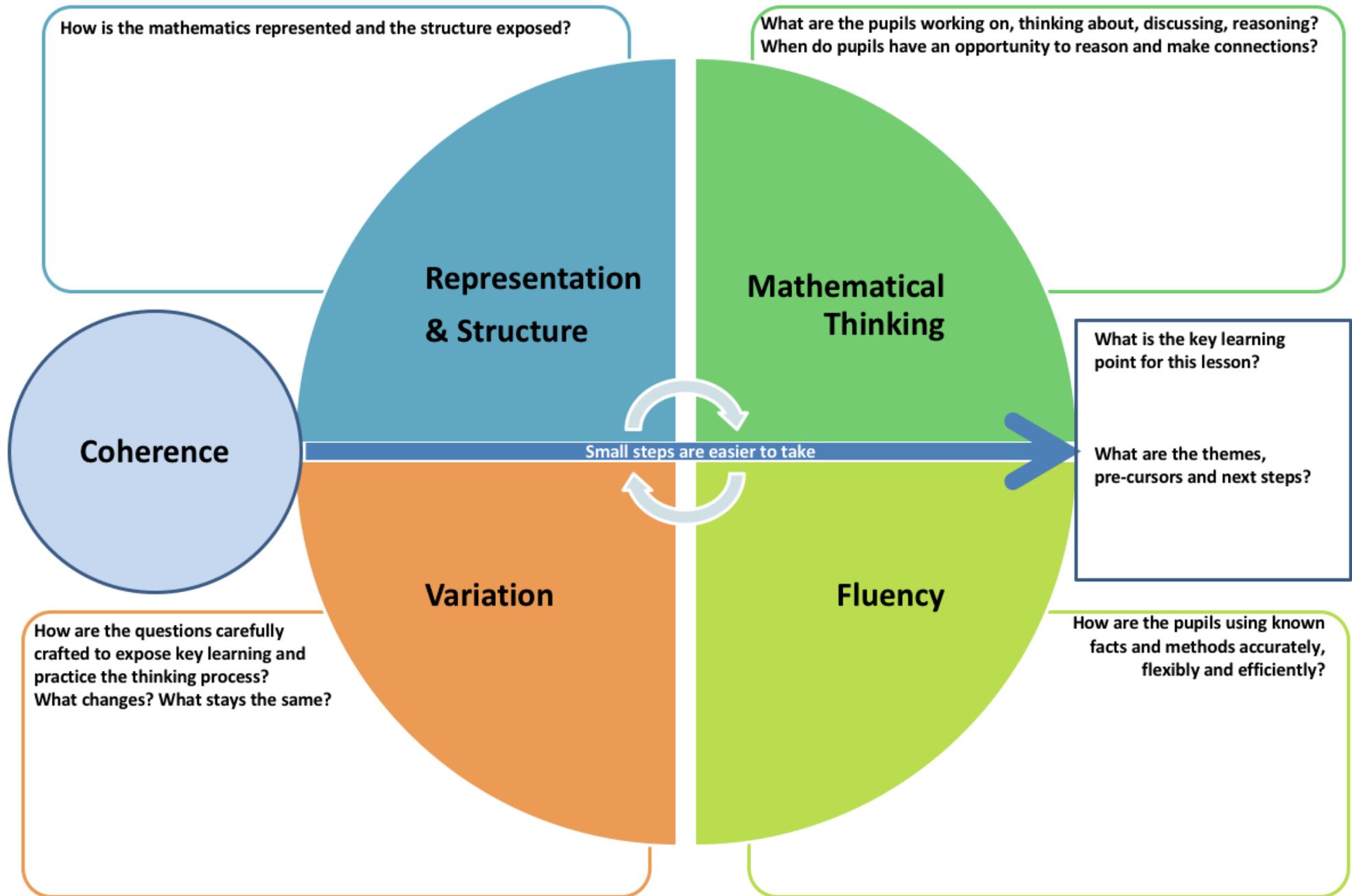
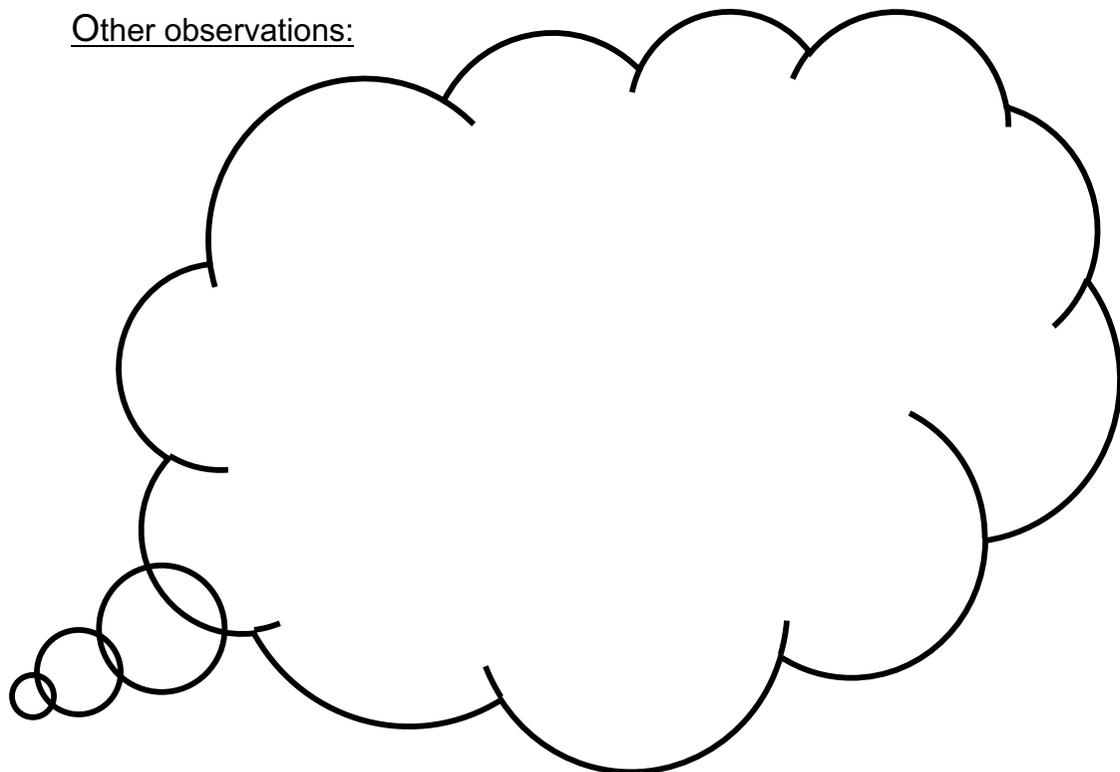


# Teaching for Mastery

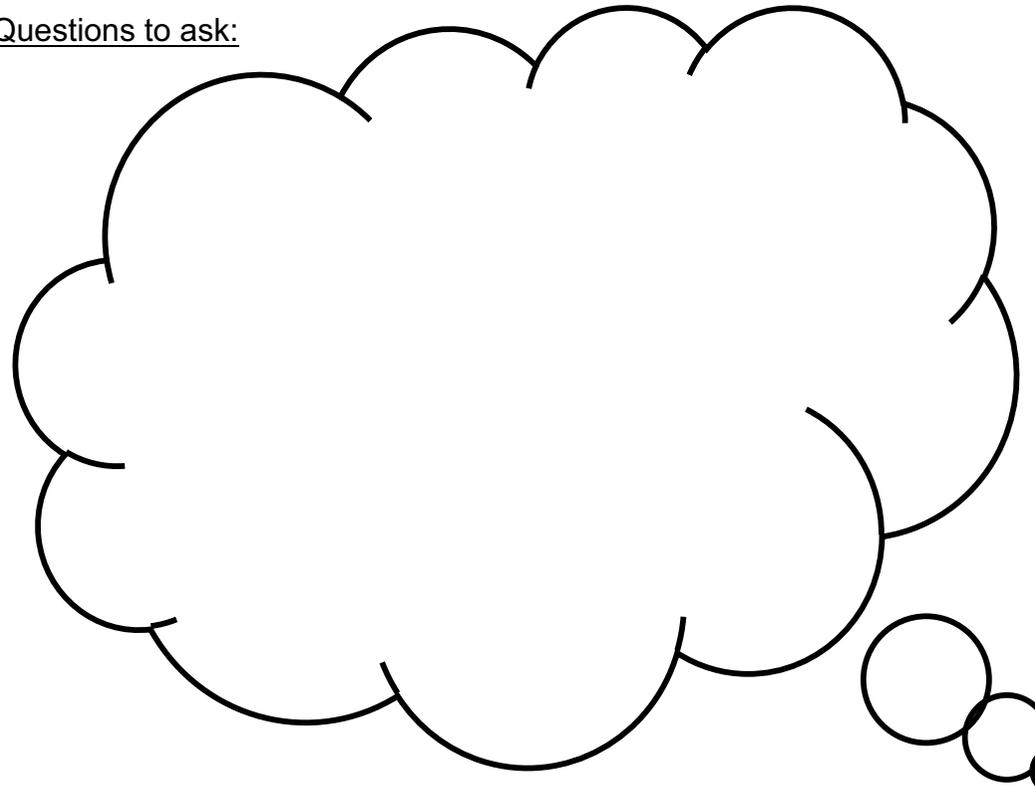


	<u>Key Messages</u>	<u>Notes/Examples</u>
Coherence	<ol style="list-style-type: none"> <li>1. Small steps are easier to take.</li> <li>2. <b>Focusing on one key point each lesson</b> allows for deep and sustainable learning.</li> <li>3. Certain images, techniques and concepts are <b>important pre-cursors</b> to later ideas. Getting the sequencing of these right is an important skill in planning and teaching for mastery.</li> <li>4. When introducing new ideas, it is important to make connections with earlier ones that have already been understood.</li> <li>5. When something has been deeply understood and mastered, it can and should be <b>used in the next steps of learning</b>.</li> </ol>	
Variation	<ol style="list-style-type: none"> <li>1. The central idea of teaching with variation is to <b>highlight the essential features of a concept or idea</b> through varying the non-essential features.</li> <li>2. <b>Variation is not the same as variety</b> – careful attention needs to be paid to what aspects are being varied (and what is not being varied) and for what purpose.</li> <li>3. When giving examples of a mathematical concept, it is useful to add variation to emphasise: <ol style="list-style-type: none"> <li>a. <b>What it is (both standard and non-standard examples)</b>;</li> <li>b. <b>What it is not</b>.</li> </ol> </li> <li>4. When constructing a set of activities or questions it is important to consider what connects the examples; what mathematical structures are being highlighted? Pupils are encouraged to avoid mechanical practice and, instead, <b>to practice the thinking process (intelligent practice)</b></li> </ol>	
Representation & Structure	<ol style="list-style-type: none"> <li>1. The representation needs to clearly show the concept being taught, and in particular the key difficulty point. <b>It exposes the structure</b>.</li> <li>2. In the end, the <b>pupils need to be able to do the maths without the representation</b></li> <li>3. A stem sentence describes the representation and helps the pupils move to working in the abstract (“ten tenths is equivalent to one whole”) and could be seen as a representation in itself</li> <li>4. There will be some key representations which the pupils will meet time and again</li> <li>5. <b>Pattern and structure are related but different</b>: Pupils may have seen a pattern without understanding the structure which causes that pattern</li> </ol>	
Fluency	<ol style="list-style-type: none"> <li>1. <b>Fluency demands more of pupils than memorisation</b> of a single procedure or collection of facts. It encompasses <b>a mixture of efficiency, accuracy and flexibility</b>.</li> <li>2. Quick and efficient recall of facts and procedures is important in order for pupils to keep track of sub-problems, think strategically and solve problems.</li> <li>3. Fluency also demands the <b>flexibility to move between different contexts and representations of mathematics</b>, to recognise relationships and make connections and to make appropriate choices from a whole toolkit of methods, strategies and approaches.</li> </ol>	
Mathematical Thinking	<ol style="list-style-type: none"> <li>1. Mathematical thinking is central to deep and sustainable learning of mathematics.</li> <li>2. Taught ideas that are understood deeply are <b>not just ‘received’ passively but worked on by the pupil</b>. They need to be thought about, reasoned with and discussed.</li> <li>3. Mathematical thinking involves: <ol style="list-style-type: none"> <li>a. looking for <b>pattern</b> in order to discern <b>structure</b>;</li> <li>b. looking for <b>relationships</b> and <b>connecting ideas</b>;</li> <li>c. <b>reasoning logically, explaining, conjecturing and proving</b>.</li> </ol> </li> </ol>	

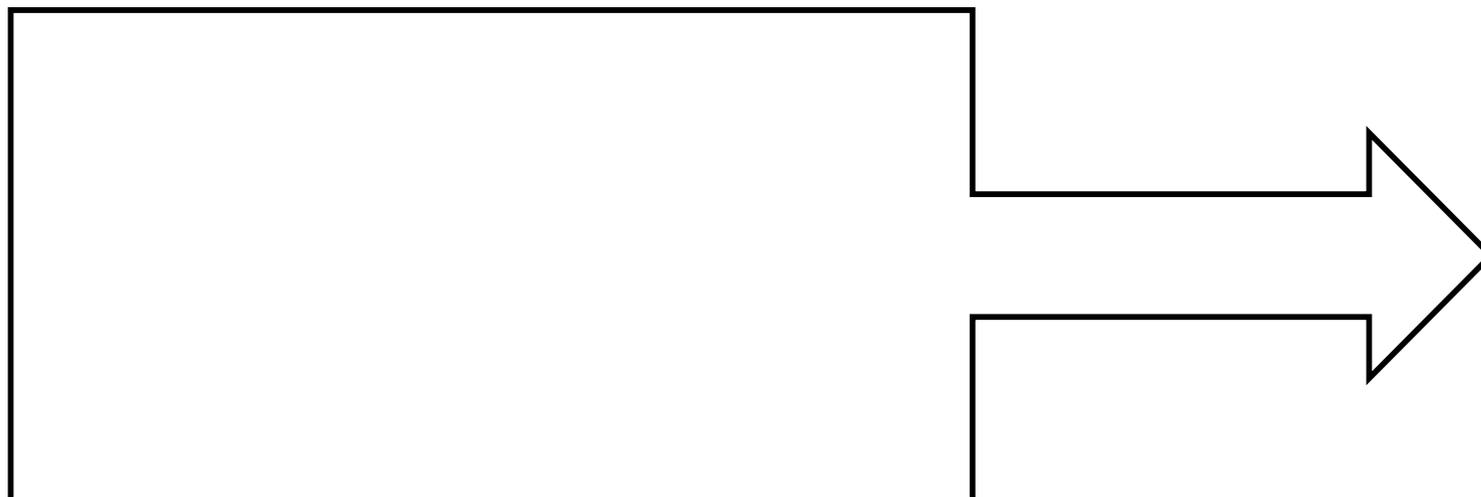
Other observations:



Questions to ask:



Strategies / Ideas / Techniques I will try as a result of today's lesson:



Developed by GLOWMaths, based on an idea  
from East Midlands West Maths Hub