Maths In KS2 at Rainbow Forge

The National Curriculum

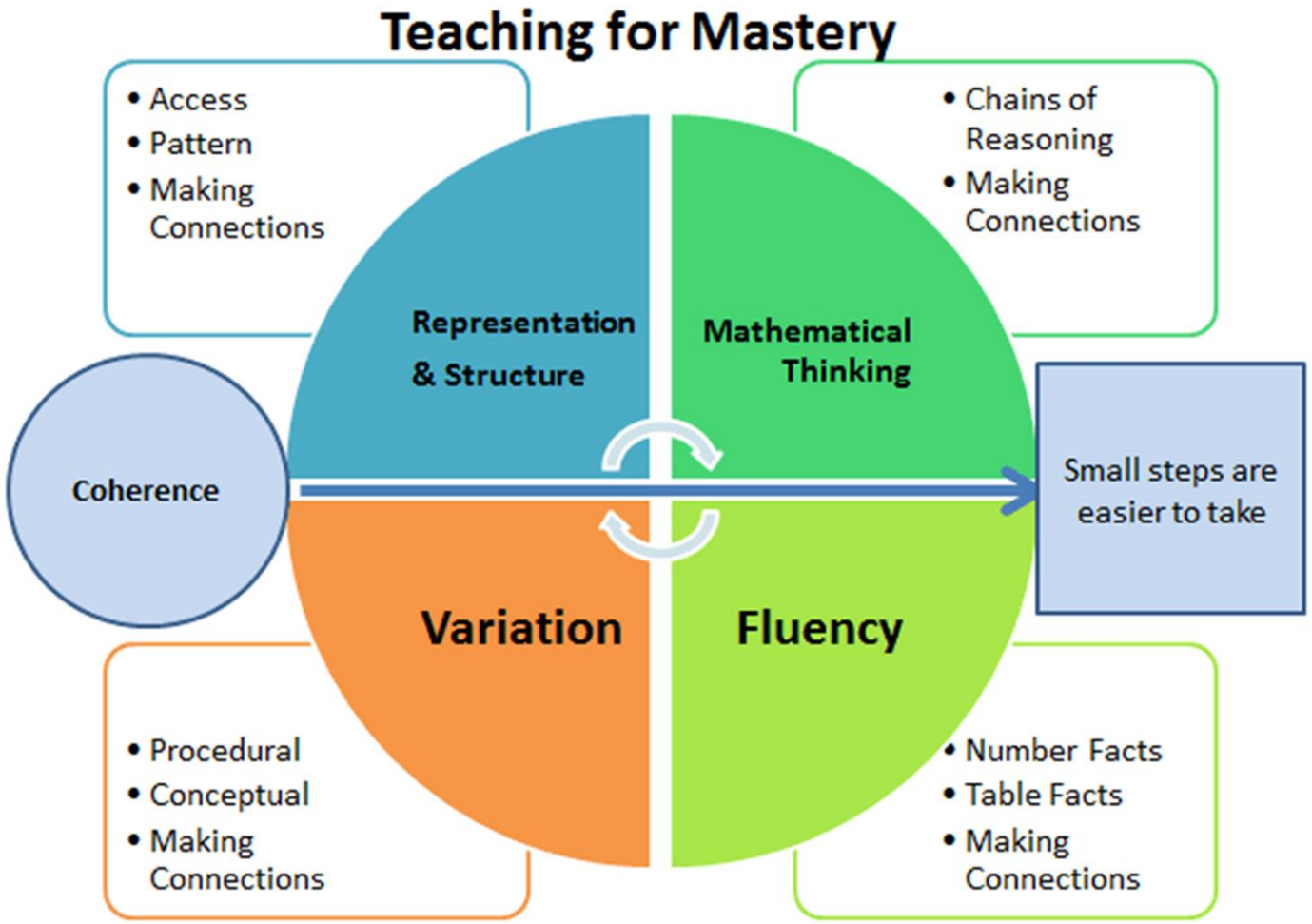
- fosters mathematical understanding of new concepts and methods, including teachers' explanations and the way they require pupils to **think and reason mathematically for themselves**
- ensures that pupils acquire mathematical knowledge appropriate to their age and starting points, and enables them to **recall it rapidly and apply it fluently and accurately**,
- uses **resources and approaches to enable pupils in the class to understand and master** the mathematics they are learning. The national curriculum for mathematics specifies the aims and then states, **'The expectation is that the majority of pupils will move through the programmes of study at the same pace.**
- develops depth of understanding and readiness for the next stage. **Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.** Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.'
- enables pupils to solve a variety of mathematical problems, **applying the mathematical knowledge and skills** they have been taught.

Mastering Maths

What does “mastery” mean?

- I know how to do it.
- It becomes automatic and I don’t need to think about it.
- I do it confidently.
- I do it well. (Does “well” mean “quickly”? Sometimes but not always)
- I can do it in a new way, or in a new situation.
- I can now do it better than I used to.
- I can show someone else how to do it.
- I can explain to someone else how to do it.

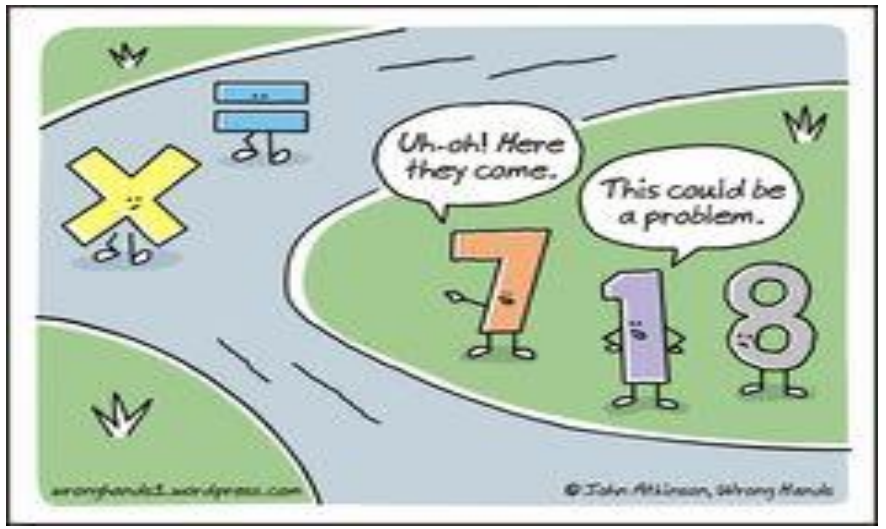
But how?



There are 5 key principles behind Teaching for Mastery. Each of these principles work together in all lessons to make sure that children become confident in their skills and can see how each concept links together.

Fluency involves:

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics

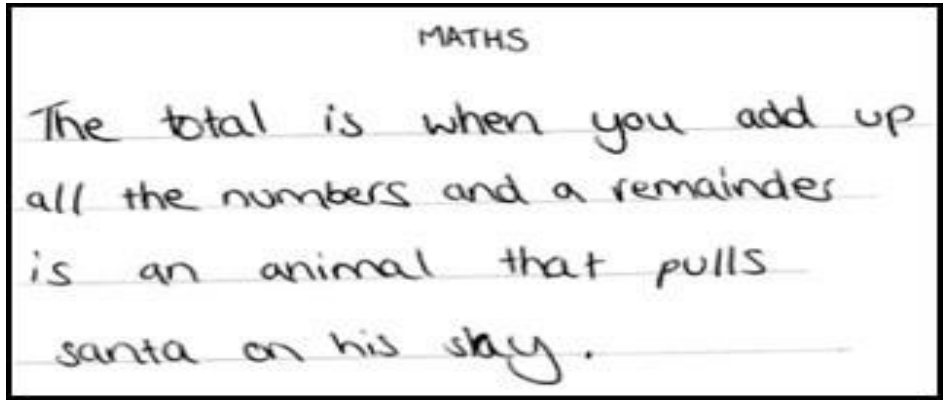


Mathematical Thinking

It is central to mathematics learning; the glue that both develops and holds mathematics learning together

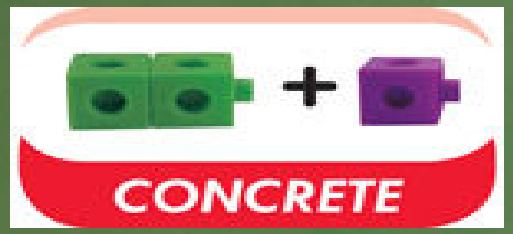
It involves:

* Looking for pattern and relationships
* Logical Reasoning
* Making Connections



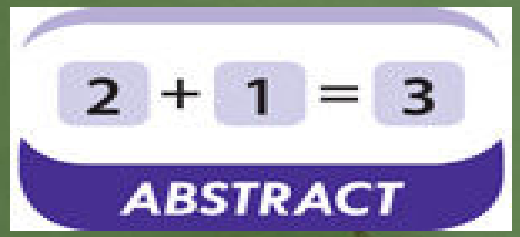
Features of a lesson

* Whole class work together – mixed ability pairs
* Adaptation through concrete and pictorial methods
* Journey taken – small steps
* Ping-pong teaching
* Accurate use of mathematical knowledge language
* Repetition (of each other and of the teacher)
* Build on each other's ideas (differentiation by questioning)
* Longer units which build on each other
* An expectation that all children can achieve
* Depth vs Acceleration – children do not move on; they explain, apply and reason



Concepts are introduced through hands-on experiences with manipulatives.

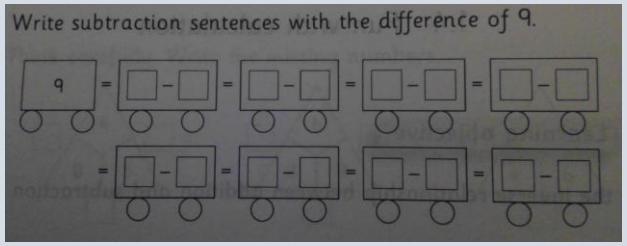
Students visualise the concept and it is represented through models like number bonds and bar models.



Students use abstract numbers and symbols alongside the context in order to understand what they mean.

Differentiating through depth for highest attainers – some ideas!*

Many different ways

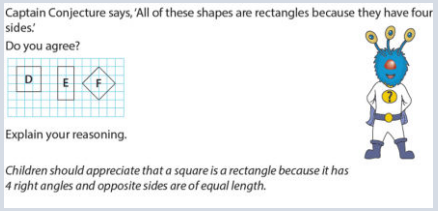


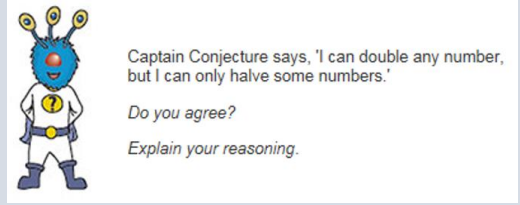
6 + 8 = 14

Find 3 different ways to solve this.

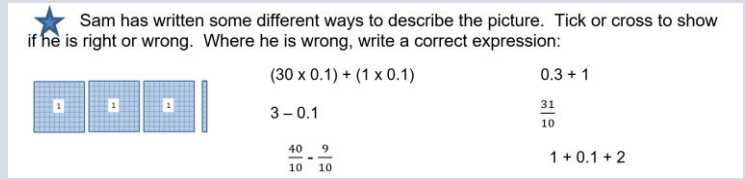
[Where relevant, would expect systematic working from highest attainers]

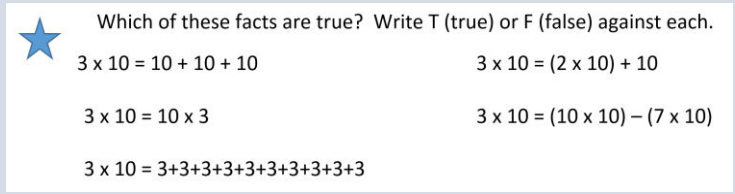
Generalising



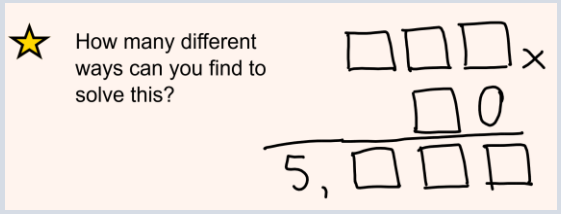


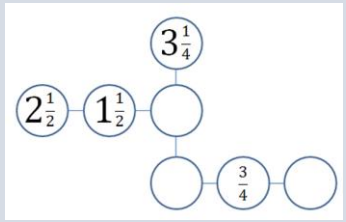
Equivalent or not?

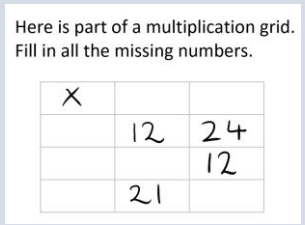




Empty box problems

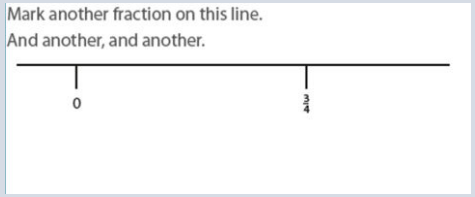






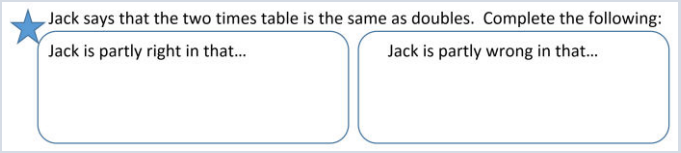
These are not the only ways!
Just some of our'go to' ones

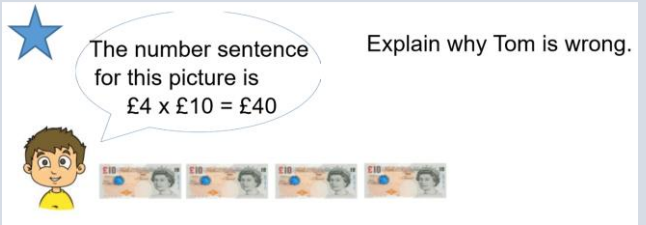
No clear signpost



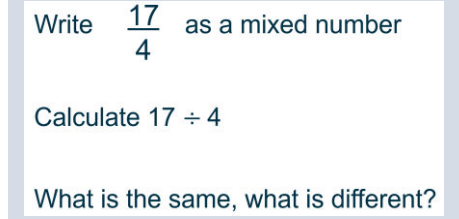
[A bit harder to write – start by using e.gs in NCETM assessing for mastery materials]

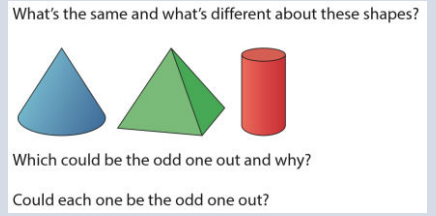
Explaining ideas/ misconceptions





What is the same, what is different?





But what is the impact?