Tudor Grange Academies Trust

Primary Maths: Lesson structure of a typical mastery lesson at TGSA

1) Making Connections

- *Practice and Variation of key basic arithmetic skills leading to fluency (ability to manipulative and make connections).*

2) Review of previous learning objectives within unit

- *AFL- marking & feedback to address recap of key concepts, common misconceptions from previous day(s) learning.*

3) New Learning

- *Contextualised word problem requiring a degree of reasoning*
- *Explore what the question is asking and the structure*
- *Derive how to solve the problem and skills needed*

4) Practice new learning

- *Show me, prove it, draw it, what have you derived?*

5) Apply new learning/ Challenge tasks

- *Independent task moving towards Mastery, 'Going Deeper' for rapid graspers or additional support for pupils who require it.*
- *Using the NCETM assessment / White Rose teaching guidance material to deepen learning and also to move pupils to Greater Depth.*

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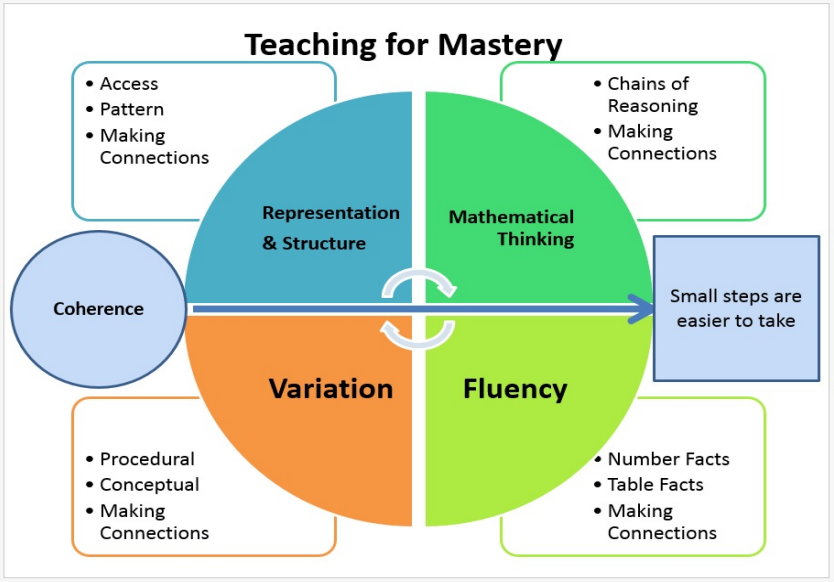
Lesson observation discussions

Coherence

Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning,

What might this look like in practice?

- Teacher explicitly links new learning to prior learning – often at the beginning and the end of the lesson
- The learning is broken into small , carefully sequenced steps
- Each lesson focuses on one point, in depth so that learning is sustainable.



Mathematical Thinking

If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others.

What might this look like in practice?

- Adults ask questions that require children to reason, 'What is the same? What is different?'
- Adults ask pupils to explain, convince, draw diagrams or use manipulatives to illustrate an idea or strategy, reason and conjecture as a natural part of all activity in the mathematics classroom. This further supports deep and sustainable learning.

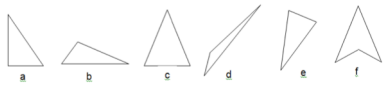
Variation

The central idea of teaching with variation is to highlight the essential features of a concept or idea through varying the non-essential features.

When giving examples of a concept, it is useful to add variation to emphasise:

- What it is (as varied as possible);
- What it is not.

When constructing a set of activities / questions it is important to consider what connects the examples; what mathematical structures are being highlighted?



To get a sense of what a triangle is learners need to see examples of triangles which show all aspects being varied (length of sides, angles, orientation). If most triangles are shown with one side as a horizontal base and the vertex pointing upwards (as in a, b and c), this feature might be over-generalised and pupils might think that d or e are not triangles. It is also important to give non-examples, as in f and to discuss why this is not a triangle.

Fluency

Fluency demands more of learners than memorisation of a single procedure or collection of facts. It encompasses a mixture of efficiency, accuracy and flexibility.

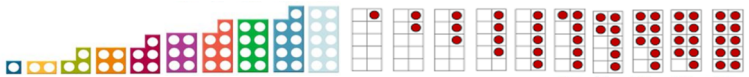
Quick and efficient recall of facts and procedures is important in order for learners' to keep track of problems, think strategically and solve problems.

Fluency also demands the flexibility to move between different contexts and representations of mathematics, to recognise relationships and make connections and to make appropriate choices from a whole toolkit of methods, strategies and approaches.

Representation and Structure

Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation.

Here are two representations for numbers within 10; the tens frame and Numicon:



Both are very helpful concrete and pictorial representations of number but they are representing different structures. The tens frame is drawing attention to the '5 and a bit' structure of numbers, whereas Numicon draws attention to the odd/even structure. Both images support seeing the complement to 10. The two images of 6, for example give different (equally important) ways of thinking about the structure of 6 which in turn influence that ways the children might transform, compare and combine numbers when calculating.

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Areas that should be seen through a Lesson Observation:

Based on the 5 big ideas

Key concepts of a Mastery lesson

- Breaking learning down into small steps and then drawing together in the form of conclusions and mathematical generalities
- Slowing the pace down, but going more deeply into each concept
- Focusing on how answers to questions are arrived at more than what the answers are
- Teacher's precise use of mathematical language, and expecting children to do likewise
- Exploring different methods of tackling calculations and questions
- Getting children to explain and discuss their methods and the identification of the most efficient strategies
- The importance of times tables and number fluency

Reviewed: Jan 2018