Maths Parent Workshop

Problem-Solving Skills:
The ability to break down complex problems into smaller, manageable parts and apply their knowledge to find solutions.

Creativity and Curiosity:
They are able to see connections between seemingly unrelated mathematical concepts and are curious about exploring new ideas.

What makes a good mathematician?

Fluency :
A strong grasp of fundamental math concepts. This allows them to quickly understand and apply new knowledge.

Perseverance:
The ability to work hard and persevere through challenges.

Overview of the workshop

- What is **mastery** and why is it important?
- How do we teach maths using a **mastery curriculum**?
- What does our curriculum look like from Reception- Year 3? (**progression** of the curriculum)
- How can you **support your child at home**?
- How can you support your child to adopt a '**growth mindset**' in maths?

What is mastery?

What is **mastery**?

Maths mastery is a teaching approach that focuses on **deep** understanding of mathematical concepts. It aims to ensure all students master key concepts before moving on.

- Mathematics teaching for mastery assumes everyone can learn and enjoy mathematics. **Every child can become a good mathematician with the right teaching.**
- The curriculum is carefully designed ensures a coherent and detailed sequence of content to support sustained progression over time. Pupils '**master**' each '**small step**' before moving onto the next concept.
- Mathematical learning behaviours are developed so that pupils can engage fully as learners who reason and seek to make connections.

Why mastery?

Why mastery?

A **deep**, **adaptable** understanding of mathematics can lead to greater success in future learning.

- The UK government has looked to **high-performing countries** like Shanghai and Singapore and recognised that they follow a mastery-based teaching approach.

- The mastery approach is rooted in research and **evidence**, with the Education Endowment Foundation | EEF having played a role in its development and evaluation.

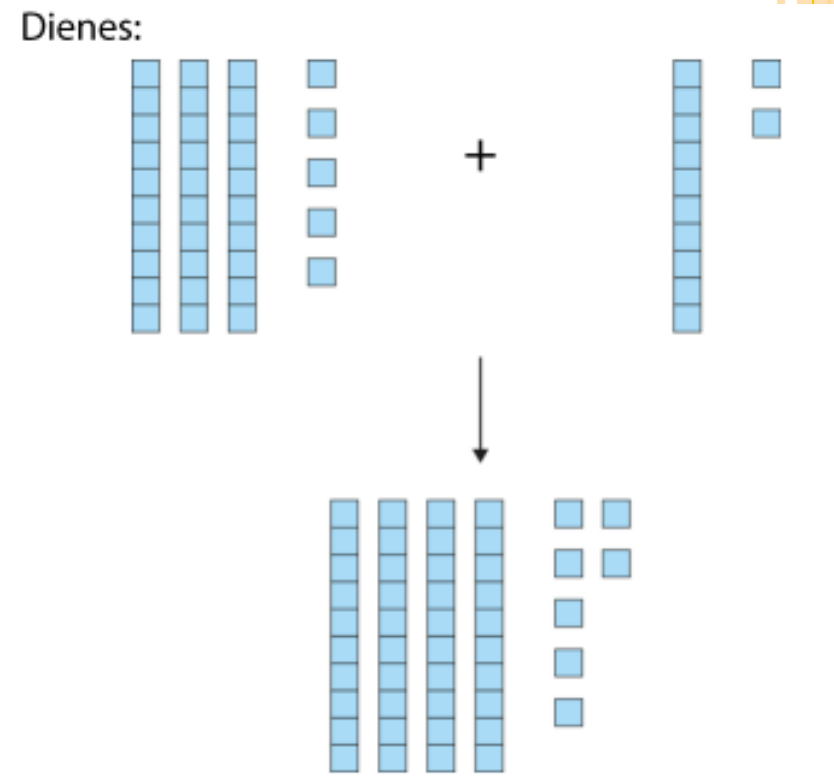
- Mastery learning approaches aim to ensure that all pupils have mastered key concepts before moving on to the next topic – in contrast with traditional teaching methods in which pupils may be left behind or pushed onto the next area of learning when not fully ready. This leads to gaps in learning and misconceptions.

How do we teach using a mastery curriculum?

Key principles of mastery teaching

A deep understanding

Mathematical relationships are built on patterns and structures that we can teach pupils to make sense of, rather than simply memorise. We want children to understand **why** not just **how.**



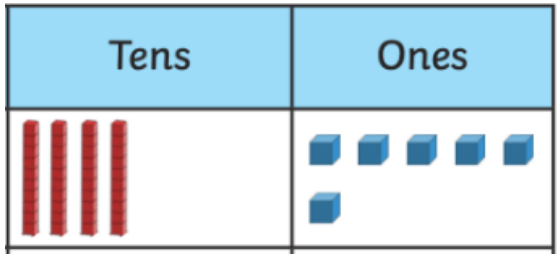
For example- Before using column method for addition and subtraction we unpick the maths behind it! We don't use column method until Year 3.

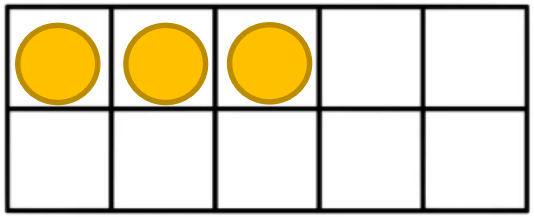
Column addition:

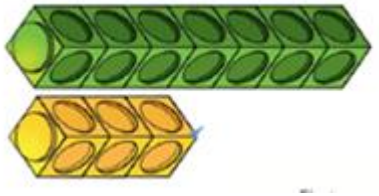
$$\begin{array}{r} 3\ 5 \\ +\ 1\ 2 \\ \hline 4\ 7 \end{array}$$

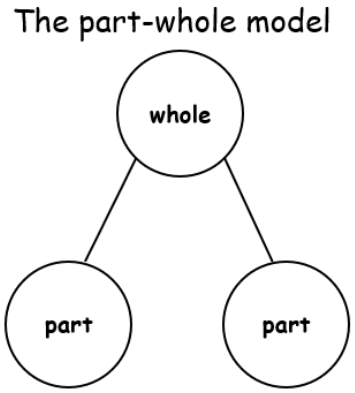
Key principles of mastery teaching
Concrete and pictorial representations

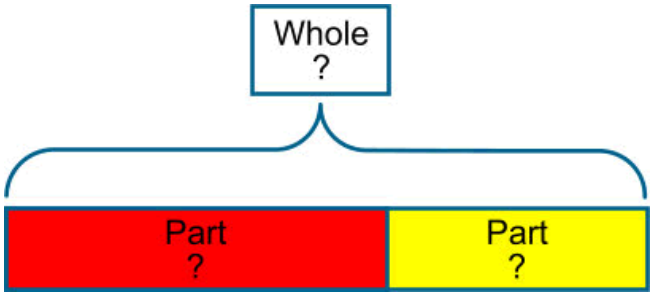
To help children understand their learning and see **mathematical relationships**, teachers carefully select representations. These include concrete resources and images.

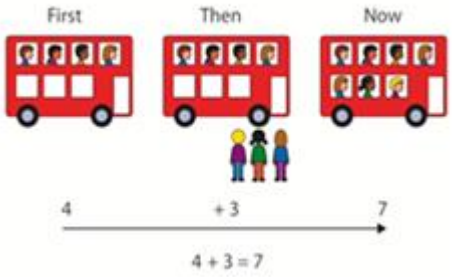












Key principles of mastery teaching

Reasoning

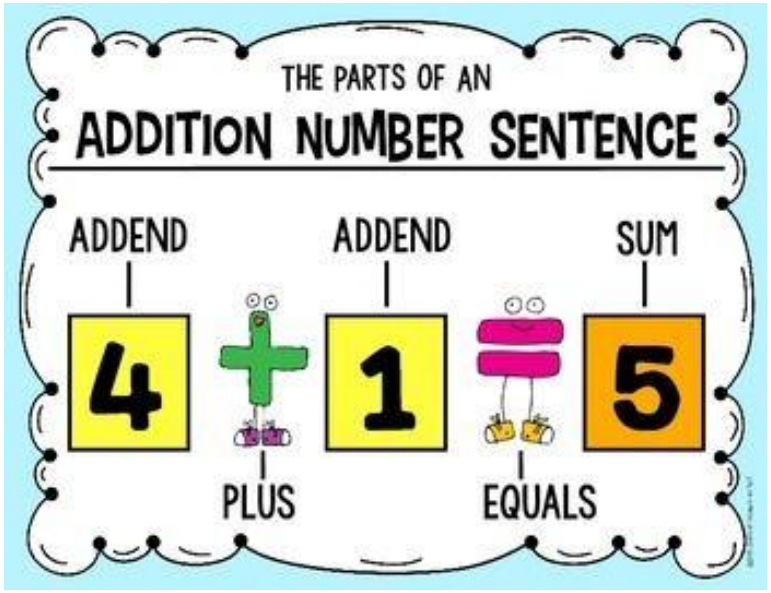
Mathematical reasoning is the process of using logical thinking and problem-solving skills to understand, explain, and solve mathematical problems. Reasoning helps children have a deep and secure understanding of the maths.

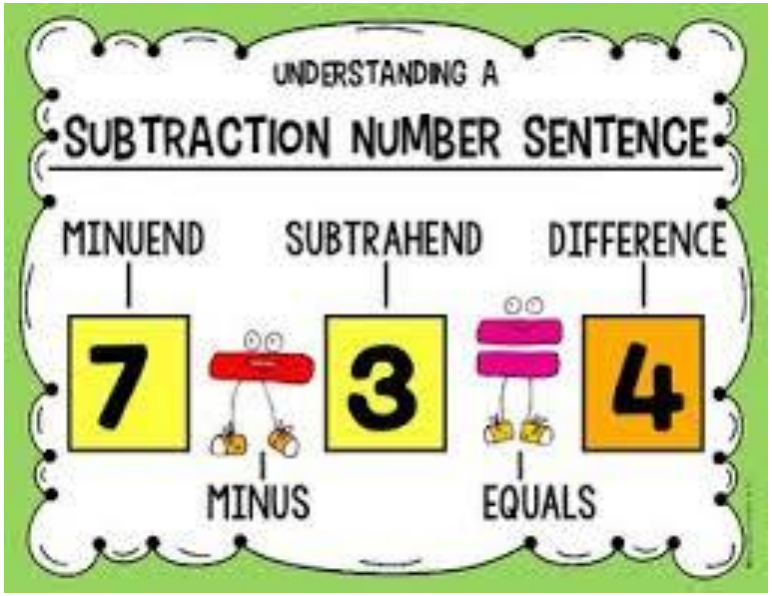
- **Describing** – articulating observations about numbers, patterns or relationships.
- **Explaining** – can pupils explain why an answer is incorrect?
- **Conjecturing** – making predictions and exploring possibilities. For example, if I double the number of apples, will I always get an even number?
- **Generalising** – identifying patterns and forming broader mathematical rules.
- **Justifying** – providing logical reasoning to support an answer or conclusion.
- **Proving** – demonstrating why the maths works through clear reasoning.

To be able to reason it really important we encourage children to use **mathematical language!** If children have the correct vocabulary they are able to explain their thinking.

Key principles of mastery teaching **mathematical language**

Children pick up vocabulary quickly- just as in phonics! Having the vocabulary allows them to explain their understanding effectively.





Please see handout.

Key principles of mastery teaching
Fluency

Although we want children to understand what they are doing we also want them to recall facts quickly. Fluency refers to the ability to **quickly** and **accurately** recall key number facts and procedures.

- Fluency in basic mathematical facts and operations **frees up working memory**, allowing individuals to concentrate on the core aspects of a problem rather than struggling with fundamental calculations.
- We aim for all children to have **automatic recall** of number facts by the end of Year 2 (not using their figures or counting on).

Key principles of mastery teaching
Fluency

Why is it important to have automatic recall of number facts early on?

4 ☐ = 8,005 + 408

1 mark

This is a year 6 SATS paper question.

I have seen a child before use a written method perfectly and then make a mistake when adding 8 + 5.

Encourage children to learn facts automatically rather than using their fingers!

Progression in the curriculum -

Why are small steps so important?

What does progression look like?
Number facts

Reception	**Year 1**	**Year 2**	**Year 3**
Develop fluency in addition and subtraction facts within 5. Begin to explore numbers facts within 10.	Develop fluency in addition and subtraction facts within 10.	Secure fluency in addition and subtraction facts within 10 through continued practice.	Secure fluency in addition and subtraction facts that bridge 10 through continued practice.

We go slow so we can go fast!

What does progression look like?
Addition and subtraction

Reception

Subitise for up to to 5 items.
Compose numbers to 5 from 2 parts.

Devise and record number stories, using pictures, Numbers.

Year 1

Compose number to 10 from 2 parts and partition numbers to 10 into parts.

Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols.

Year 2

Add and subtract across 10.

Recognise the subtraction structure of 'difference' ("How many more…?").

Add and subtract within 100 by applying related one-digit addition and subtraction facts.

Year 3

Calculate complements to 100. (49 + ?= 100)

Add and subtract up to three-digit numbers using **columnar methods.**

Have a deep understanding of the additive relationship and apply this to problems.

What does progression look like?
Multiplication and division

Reception	Year 1	Year 2	Year 3
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally into groups.	Begin to count in multiples of 2, 5 and 10.	Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, **within** the 2, 5 and 10 multiplication tables. Relate grouping problems where the number of groups is unknown to multiplication (___ x 5 = 15) Solve division equations.	Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8. Apply known multiplication and division facts to solve contextual problems.

How can I support my child at home?

You can help support your children at home by…

- **Make it fun and engaging** – Play games: such as snakes and ladders, card games, or even building towers with blocks. This can make learning enjoyable and support key maths skills such a subitising and number facts.

- **Work on their fluency** – focus on number facts and make sure their recall is automatic before moving to larger numbers. If they have fluency of number facts to 10 they can apply this to bigger numbers.

- **Use maths in everyday situations**- Count objects, measure ingredients while cooking, or simply quiz them on their number bonds on the way to school!

- **Use concrete resources**- When doing homework with your child consider how you could use pictures and objects to help explain and make connections. Tens frames and dienes are particularly helpful!

- **Encourage a growth mindset** –A growth mindset is a belief that you can develop your skills and talents through hard work, the right strategies, and guidance from others. It is not unusual for people to say "I can't do maths". You rarely hear people say this about reading or writing. This 'fixed mindset' thinking can hinder mathematic potential.

How can I support my child at home?
Developing a growth mindset

It is important to actively nurture growth mindsets from an early age. Children's beliefs about their own potential are heavily influenced by the perceptions of their parents, carers and teachers. If children hear the people around them saying they can't do maths, or that they don't like maths, this is likely to have a negative impact on children's learning!

Fixed mindset	Growth mindset
I'm not good at maths - I've never been good at maths.	I'm finding maths hard now, but I can improve with time and effort.
I give up – I can't make this any better!	I can improve if I keep trying!
If I fail, I am a failure.	Most successful people fail along the way.
I can't do this – I keep making mistakes.	Mistakes help me learn!

Thank you!

Any Questions?