

Maths workshop – Year 4 Pine class

Has maths changed?

- <https://whiteroseeducation.com/parent-pupil-resources/maths/maths-with-michael#watch>
- Further videos in this series will be on the website after the workshop

What is maths mastery?

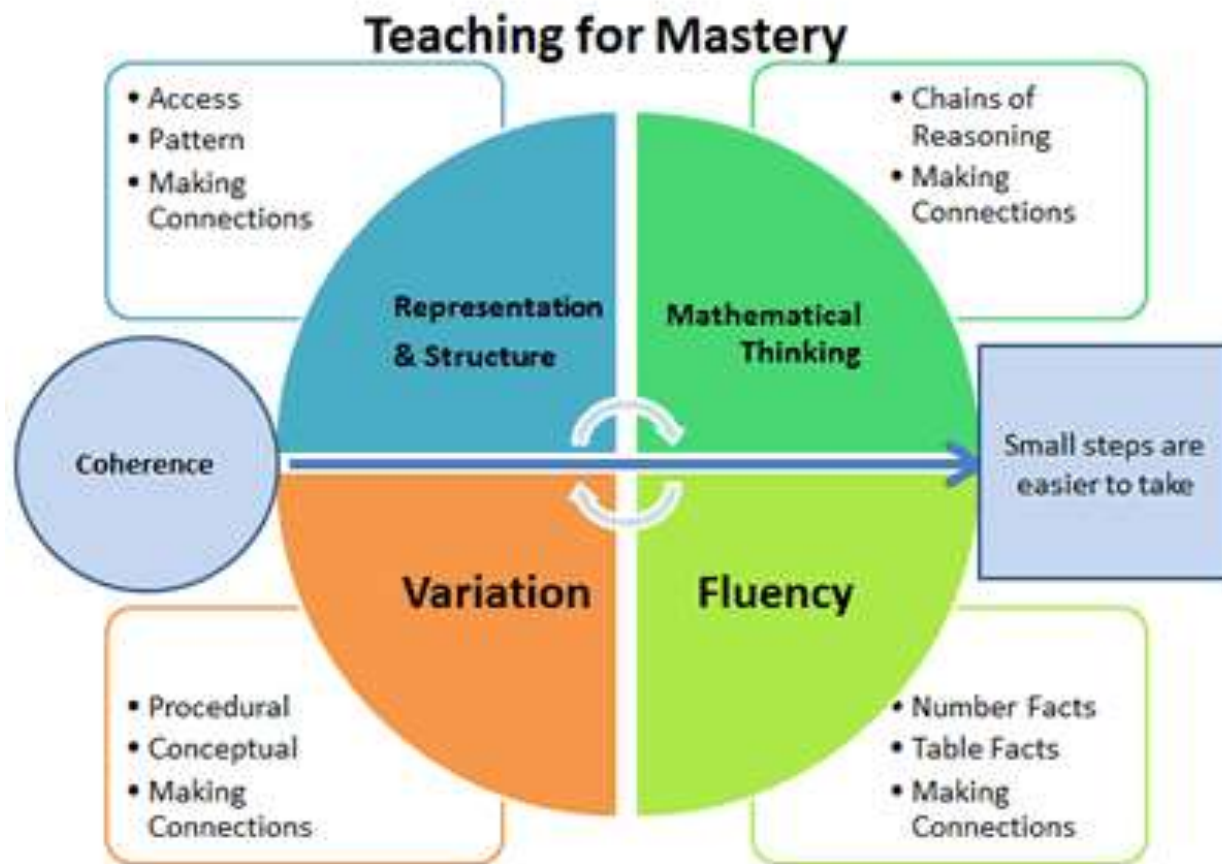
Mastering maths means pupils acquiring a deep, long-term, secure and adaptable understanding of the subject.



The phrase 'teaching for mastery' describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths.



Achieving mastery means acquiring a solid enough understanding of the maths that's been taught to enable pupils to move on to more advanced material.



FIVE BIG IDEAS IN TEACHING MASTERY

Ways not to overload working memory in maths



Subitise – recognise number patterns/groups and **not** only use counting



Know whole numbers



Learn number bonds constantly even when you know them so that they are instantly remembered/pictured/represented in your long term memory for recall



Learn times tables over and over for instant recall and understanding.



Know equal parts of a whole number are fractions. Use the phrase 'part of a whole' in different ways e.g. a lego brick is part of the whole model



Partition numbers using tens, hundreds, thousands, hundred thousands. Know place value.

Vocabulary and using whole sentences

It is important to practice explaining, saying and using maths vocabulary. This can be found on the Power Maths website.

Key vocabulary list – Year 4

Textbook and unit	Key vocabulary highlighted in this unit	New vocabulary
4A Unit 1: Place value – 4-digit numbers (1)	tens hundreds thousands partition place value number line multiples digit	
4A Unit 2: Place value – 4-digit numbers (2)	thousands ascending descending round order multiple round up round down greater than (>) less than (<)	round round up round down
4A Unit 3: Addition and subtraction	addition total subtraction more than less than column method estimate how much strategy efficient accurate exact fact	how much strategy efficient accurate exact
4A Unit 4: Measure – area	space area rectangle square rectilinear shape unit larger greater smaller	space area unit rectilinear shape
4A Unit 5: Multiplication and division (1)	multiple (x) divide (÷) multiplication fact division fact factor groups of times-table array product fact family related fact	groups of product factor

A mastery lesson using Power Maths

How do mathematicians divide numbers efficiently? (Year 4 Unit 7, lesson 3)

We will start by recapping previous learning. Then, introducing the session. We will complete the Discover activity, look at the picture together, share our methods and then complete the learning pit on our success criteria.

Children complete these as paired/individual work. Whole class discussion and view text book solution. Share. Drawing attention to the representations and encouraging children to draw, use models when solving a problem.

Perimeter of a rectangle

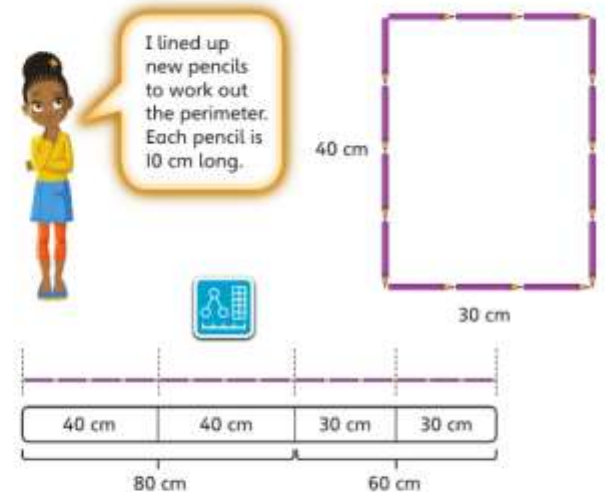
Discover



- a) Will the coloured lights fit all the way around the mirror? How do you know?
- b) Lexi has another mirror that is the same height, but a different width. The lights fit around it perfectly. What is its width?

Share

- a) The distance around the mirror is its perimeter.



$$80 + 60 = 140$$

The perimeter of the mirror is 140 cm.

The coloured lights are 120 cm long.

The coloured lights will **not** fit around the mirror because their length is too short.

Children complete 'Think together' questions with their talk partners, checking answers with the teacher once complete through a whole-class discussion. Children are encouraged to share their ideas, whether correct or not, to find the best way of solving the problems.

b) The coloured lights are 120 cm long, so the perimeter of the mirror will also be 120 cm.
We know that the height of the mirror is 40 cm.
The perimeter of the mirror is 2 heights plus 2 widths.



120 cm			
40 cm	40 cm	20 cm	20 cm
80 cm		40 cm	

The total of the two widths is 40 cm.
 $40 \div 2 = 20$
The width of the mirror is 20 cm.

- 2 The perimeter of a mirror is 160 cm.
Its height is 45 cm.
What is its width?

160 cm			
45 cm	45 cm		

- 3 The perimeter of a rectangle is 20 cm.
What could the length and width of the rectangle be?



If I know the perimeter, I just need to divide it by 4 to find the length and the width.

Is that always true? I think your idea will only work for squares.



Think together

- 1 These lanterns fit exactly around the perimeter of the garden.

How long are the lanterns?

7 m	7 m	4 m	4 m
? m			

$7 + 7 + 4 + 4 =$

The perimeter is m.

The lanterns are m long.



After this, I ask the children to close their eyes and represent their confidence as a number on their fingers. If they are unconfident, Mrs Malynn, Mrs McGill and I will give them some small group support. More confident children are allowed to begin independently, but we will visit each one of them to make sure they understand.

Representations/equipment

Subitise
(counting in
groups/recognis
ing number
patterns)

Tens frame

Number lines

100 square

Part whole
model

Bar models

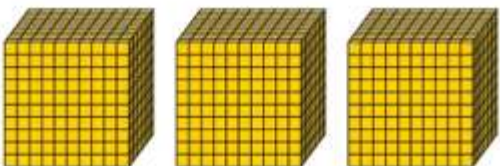
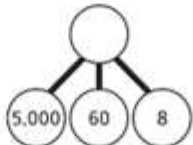
Base 10/dienes,
ones, hundreds

Place value
counters

Maths home learning support

- Supporting and encouraging children with regular routines such as having a set day and time to complete their maths home learning.
- Setting goals to achieve such as practising the 8 times table.
- Working on managing time and working through problems step by step.
- Using maths vocabulary with child and encouraging child to use it in a sentence.
- Have a look at the calculation policy (next slide) on our website.

Calculation policies

Year 4			
	Concrete	Pictorial	Abstract
Year 4 Addition			
Understanding numbers to 10,000	Use place value equipment to understand the place value of 4-digit numbers.  4 <u>thousands</u> equal 4,000. 1 thousand is 10 hundreds.	Represent numbers using place value counters once children understand the relationship between 1,000s and 100s.  $2,000 + 500 + 40 + 2 = 2,542$	Understand partitioning of 4-digit numbers, including numbers with digits of 0.  $5,000 + 60 + 8 = 5,068$ Understand and read 4-digit numbers on a number line. 

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Power Maths White Rose Edition calculation policy



Choosing mental methods where appropriate	Use unitising and known facts to support mental calculations. <i>Make 1,405 from place value equipment.</i> <i>Add 2,000.</i> <i>Now add the 1,000s.</i> <i>1 thousand + 2 thousands = 3 thousands</i> <i>1,405 + 2,000 = 3,405</i>	Use unitising and known facts to support mental calculations. <table border="1"> <thead> <tr> <th>Th</th><th>H</th><th>T</th><th>O</th></tr> </thead> <tbody> <tr> <td>●●●●</td><td>●●</td><td>●●●●●●</td><td>●●●●●●</td></tr> <tr> <td></td><td>●●●●</td><td></td><td>●</td></tr> </tbody> </table> <i>I can add the 100s mentally.</i> $200 + 300 = 500$ <i>So, $4,256 + 300 = 4,556$</i>	Th	H	T	O	●●●●	●●	●●●●●●	●●●●●●		●●●●		●	Use unitising and known facts to support mental calculations. $4,256 + 300 = ?$ $2 + 3 = 5$ $200 + 300 = 500$ $4,256 + 300 = 4,556$
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