](#) –)
- Discuss simple routes – forwards, backwards, turn, corner (outdoor provision)
- Begin to describe a sequence of events, real or fictional, using words such as ‘first’, ‘then..
- Pay for items in role play shop using pennies
- Know that coins are collectively called money and we spend them, **save them**



## Area of Learning : Mathematics

Summer Term N2 (N2+)

By the end of the Summer term N2 children should be able to...

- **Subitise up to three objects (fast recognition without counting)**
- **Recite numbers past 5 by rote and with visual aid e.g number line with picture to match each numeral**
- **Recognise that each counting number is one more than the one before – visual aid including the idea of a staircase in ones**
- **Count back from 5 to 0 by rote**
- **Hold fingers up correctly for each number to 5 when counting orally**
- **Count on in 1s from any number up to 5 – visual aid and fingers**
- **Be able to say the number before and after a given number to 5 – visual aids**
- **Chant rhymes and songs involving numbers to 5 and beyond, e.g., 1,2,3,4,5 once I caught a fish alive**
- **Recognise numerals 0-3**
- **Counting one-to-one correspondence to 3 – how many? (1:1 principle)**
- **Counting one-to-one correspondence to 3 – give me? (1:1 principle)**
- **Know that the order in which objects are counted doesn't affect the total e.g left to right or right to left ... (order irrelevance principle)**
- **When counting objects, Say one number for each item in order e.g 1,2,3 ... (stable order principle)**
- **Know that the last number reached when counting a small set tells you how many there are (cardinal principle)**
- **Know that anything can be counted to 3, for example drum beats, claps, pictures in a book, large objects and tiny... (Abstraction principle)**
- **Link numerals and amounts to up to 3 by matching objects to the number**
- **Experience the language of zero meaning nothing through play and every day practical activities, e.g., *there are no oranges left in the bowl***
- **Display an understanding of the composition of numbers to 3, for example  $1 + 2$ ,  $0 + 3$ ,  $1+1+1$  with objects**
- **Begin to add and subtract using practical resources to 3, with practitioners modelling the language e.g., *add, altogether, total, is the same as, subtract, take away, how many left, more and less, bigger and smaller***
- **Solve real world maths problems with numbers up to 5 – e.g., *there are 4 children and 3 chairs – how many more chairs do we need?***
- **Begin to understand ordinal numbers in real-life situations: first, second ...**
- **Order and compare a set of numbers 0-3, and explore the language more and fewer with objects and quantities**
- **Match items to small numbers in the environment e.g 5 pencils in the pot, 3 glue sticks ... picture clues**
- **Make pictures and patterns (e.g., in sand or paint) using key mathematical resources, including: numicon, counters, 10-frames and cubes**
- **Be able to recognise and name numicon pieces for 1, 2, 3,4 and 5**
- **Say some common shape names, e.g., circle, square, rectangle, triangle**
- **Talk about and explore 2D and 3D shapes using informal language – sides, corners, straight, flat, round**
- **Enjoy partitioning and combining shapes to make new shapes, e.g., circle, square, rectangle, triangle, heart, star, diamond**
- **Sort shapes by a given criteria, for example *circles here, straight sides in here – use a variety of sized shapes***
- **Understands and uses the language of position, e.g., on, inside, next to, under, over, in front, behind through play, for example a doll's house or garage**
- **Create their own spatial patterns showing some organisation or regularity**
- **Make models in the block area and respond to practitioners using the vocabulary can you make it taller? Shorter? Longer?**
- **In meaningful contexts, find the longer or shorter, heavier or lighter and more/less full of two items**
- **Recognise and discuss patterns on clothes, in nature and in the environment, e.g., stripes, spots, checks, etc**



- Notice and correct an error in a repeating pattern – show AB patterns correct and incorrect
- Recall a sequence of events in everyday life and stories
- Show an awareness of a sense of time, e.g., morning, afternoon, evening and night-time
- Begin to sing days of the week – begin to understand yesterday and tomorrow

#### Spring Term N2 (N2=)

By the end of the Spring term N2 children should be able to...

- In preparation for subitising, play games with a dice and dominos
- With support name numicon pieces to 5 whilst printing in sand or paint
- Recite numbers up to 5 and beyond with support - Adult to model counting at all times in the school day, for example lining up, giving out fruit...
- Begins to point, touch or move each item, saying one number name for each item - 1, 2, 3 (stable order principle) whilst playing
- Begin to recognise numbers which are familiar to themselves, e.g., their age... Have visual number lines on display and begin to refer to them. How old are you 3? 4? Can you find the number 3? ...
- Chant rhymes and songs involving numbers, e.g., *five speckled frogs*
- Show fingers for numbers to 5 with support whilst counting or singing number songs
- Becoming familiar and aware of (through play) the key mathematical resources, including: numicon, counters, tens frames and cubes
- Compare two small groups of objects, saying when there are the same number of objects in each group, e.g., 'You've got two, I've got two. Same!'
- Play with and begin to name some common shapes, e.g., name circle, square
- Respond to both informal and common shape names, e.g., find something pointy, twisty, wiggly, bumpy, heart, star, flower, straight, wavy, bent
- Classify and sort shapes by a given criteria, for example *big circles and small circles*
- Classify and sort classroom objects according to a given criteria, e.g., put the books in the book area, cars in the basket ...
- Begin to understand and respond to the language of position, e.g., on, inside, next to, under, over, in front, behind - playing with practitioner and following instructions
- Show an awareness of what's happening now and what is happening next through every day activities, getting dressed – first socks then shoes
- Create and extend AB patterns, e.g., stick, leaf, stick... red, blue, red ... movement patterns clap, stamp ...

#### Autumn Term N2 (N2-)

By the end of the Autumn Term N2 children should be able to...

- Shows an interest in numbers through games and playful activities
- Begin to say the number names, some of which are in the right order (rote counting)
- Begin to count on their fingers to 3
- Compare amounts saying which has more or the same
- Listen and enjoy number songs and rhymes – join in with some parts e.g finish the line of song, fill in missing parts
- Explore how things look from different viewpoints including things that are near or far away
- Explore differences in size, length, weight and capacity – which one is longest? Heaviest? Full? Empty?
- Predict, move and rotate objects to fit the space or create the shape they would like (inset puzzles and pattern blocks)
- Begin to understand some talk about immediate past and future – before, now and next
- Join in with simple patters in sounds, objects, games, stories, dance and movements, predicting what comes next

#### N1 (N1+)

By the end of the Summer Term N1 children should be able to...

- Listen to, enjoy and begin to sing counting songs - such as '10 Green Bottles', '1, 2, Buckle My Shoe' and '1, 2, 3, 4, 5, Once I Caught a Fish Alive' – as a means to develop early counting
- Join in with listening to books and stories involving numbers, for example *My Three Book*, and join in with naming numbers in the book
- Talk about numbers around them, for example from door numbers, and begin to know that numbers are part of everyday life
- Say some counting words, engaging in counting-like behaviour, making sounds and pointing or saying some numbers – possibly in sequence

# CPD

*All of our children can be mathematicians!*



We apply the mastery approach to our staff CPD to model ensure all teachers are as skilled as possible to teach maths. All staff means SLT, teachers and support staff!

