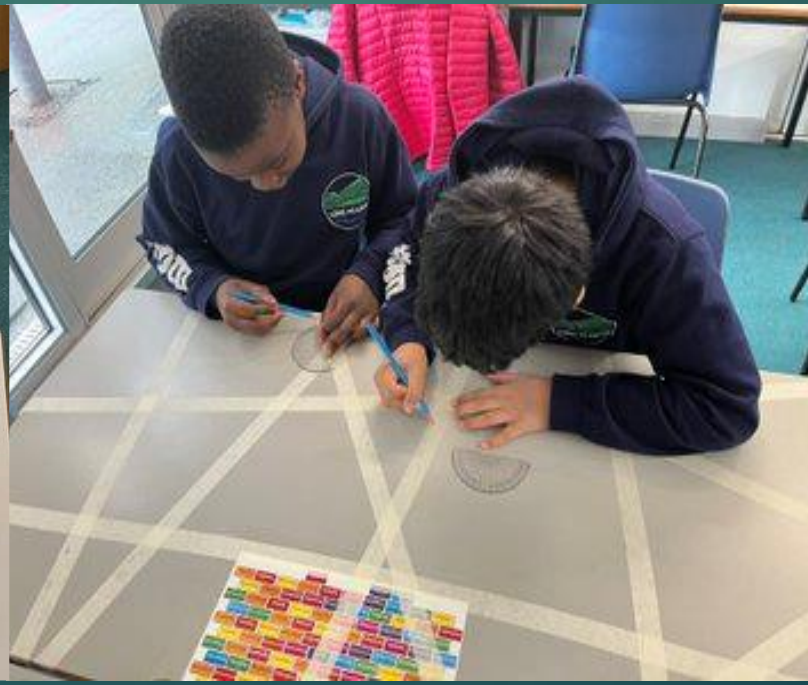
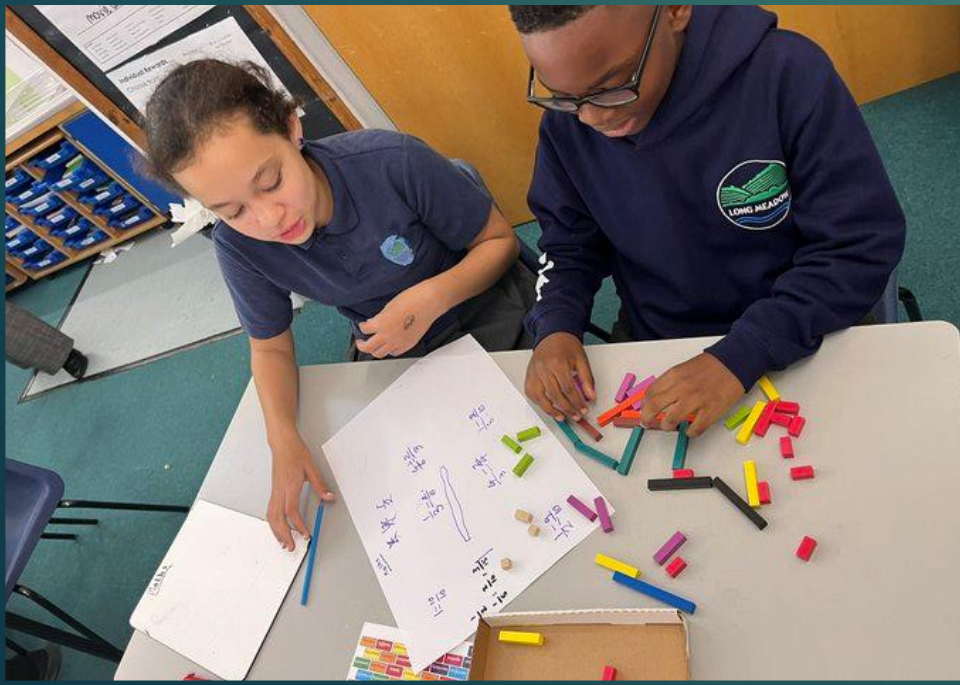
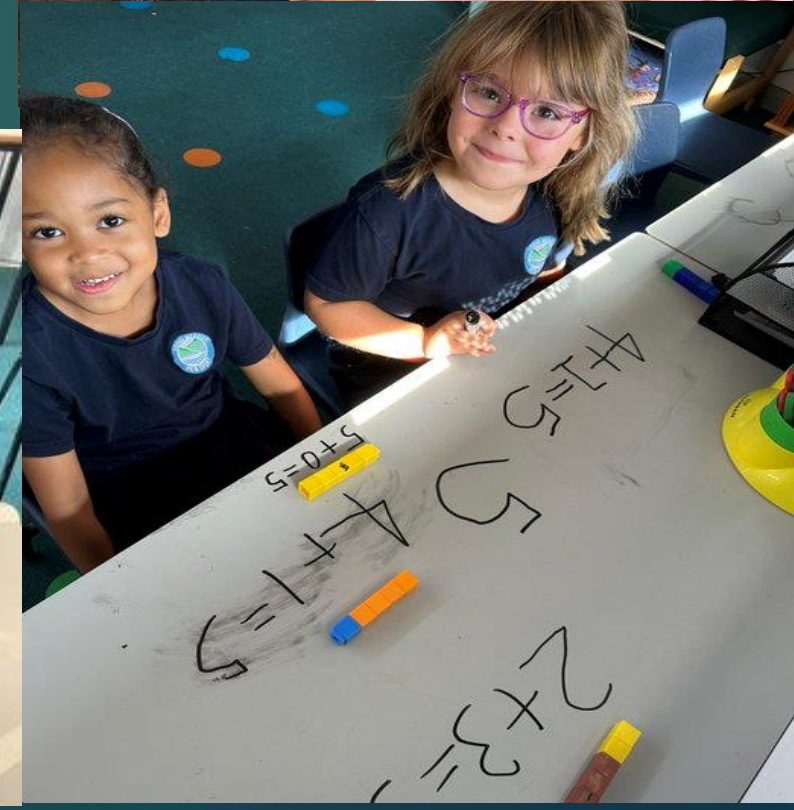




# Maths at LMS



# National Curriculum

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

- ▶ Fluency: ability to recall and apply knowledge quickly and accurately
- ▶ Reasoning: being able to explain their mathematical thinking
- ▶ Problem Solving: apply their knowledge to solve problems in a variety of contexts

**Mastery will support this.**

# What is mastery in maths?

- ▶ Improves performance.
- ▶ Inspired by the teaching practices in Singapore, Hong Kong and Shanghai.
- ▶ These countries regularly top the rankings for maths results in the world. In 2015, the UK was in 23<sup>rd</sup> place.

# What is mastery in maths?

- ▶ The belief that all children can achieve in maths.
- ▶ All pupils work together on the same content at the same time.
- ▶ Support and challenge is provided.
- ▶ Concepts are built in small, logical steps.
- ▶ Mathematical language used by everyone and having clear sentence structures to support mathematical explanations.
- ▶ Children use objects and pictures to physically represent mathematical concepts alongside numbers and symbols – Concrete Pictorial Abstract

# What does it mean to master something?

- ▶ I know how to do it
- ▶ It becomes automatic – I do not have to think about it
- ▶ I am really good at doing it
- ▶ I can show someone else how to do it

**Children need to master concepts to make progress.**

*“In mathematics, you know you’ve mastered something when you can apply it to a totally new problem in a unfamiliar situation.”*

Dr. Helen Drury, Director of Mathematics Mastery.

# How does mastery support children?

- ▶ Rejects the idea that 'I just can't do maths'.
- ▶ Builds confidence – progress in achievement as well as attitude.
- ▶ More children should achieve the expected standard in mathematics.
- ▶ Develops a deep understanding of maths to sustain learning.
- ▶ Avoids cognitive overload in working memory and enables pupils to focus on new learning.

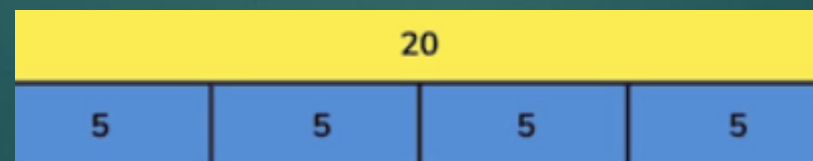
# How are children supported and challenged?

- ▶ Scaffolding - a range of techniques and strategies to support children during lessons.
- ▶ Same/next day intervention to help close gaps in understanding quickly.
- ▶ Challenge is not 'bigger numbers' nor acceleration to objectives in year groups above.
- ▶ Activities are provided that give children depth and breadth of understanding around a concept.

# Concrete, Pictorial, Abstract (CPA)

Maths can be difficult because it can be quite abstract – this helps them to visualise ideas and ‘see’ the maths.

- ▶ CPA approach is a highly effective way of deep and sustainable understanding of maths.
- ▶ Introduces abstract concepts through concrete resources, then moving on to pictorial representations then onto abstract symbols.
- ▶ CPA is used from EYs to Year 6, regardless of ability



$$16 - 8 =$$

$$30 = 5 \times 6$$



# Concrete

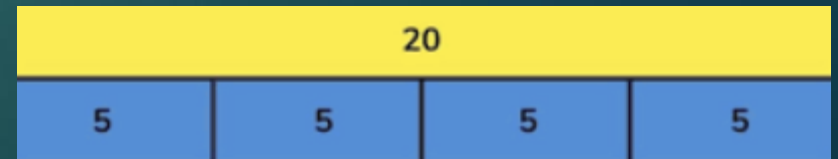
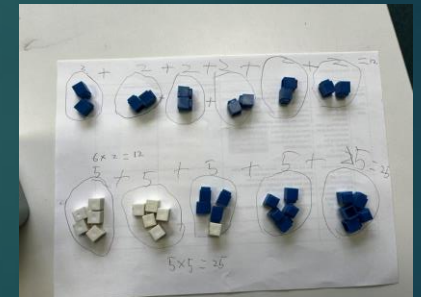
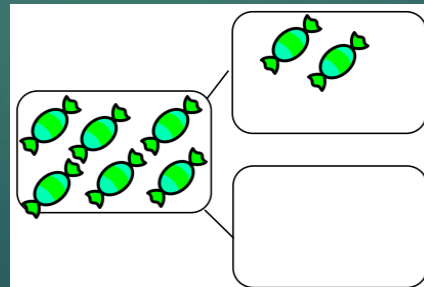
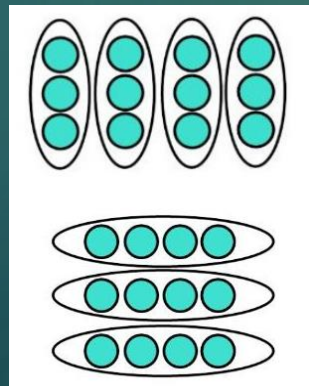
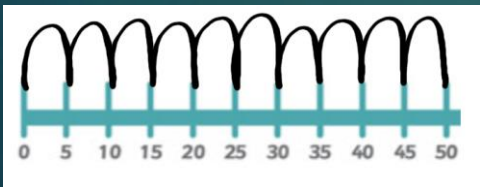
- ▶ Concrete resources allow children to use physical objects when exploring new concepts.
- ▶ They can be used in a variety of ways and they promote reasoning and discussion with the children.



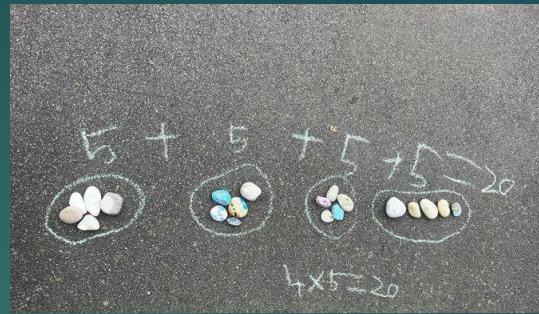
# Pictorial

When confident with a concept, they progress to drawing pictorial representations or quick sketches of the objects.

- ▶ Drawings act as a bridge between the concrete objects and the abstract symbols
- ▶ Enables children to 'see' the maths.



# Abstract

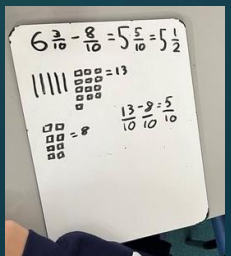


$$16 - 8 =$$

Once children have a secure understanding of the concept through the use of concrete resources and visual images, they are then able to move on to the abstract stage.

- ▶ Children are using abstract symbols to model problems – usually numerals.
- ▶ Constantly go back and forth between each of the stages.

$$30 = 5 \times 6 \quad 124 + 36 = 160 \quad 48 \div 6 = 8$$



# What can I do at home?



- ▶ Stay positive about maths!
- ▶ Help your child develop a growth mindset.
- ▶ No 'shortcuts' or how you learnt in school please.
- ▶ Speak to the class teacher/school website.
- ▶ Home Learning, Doodle, Times Table Rock Stars.
- ▶ Counting at every opportunity.
- ▶ Shopping trips and other outings – talk about money, change, discounts, offers.
- ▶ Noticing shapes in surrounds – generalise – doesn't have to be a perfect shape.
- ▶ Everyday problem solving – telling the time, weighing ingredients.



**Thank you!**