Teaching for Mastery

Parent Meeting
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
Teaching for Mastery

• The belief that all pupils can achieve
• Keeping the class working together so that all can access and master mathematics
• Development of deep mathematical understanding
• Development of both factual/procedural and conceptual fluency
• Longer time on key topics, providing time to go deeper and embed learning
The Curriculum

Factual & Procedural Fluency

Conceptual Understanding

INTEGRATION
1256 apples are divided among 6 shopkeepers. How many apples will every shopkeeper get? How many apples will be left?

Working:

\[ 30 + 60 + 36 + 110 = 470 \]

Is there evidence of conceptual understanding?

Is there procedural fluency and efficiency?
Sally knows all her tables up to 12 x 12

When asked what is 12 x 13 she looks blank.

Does she have fluency and understanding?
Mastery

Involves the development of three forms of knowledge:

Factual – I know that
Procedural – I know how
Conceptual – I know why
Solve the following

\[ \square + 17 = 15 + 24 \]
\[ 99 - \square = 90 - 59 \]
Concrete Pictorial (iconic) Abstract

1. Watermelon
2. Lemon and lemon
3. Tomatoes
4. Oranges
Amy

\[ 6 + \boxed{3} + 4 = 13 \]

[Diagram with boxes and numbers]
WALT add three 1-digit numbers

$$5 + 4 + 9 = 18$$  $$6 + 2 + 4 = 12$$

$$6 + 3 + 2 = 11$$  $$3 + 2 + 5 = 10$$
Resources and Representations of Mathematics

*Resources to help build concepts*

Ofsted 2013
Conceptual Variation

2. 绿色部分是长方体的几分之几？用分数表示。

A. Use fractions to express the coloured parts.
Variation to develop depth

\[
\frac{2}{3} \quad \frac{1}{4} \quad \frac{4}{9} \quad \frac{2}{3}
\]
Procedural variation leading to Intelligent Practice

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Shanghai Practice Book
KS1 activities - Year 1

Jo has counted the toy cars and said:
There are 3 cars

Explain the mistake she could have made.

Katie is counting ....9,8, 7
Is she counting forwards or backwards?
How do you know?
What is the largest number?
Prove it using concrete resources.
What is the smallest number?
Prove it using concrete resources.
Why can’t the 0 be used as a tens number?

Bill has written a list of two digit numbers.
The digits of each number add up to 5.
None of the digits are 0.
Can you find all of the numbers Bill could have written?
Write the numbers in order from smallest to largest.

Sid is counting in 3’s. Luke is counting in 2’s.
Sid says if we add our numbers together as we count we get a new pattern.
What pattern do they make?
What happens if Sid and Luke both count in 5’s?
KS1 activities - Year 1

All the dots have fallen off 2 toadstools how many different ways can you put them back?

There are no more than 10 counters in total. How many counters could be in the bag? Why can’t it be six?

Two numbers have a difference of 4. The larger number is less than 10. What could the two numbers be?
Sam says “I am thinking of a two digit number, if I add ones to it, I will only need to change the ones digit.” Is he right? Explain your answer.

What digits could go in the boxes?

2 + 5 = 8

Complete the pattern

15 + 85 = 100
20 + 80 = 100
25 + 75 = 100
30 + ____ = 100
____ + ____ = 100

Can you explain the pattern?
KS2 Arithmetic Paper

\[ 326 \div 1 = \]

Does this demonstrate mastery?
468 − 9 =

\[ \begin{array}{c}
459 \\
\end{array} \]
Thinking about relationships

21

$$5,542 \div 17 = 326$$

Explain how you can use this fact to find the answer to $$18 \times 326$$

17 x 326 = 5,542
18 x 326 = 5,542 + 326

How might children respond to this question? What is the best response?
How can you help at home?

- Discuss home learning activities set with your child- ask them to talk about what they have been learning.
- Look out for and spot numerals which are all around us: road signs, in shops, in books, door numbers.
- Number rhymes.
- Play games which involve counting: snakes and ladders, shut the box, ludo, junior monopoly, Uno, card games
- Count objects, count larger groups of objects in 2’s, 10’s 5’s.
- Cooking, weighing and counting
- Time: look at analogue clock faces and digital time. Time activities using stopwatch.
Thank you for coming

Hope I have answered some of your questions!

Any other questions?