Maths Mastery Curriculum For Parents

KS2 SATs PAPERS

- Please feel fee to have a look at the Arithmetic and Reasoning papers on the chairs- this is where all primary children need to be by the time they take their SATs in Year 6…it's hard!

- Written Arithmetic – 30 minutes – 40 marks
- Reasoning Papers – 40 minutes – 35 marks each
- Total Marks available - 110
- Pass Marks - Age Related Expectations – 61 marks (55%)
  - Greater Depth – 96 marks (87%)

Aims

- The changes in the National Curriculum in recent years
- The changes to our Teaching and Learning strategies in Mathematics
- Examples of Reasoning Tasks
- Ways in which you can continue to support your children

Changes

The National Curriculum for Mathematics aims to ensure that all pupils:

- 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
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- 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

Teaching and Learning :‘Maths Mastery’

- An approach to teaching and learning - not a level of attainment.
- The belief that **all** pupils can achieve age-appropriate targets.
- Development of **deep** mathematical understanding.
- Development of both factual/procedural and conceptual fluency.
- Longer time spent on key topics, providing time to go deeper and embed learning rather than moving on to concepts in the next year group.
- Loosely based on the Shanghai / Singapore style of teaching of mathematics.
- A style of teaching that the Government is supporting.

Principles of Mastery at Westbourne

- ✓ All children can succeed
- ✓ All children are taught together
- ✓ All children's needs are catered for by careful scaffolding, skilful questioning and appropriate interventions

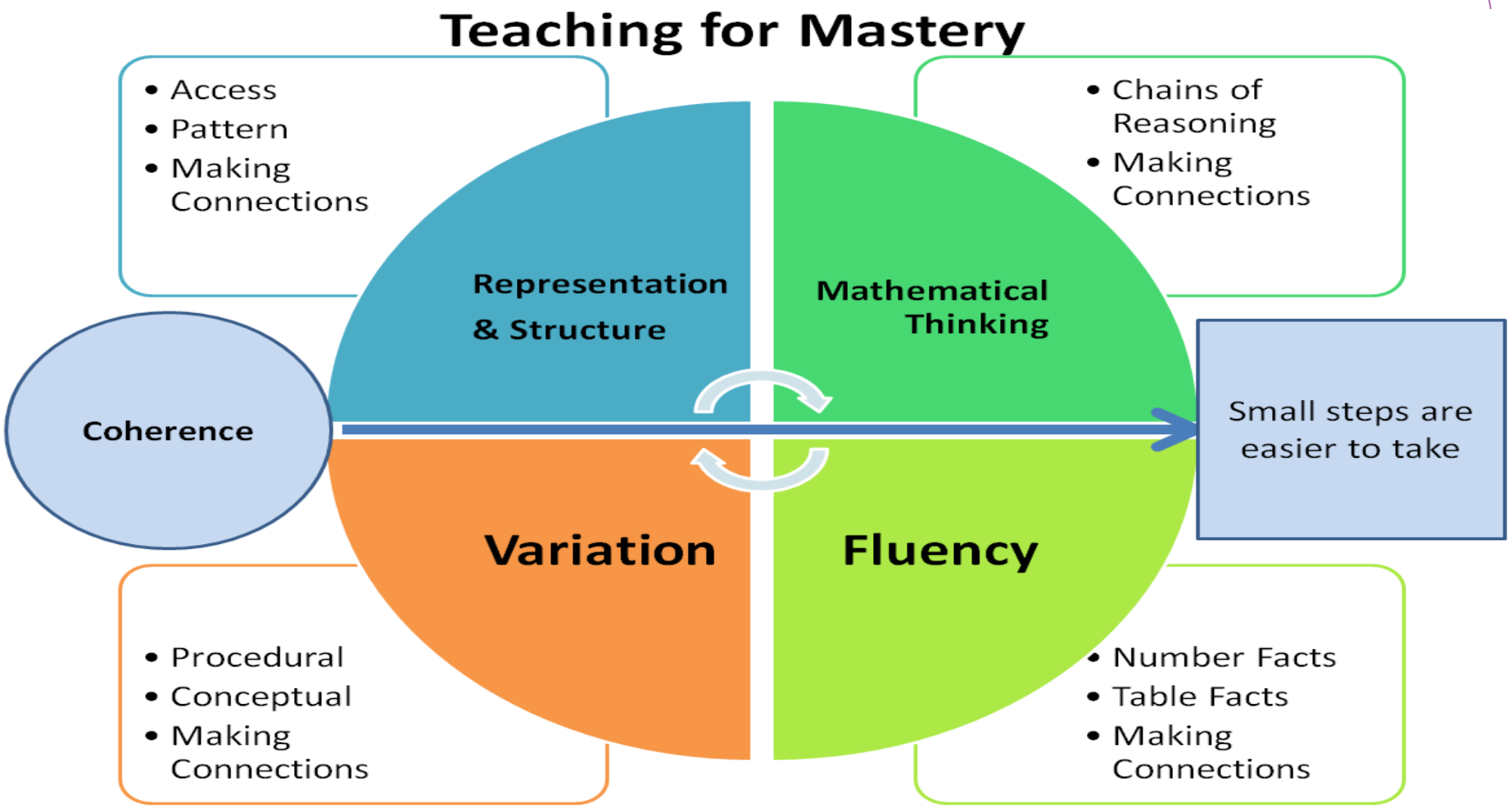
Mastery means that learning is sufficiently:

- Embedded
- Deep
- Connected
- Fluent

In order for it to be:

- Sustained
- Built upon
- Connected to

Teaching and Learning



Coherence

- Small steps (within a lesson, unit, year), continually building up knowledge
- Focused, key Learning Objectives
- Careful sequencing, building to generalisation
- Pre-empting misconceptions
- Opportunities for Fluency, Reasoning and Problem Solving with each objective

What does this mean?

8 + 3 = 11

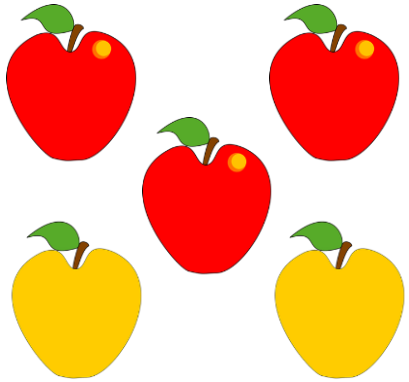
In which order should concepts be introduced?

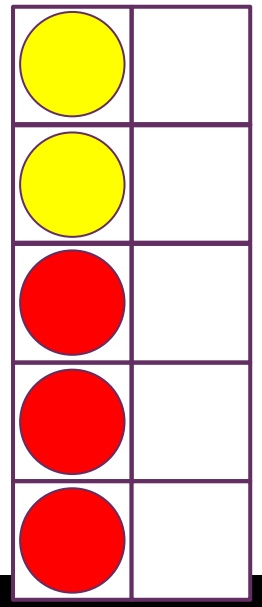
What understanding is required to access this?

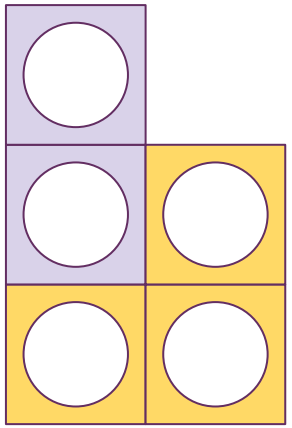
How might it be misunderstood?

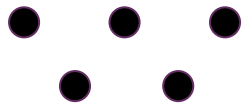
Representation & Structure

- Concrete, pictorial and abstract representations are used meaningfully
- Representations that demonstrate the structure of the problem or calculation
- Linguistic representations (emphasis on vocabulary and using Stem Sentences, 'I say, you say, we all say together', Ping Pong teaching!)
- Representations must be carefully selected and used in a meaningful order









3 + 2

Mathematical Thinking

- The answer is just the beginning
- Reasoning as a regular part of each lesson
- Questioning to deepen understanding
- Explaining how to do the maths demonstrates the depth of understanding

Is this sometimes, always or never true?

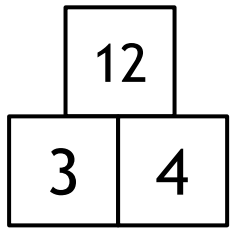
Can you prove this?

How is this the same? How is it different?

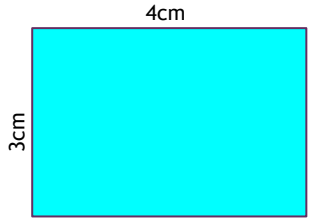
Variation

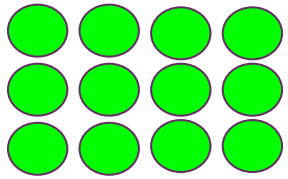
- Activating the thinking process and avoiding mechanical repetition
- Making step by step links

Conceptual Variation



3 x 4 = 12



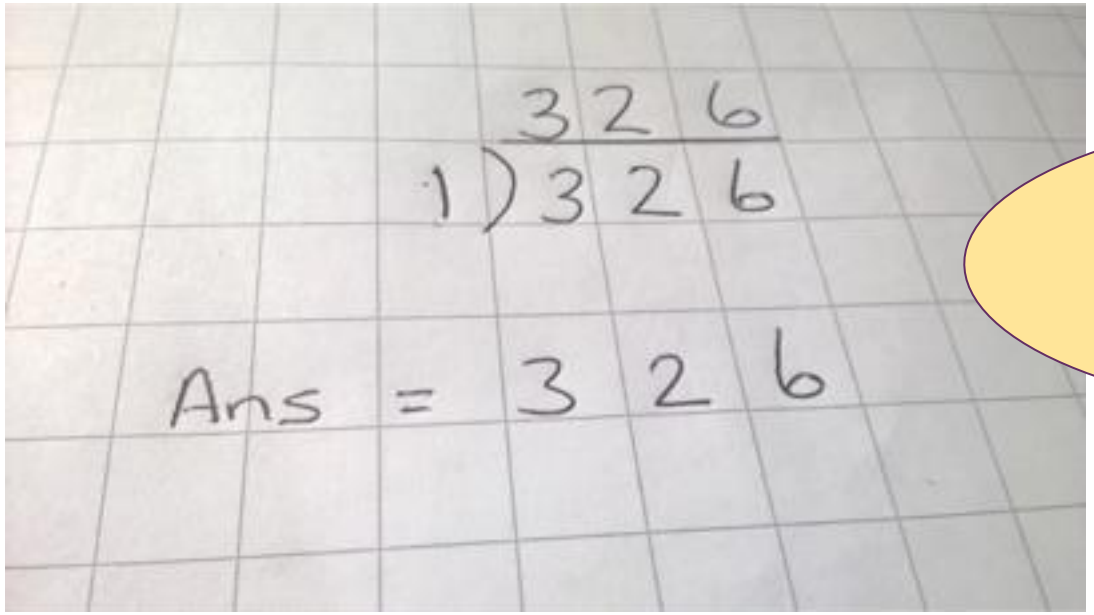


Procedural Variation

7 x 4
70 x 4
70 x 8
14 x 4
140 x 40

Fluency

- Teaching procedural and factual knowledge develops students' automaticity
- Automaticity frees the mind to focus on the concept



Has this student demonstrated fluency?

Examples of Reasoning Activities

Another, another, another...

- An even number...
- Number with the product of 60
- Factors of 36
- A triangle
- A prime number

Draw out the links and generalisations between the sets generated.

Examples of Reasoning Activities

Convince me ...

- All angles in a triangle always add up to 180 degrees.
- That the next whole number after 119 will be 120.
- That coordinates are useful for identifying points.
- An odd number plus an odd number always equals an even number.
- That the area of a rectangle divided by the length of one side gives the length of the other side.

Examples of Reasoning Activities

CPD

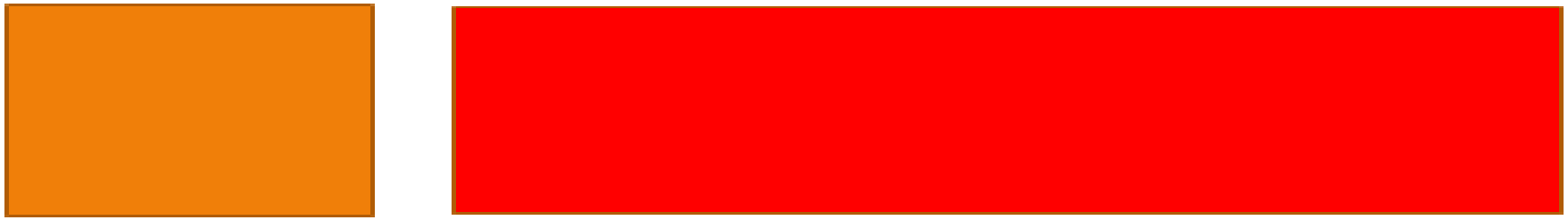
If this is the answer, what's the question?

- 24
- Impossible
- No
- Square numbers
- 15.3

Examples of Reasoning Activities

What's the same? What's different?

- One and 1
- 9 and 18
- Multiples of 3 and Multiples of 6
- $^1/_2$, 0.5, 50%, 4:8, $^3/_6$, 1:2
- Square numbers and numbers that are not square
-



Examples of Reasoning Activities

What do you notice?

- 2, 4, 6, 8, 10, 12, 14, 16
- 2, 3, 5, 7, 11,13 (Can you give me more in this set?)
- $^{1}/_{2}$, $^{2}/_{4}$, $^{3}/_{6}$, $^{4}/_{8}$
- 4, 9, 16, 25, 36, ...

Examples of Reasoning Activities

Zooming in

Write down a:

- Multiple of 4...
- ... that is greater than 30...
- ... that is also square...
- ... where both digits are even.

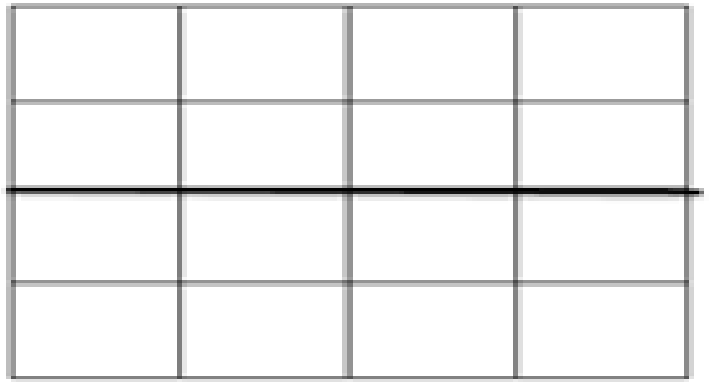
Draw a:

- Quadrilateral...
- ... that has at least one line of symmetry...
- ... and only one pair of parallel sides...
- ... and at least one acute angle.

Examples of Reasoning Activities

Take a slice: a non-numerical activity

Here is one way of splitting a 4 x 4 board into 2 identical pieces:



How many other ways can you find?

Success So Far!

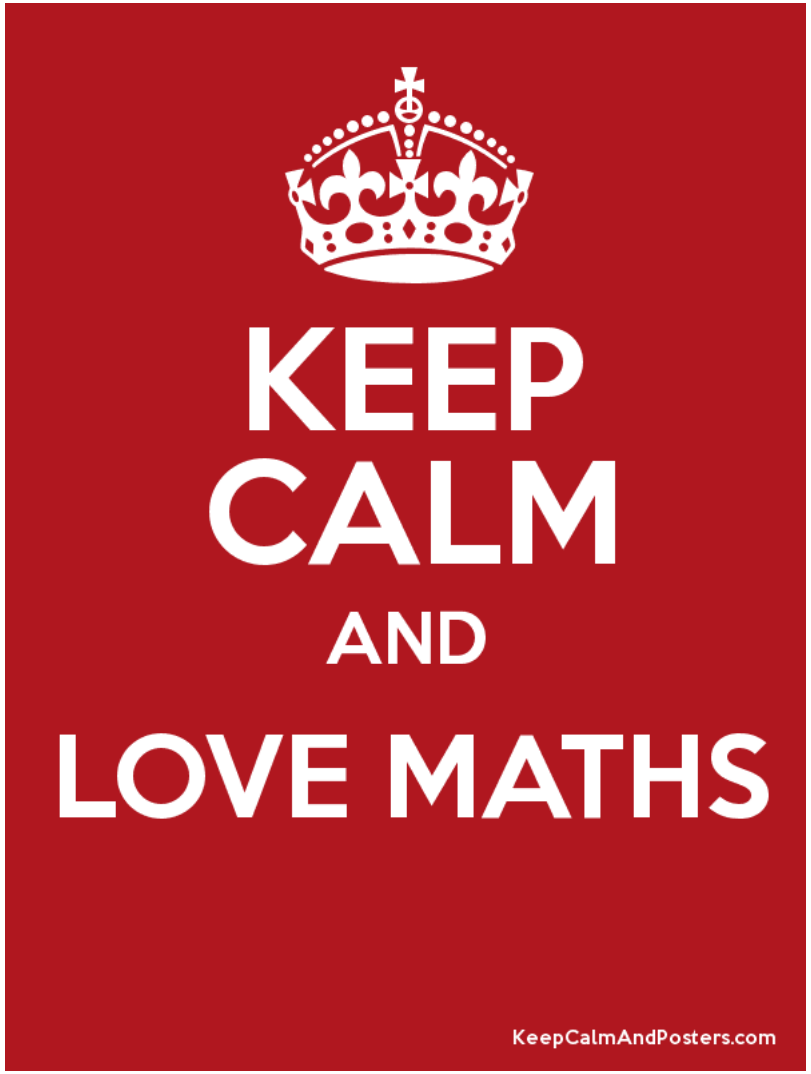
- Increased participation
- Accurate use of vocabulary and mathematical talk
- Greater retention and deeper understanding of concepts
- Children willing to be challenged alongside an enjoyment of being challenged
- Children becoming more resilient
- More use of concrete apparatus
- Fewer pages of ‘just sums’
- Greater quality of work being completed
- Children supporting one another
- Improvement in explaining why, not just how

Supporting Your Child

- Repetition of procedures
- Explanation of procedures – maths talk in full sentences
- Reasoning EG- prove it … what if … always, sometimes, never true…
- Practical maths to apply understanding
- Fluency of maths facts- counting, number bonds, timestables and related division facts, equivalent FDPs
- Representing answers in a variety of ways
- Use of correct vocabulary and terminology
- http://amathsdictionaryforkids.com/dictionary.html
- Use of Education City

Year 4 Multiplication Tables Check

- A new multiplication online test to determine whether Y4 pupils can FLUENTLY recall their multiplication tables up to 12 x 12
- It can help to identify who might require additional support
- It becomes a statutory test from 2019-2020
- The test lasts for no longer than 5 minutes and consists of 25 questions
- Children will get up to 6 seconds to answer each question
- Results are reported to the DfE so that standards can be tracked over time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