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What is Mastery?

Information Session For Parents
20.5.2016

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Welcome

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Session aims:

- To gain an insight into our Mastery approach to Maths and how it works in school.

- To give ideas for supporting maths at home – making it fun!

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What does it mean to master something?

- I know how to do it

- It becomes automatic and I don't need to think about it- for example driving a car

- I'm really good at doing it – painting a room, or a picture

- I can show someone else how to do it.

Mastery of Mathematics is more...

- Achievable for all
- **Deep** and sustainable learning
- The ability to build on something that has already been sufficiently mastered
- The ability to reason about a concept and make connections
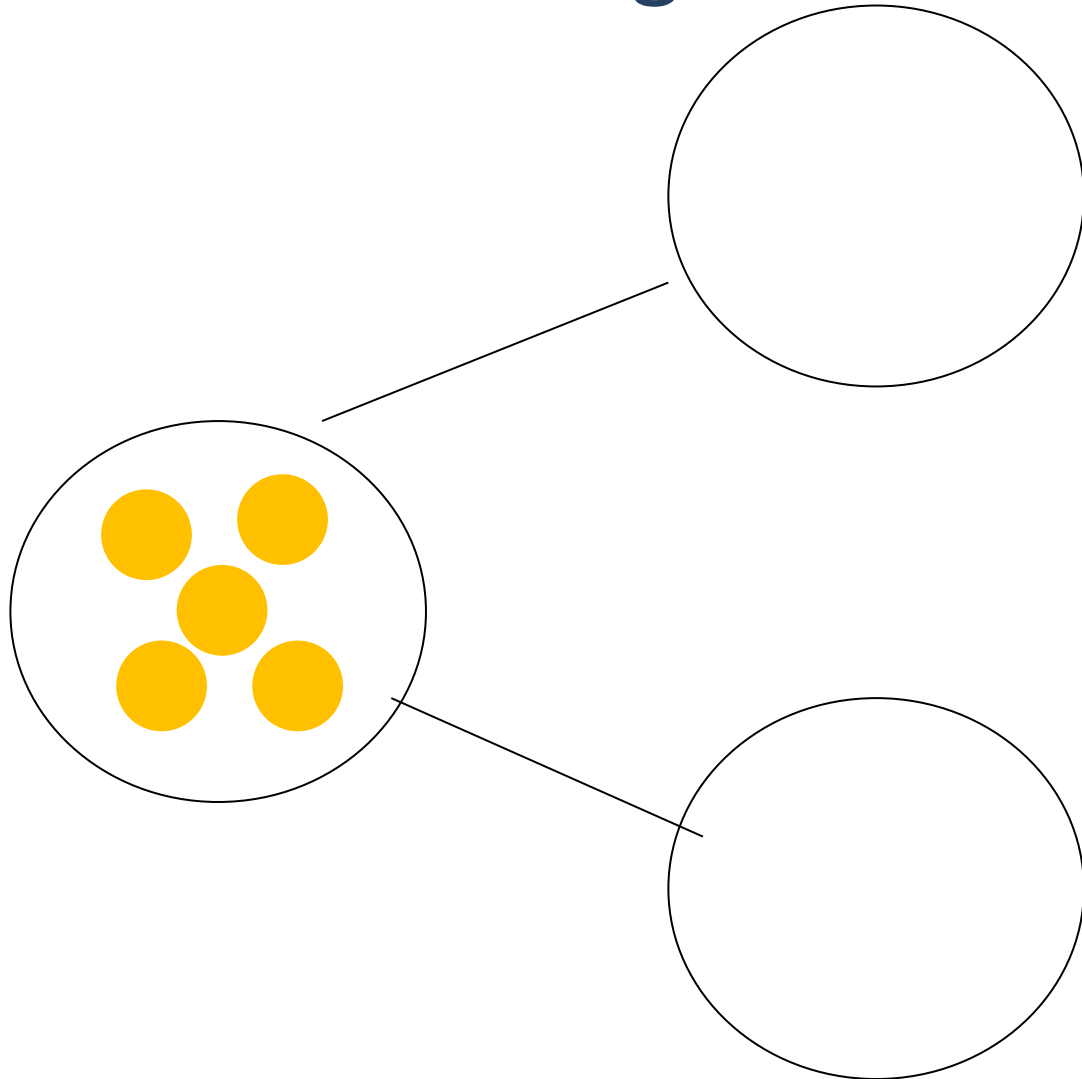- Conceptual and procedural fluency

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Teaching for Mastery

- High expectations for every child
- Fewer topics covered in greater depth
- Number sense and place value come first
- Problem solving is central
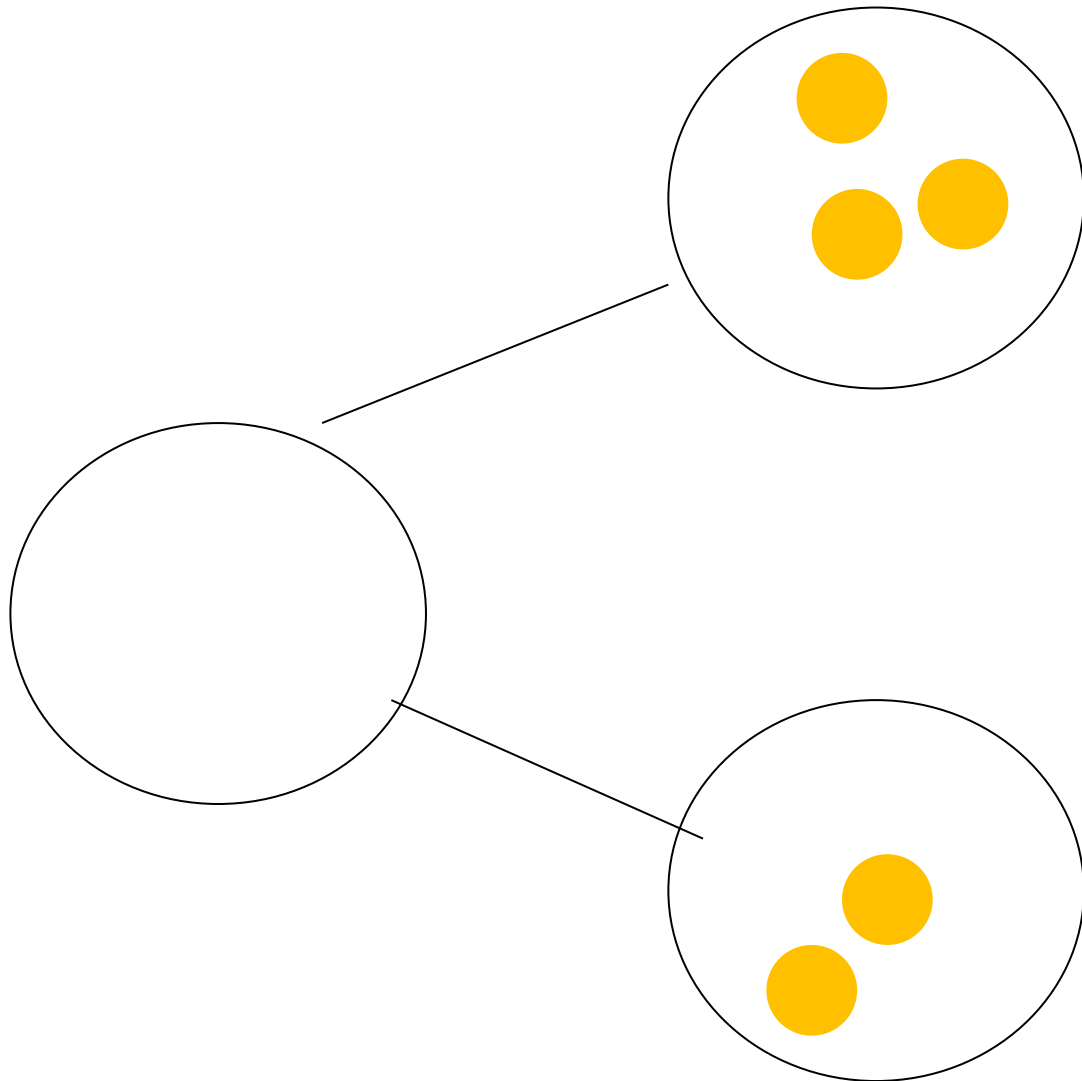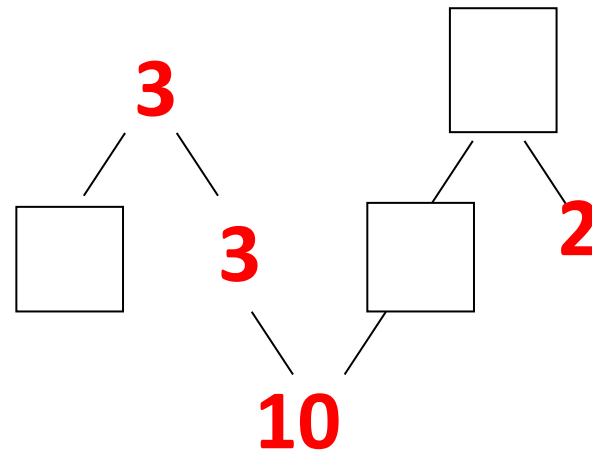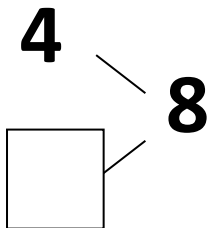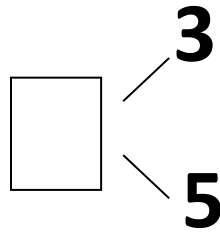- Challenge is provided through an increased depth, rather than acceleration of content

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What is depth?

Partitioning and Combining

Partitioning and Combining

10

5 ☐

10

1 ☐

☐

2 8

10

☐ ☐

☐

9

2

☐

3

5

3

☐

3

☐

☐

2

10

4

8

☐

10
5   **5**

10
1   **9**

10
2   8

10

7
9
2

3
8
5

3
0   3
7   2
9
10

4
8
4
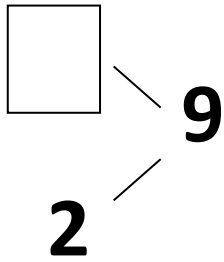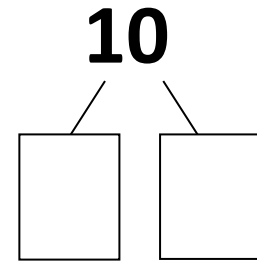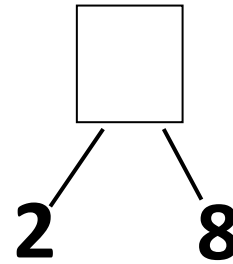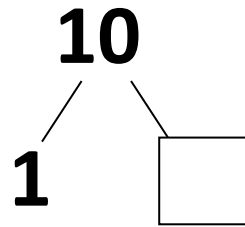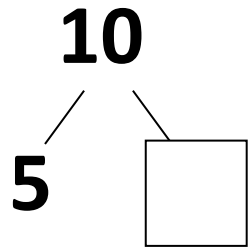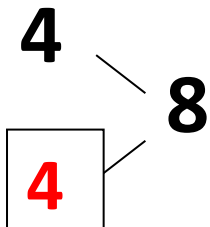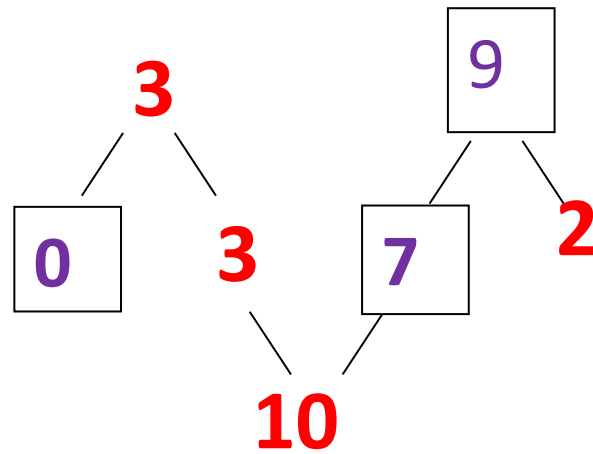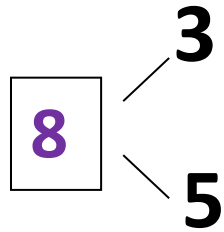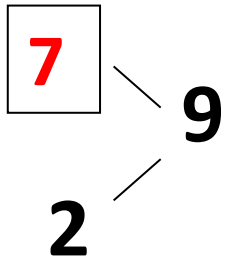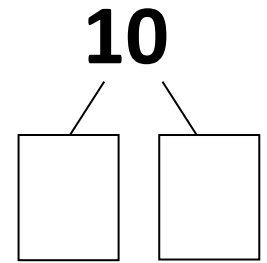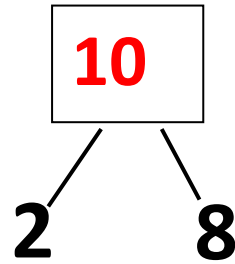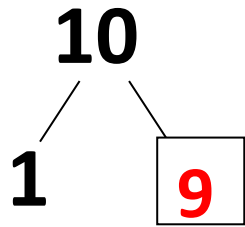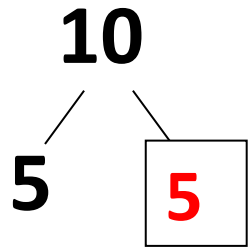
Building on prior knowledge

$2 \times 3 =$	$6 \times 7 =$	$9 \times 8 =$
$2 \times 30 =$	$6 \times 70 =$	$9 \times 80 =$
$2 \times 300 =$	$6 \times 700 =$	$9 \times 800 =$
$20 \times 3 =$	$60 \times 7 =$	$90 \times 8 =$
$200 \times 3 =$	$600 \times 7 =$	$900 \times 8 =$

Moving on to solve problems such as:

$360 \div \boxed{} = 60$

Teachers promote reasoning during Maths lessons, through using carefully chosen questions

E.g.

- _____ thinks that, _____. Do you agree? Explain your answer.

- Is it always true, sometimes true or never true that_____?

- Can you spot the mistake? Explain why they are wrong.

How do we develop reasoning in lessons?

$$\frac{3}{8} + \frac{2}{8} = \frac{5}{16}$$

$$\frac{3}{9} - \frac{2}{9} = \frac{1}{9}$$

$$\frac{2}{14} - \frac{1}{7} = \frac{1}{7}$$

True
or
False?

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Which is the odd one out? Why?
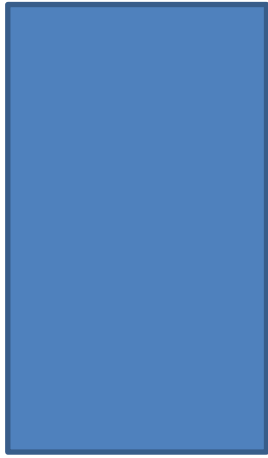
81   18   45

Teachers will secure fluency and then go deeper by using reasoning and problem solving

For example, if the learning intention was to multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 (Year 5) a series of questions may be …

| | Fluency | Reasoning | Problem Solving |

Fluency

- Complete the grid:

	×100	÷1000	×10
365			
2669			
12			

- Fill in the boxes:

[ ] × 100 = 38

56 [ ] = 5.6

0.8 x 1000 = [ ]

- Some facts have been cut up. Work with a partner to put them back together.
e.g. 74 ÷ 10 = 7.4

| 100 |

| 31 |

| ÷1000 |

| ×100 |

| 3100 |

| =0.031 |

| ÷100 |

| 31 |

| = 1 |

Reasoning

- **True or false?**
When you multiply whole and decimal numbers by 10, 100 or 1000, you just add noughts on to the end.

- If 5 x 4 = 20

Explain why these facts are true without working them out:

0.5 × 4 = 2
200 ÷ 4 = 50
0.4 × 0.5 = 0.2

Problem Solving

- Put these calculations in order from smallest to biggest:

100 x 540

5.4 x 1000

5400 ÷ 10

5400 ÷ 1000

540 ÷ 10

- Using a number from column A, an operation from B and a number from C, how many ways can you find to make 70? (There are more than 4 ways!)

A	B	C
7	X	1
70		10
700	÷	100
7000		1000

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How can you support at home?

Maths learning can happen anywhere. Maths is all around us and problem solving is at the heart of the mastery approach. Look for maths problems you can solve together, making connections between what your child has been learning at school and the world around them.

- **Follow a recipe:** work together to find out the quantities needed, ask your child to weigh the ingredients, discuss how you'd halve or double the recipe and discuss the ratio of ingredients.

- **Talk about the weather forecast:** is today's temperature higher or lower than yesterday's? What do the numbers mean?

- **Going shopping:** talk about the cost of items and how the cost changes if you buy two items instead of one. Let your child count out the coins when paying and discuss the change you get back. Use coins to explore addition, subtraction, multiplication and division.

- **Planning an outing:** discuss how long it takes to get to the park, and so work out what time you need to leave the house. Encourage your child to work out the best solution based on the time and distances. Discuss what shapes you see when you get there.

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Think and talk like a mathematician

Mathematics language often uses common words in a new way. For example, 'difference', 'right', 'product', 'table'.

- Always encourage your child to *explain* how they have gone about solving a problem, and work with them to test, prove, explain, reflect and spot patterns. Questioning and prompts can be powerful tools to boost your child's mathematical thinking: 'What do you think…?' 'Why …?' 'What will happen if…?' 'What do you notice about…?' 'Can you see a pattern between…?' 'What if we try…?'

- Communicating and discussing maths problems (in a way that others can understand) demonstrates depth of understanding – another fundamental aspect of mastering mathematics.

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Any Questions?