Maths Workshop

The Horsell Village School
October 2022

The aims of this presentation are to share with you :

- The aims of the Maths National Curriculum.

- What does Maths look like at HVS?

- Developing Number sense.

- The 3 spines of Maths Mastery.

Our Intent:

- We ensure that the curriculum design allows for small secure steps and acknowledges the importance of the children being secure and fluent.

- Pupils are required to explore and investigate Maths in depth, using mathematical vocabulary to reason and explain their workings.

- A wide range of mathematical resources are used in lessons and pupils are taught to show their workings using concrete materials, before establishing ways of pictorially and formally representing their understanding.

- We encourage children to respond positively to challenge, developing resilience in all aspects of maths learning as well as self-reflection in order to identify next steps in their learning.

- There is a Number focus in day-to-day teaching and learning as we want pupils to develop confidence and mental fluency with whole numbers, counting and place value.

The three aims of the maths curriculum are:
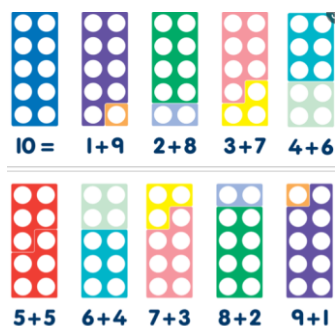
Number fluency   Problem Solving   Reasoning

Fill in the circles with either $<$, $>$ or $=$

$6 + 4$ ◯ $6 + 5$

$6 + 4$ ◯ $3 + 6$

$11 - 4$ ◯ $12 - 5$

$11 - 4$ ◯ $12 - 4$

$8 - 5 = 3$
$8 - 3 = 5$
$8 = 5 - 3$
$3 = 8 - 5$

Rosie says,

I think that all of these facts are correct because the numbers are related

Ron disagrees.
Who is correct? Can you prove it?

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).

End of Year One Expectations:

Number	Addition and subtraction	Multiplication and division	Fractions	Measurement	Geometry
count to and across 100, forwards and backwards, from any given number.	read, write and interpret statements involving +, – =	Solve one – step problem involving multiplication	Recognise, find and name ½ of a shape, quantity and object.	Compare and solve problems involving measures.	Recognise and name common 2D shapes.
count, read and write numbers to 100.	represent and use number bonds 20.	Solve one – step problem involving division	Recognise, find and name ¼ of a shape, quantity and object.	Measure and begin to record lengths and heights.	Recognise and name common 3D shapes.
count in multiples of twos, fives and tens.	Show and use subtraction facts to 20.	Show multiplication using arrays	Solve simple ½ and ¼ problems.	Measure and begin to record mass/weight.	Describe the position, direction and movement of objects.
Identify one more and one less of a given number.	add and subtract one-digit and two-digit numbers to 20.	Count in twos, fives and tens.		Measure and begin to record time.	
read and write numbers from 1 to 20 in digits and words.	solve one-step problems that involve subtraction.			Tell the time to the hour and half past.	
	solve one-step problems that involve addition			Recognise and know the value of different coins and notes.	
				Recognise and use language relating to dates.	

Number - Number and Place Value

I can:

- [ ] count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward
- [ ] recognise the place value of each digit in a two-digit number (10s, 1s)
- [ ] identify, represent and estimate numbers using different representations, including the number line
- [ ] compare and order numbers from 0 up to 100; use <, > and = signs
- [ ] read and write numbers to at least 100 in numerals and in words
- [ ] use place value and number facts to solve problems

Number -Addition and Subtraction

I can:

- [ ] solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental and written methods
- [ ] recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- [ ] add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and 1s
  - a two-digit number and 10s
  - 2 two-digit numbers
  - adding 3 one-digit numbers
- [ ] show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
- [ ] recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

Number - Multiplication and Division

I can:

- [ ] recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- [ ] calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- [ ] show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- [ ] solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Number - Fractions

I can:

- [ ] recognise, find, name and write fractions , , and of a length, shape, set of objects or quantity
- [ ] write simple fractions, for example   of 6 = 3 and recognise the equivalence of   and

Measurement

I can:

- [ ] choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- [ ] compare and order lengths, mass, volume/capacity and record the results using >, < and =
- [ ] recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- [ ] find different combinations of coins that equal the same amounts of money
- [ ] solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- [ ] compare and sequence intervals of time

- [ ] tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- [ ] know the number of minutes in an hour and the number of hours in a day

Geometry - Properties of Shapes

I can:

- [ ] identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line
- [ ] identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- [ ] identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
- [ ] compare and sort common 2-D and 3-D shapes and everyday objects

Geometry - Position and Direction

I can:

- [ ] order and arrange combinations of mathematical objects in patterns and sequences
- [ ] use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)

Statistics

I can:

- [ ] interpret and construct simple pictograms, tally charts, block diagrams and tables
- [ ] ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- [ ] ask-and-answer questions about totalling and comparing categorical data

End of Year Two Expectations:

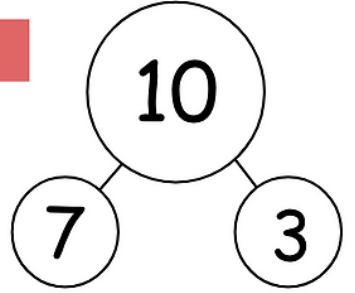# What does it mean to master maths?

I Can **MASTER** Maths!
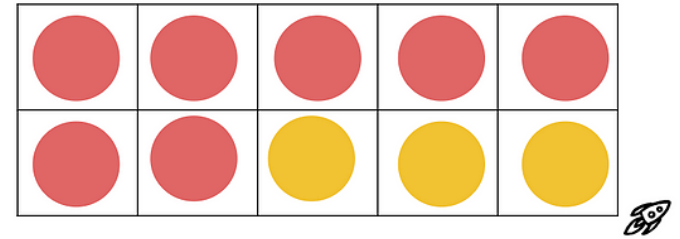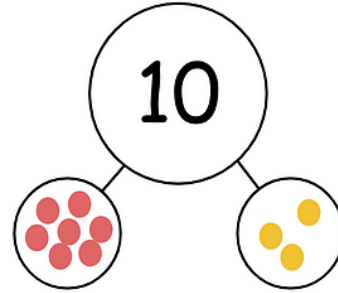
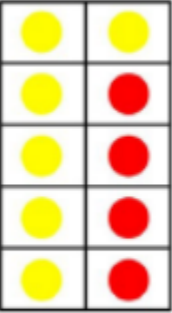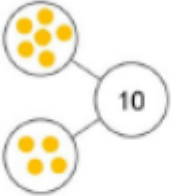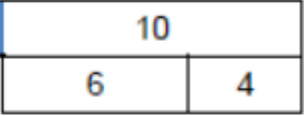- By explaining it.
- By drawing it.
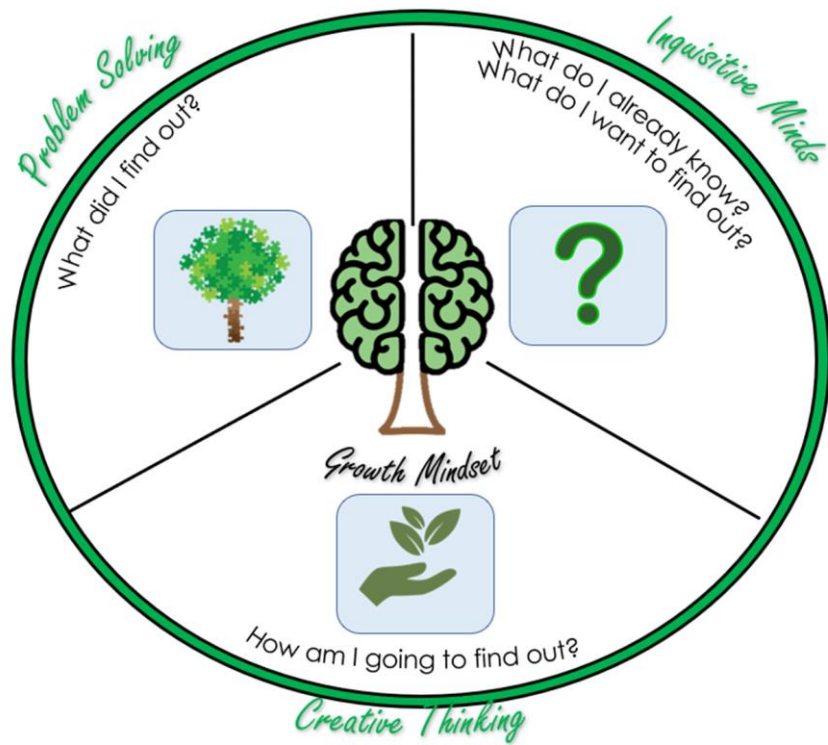- By showing it in different ways.
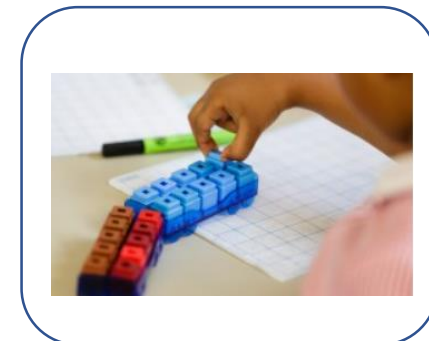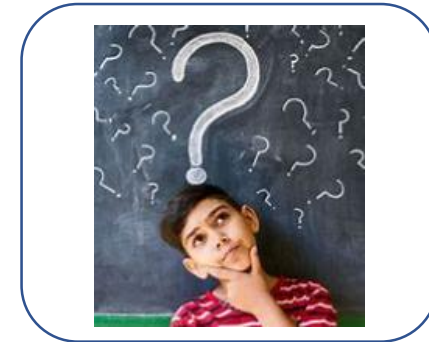- By teaching it.

Same concept in different ways:

7 + 3 = 10

10
7   3

10
6 + 4 = 10
4 + 6 = 10
10 − 4 = 6
10 − 6 = 4

10	
6	4

6 + 4 = 10
4 + 6 = 10
10 − 4 = 6
10 − 6 = 4

Tens Frame

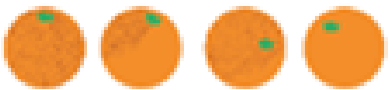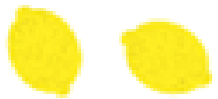Part Whole Model

Bar Model

What does a Maths lesson look like?

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

What do we do to help children achieve mastery?

Concrete
(Physical Objects)

Pictorial
(Drawings/Models)
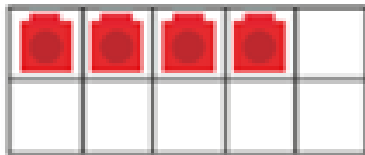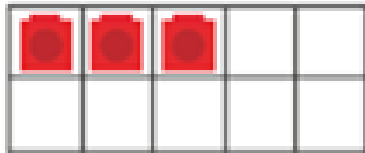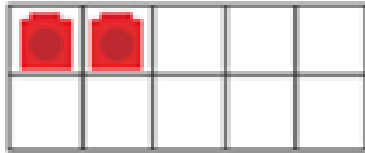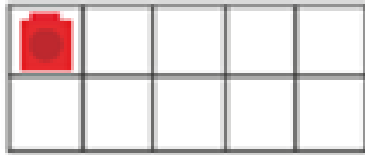
Abstract
(Using numbers)

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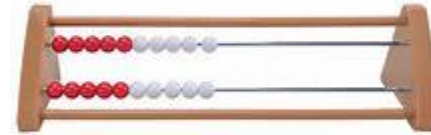
The starting point…. Number Fluency- Developing number sense

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?
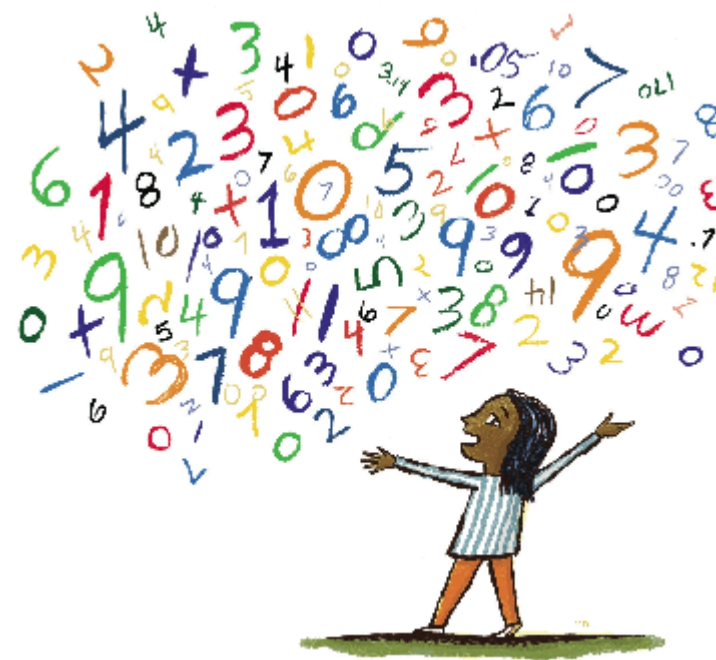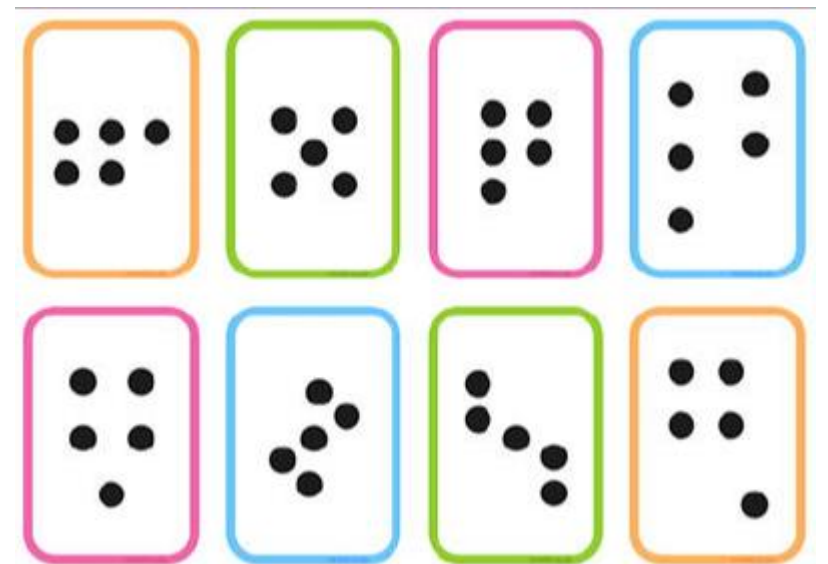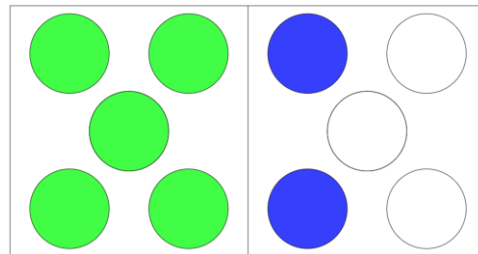
How do we help develop Number sense?

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:

* conceptual subitising
(seeing smaller numbers)

* perceptual subitising
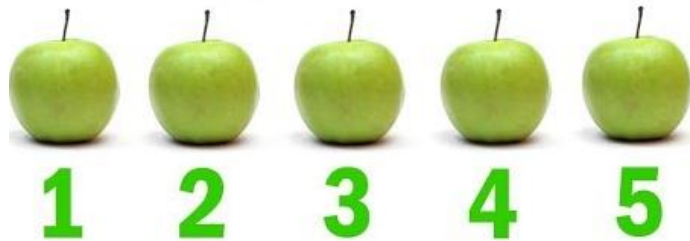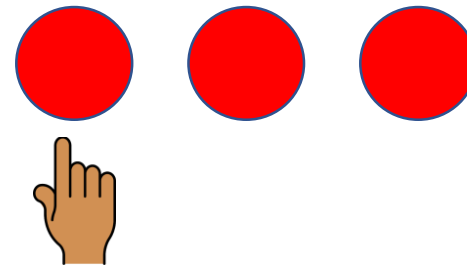(seeing numbers straight away)

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

1 2 3 4 5

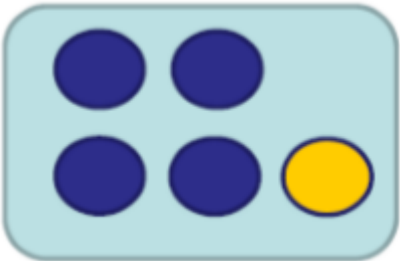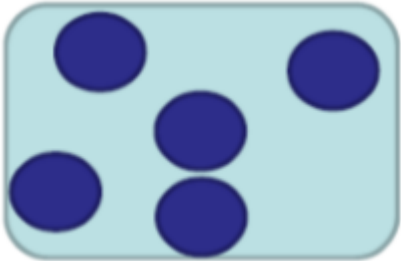# How do we help develop Number sense?

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.

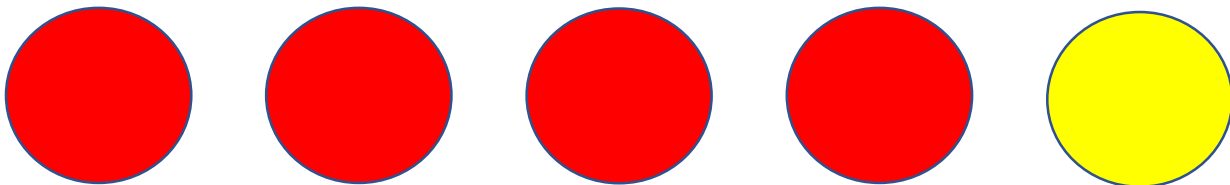| Familiar and structured dot patterns	Structure dot patterns	Unstructured dot patters

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
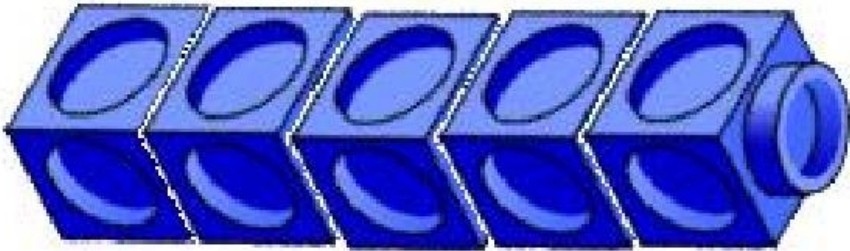
5 is the whole
   2 is a part and 3 is a part
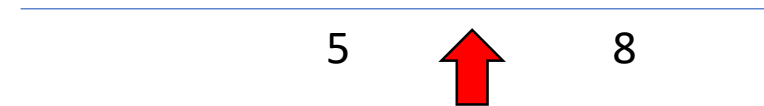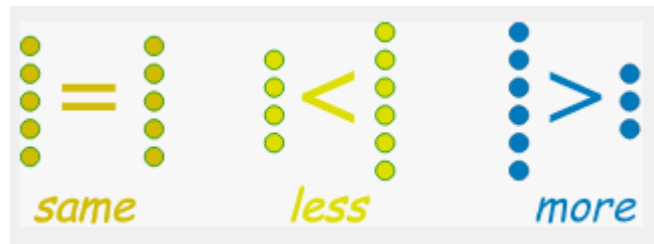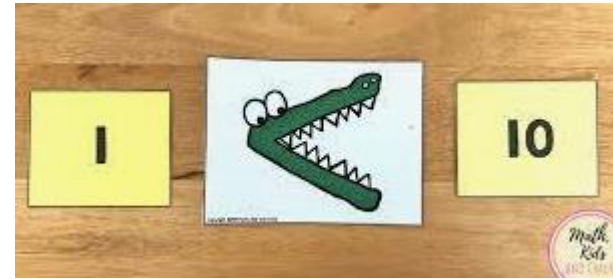
4 is a part and 1 is a part
5 is the whole

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

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.

5   8

Primary Maths Mastery is based on 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.
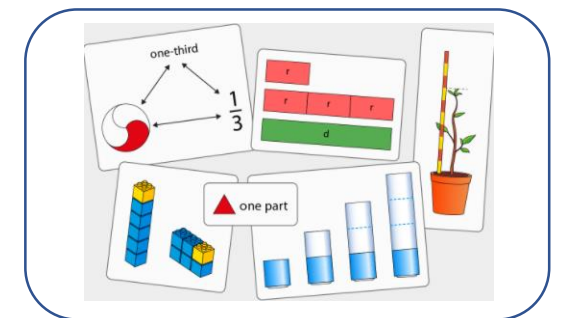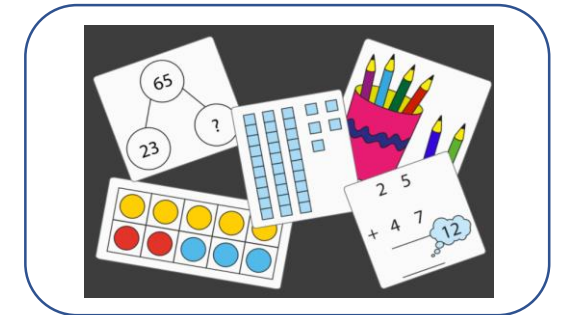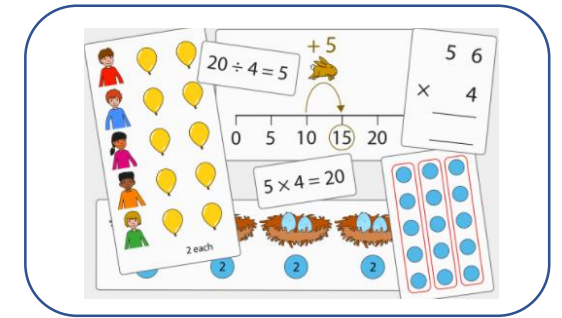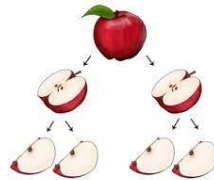
Ideas to support your child at home:

Finding number patterns.

Counting opportunities to secure 1:1 correspondence.

Subitising when playing games with a dice or anywhere at home.

Telling the time on an analogue clock.

Exploring fractions when cutting pizza, cake, fruit.

Practise exploring coins and working out the change.

Opportunities to weigh and measure when cooking!

Thank you for your time.

We hope you found this presentation helpful.