



Welcome to Mastery in Maths at BPS

Watch how 32 eighth graders responded to:

There are 125 sheep
and 5 dogs in a flock.
How old is the shepherd?



Mastery

- We are using White Rose Maths Hub (WRMH) as the framework for maths teaching
- The aim is to develop both fluency with calculations and reasoning skills logical thinking with number
- WRMH requires children to recognise maths in a range of contexts and representations
- Use of 'Concrete, Pictorial and Abstract' teaching approach.

Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

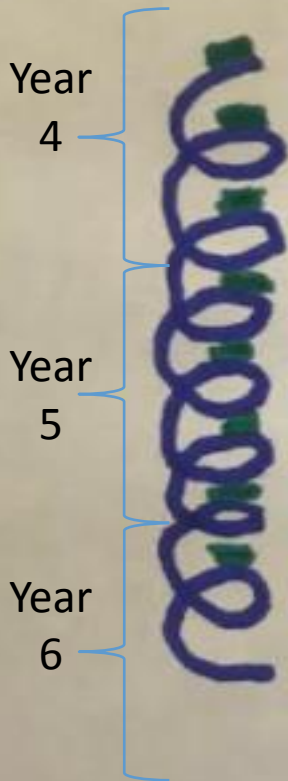
The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

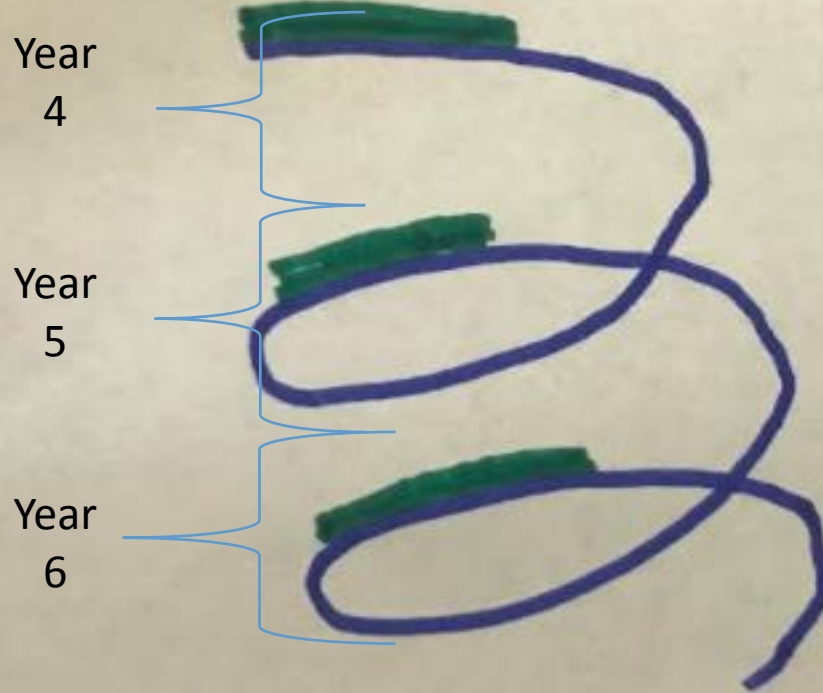
(White Rose Maths Hub, Scheme of Learning 2.0, 2017)

Mastery Approach

Old approach



Master Approach



Addition and multiplication





Why adopt a Mastery Approach?

- Too many children falling behind- Very difficult to 'catch up'
- Not enough children excelling
- Teaching had been focussed on procedures over understanding
- To create enjoyment in maths and avoid negative attitudes.

Press release

Every pupil needs a good mathematics education

Mathematics: made to measure emphasises the importance for every pupil to have the best possible mathematics education.

Published 22 May 2012
From: [Ofsted](#)

- firstly, not enough is being done to help pupils catch up who fall behind early; the 10% who do not reach the expected standard at age 7 doubles to 20% by age 11, and nearly doubles again by age 16
- secondly, inspection evidence shows that pupils in lower ability sets and younger pupils received the weakest teaching; inspectors regularly saw outstanding and satisfactory teaching, and sometimes inadequate too, within an individual school
- thirdly, lots of the brightest pupils do not fulfil their potential when they get to secondary school; 37,000 of the highest attaining primary school pupils got no better than a grade C at GCSE in mathematics last year; schools which routinely enter students early for GCSE mathematics are hindering their ability to reach the highest grades



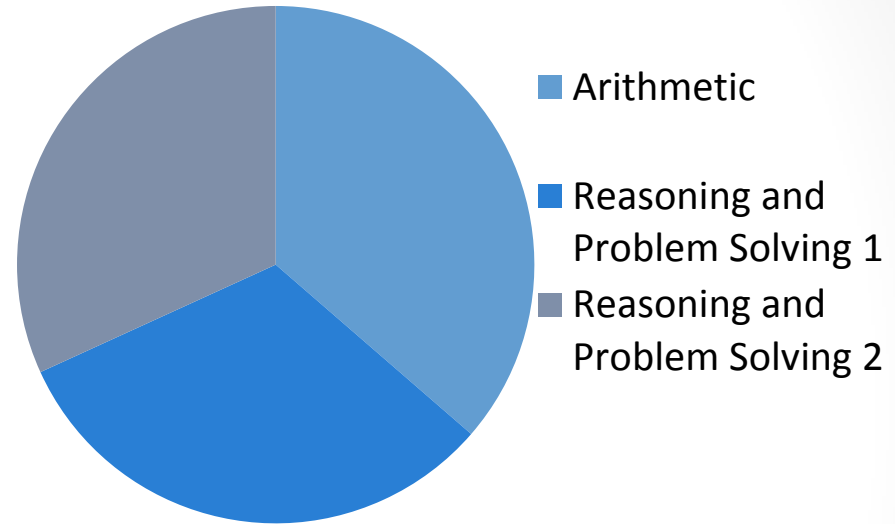
Change to the curriculum

- Four years ago the National Curriculum changed- most drastic changes to maths
- Influenced by 'Shanghai Approach'
- Emphasis on fluency, reasoning and problem solving
- Positive impact.

End of KS2

Arithmetic-

- Demonstrates 'fluency'
- Straight calculations
- Children can receive extra marks for correct calculation use.



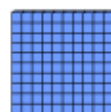
Reasoning and Problem Solving-

- Children have to solve problems in real life context
- Points awarded for explaining thinking
- Must understand number in a range of contexts- pictorial, diagrams, words, etc.
- Identify and explain mistakes.

Fluency

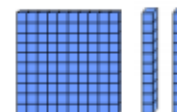
- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. (The National Curriculum in England Key stages 1 and 2 framework document, 2013)
- Different representations, dissecting number, varied fluency

Put the correct number in each box.



10 less

Number



10 more



100 less

Number

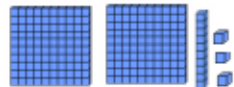



100 more

Show ten more and ten less than the following numbers using Base 10 and place value counters.

- 550
- 724
- 302

Complete the table.

100 less	Number	100 more
		
		

Procedural Variation

$$1) \quad \frac{4}{9} = \frac{8}{18} = \frac{12}{27} = \frac{16}{36} = \text{---} = \frac{24}{54} = \text{---} = \frac{32}{72}$$

$$2) \quad \frac{2}{5} = \frac{6}{15} = \frac{10}{25} = \text{---} = \frac{18}{45} = \text{---} = \frac{26}{65} = \frac{30}{75}$$

$$3) \quad \frac{1}{8} = \frac{2}{16} = \frac{3}{24} = \text{---} = \frac{5}{40} = \frac{6}{48} = \frac{7}{56} = \text{---}$$

$$4) \quad \frac{7}{4} = \frac{14}{8} = \frac{21}{12} = \frac{28}{16} = \text{---} = \frac{42}{24} = \text{---} = \frac{56}{32}$$

$$5) \quad \frac{5}{9} = \frac{10}{18} = \text{---} = \text{---} = \frac{25}{45} = \frac{30}{54} = \frac{35}{63} = \frac{40}{72}$$



Intelligent Practice

$$\frac{5}{7} = \frac{?}{?}$$

$$\frac{16}{36} = \frac{?}{?}$$

$$\frac{4}{8} = \frac{12}{?}$$

$$\frac{3}{5} = \frac{?}{40}$$

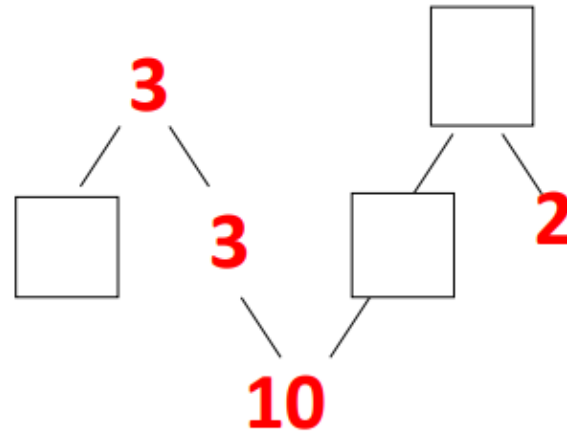
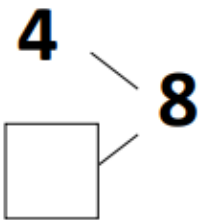
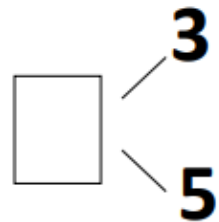
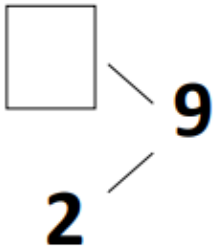
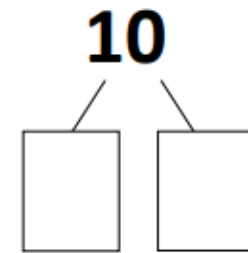
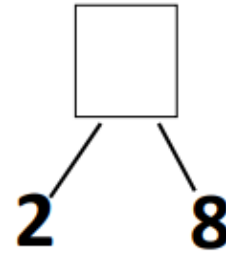
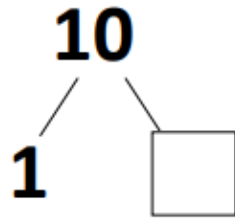
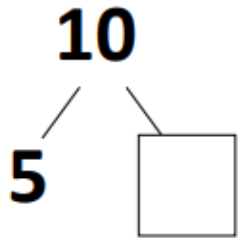
$$\frac{3}{?} = \frac{21}{63}$$

$$\frac{20}{32} = \frac{8}{?}$$

$$\frac{?}{11} = \frac{?}{88}$$

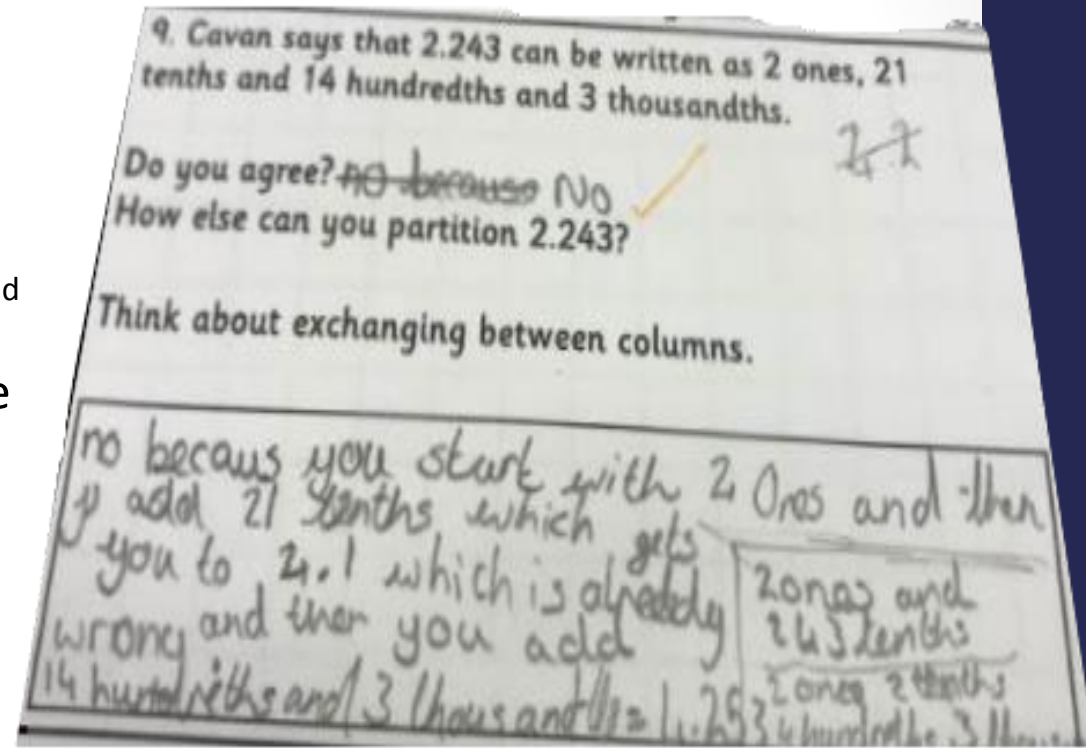
$$\frac{48}{64} = \frac{?}{48}$$

Varied Fluency



Reasoning

- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language (The National Curriculum in England Key stages 1 and 2 framework document, 2013)
- Our aim is to ensure children are both able to have ability with calculations and what these calculations represent
- Children look at errors and misconceptions and identify the thinking behind this
- Children explain their thinking and how they know they are correct



Reasoning

Conceptual and Non-Conceptual (Examples and non examples)

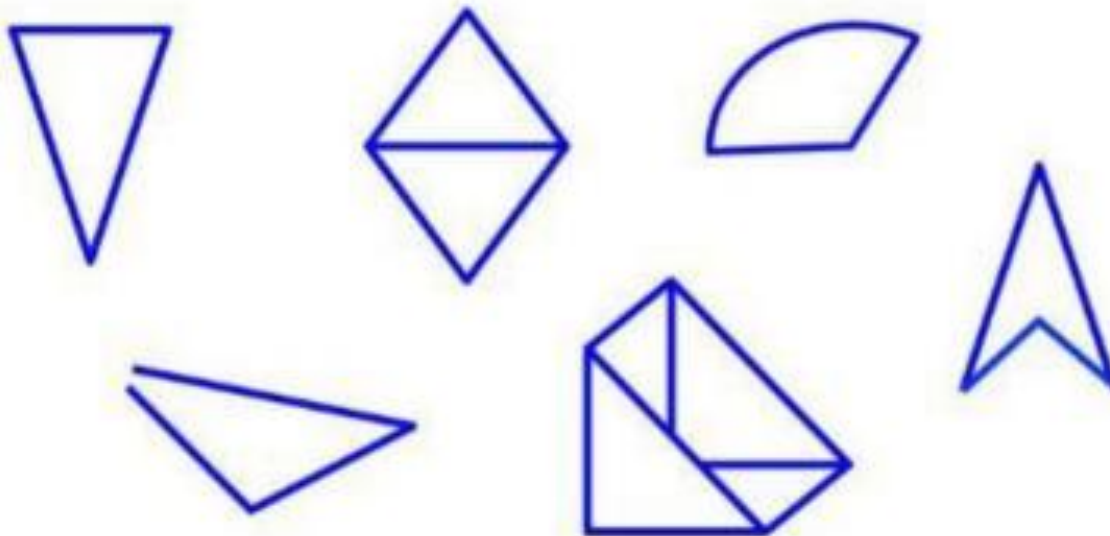
- An elephant
- A non-elephant



Developing Language

Conceptual and Non-Conceptual
(Examples and non examples)

Triangle or Not a Triangle?





Problem Solving

- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. (The National Curriculum in England Key stages 1 and 2 framework document, 2013)
- Children solve problems and look at 'real life' scenarios to equip them in later life.
- Use logic and systematic approaches to find possible solutions

I am thinking of two numbers.
The sum of the numbers is 17
The product of the numbers is 72
What are my secret numbers?

Can you choose your own two secret numbers from the 9 times table and create clues for your partner?

White Rose Maths, Year 4- Block 4:
Multiplication and Division

Diving for depth

Diving for depth

Show it	Draw it
Explain it	Prove it

$3 \times 8 = _ \times _$



Challenge in Maths

- The new curriculum clearly states that teachers should not be tempted to dip into the following year's programme of study to stretch high achieving pupils
- To support these children and help them achieve 'greater depth' in maths, the work in class is differentiated and challenge tasks are always available
- Children encouraged to deepen understanding, rather than progress to further concepts.



How can you help?

- Tables (multiplication and related division facts)
- Websites eg: BBC bitesize
- Maths apps
- Revision booklets eg: CGP
- Have positive conversations about maths
- Show how maths is relevant in the real world

- Over to you – have a go!



Thank you

Many thanks for joining us.

We hope this presentation has been useful.

We're here to help your children, but we are also here to help you where we can.

By working together and giving the children the same message, we will have happier children who will achieve their potential.