Maths Workshop

10th October 2023

Aims of the morning

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General Maths Overview

02

Overview of Maths at St Anne Line Infants

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How we teach maths

04

How you can help at home.

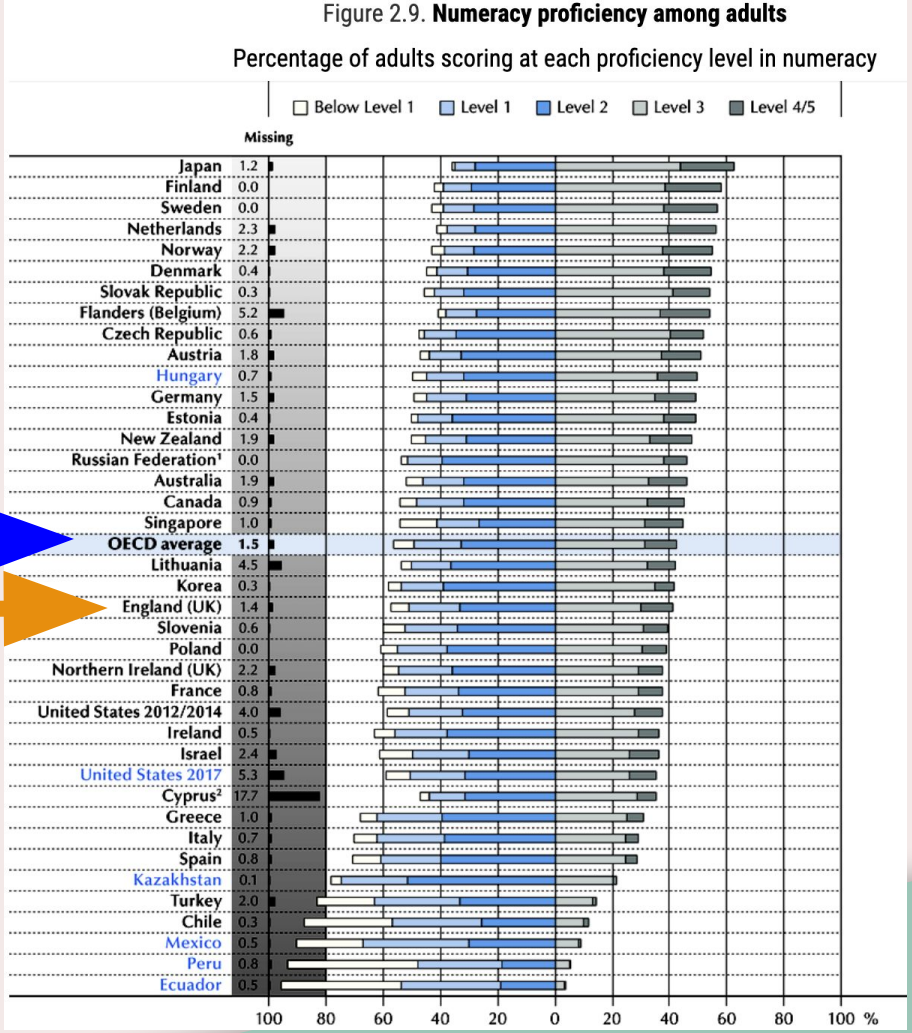
01

General maths overview

Government Focus

The curriculum of 2014 was one of the ways to address the UK being 3rd from the bottom.

England has improved however are still below the average (blue arrow)



Government Focus

Rishi Sunak has set up an advisory committee of education leaders and business representatives.

Recently, it has been announced that all children are to study mathematics until they are 18 years of age.

Essex Local Authority have announced this year will be "The Year of Maths."

National Curriculum

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

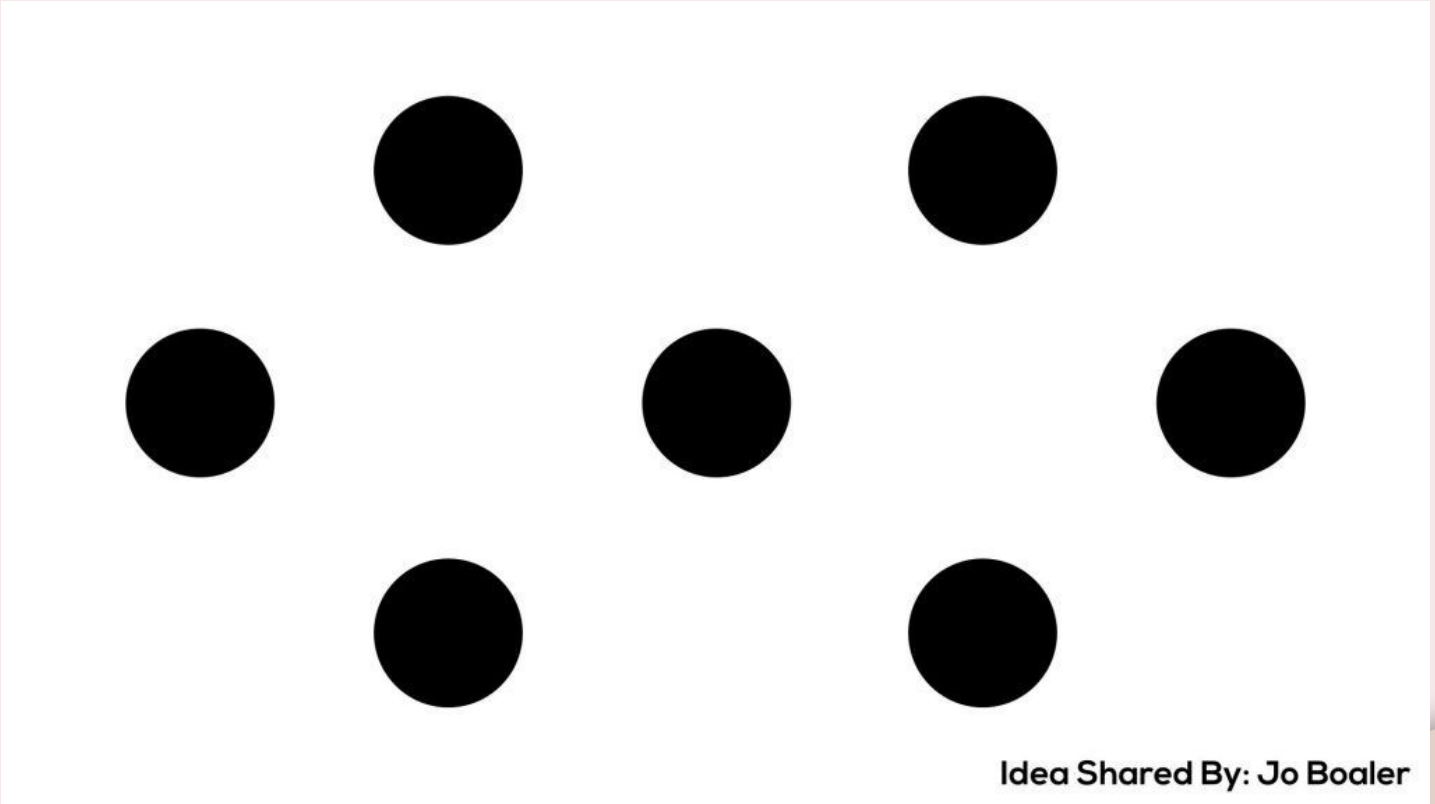
What does it mean to be fluent?

- **Fluency is the "quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics." (NCETM, 2017)**

02

Overview of Maths at St Anne Line Infants

What do you see and how do you see it?



Our goals

For children to enjoy maths

For children to feel confident with maths

For children to be fluent with number

For children to problem solve and reason

OECD & PISA worldwide studies

3 areas identified as key to economic success:

1. literacy – the ability of understand and respond appropriately to written texts;
2. numeracy – the ability to use numerical and mathematical concepts;
3. problem solving in technology-rich environments – the capacity to access, interpret and analyse information found, transformed and communicated in digital environments.

Our Maths Curriculum

We have engaged with the NCETM (National Centre for Excellence in Teaching Mathematics) for the last 3 years.

This teaching and learning approach is based on research from maths successful countries along with scientific research about the brain, learning and cognition of maths.

Our Maths Curriculum

We use the prioritisation curriculum, whilst the whole national curriculum is covered, certain units identified by the Department for Education are given more time. This means children:

- can all master the foundations before moving forwards which prevents misconceptions developing and struggling later on.

- gain a greater depth of understanding (mastery).

Early Years Maths

In Reception the children have 2 daily maths sessions.

- NCETM lessons supported by Numberblocks videos
- Mastering Number, exploring manipulatives and models

The environment:

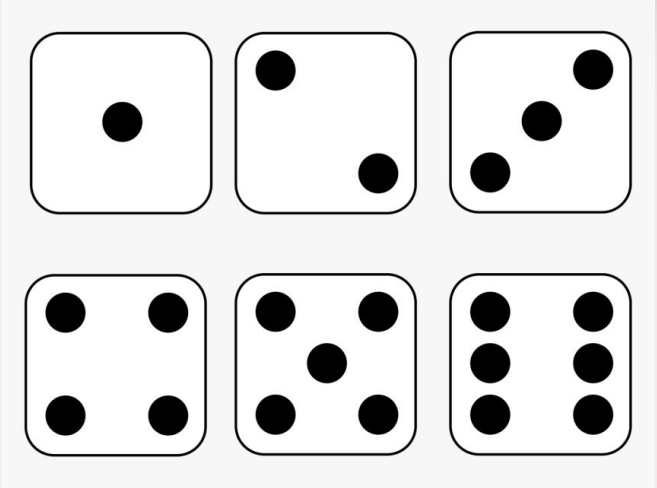
- Access to maths resources all year round inside & outside
- Highly trained staff (by NCETM Early Years Specialists)

The children can apply their maths in real world scenarios through their play, e.g keeping score, setting the table in the home corner, making models with 3D boxes.

Early Years Maths

The children begin their maths journey by learning to subitise and gaining a secure understanding of the value of a digit/amount.

Subitising is the ability to recognise an amount without counting and see how an amount is made. This skill is important later to support calculations.



R: 5 is made of 2 and 3
Yr1: 15-3=12
Yr2: 50-20=30 or 65-12=53

Our Maths Curriculum

Place Value	First block of the academic year	To give children fluency foundations for the calculation units which follow the rest of the year.	Through maths mastery teaching
Measures	Taught through calculation blocks in addition to discrete blocks in spring and summer term	To give children variation and conceptual understanding of calculation as well as measures.	Through maths mastery teaching
Key Instant Recall Facts (KIRFS)	Taught through place value & calculation units Free Minutes – e.g lining up, before home time, early morning work	To give children fluency of facts to enable them to calculate efficiently.	Rehearsal - memorization is expected Playful Practice – games & puzzles As homework each half term
Problem Solving & Reasoning	In every maths lesson (depending upon pace of small steps)	To ensure our pupils have skills needed for future economic success (OECD) Deepen pupils understanding Pupils enjoy maths creatively	Modelled & Guided problem solving Playful Practice – games & puzzles LTHC approach including 'neriage' (reasoning) Teacher as Facilitator

03

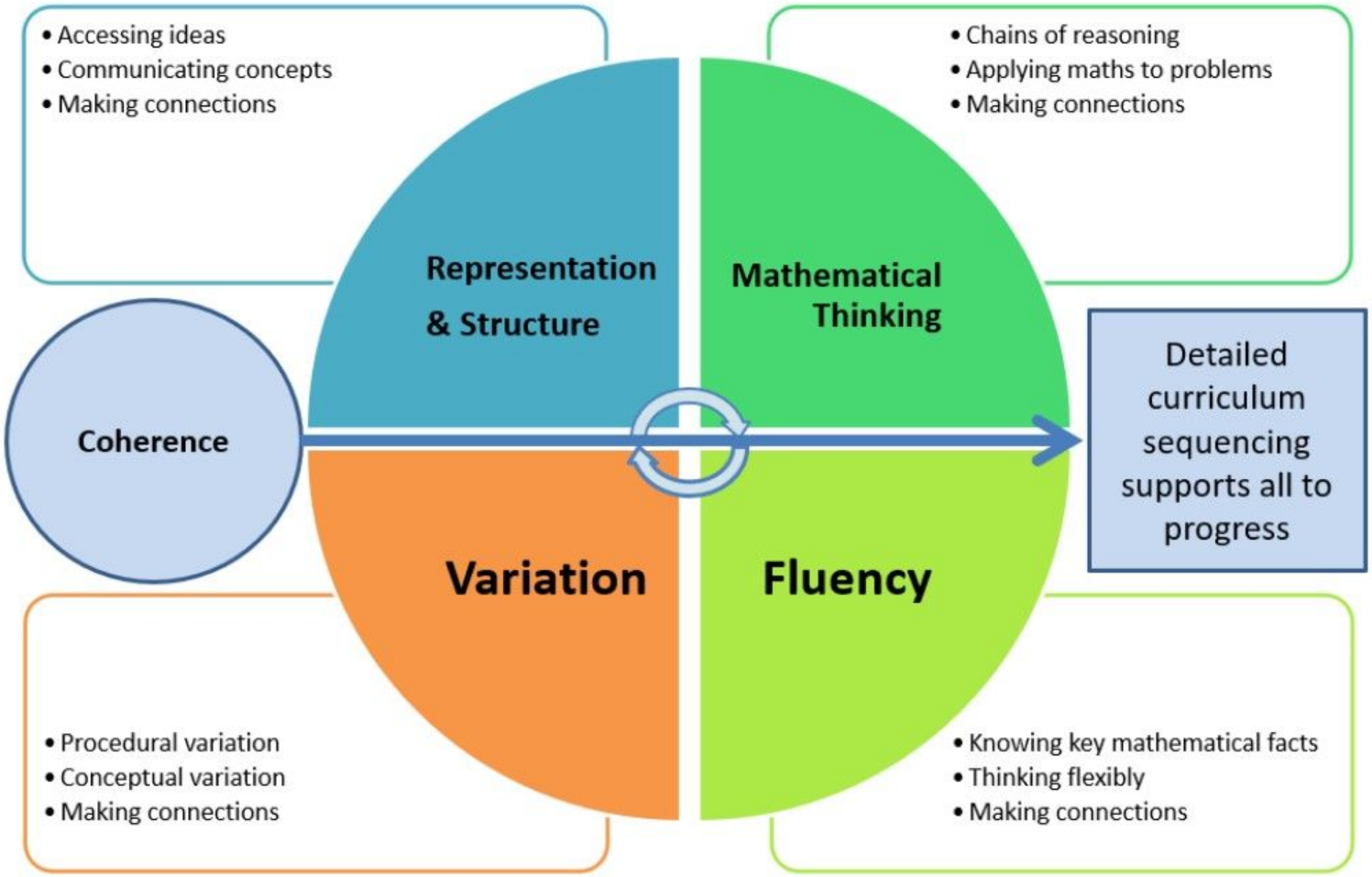
How we teach maths

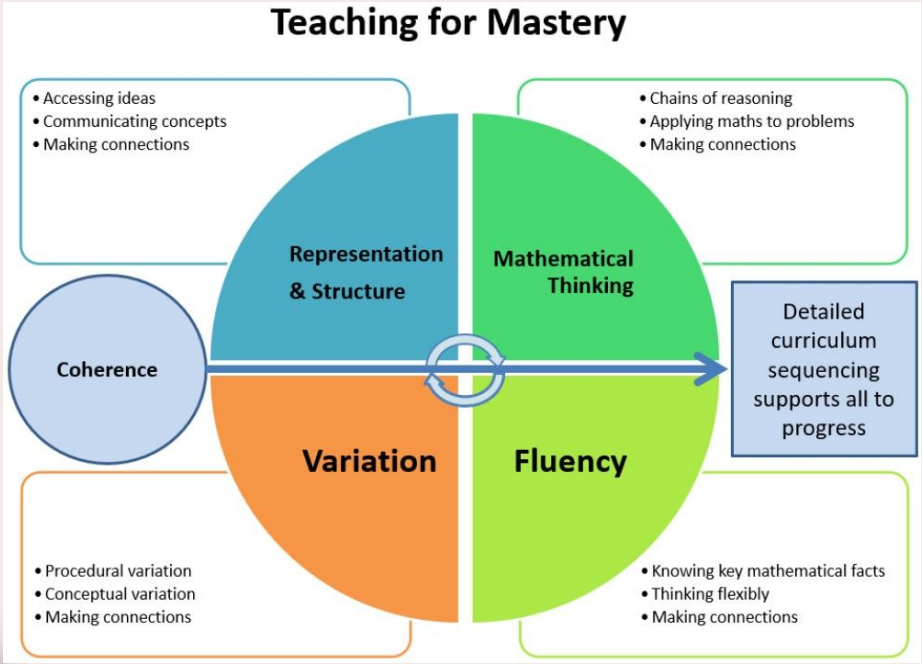
Research Says:

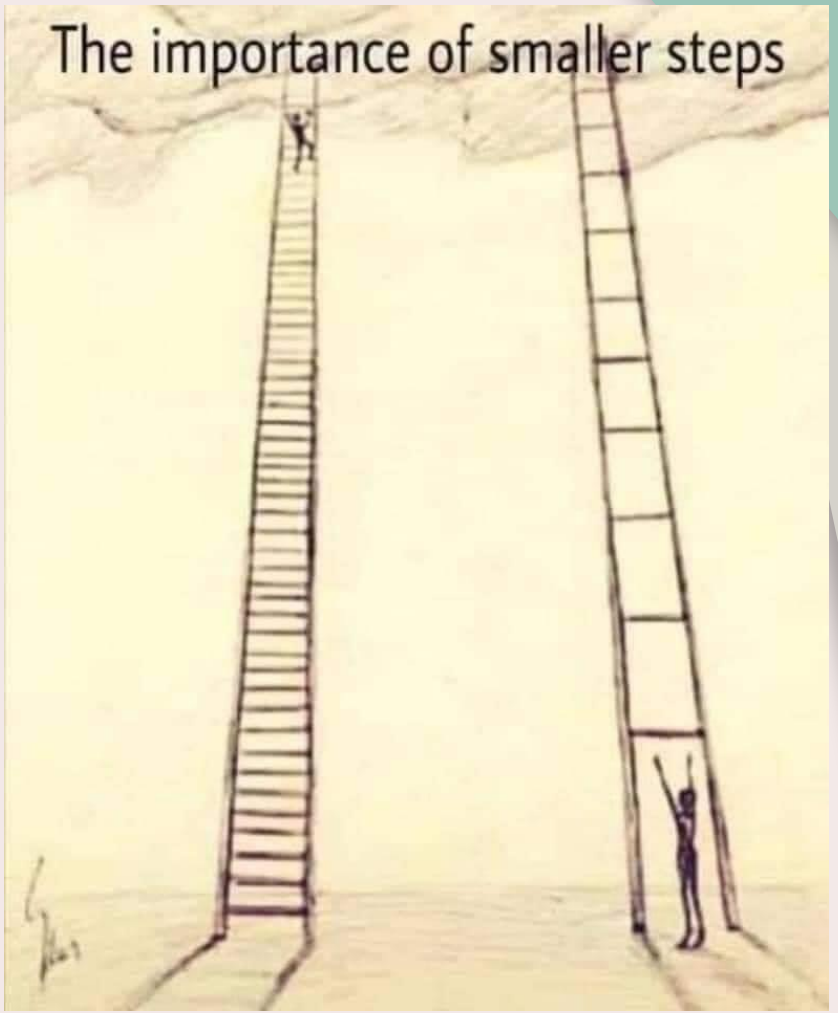
People are most successful with learning by following a 3 step process:

Concrete	→	Pictorial	→	Abstract
Hands on	→	Images/Diagrams	→	Apply knowledge to something new

Teaching for Mastery



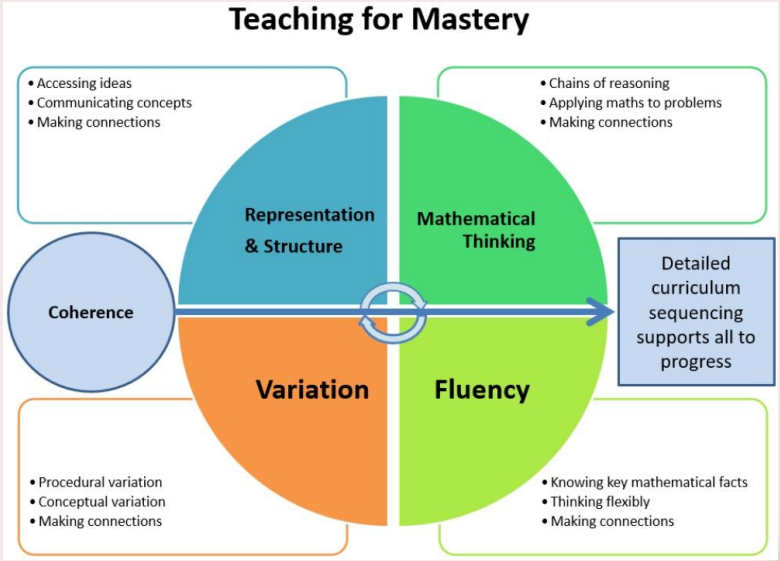

Teaching for Mastery
• Accessing ideas
• Communicating concepts
• Making connections
• Chains of reasoning
• Applying maths to problems
• Making connections
Representation & Structure
Mathematical Thinking
Coherence
Detailed curriculum sequencing supports all to progress
Variation
Fluency
• Procedural variation
• Conceptual variation
• Making connections
• Knowing key mathematical facts
• Thinking flexibly
• Making connections


The importance of smaller steps

Manipulatives

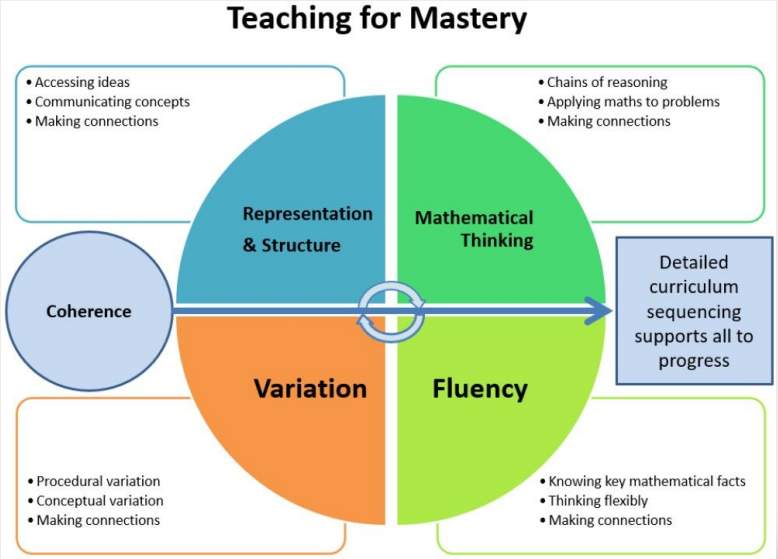
There are key pieces of equipment that are used to help children.

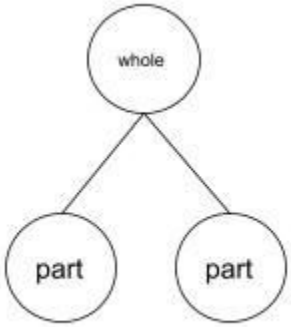
These are designed to have a low cognitive load – plain equipment so the focus is on the maths – this helps children to visualise and remember



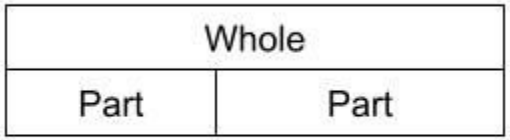
Representation & Structure

There are key models that are used to expose the maths clearly.

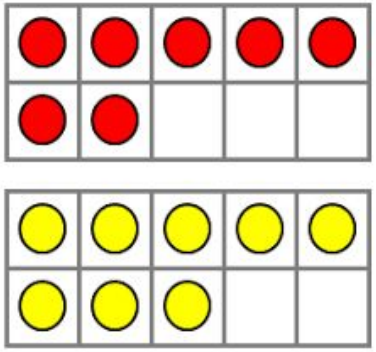


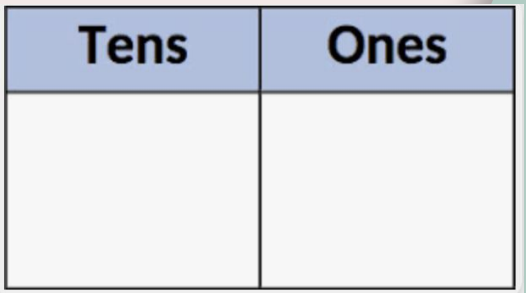


cherry diagram



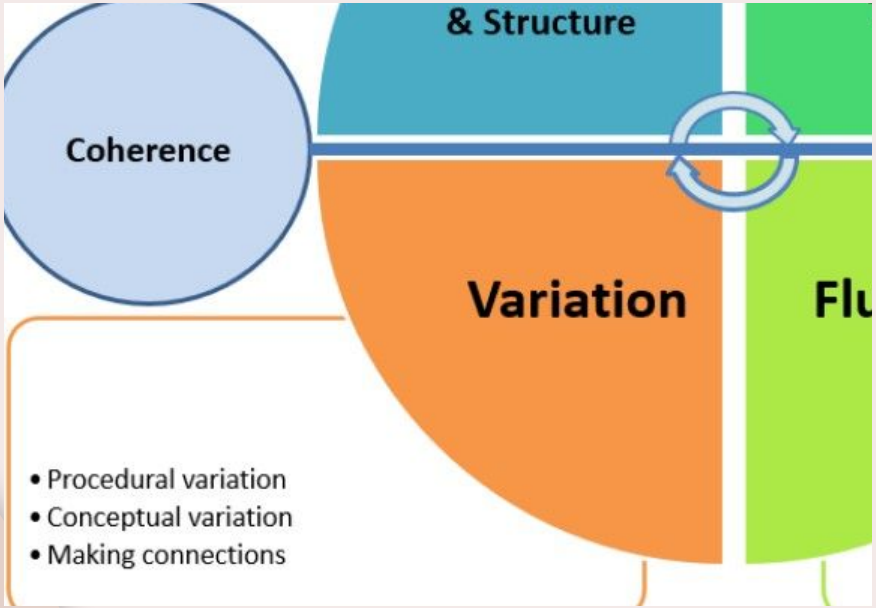
Bar model





Let's explore these manipulative and models practically...

Our Maths Curriculum



Conceptual variation

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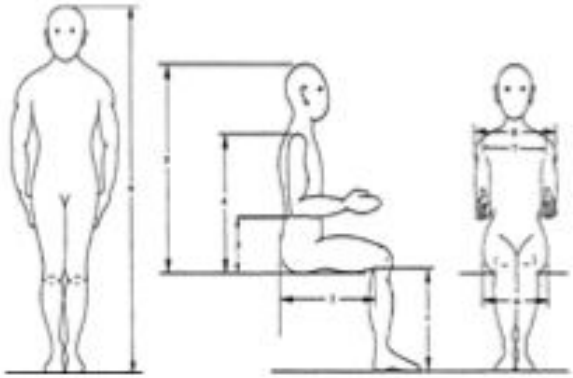
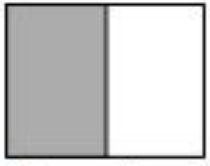


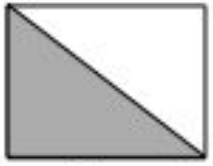
Conceptual variation

Conceptual Variation

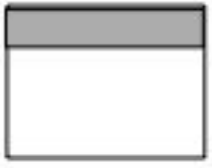
- Varying the representation to extract the essence of the concept.



Standard

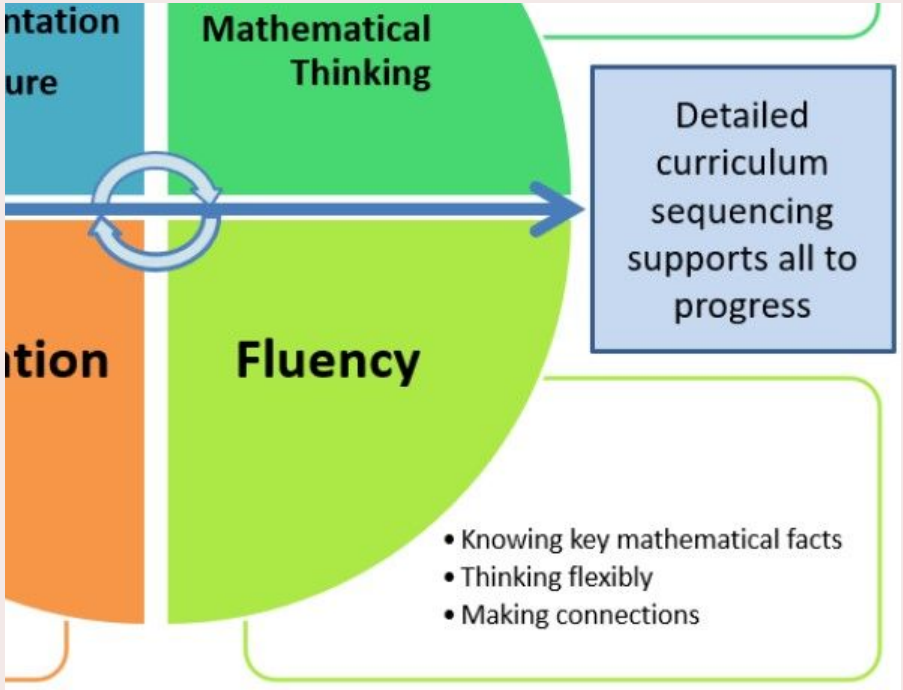


Non-standard



Non-concept

Our Maths Curriculum



Fluency - Efficiency

If I know….. then I also know

3 + 4 = 7

Fluency - Efficiency

If I know….. then I also know

3 + 4 = 7

3 tens + 4 tens = 7 tens

3 million + 4 million = 7 million

3 cats + 4 cats = 7 cats

£3 + £4 = £7

$$\frac{3}{9} + \frac{4}{9} = \frac{7}{9}$$

3 tenths + 4 tenths = 7 tenths (0.3 + 0.4 = 0.7)

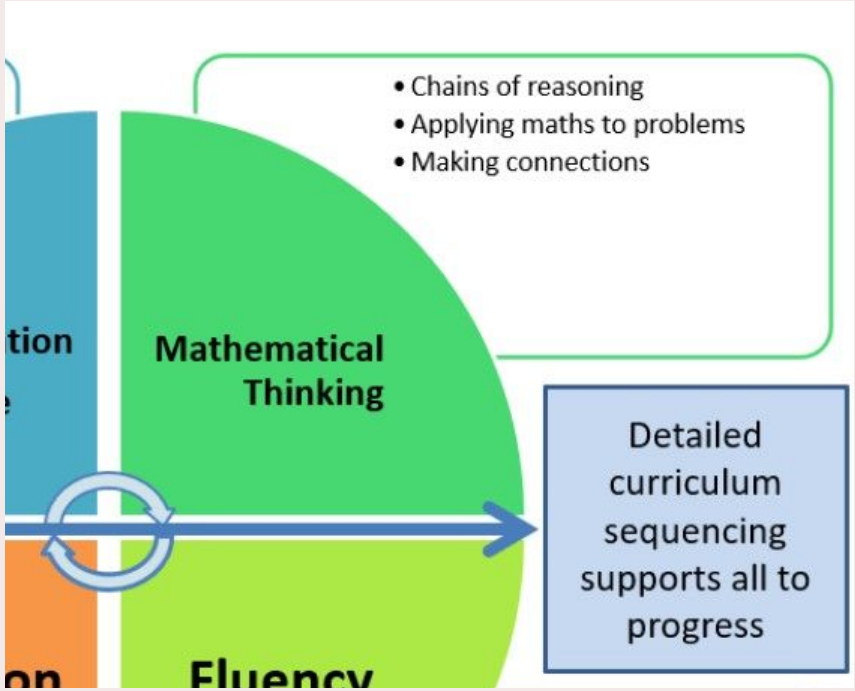
Fluency - Flexibility

If children are fluent in more than one method, they can choose the correct approach for the correct problem.

They can choose the method that suits them best at that time.

It deepens their understanding.

Our Maths Curriculum



Mathematical Thinking

Thinking is at the heart of mathematics and therefore is at the heart of teaching and learning at St Anne Line.

We believe ALL of our children can do maths (and do it well) because we aim to develop children's thinking.

Vocabulary is key for this!!

In order for the children to explore, explain and reason they need the language to express themselves clearly.

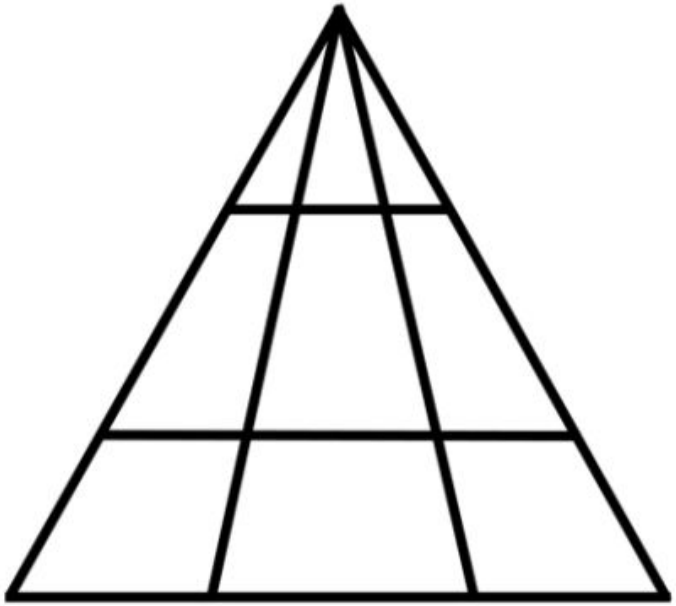
We use the correct mathematical terminology with the children which is consistent across the school.

Mathematical Thinking

- Concepts are built on each year
- Children are encouraged to apply previously taught skills
- Children apply what they know in other strands of maths and other curriculum areas
- Children apply what they know in the real world.

How many triangles are there?

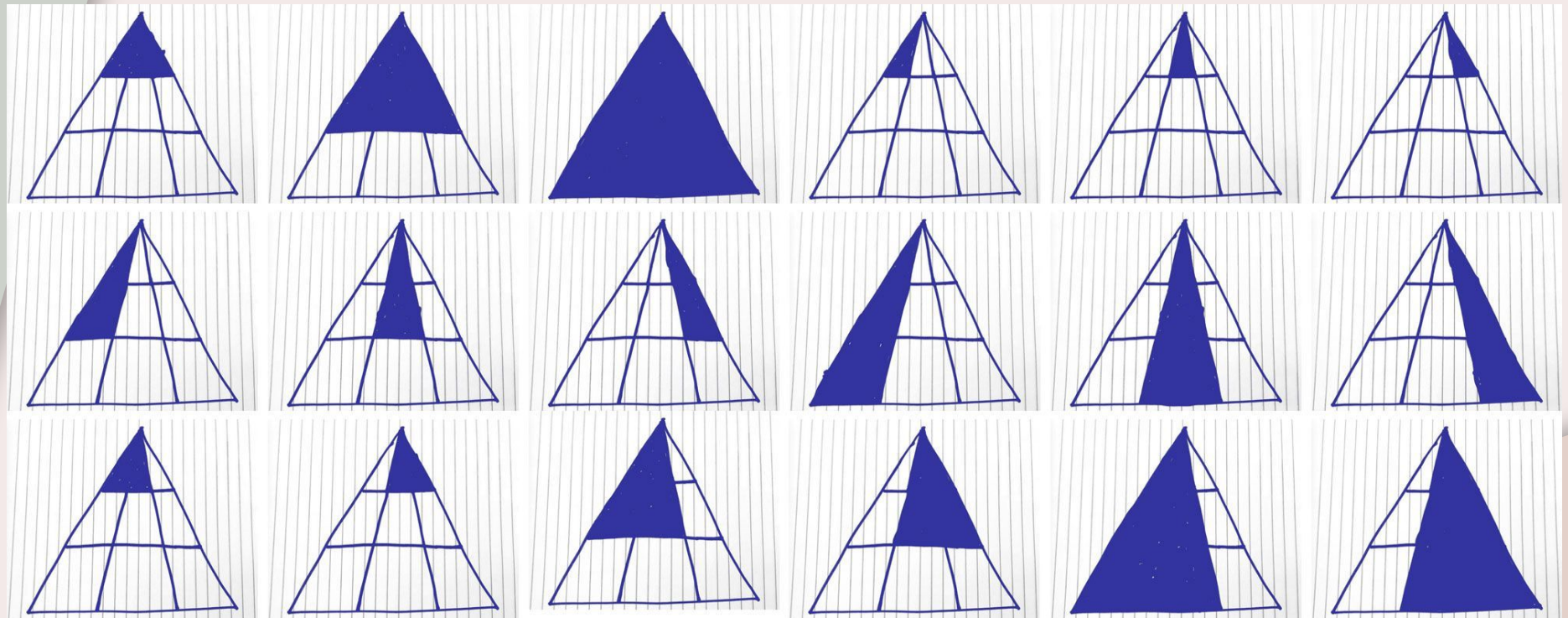
Show me.... Prove it....



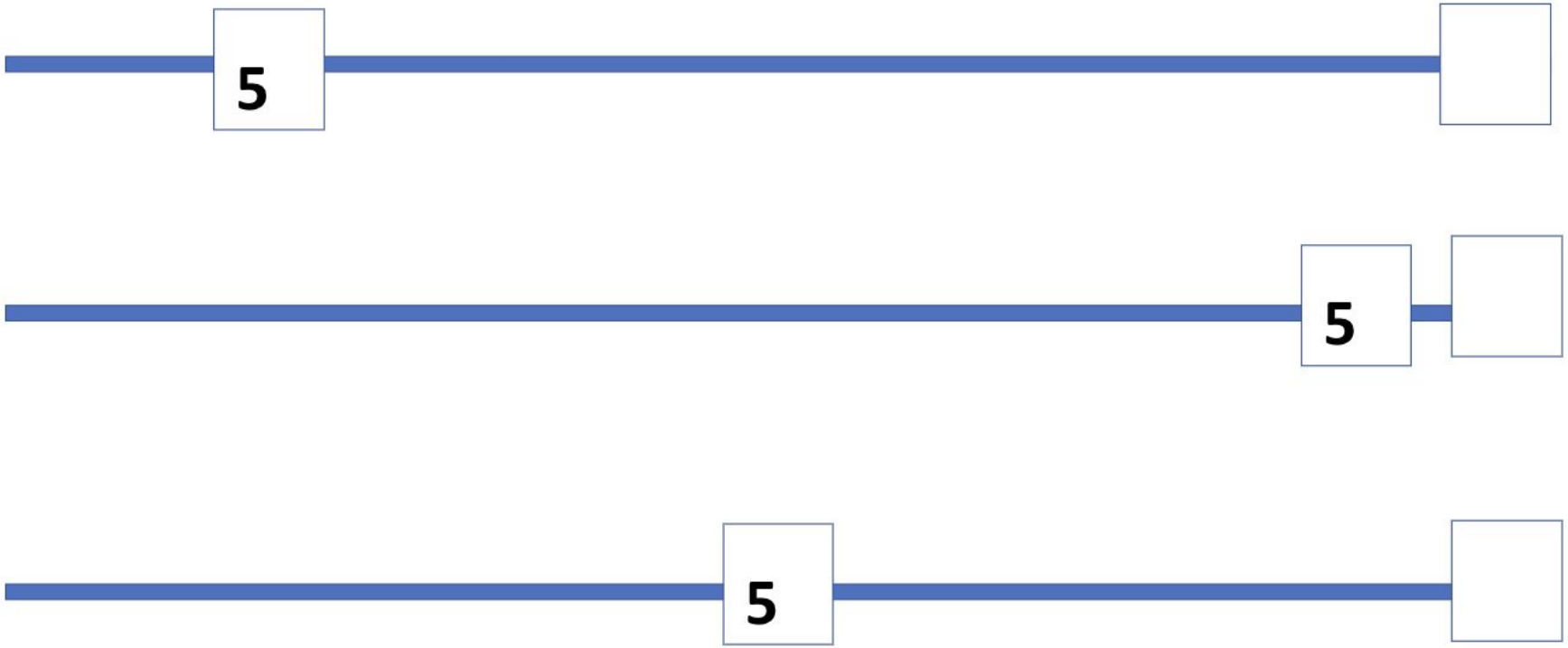
Mathematical thinking

- Using knowledge
  - I know triangles have 3 vertices and 3 sides
  - I know irregular triangles have sides of different lengths

- Be logical and methodical in my approach to ensure I have explored all possibilities



Given the position of 5 what could the missing number at the end of the number line be?



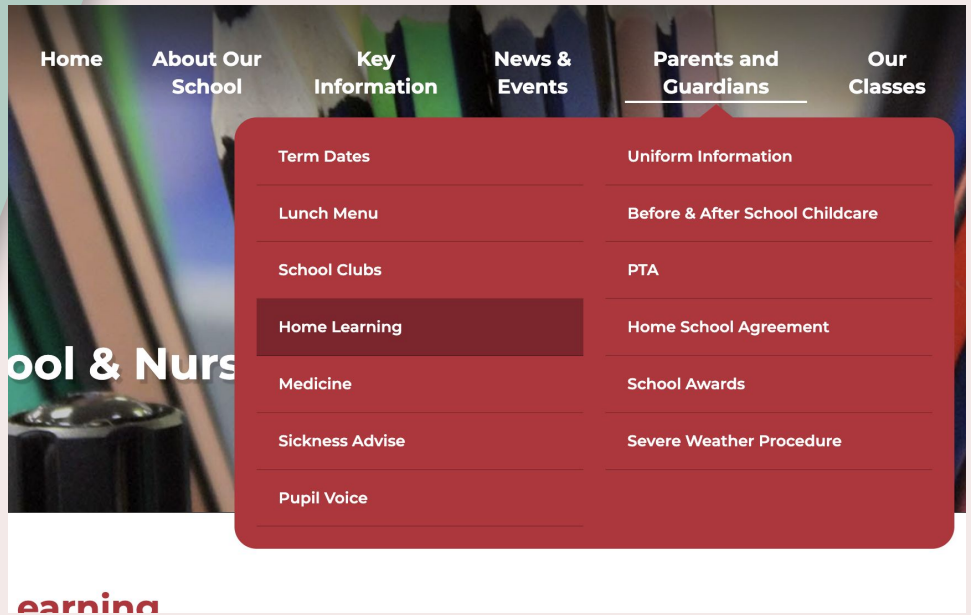
Enquiry Approach

Is it true that your foot is about the same size as the distance your elbow and wrist?

04

How you can help at home

School Website



The MATH LEARNING CENTER

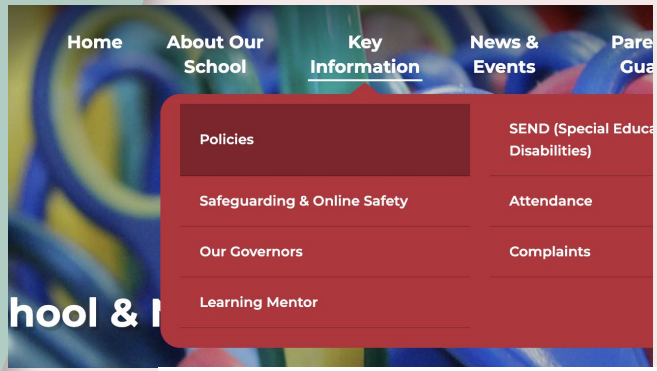
Topmarks

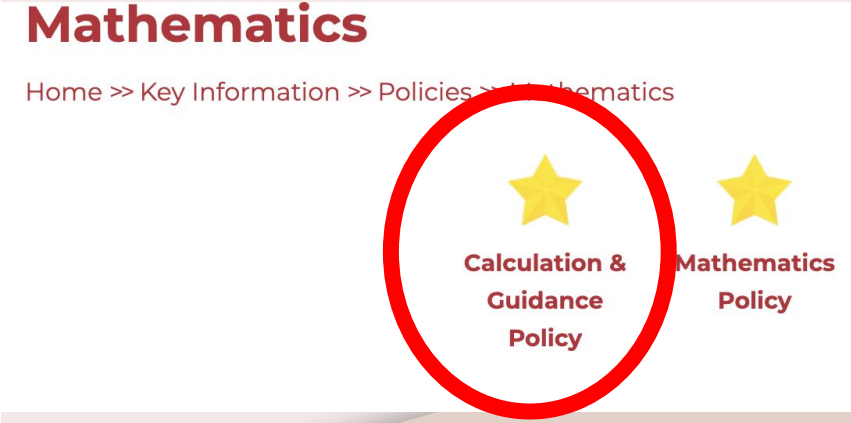
Purple Mash

purple mash

2simple

School Website



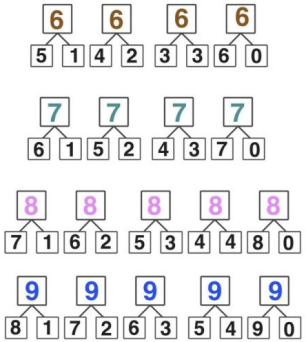


Practise the K1RFs

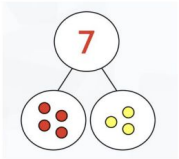
- Learning key facts ‘by heart’ enables children to concentrate on the calculation which helps them to develop calculation strategies.
- Using and applying strategies to work out answers helps children to acquire and so remember more facts.
- Many children who are not able to recall key facts often treat each calculation as a new one and have to return to first principles to work out the answer again.
- Once they have a secure knowledge of some key facts, and by selecting problems carefully, you can help children to appreciate that from the answer to one problem, other answers can be generated.

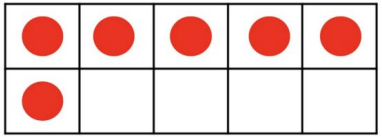
Year 1 - Autumn 1st Half Term (Sept-Oct)

- Rapidly recall bonds of the numbers 6-9



To begin, some children may benefit from using concrete objects to partition a number into parts before moving on to a pictorial representation such as this.





____ is made of 5 and ____ ; 5 and ____ make ____ .

Vocabulary & Stem Sentences	Application
First we have 5, **then** we add 2, **now** we have 7 **altogether**. **First** we have 8, **then** we subtract 5, **now** we have 3 **altogether**. What is 1 **less than** 8? What is 2 **more than** 6?	**Solve missing number equations** 5 + 3 = ? 2 + ? = 7 9 = 5 + ? 6 = ? + 1

Tips:

- Practise understanding the composition of numbers 6-10 using an online interactive Rekenrek just like the physical ones we use in school. https://mathsbot.com/manipulatives/rekenrek

Food Maths

- Ask your child to help out organise a food cupboard by separating items into heavier and lighter.
- Using the fruit bowl – “I have 3 apples and 2 bananas, how much fruit have I got altogether?” “There were 6 carrots on your plate. How many are there now?” “I have 3 apples. You have 4. Who has the most? Who has the least?
- Repeating patterns - I.e. potato, carrot, onion, potato, carrot, onion.
- Can you cut your toast into 4 pieces and share it out?
- Helping with cooking by measuring and counting ingredients.
- Positional language – put the apple on top of table. Put the banana under the table.

Measuring

Use different objects of the same size – i.e. spoons or cars. How many spoons long is the sofa? How many spoons long is the table? Which one is the longest? Which one is the shortest?

Games

Playing adding games with playing cards, turning 2 over and working out how many they have altogether. Snakes and ladders or other simple dice games to support number recognition and counting on. Bingo with numbers or shapes.

Doing the washing

- Sorting by colour and size.
- Matching/pairing up socks.
- Find 4 socks that are different sizes. Can you put them in order by length? Whose socks are the longest? Whose socks are the shortest?
- Count how many pegs we need.

Time

- What day was it yesterday? What day is it today? What day will it be tomorrow?
- Use timers, phones and clocks to measure short periods of time (seconds, minutes).
- Count how many seconds it will take to get down the stairs or into bed etc.

There will be further workshops during the year which will be specific.

Any questions?

Thank you for coming!