REGENTS INTERNATIONAL SCHOOL PATTAYA

A NORD ANGLIA EDUCATION SCHOOL

MATHS AT REGENTS

PRESENTED BY JENNIFER BILHAM

March 2023

INTRODUCTION

- 1. Introduction: Maths at Regents

- 2. What is Maths Mastery?

- 3. Maths Mastery Approach: Lesson design & Maths in the Classroom

- 4. White Rose Scheme

- 5. Concrete, Abstract and Pictorial Approach

- 6. Models & images

- 7. Bar Modelling

- Questions!

MATHS AT REGENTS

WHAT IS MATHS MASTERY?

The underpinning principles of the Maths Mastery Approach:

- Maths teaching assumes everyone **can** learn and enjoy mathematics.

- Mathematical learning behaviours are developed such that pupils focus and engage fully as learners who reason and seek to make connections.

- Teachers continually develop specialist knowledge for teaching mathematics, working collaboratively to refine and improve teaching.

- Curriculum design ensures coherent and detailed sequence of essential content to support sustained progression over time.

# MATHS MASTERY: LESSON DESIGN & MATHS IN THE CLASSROOM

**Year 1 | Spring term | Block 2 – Addition and subtraction (within 20)**
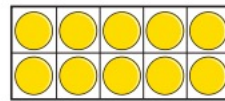
Small steps

Step 1	Add by counting on within 20
Step 2	Add ones using number bonds
Step 3	Find and make number bonds to 20
Step 4	Doubles
Step 5	Near doubles
Step 6	Subtract ones using number bonds
Step 7	Subtraction – counting back
Step 8	Subtraction – finding the difference

First Then Now

$4 + 2 = \underline{\hspace{1.5cm}}$

$14 + 2 = \underline{\hspace{1.5cm}}$

$12 + 4 = \underline{\hspace{1.5cm}}$
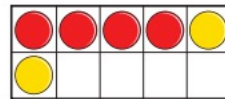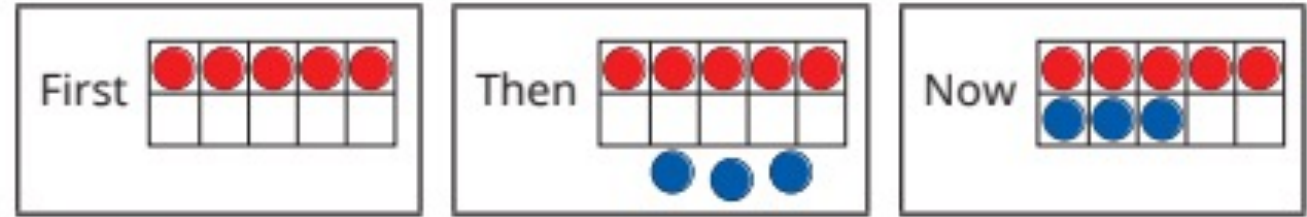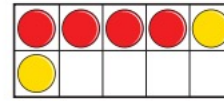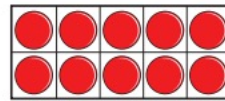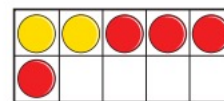
Procedural fluency and conceptual understanding are developed side by side.

WHITE ROSE SCHEME

NUMBER FLUENCY

Depth of **Knowledge**

research

RESILIENCE

WHITE ROSE SCHEME: GROWTH MINDSET, PROBLEM SOLVING AND REASONING

WHITE ROSE SCHEME

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12

Autumn term

Number — **Place value** — VIEW

Number — **Addition and subtraction** — VIEW

Geometry — **Shape** — VIEW

Spring term

Measurement — **Money** — VIEW

Number — **Multiplication and division** — VIEW

Measurement — **Length and height** — VIEW

Measurement — **Mass, capacity and temperature** — VIEW

Summer term

Number — **Fractions** — VIEW

Measurement — **Time** — VIEW

Statistics — VIEW

Geometry — **Position and direction** — VIEW

Consolidation

Multiplication and division

Spring Term

Scheme of learning

Reasoning and problem solving questions

End of block assessment (version A)

Topic based CPD – **New for 2022/23**

Premium resources

Flashback 4

Step 1 Recognise equal groups

Step 2 Make equal groups

Step 3 Add equal groups

Step 4 Introduce the multiplication symbol

Step 5 Multiplication sentences

Step 6 Use arrays

Step 7 Make equal groups — grouping

Step 8 Make equal groups — sharing

Step 9 The 2 times-table

Step 10 Divide by 2

Step 11 Doubling and halving

Step 12 Odd and even numbers

Step 13 The 10 times-table

Step 14 Divide by 10

Step 15 The 5 times-table

Step 16 Divide by 5

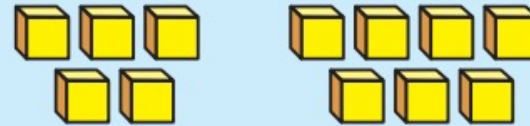Step 17 The 5 and 10 times-tables

ACTIVITY 1

What do you know about the number 12?

NUMBER FLUENCY
What is it?

CONCRETE, PICTORIAL AND ABSTRACT (CPA) APPROACH

Concrete

Children should have the opportunity to work with physical objects/concrete resources, in order to bring the maths to life and to build understanding of what they are doing.

Pictorial

Alongside concrete resources, children should work with pictorial representations, making links to the concrete.
Visualising a problem in this way can help children to reason and to solve problems.

Abstract

With the support of both the concrete and pictorial representations, children can develop their understanding of abstract methods.

?

| 5 | 7 |

5 + 7

CONCRETE, PICTORIAL AND ABSTRACT (CPA) APPROACH

CONCRETE, PICTORIAL AND ABSTRACT (CPA) APPROACH

CONCRETE, PICTORIAL AND ABSTRACT (CPA) APPROACH

$$7 - 3 = 4$$
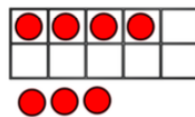
First   Then   Now
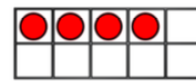
CPA MODELS & IMAGES

Part-Whole Model

$$7 = 4 + 3$$
$$7 = 3 + 4$$

$$7 - 3 = 4$$
$$7 - 4 = 3$$

Benefits

This part-whole model supports children in their understanding of aggregation and partitioning. Due to its shape, it can be referred to as a cherry part-whole model.
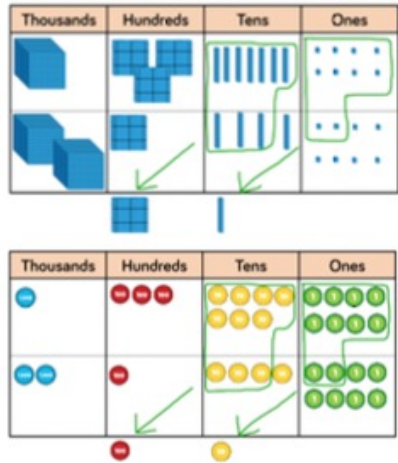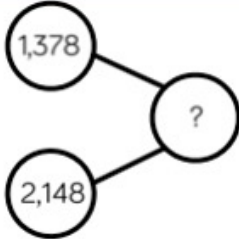
When the parts are complete and the whole is empty, children use aggregation to add the parts together to find the total.

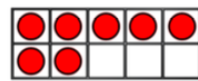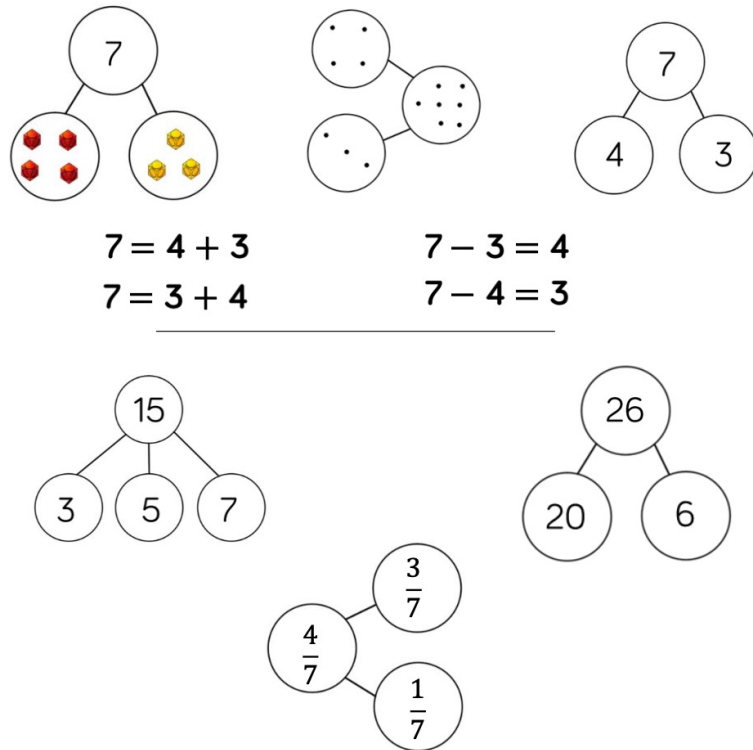When the whole is complete and at least one of the parts is empty, children use partitioning (a form of subtraction) to find the missing part.

Part-whole models can be used to partition a number into two or more parts, or to help children to partition a number into tens and ones or other place value columns.

In KS2, children can apply their understanding of the part-whole model to add and subtract fractions, decimals and percentages.

CPA MODELS & IMAGES

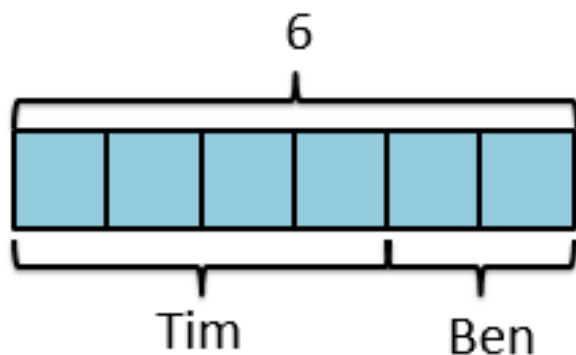| Year 4			
Skills & Stem sentences	**Concrete (Can we make it?)**	**Pictorial (Can we draw it?)**	**Abstract (Can we write the equation?)**
Add numbers with up to 4 digits	Base 10 and place value counters are the most effective manipulatives when adding numbers up to 4 digits		Ensure children write out their calculation alongside any concrete resources so they can see links with the column method.

CPA MODELS & IMAGES: BAR MODELS (SINGLE)

CPA MODELS & IMAGES: BAR MODELS (SINGLE)

CPA MODELS & IMAGES: BAR MODELS (SINGLE)

ACTIVITY 2

Tim has 4 sweets and Ben has 2 sweets.

How many sweets do they have altogether?

19
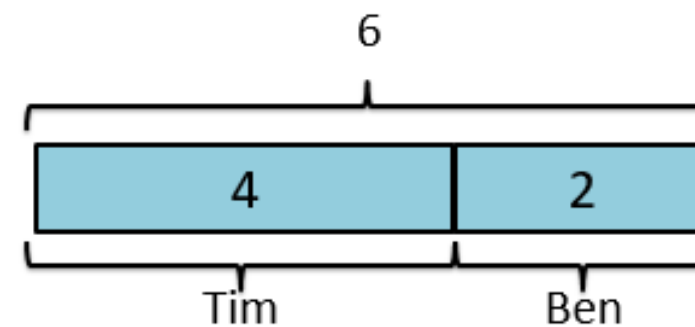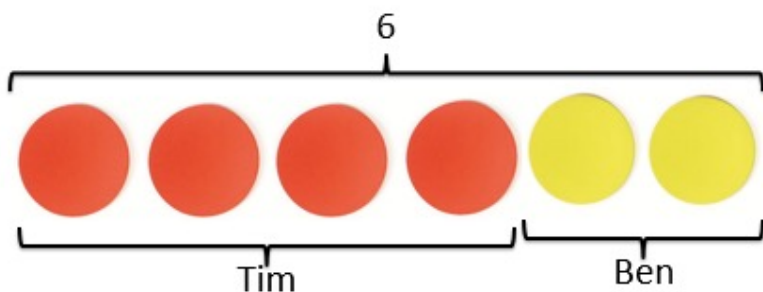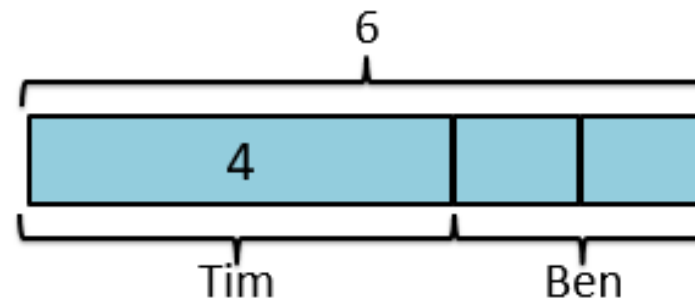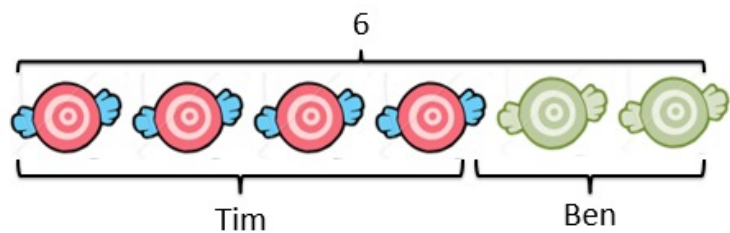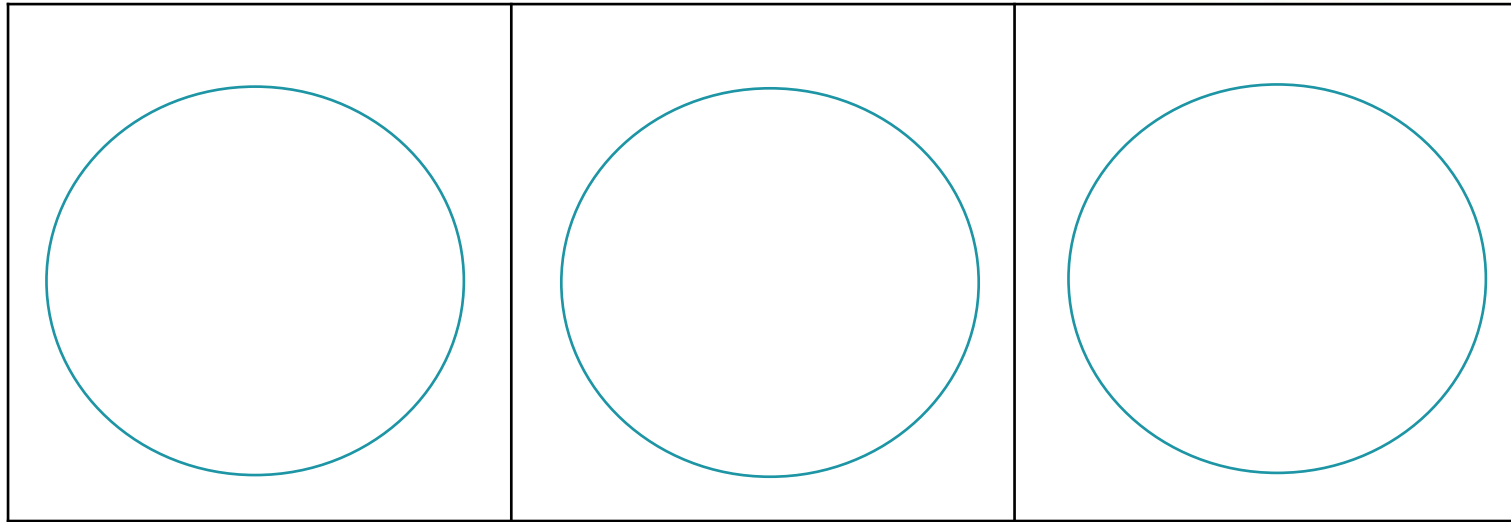
CPA MODELS & IMAGES: BAR MODELS

Tim has 4 sweets and Ben has 2 sweets.

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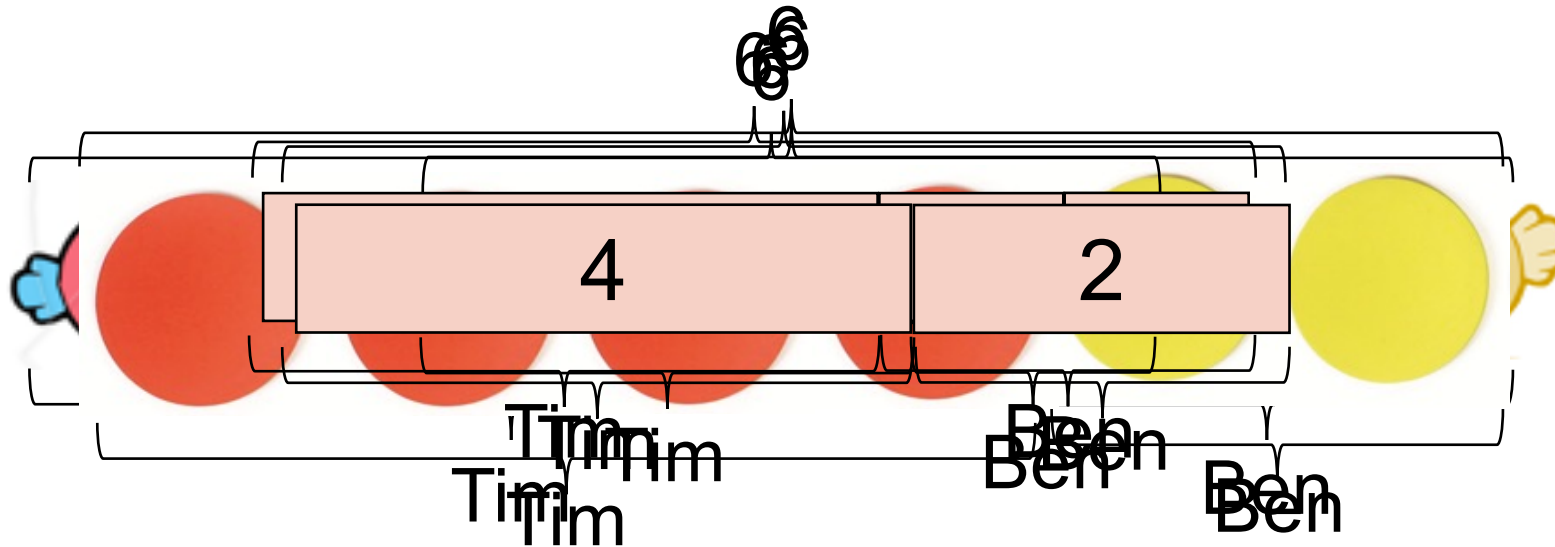
CPA MODELS & IMAGES: BAR MODELS (SINGLE)

Solve… Matthew has a 300g block of cheese. He eats $\frac{2}{5}$ of the cheese and puts the rest back in the fridge.

How much cheese did Matthew put back in the fridge?

- Model

- Calculations

300g

| 60 | 60 | 60 | 60 | 60 |

Eats

Put back

180
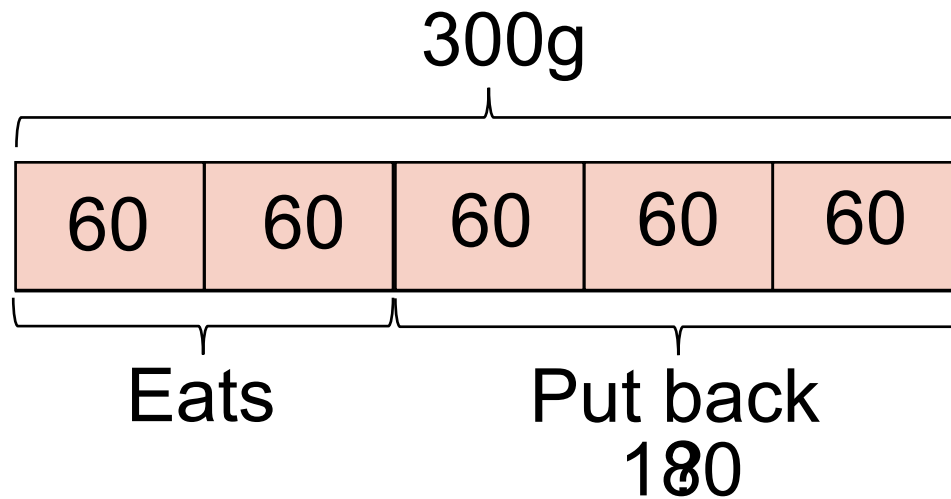
$$300 \div 5 = 60$$

$$3 \times 60 = 180$$

CPA MODELS & IMAGES: BAR MODELS (MULTIPLE)

a

10    $7 + 3 = 10$

$7 - 3 = 4$

4

b

7

3

4

$7 - 3 = 4$

2,394

1,014

1,380

$2,394 - 1,014 = 1,380$
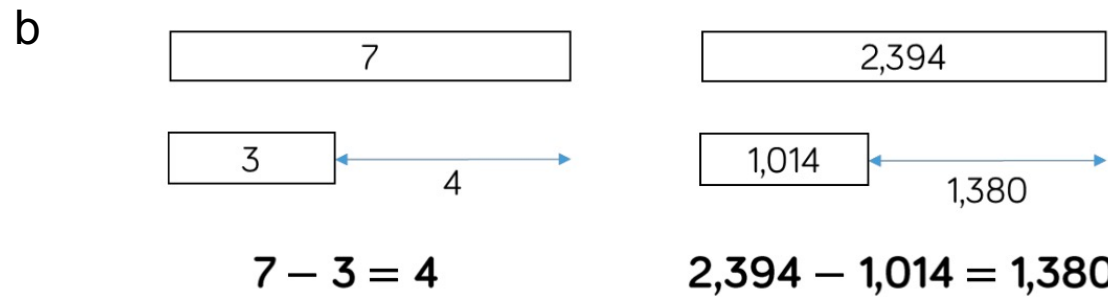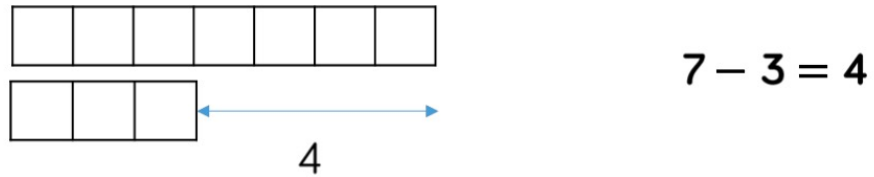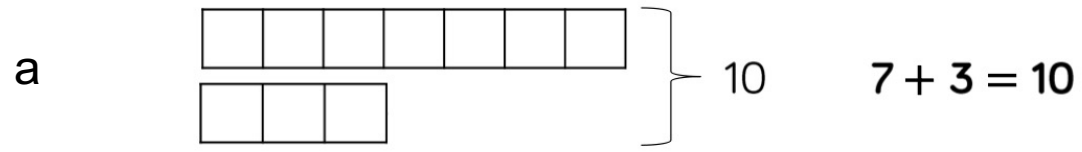
ACTIVITY 3

Here are 2 number cards.

- B is three times the size of A
- The difference between A and B is 56

Find the sum of the two numbers.

CPA MODELS & IMAGES: BAR MODELS (MULTIPLE)

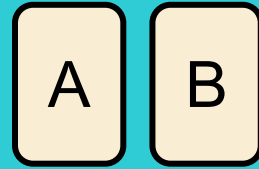Here are 2 number cards.

- B is three times the size of A
- The difference between A and B is 56

A   B
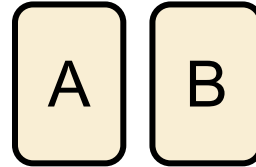
Find the sum of the two numbers.

MODEL	CALCULATIONS

MODEL

A | 28 | ← 56 →

} 112

B | 28 | 28 | 28

CALCULATIONS

$$56 \div 2 = 28$$

$$4 \times 28 = 112$$

"Models drawing trains children to think analytically, providing an important transition between..."

Försten 2014

Beckmann 2014

Beckmann 2014

Bah Har 2016

TAKE HOMES…

https://whiterosemaths.com/resources/digital-tools

CPA Models & Images

Representation	Image	Information
Bar model (single)		Bar models can support children in representing calculations and help them to unpick the structure. Cubes/counters can be used in a line as a concrete representation of a bar model. Discrete bar models are a good starting point with smaller numbers as each box represents a whole. The combination bar model can support children to calculate by counting on from the larger number and is a good steppingstone towards the continuous bar model. Continuous bar models are good for a range of values.
Bar model (multiple)		The multiple bar model is a good way to compare quantities whilst still unpicking the structure. Two or more bars can be drawn with bracket labelling. Smaller numbers can be represented with discrete bars whereas continuous bar models are effective for larger numbers. Multiple bar models can also be used to represent the difference in subtraction. An arrow can be used to model the difference.

Other Manipulatives
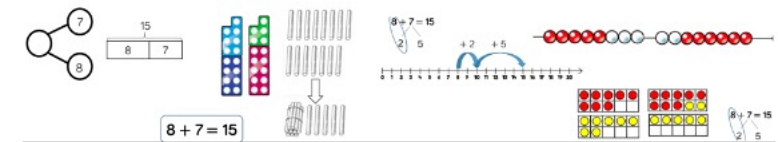
ANY QUESTIONS?

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THANK YOU