The background of the slide is a dense, colorful pattern of various numbers (0-9) in different colors and sizes, creating a vibrant and mathematical atmosphere. The numbers are scattered across the entire page, with some appearing larger and more prominent than others.

Maths Mastery

The Horsell Village School

The aims of this presentation are to share with you :

- The aims of the Maths National Curriculum.
- What is Mastery?
- How we help children to achieve Mastery.
- What a Mastery maths lesson looks like.
- Developing Number sense.
- The spines of Mastery maths.





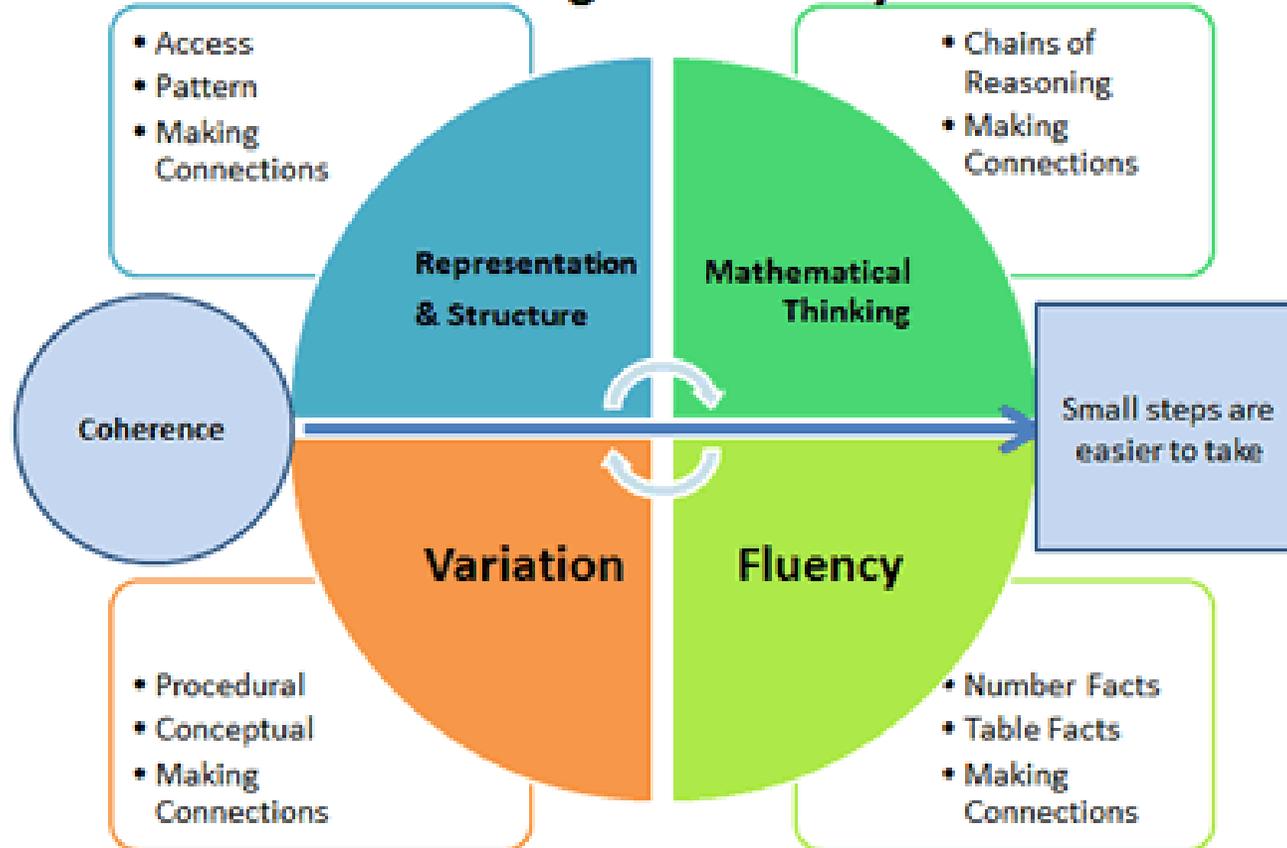
Department
for Education

The three aims of the maths curriculum are:

- Number fluency-
This focuses on becoming fluent in the fundamentals of mathematics, through varied and frequent practice which increases in complexity over time. Children develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Problem Solving. Children 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 simple steps and persevering in seeking solutions.
- Reasoning
Children can follow a line of enquiry, conjecturing relationships and generalizations, and developing argument, justification or proof using mathematical language.

Each maths lesson here at The Horsell Village School will have an element of all 3 aims within it. We teach through maths mastery following the National Centre for Excellence in the Teaching of Mathematics (NCETM).

Teaching for Mastery



What does it mean to master maths?

Procedural Fluency

This is a critical component of mathematical proficiency. It involves having a depth of understanding that allows a child to apply mathematical procedures accurately, efficiently and flexibly and be able to transfer these procedures to different problems and contexts.

In practice this will involve the pupils being able to recognise where one strategy or procedure is more appropriate than another in solving a problem or challenge

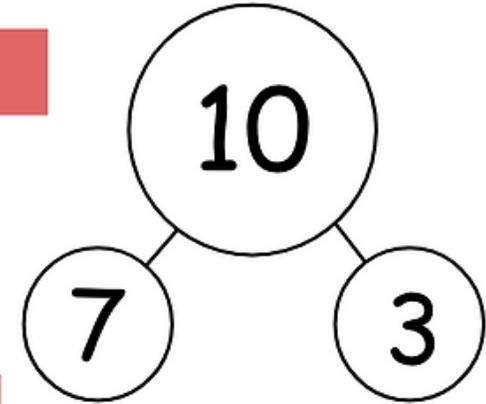
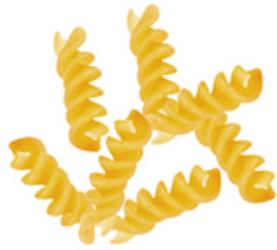
Thinking mathematically

The children should have a deep understanding of the key ideas, having explored them, discussed them and practiced reasoning with them, rather than passively accepting the information.

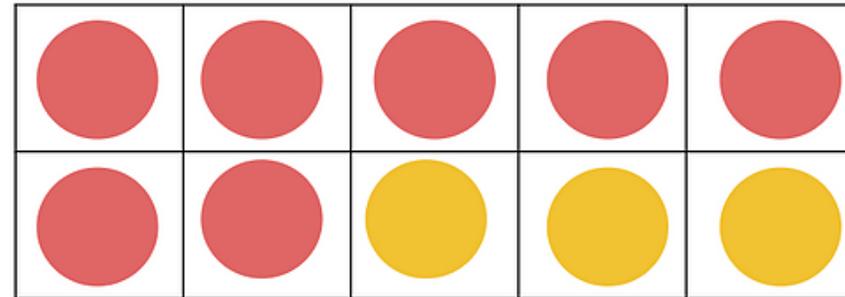
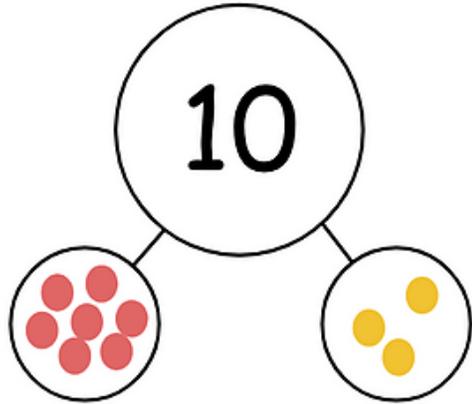
Variation

The children understand what is the same and what is different in a set of mathematical information, and can explain how they know this, drawing on their deep understanding of key mathematical ideas.

In the Classroom:

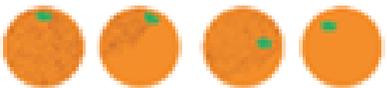
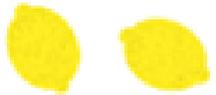


$$7 + 3 = 10$$

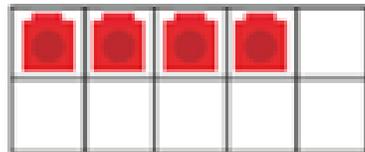
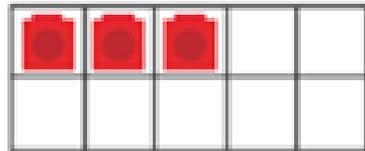
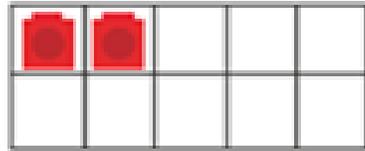
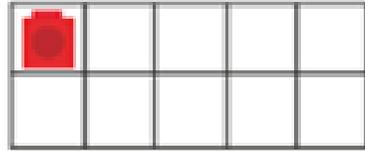


What do we do to help children achieve mastery?

Concrete
(Physical Objects)



Pictorial
(Drawings/Models)



Abstract
(Using numbers)

1

2

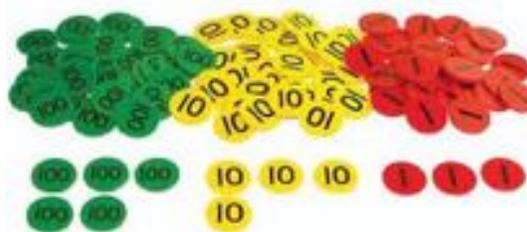
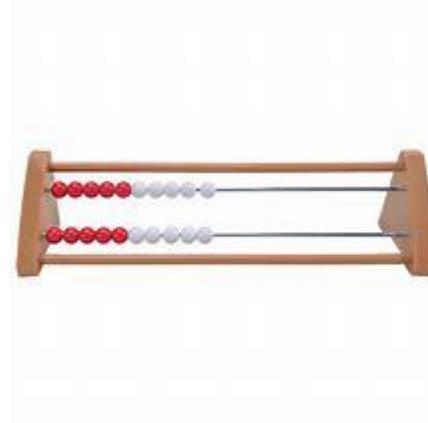
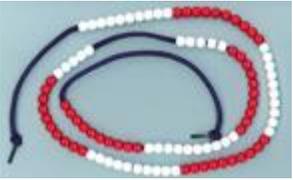
3

4

Concrete and pictorial representations support children to understand abstract concepts and deepen their knowledge.

What do we do to help children achieve mastery?

We teach children how to use a variety of manipulatives. Once a child has mastered the key mathematical ideas using the manipulatives, they remain accessible. The children can then choose their preferred choice of learning, being concrete (manipulatives), pictorial or abstract, and return to use the manipulatives at any point in their exploration, should they feel that it will enhance their learning.



What does a Maths Mastery lesson look like?

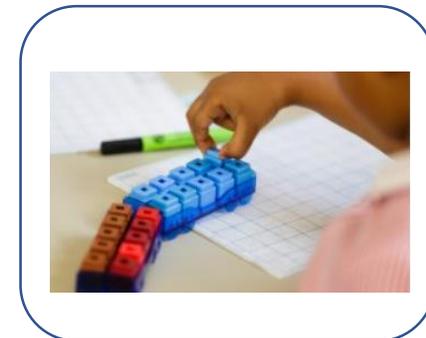
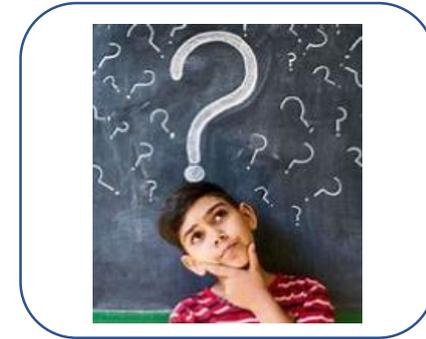
Maths Mastery is a carefully sequenced journey through the learning of key mathematical ideas.

Questioning is a key part of Maths Mastery. The teacher will ask key questions designed to prompt investigation and exploration.

The children investigate the teacher's questions using concrete resources.

The teacher will encourage the children to reflect upon their investigation and then provide further explanation and demonstration.

This structure will be repeated multiples times in the journey through the key mastery ideas, and even a number of times in each lesson.



The starting point.... Number Fluency- Developing number sense

Number sense refers to a child's fluidity and flexibility with numbers.

It helps children understand what numbers mean, increasing mental mathematics and giving children the tools to look at maths in the outside world and make comparisons.



So.... What is number sense and why is it so important

So ... where does it all begin and how do we support and plan for progression in number sense here at school?



Children develop a number sense gradually over time through exploring numbers, visualising them in a variety of contexts and relating them in ways that are not limited by formal written methods.

Number sense is the main focus on the Early Years Curriculum however forms an essential part of fluence for all year groups.

How do we help develop Number sense?

These key elements are the basis for development of children's early number sense and future success in maths.

- Counting
- Subitising
- Cardinality
- Composition
- Comparison

How do we help develop Number sense?

Counting

3 rules of counting

1. Count everything once
2. Say the numbers in the right order
3. The last number you say is how many there are

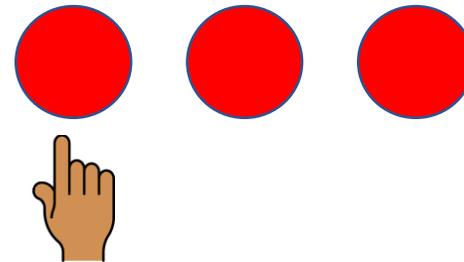
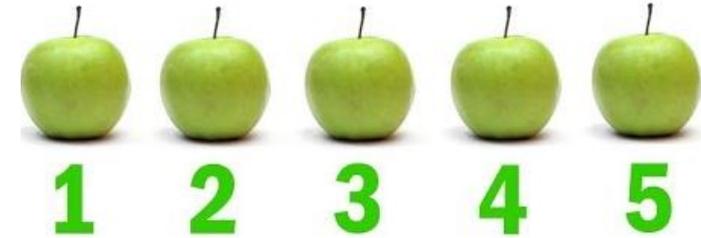
1:1 correspondence

When counting, the concept of 1:1 correspondence is the understanding that each object being counted represents 'one more'. It is important for children to be able to count out the number of objects from a larger group set of objects so they understand the stopping number.

Count things identical in appearance



Count things that can be conceptualised as being the same but aren't identical, vary by colour / non-infering variables



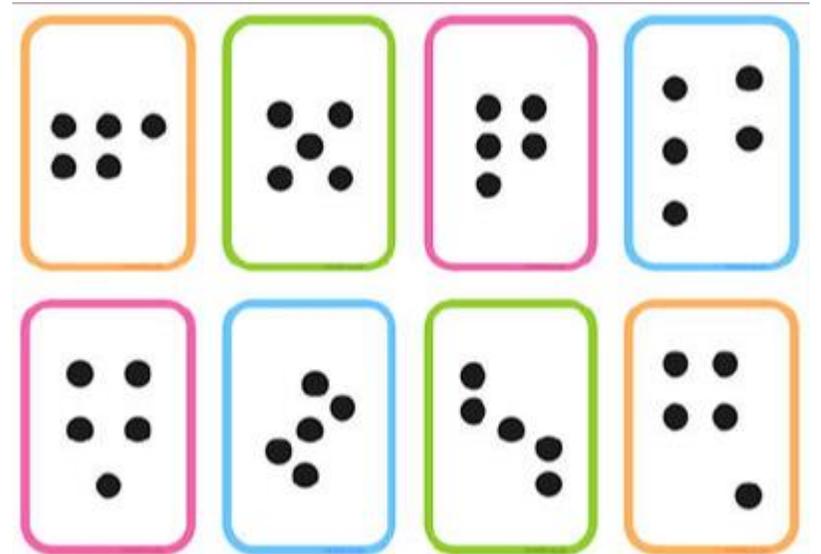
How do we help develop Number sense?

Subitising

Don't count, say the amount.

Children need a variety of opportunities to see regular amounts of quantities and be encouraged to 'say what they see.'

These regular amounts also need to be shown in irregular ways:



How do we help develop Number sense?

Cardinality

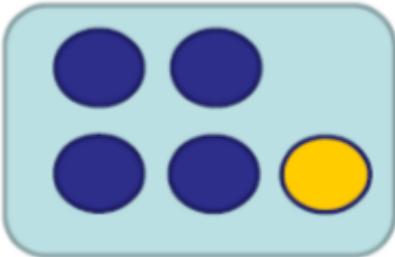
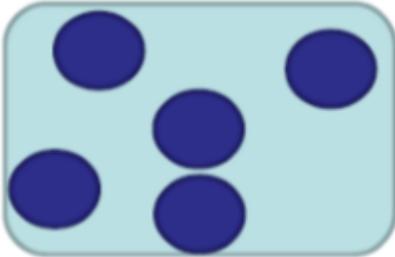
Cardinality means the quantity or total number of items in a set.

This can be determined by subitising or counting.

While subitising allows children to perceive the cardinality of small sets, counting requires them to understand that the last number in the counting sequence represents the quantity of the set. We refer to this as....

'The 5-ness of 5'

Subitising – is the process of immediately knowing how many objects are in a small group without needing to count them.

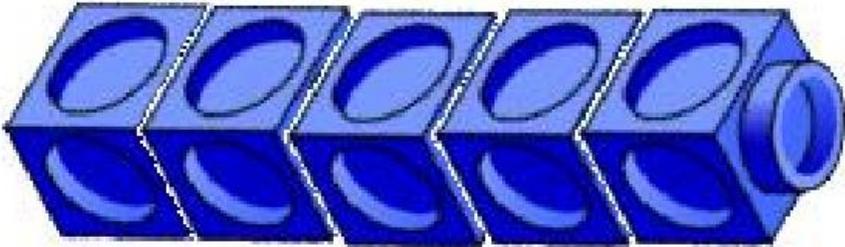
Familiar and structured dot patterns	Structure dot patterns	Unstructured dot patterns
		

How do we help develop Number sense?

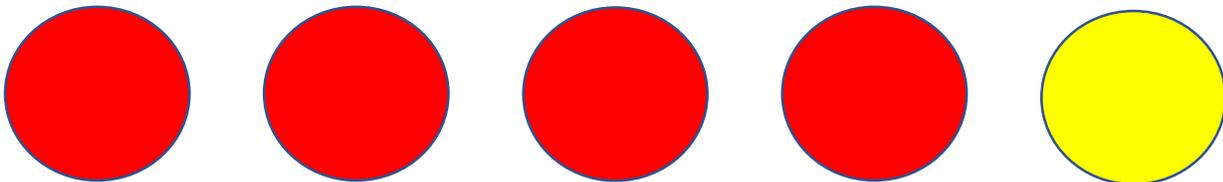
Composition

Composition refers to part part whole relationships. This is often referred to as the 'hidden numbers' with a number, ie: understanding that the number 5 can have several different parts in its composition.

For example



**5 is the whole
2 is a part and 3 is a part**



**4 is a part and 1 is a part
5 is the whole**

Being able to see numbers within numbers helps to develop efficient calculating skills

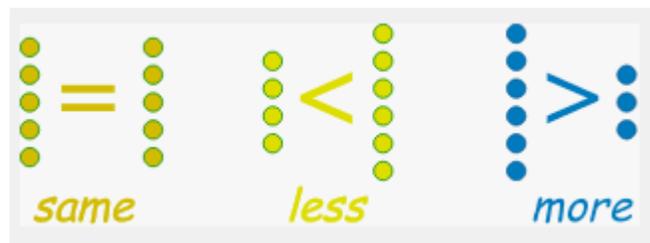
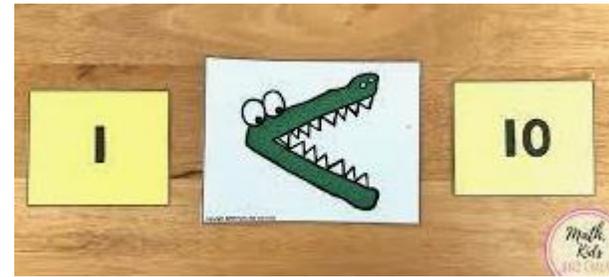
The program 'Number blocks' focuses on the concept of composition



How do we help develop Number sense?

Comparison

When we ask children to compare numbers we are asking them to examine the difference, to decide if one number is greater than, smaller than or equal to another number.



Primary Maths Mastery is based on a 3 main 'spines'.

This is a carefully sequenced progressive journey including:

Number, addition and subtraction

This is a carefully sequenced progressive journey including:

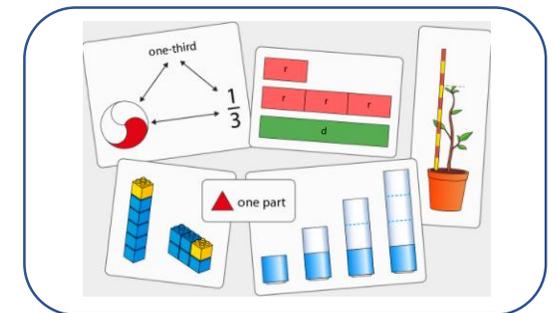
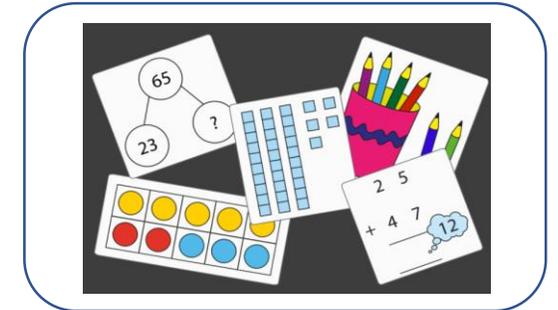
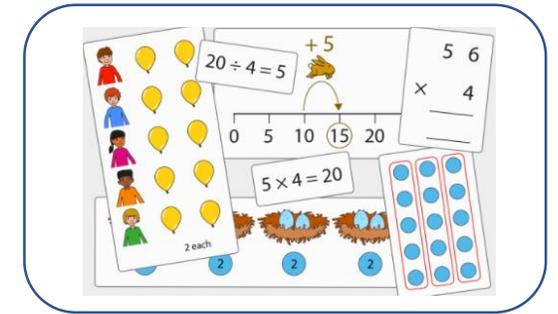
- Whole and parts
- Composition of starting at 0-5 and building gradually up to 100
- Addition and subtraction strategies initially within 10 and then bridging 10
- Addition and subtraction of 1 digit and 2 digit numbers, extending to 2 digit and 2 digit numbers.

Multiplication and division

- Counting and unitizing (counting groups rather than individual items, for example egg boxes, rather than individual eggs).
- Times tables : groups of 2s, 5s and 10s and commutativity
- Doubling and halving
- Division: sharing and applying knowledge of multiplication to solve grouping problems.

Fractions

- Recognising and finding fractions of an object, shape and quantity, relating fractions of a quantity to previously taught division.





Thank you

We hope you found this presentation
and document helpful.