

# Maths Information Evening



Claudine Pavier and Chris Heeley

- Approaches to Maths
- How we teach Maths at WBIS
- Ways to support your child at home
- Explore

# Approaches to Maths

# Maths Mastery Approach

“In mathematics, you know you’ve mastered something when you can apply it to a totally new problem in an unfamiliar situation.” – Dr Helen Drury, Director of Mathematics Mastery.

- Maths Mastery builds confidence in pupils that everybody can achieve – breaking down a common notion that “I can’t do Maths!”
- Children are taught as a whole class, with concepts broken down into granular steps and taught sequentially.
- Concepts are fully mastered before moving on to the next step.
- Significant time is spent **developing deep knowledge** of the key ideas that are needed to underpin future learning.

# Maths Mastery is not just.....

- Learning Maths facts by wrote, eg: number bonds, times tables.
- Being able to calculate using larger numbers.

# However Maths Mastery is.....

- Having a deep understanding of number and mathematical concepts, with a competent, fluent knowledge of mathematical facts.
- The ability to reason and explain what you are thinking using the correct vocabulary.
- Being able to flexibly use and apply what you know within unfamiliar contexts.
- The belief that you are a mathematician who can achieve!

# How we teach Maths at WBIS

# How we teach Maths at WBIS

- We've planned a carefully sequenced curriculum following the EYFS and National Curriculum.
- We use the **White Rose Maths** scheme to supplement our planning.
- Maths is taught multiple times a week with whole class carpet sessions. Teachers then work with children in small groups to practise and apply their learning, giving feedback to the children and addressing any misconceptions.
- Children are then challenged to independently practise, embed and apply their learning during Independent Learning time in the Maths Area.

# Small steps

Step 1 Introduce parts and wholes

Step 2 Part-whole model

Step 3 Write number sentences

Step 4 Fact families - addition facts

Step 5 Number bonds within 10

Step 6 Systematic number bonds within 10

Step 7 Number bonds to 10

Step 8 Addition - add together

## Number bonds to 10

### Notes and guidance

In this small step, children move on from number bonds within 10 to number bonds to 10

Initially, allow children to explore finding the number bonds. They could use two different colour cubes to build towers of 10 and represent their tower in a number sentence. For example, if their tower is made up of 2 blue cubes and 8 red cubes, they have 10 cubes altogether, so  $2 + 8 = 10$

As children become more comfortable in finding these bonds to 10, encourage them to use their earlier learning to work systematically to find all the number bonds. Ten frames and double-sided counters can support them with their thinking.

This is essential learning that forms the basis of our number system, so time should be spent ensuring that children are comfortable with finding and recognising these bonds.

### Key questions

- How many \_\_\_\_\_ are there?
- How many more do you need to make 10?
- What number bond can you see?
- What is the same about  $2 + 8$  and  $8 + 2$ ? What is different?
- Can you write any of the bonds another way?
- How do you know that you have found them all?

### Possible sentence stems

- There are \_\_\_\_\_ red counters and \_\_\_\_\_ yellow counters. There are \_\_\_\_\_ counters altogether.  
\_\_\_\_\_ + \_\_\_\_\_ = 10

## Number bonds to 10

### Key learning



Give children sets of cubes of two different colours. They should have 10 of each colour.



Ask children to build a tower of 10 cubes and then ask:

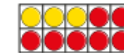
- How many \_\_\_\_\_ cubes have you used?
- How many \_\_\_\_\_ cubes have you used?
- What bond to 10 can you see?

Ask children to repeat this to find more bonds to 10. Have they found the same bonds as their partner?

- Max shows a number on his fingers.  
How many more are needed to make 10?  
What is the bond to 10?



- Here is a ten frame.



How many yellow counters are there?

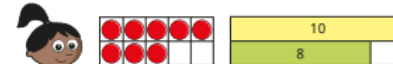
How many red counters are there?

How many counters are there in total?

Complete the number sentence.

$$\underline{\quad} + \underline{\quad} = 10$$

- Sam puts some counters on a ten frame and draws a bar model.



How many more counters does Sam need to fill the ten frame?

Complete the bar model.

Write a number sentence to show the bond to 10

### National Curriculum links

- Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Add and subtract 1-digit and 2-digit numbers to 20, including zero



# CPA approach

- Concrete, Pictorial, Abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths.
- Children (and adults!) can find maths difficult because it is abstract. The CPA approach builds on children's existing knowledge **by introducing abstract concepts in a concrete and tangible way**. It involves moving from concrete materials, to pictorial representations, to abstract symbols and problems (Maths No Problem, 2019).

## The CPA Approach



CONCRETE -  
using physical objects  
to solve maths problems.

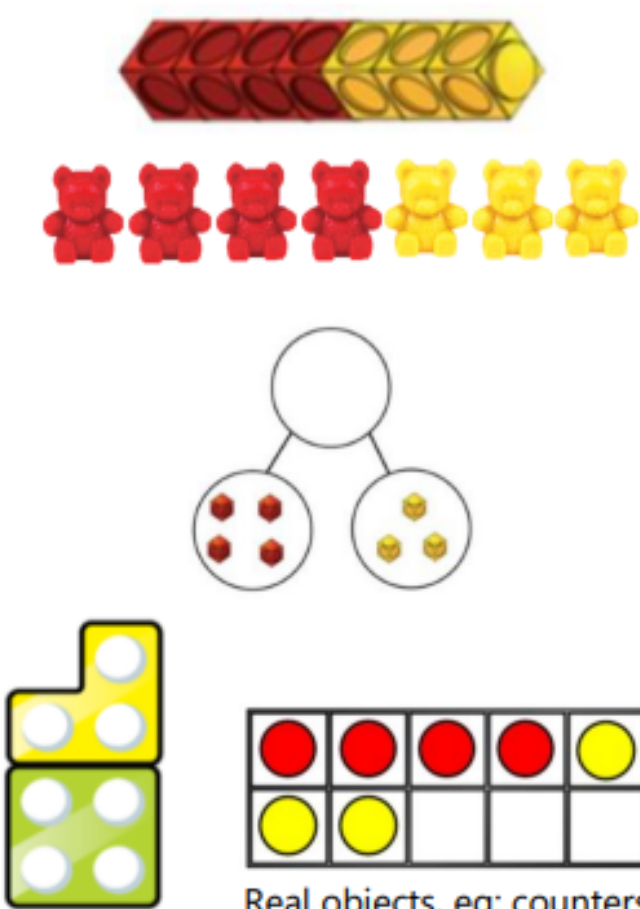
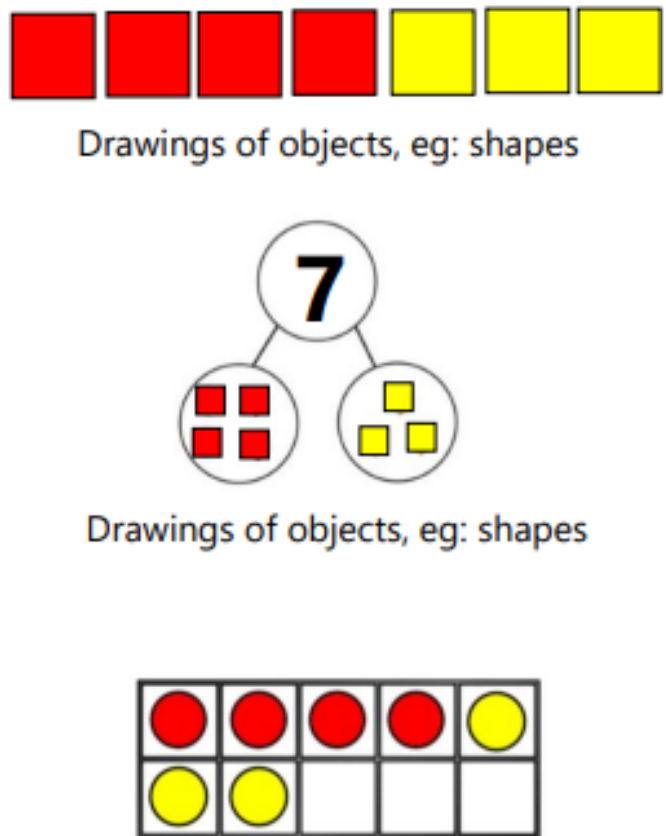
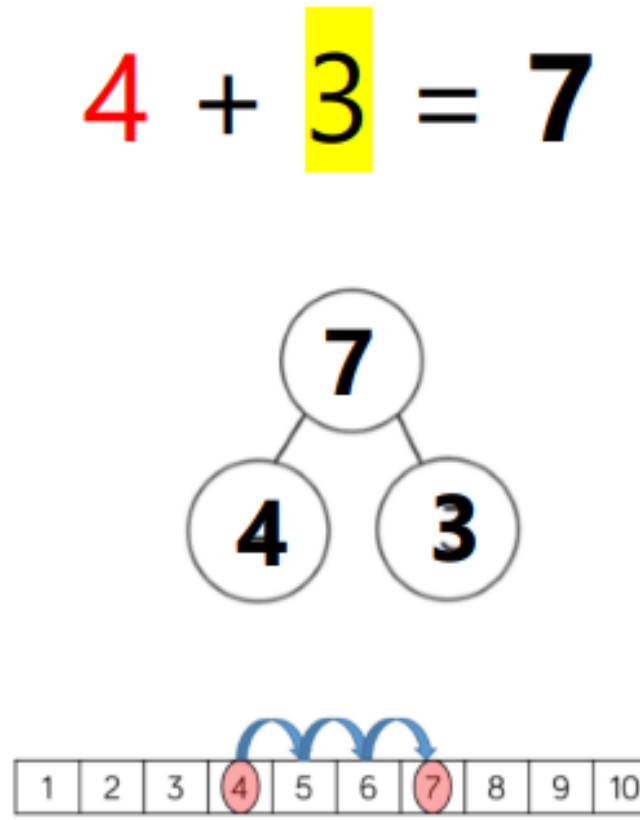


PICTORIAL -  
using drawings  
to solve maths problems.



ABSTRACT -  
solving maths problems  
using only numbers.

# Addition at WBIS – Stage One

Concrete	Pictorial	Abstract
 <p>Real objects, eg: counters, unifix</p>	 <p>Drawings of objects, eg: shapes</p>	
<p><b>Skill – Add two 1-digit numbers</b></p>		

# Addition at WBIS – Stage Two



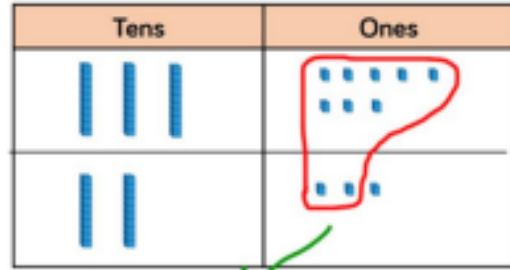
Concrete	Pictorial	Abstract
<p>Real objects, eg: counters, unifix, numicon, dienes. Regrouping to make 10.</p>	<p>Drawings of objects, eg: shapes</p>	<p><math>8 + 7 = 15</math></p> <p>+ 2 + 5</p>

**Skill – Add 1 and 2-digit numbers to 20**

# Addition at WBIS – Stage Three



## Concrete



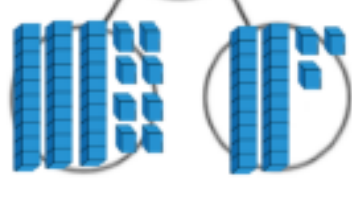
Using dienes in place value chart.



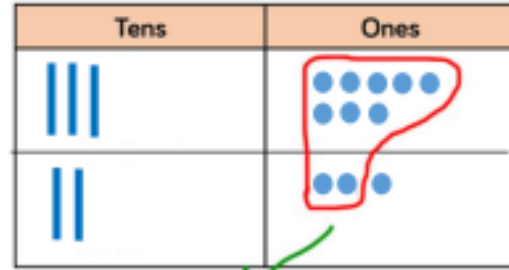
Can also use place value counters



**61**



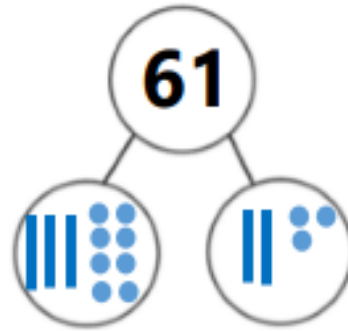
## Pictorial



Drawings of dienes in place value chart.



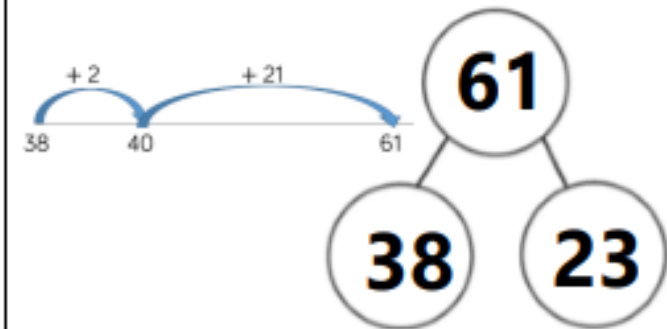
Can also use drawings of place value counters



## Abstract

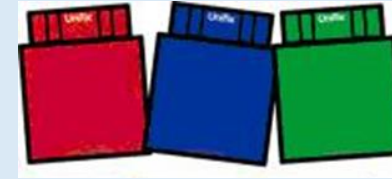
$$38 + 23 = 61$$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



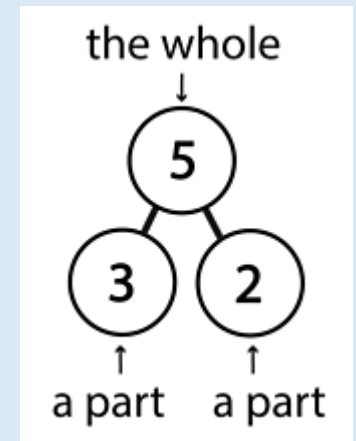
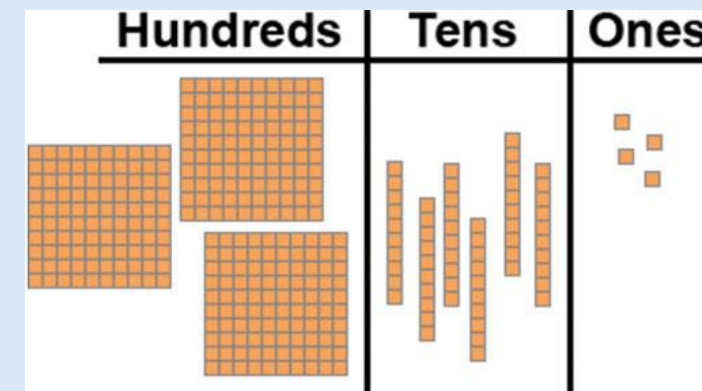
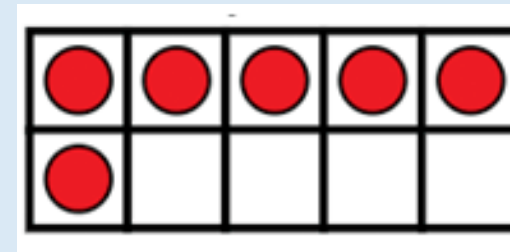
**Skill – Add 1-digit and 2-digit numbers to 100**

# Resources



- We use a variety of mathematical resources throughout the school to scaffold the understanding of abstract concepts.
- This also deepens the understanding by presenting it using different resources.

**10 =**      **1 + 9**      **2 + 8**      **3 + 7**      **4 + 6**





# Three Strands of Mastery

- To achieve a deep mastery of a mathematical concept, teachers plan lessons so the children can develop;

1. Fluency
2. Reasoning skills
3. Problem solving

If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others (NCETM, 2019).

# Reasoning Skills – explaining why and how.

Tiny is counting backwards in 2s.

36, 34, 32, 30,  
27, 26



What mistake has Tiny made?

Ron and Max have each made a number in a place value chart.



Tens	Ones



Tens	Ones

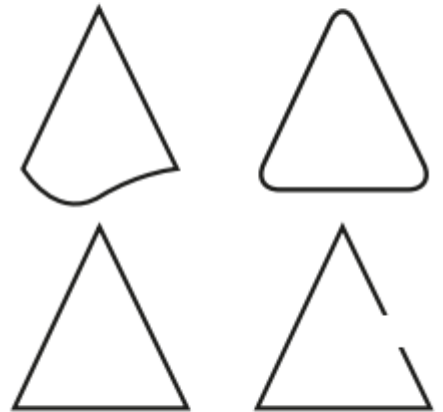
Is the statement true or false?

Ron and Max have made  
the same number.

Talk about it with a partner.



These shapes  
are all triangles.



Do you agree with Tiny?

Why?



# Reasoning Skills – explaining why and how.

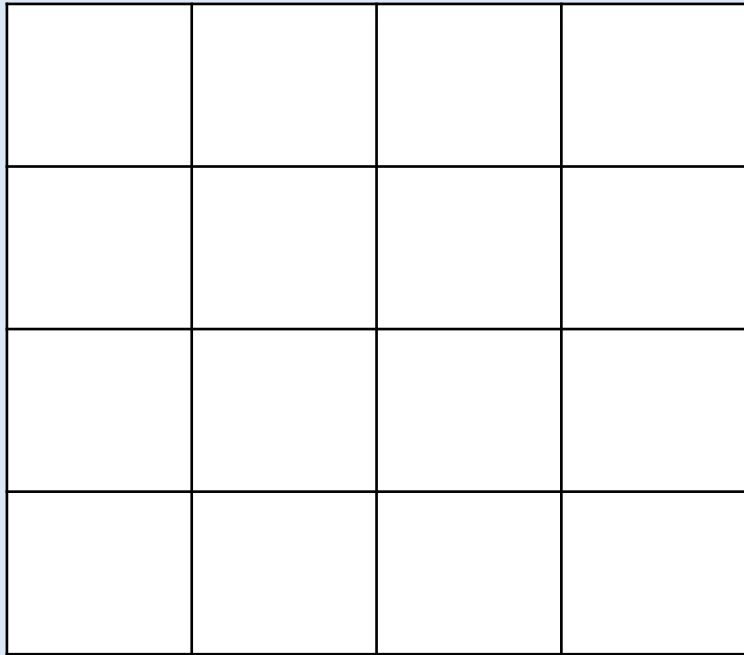
- Stem sentences and explicit teaching of the correct vocabulary is used to ensure **all** children can develop and master their reasoning skills.

I checked  
by .....

I noticed  
that .....

I think that ...  
because .....

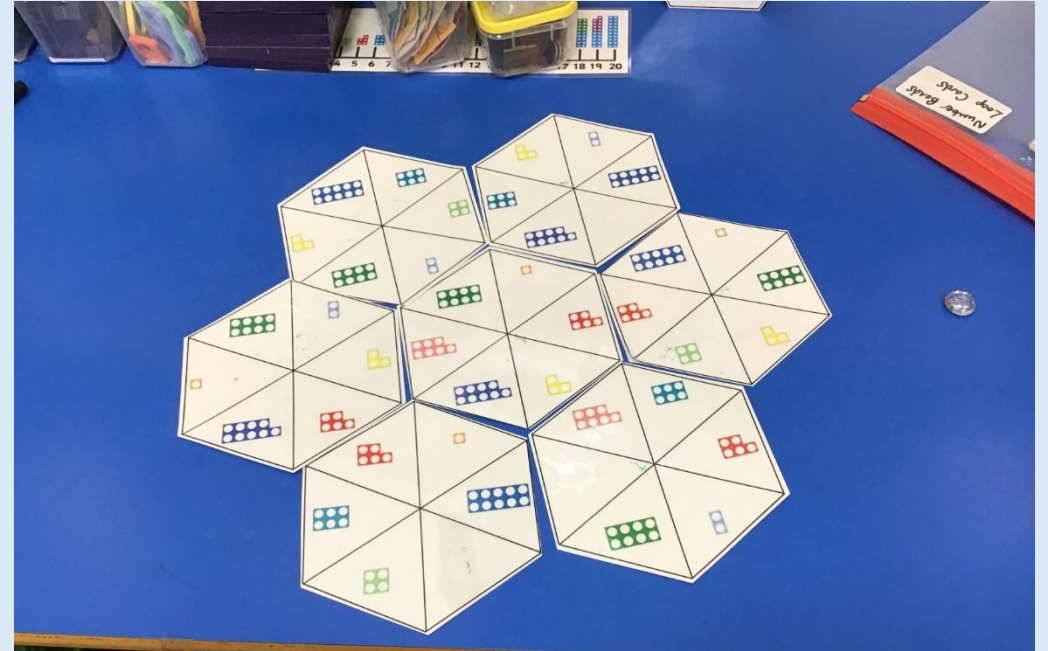
# Problem solving – applying learning to unfamiliar contexts.



How many ways can you colour  
in half of this shape?

$$2 < \boxed{\phantom{00}} < 9$$

What numbers can go in the box?



Match the puzzle pieces so each side of  
any touching hexagon adds up to 10.

# THE LEARNING PIT



MODEL:  
JAMES NOTTINGHAM  
[challenginglearning.com](http://challenginglearning.com)

sketchplanator

Have a go  
Hero



Professor  
Perseverance



Ways to support your  
child at home

# Make Maths fun and positive

- Frame Maths talk not in a negative way;
  - Oh well, I wasn't any good at maths.
  - Maths is really hard.
  - My child just doesn't get maths.
  - Maths is a different way of thinking. You're good at English.
- Instead;
  - It's OK if we don't know yet. Lets keep persevering!
  - Mistakes make our brains grow. They are a part of learning.
  - We might not understand this yet, but we will get it if we stick at it.



Be Brave



Be Curious



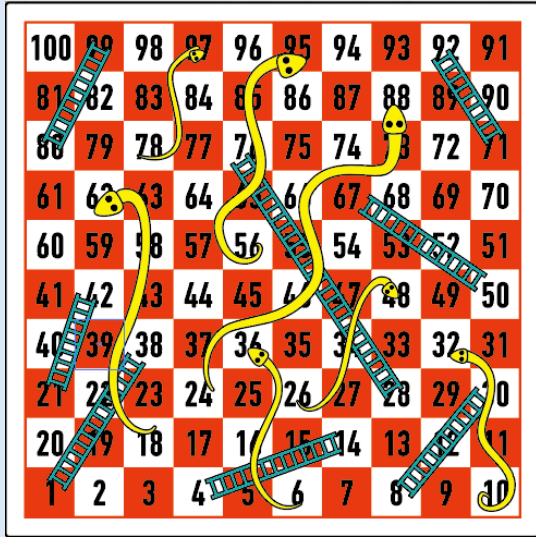
Be Your Best



Be Creative

Be a Team

# Maths is a part of our daily lives.



Playing board games and card games



Cooking/Baking



Telling the time



Role play, eg: shops



Counting, sorting and organising toys

# White Rose Maths App



- The 1-Minute Maths app helps children **build greater number sense, confidence and fluency**.
- Children can **practise the four operations** and **subitising** in targeted, one minute quizzes.
- Questions are randomly generated each time with instant feedback given on how your child has done.
- Difficulty settings within the app will help you **target the app to your child's needs**.



Explore