



# **PLACE VALUE, ADDITION AND SUBTRACTION**

**INFORMATION EVENING ONE: WEDNESDAY 18<sup>TH</sup> JANUARY 2017**



# AIMS OF SESSION ONE:



By the end of the session, you should:

- Have a better knowledge of what mastery means.
- Have a better understanding of how we teach maths with the CPA approach.
- Have an increased understanding of how we will be using the 'Bar Model' as a method to help solve problems involving addition and subtraction.
- Have an increased understanding of addition, subtraction and place value and how vital these basic skills are.

# HOW MATHS IS TAUGHT:



## We are teaching a MASTERY curriculum.

- Gone are the days of setting into high and low groups for maths in primary school; everyone: teachers, parents, children, need to change the mind-set of a high and low maths group.
- The whole class is taught the same concept, at the same time with the same input.
- Teachers remain the most influential factor in children's mathematical attainment.
- Apparatus (manipulatives) will be used to support the Concrete-Pictorial-Abstract (CPA) approach in all year groups.

# WHAT IS MASTERY?

THE ESSENTIAL IDEA BEHIND MASTERY IS THAT **ALL CHILDREN** NEED A ***DEEP*** UNDERSTANDING OF THE MATHEMATICS THEY ARE LEARNING...THE CPA APPROACH GIVES THIS DEEP UNDERSTANDING.

# CHARLIE STRIPP: (DIRECTOR NCTEM)

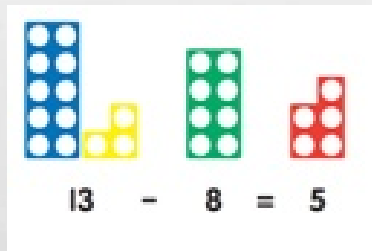
THE 'TRADITIONAL' WAY WE DIFFERENTIATE I.E. PUTTING THE CHILDREN INTO ABILITY GROUPED TABLES AND PROVIDING EASIER WORK FOR THE LESS ABLE AND MORE CHALLENGING 'EXTENSION' WORK FOR THE MORE ABLE HAS 'A VERY NEGATIVE EFFECT ON MATHEMATICAL ATTAINMENT'



# STRIPP CLAIMS:

- IT DAMAGES THE LESS ABLE BY FOSTERING A NEGATIVE MINDSET THAT THEY ARE NO GOOD AT MATHS.
- IN PRACTICE, IT RESULTS IN THE LESS ABLE CHILDREN BEING GIVEN A 'REDUCED CURRICULUM'.
- IT DAMAGES THE MORE ABLE BECAUSE IT ENCOURAGES CHILDREN TO RUSH AHEAD TO FIND THE ANSWER AS QUICKLY AS THEY CAN OR CAN 'INVOLVE UNFOCUSED INVESTIGATIVE WORK'.
- LABELLING THE CHILD AS 'ABLE' CREATES A FIXED MINDSET SO THE CHILD BELIEVES THAT THEY SHOULD FIND MATHS 'EASY' AND BECOMES UNWILLING TO TACKLE DEMANDING TASKS FOR FEAR OF FAILURE.

# Structuring Learning using CPA approach



$$13 - 8$$



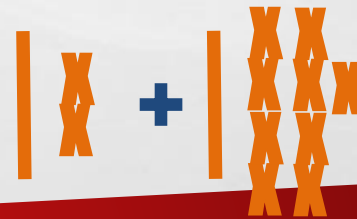
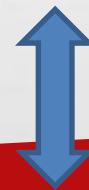
Abstract

$$12 + 19$$

Concrete



Pictorial



# EXAMPLE: SUBTRACTION



## CONCRETE

Can you use the manipulatives to show me 23 subtract 15

Using manipulatives to subtract 15 from 23

## PICTORIAL

Can you show me 23 take away 15?

Representing subtraction by drawings.

## ABSTRACT

Calculate  $23 - 15$

Being able to solve the number sentence  $23 - 15$



# EXAMPLE TWO: ADDING FRACTIONS



CONCRETE	PICTORIAL	ABSTRACT
Can you show me, using the manipulatives on your table, $\frac{1}{4} + \frac{1}{4}$ ?	Can you draw $\frac{1}{4} + \frac{1}{4}$ on your mini whiteboards?	What is $\frac{1}{4} + \frac{1}{4}$ ?
Using manipulatives to add together $\frac{1}{4}$ and $\frac{1}{4}$ .	Representing $\frac{1}{4}$ added to $\frac{1}{4}$ by drawing.	Being able to solve the number sentence $\frac{1}{4} + \frac{1}{4} =$

# CPA:



- The CPA approach ensures that children master the ideas behind the maths (conceptual understanding) and can explain what they are doing when they answer questions rather than just knowing how to do something by 'rote' and not understanding it.

# MASTERY AND CPA APPROACH IN CLASS:

- [HTTPS://WWW.NCETM.ORG.UK/RESOURCES/49420](https://www.ncetm.org.uk/resources/49420) YEAR 4 LESSON ON DECIMAL NUMBERS (TENTHS)

# QUESTIONS:

ANY QUESTIONS ABOUT THE 'METHOD' BEHIND HOW WE TRY TO STRUCTURE AS MANY MATHS LESSONS AS POSSIBLE?

# **BAR MODEL AS A MEANS TO PROBLEM SOLVE:**

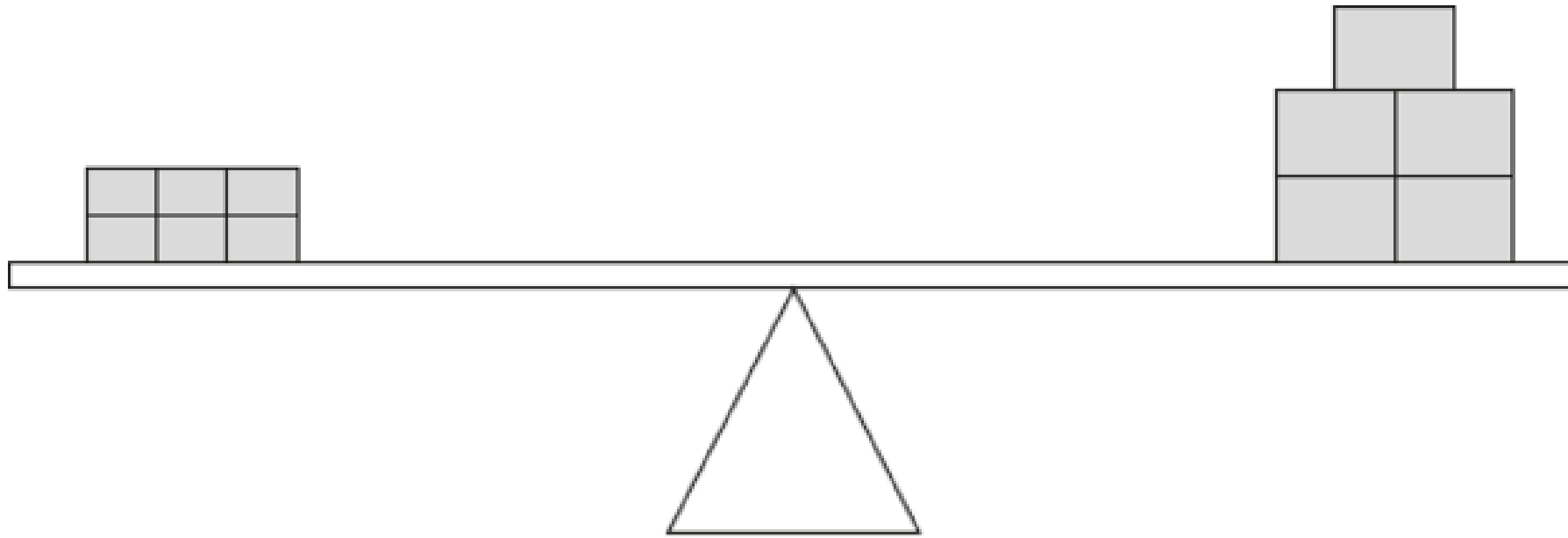
THE BAR MODEL METHOD IS A STRATEGY USED BY CHILDREN TO VISUALISE MATHEMATICAL CONCEPTS AND SOLVE PROBLEMS. THE METHOD IS A WAY TO REPRESENT A SITUATION IN A WORD PROBLEM, USUALLY USING RECTANGLES.



# IT DOESN'T ANSWER THE QUESTION...

- BUT IT DOES REPRESENT AN ABSTRACT CONCEPT TO THE CHILDREN TO HELP THEM UNDERSTAND PROBLEMS WITH MORE EASE.

6 small bricks have the same mass as 5 large bricks.



The mass of one small brick is 2.5 kg.

What is the mass of one large brick?