

Representation and Structure

1. The representation needs to clearly show the concept being taught, and in particular the key difficulty point. It **exposes the structure**.
2. In the end, the students need to be able to do the maths without the representation
3. A stem sentence describes the representation and helps the students move to working in the abstract ("ten tenths is equivalent to one whole") and could be seen as a representation in itself
4. There will be some key representations which the students will meet time and again
5. **Pattern and structure are related but different:** Students may have seen a pattern without understanding the structure which causes that pattern

Mathematical Thinking

1. Mathematical thinking is central to deep and sustainable learning of mathematics.
2. Taught ideas that are understood deeply are **not just 'received' passively but worked on by the student**. They need to be thought about, reasoned with and discussed.
3. Mathematical thinking involves:
 - looking for **pattern** in order to discern **structure**;
 - looking for **relationships** and **connecting ideas**;
 - **reasoning logically**, explaining, conjecturing and proving.

Coherence

1. Small steps are easier to take.
2. **Focusing on one key point each lesson** allows for deep and sustainable learning.
3. Certain images, techniques and concepts are **important pre-cursors** to later ideas. Getting the sequencing of these right is an important skill in planning and teaching for mastery.
4. When introducing new ideas, it is important to make connections with earlier ones that have already been understood.
5. When something has been deeply understood and mastered, it can and should be **used in the next steps of learning**.

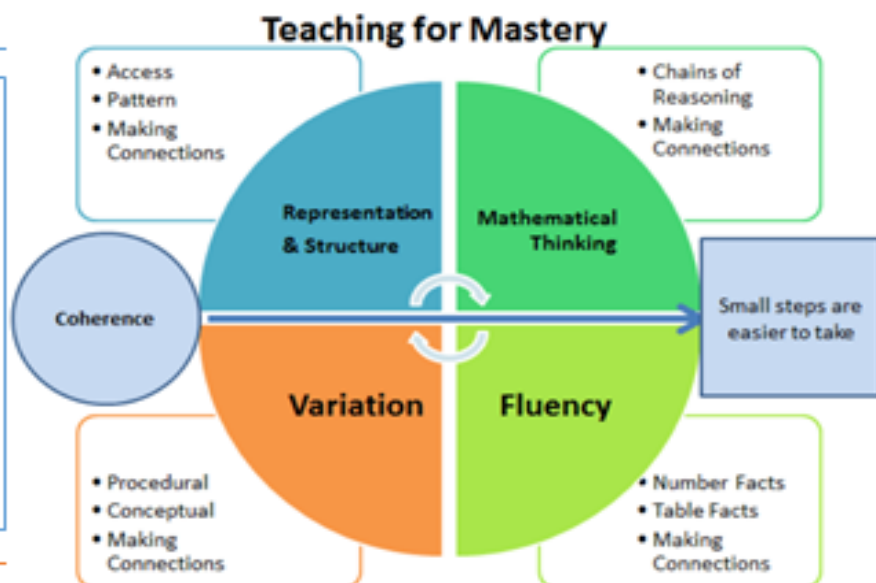
Variation

1. The central idea of teaching with variation is to **highlight the essential features of a concept or idea** through varying the non-essential features.
2. **Variation is not the same as variety** – careful attention needs to be paid to what aspects are being varied (and what is not being varied) and for what purpose.
3. When giving examples of a mathematical concept, it is useful to add variation to emphasise:
 - a. What it is (both standard and non-standard examples);
 - b. What it is not.

When constructing a set of activities or questions it is important to consider what connects the examples; what mathematical structures are being highlighted? Students are encouraged to avoid mechanical practice and, instead, to **practice the thinking process (intelligent practice)**

Fluency

1. **Fluency demands more of learners than memorisation** of a single procedure or collection of facts. It encompasses a **mixture of efficiency, accuracy and flexibility**.
2. Quick and efficient recall of facts and procedures is important in order for learners' to keep track of sub problems, think strategically and solve problems.
3. 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.



Intent

At Hatch Warren Infant school we want children to leave us being confident in the five main elements of Mastery: representation and structure, coherence, variation, mathematical thinking and fluency. We want to instill confidence into our children so they can accurately and confidently answer questions and talk about their mathematics to show their understanding. We want to give children the language to confidently explain their thinking and to be creative when solving problems. This is underpinned by high expectations of all; where all children move through the curriculum at broadly the same pace; high quality modelling and reinforced ambitious vocabulary. The children are introduced to a wide variety of models, methods and equipment so they can become independent to support themselves in their own chosen way.

Implementation

In order to achieve this we use the following documents to support our planning;

White Rose Small steps

<https://assets.whiteroseeducation.com/Resources/early-years/reception/Reception%20small%20steps%20Autumn.pdf>

https://assets.whiteroseeducation.com/Resources/early-years/reception/EY%20Maths%20Prelim_Spring_Blocks%201-6.pdf

https://assets.whiteroseeducation.com/Resources/early-years/reception/EY%20Maths%20Prelim_Summer_Blocks%201-6.pdf

Numberblocks: Numberblocks are used to help support the early concepts of maths.

I See Reasoning: we use this high-quality resource to help drip feed in reasoning examples within lessons.

Dip and Pick cards / Thinking Tom: We use these for problem solving and reasoning.

Impact

- Pupils enjoy Maths and show resilience when faced with a challenge.
- Pupils are able to confidently articulate their understanding of mathematics and will talk enthusiastically about solving problems.
- Pupils are able to make links in their learning.
- Pupils have opportunities to experience a practical approach to Maths using a range of resources and outdoor opportunities where possible.
- Pupils are engaged in their learning and make significant progress.

The Overview:

- Has number as its central concept;
- Spends large proportions of time reinforcing number to build competency;
- Ensures teachers stay in the required key stage and support the ideal of depth before breadth;
- Ensure students have the opportunity to stay together as they work through the schemes as a whole group;
- Provide plenty of time to build reasoning and problem solving elements into the curriculum.

Statutory Framework: Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Mathematics ELG: Number Children at the expected level of development will: - Have a deep understanding of number to 10, including the composition of each number; 14 - Subitise (recognise quantities without counting) up to 5; - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical Patterns Children at the expected level of development will: - Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Daily Maths

As part of our everyday practice in EYFS we change our number on the working walls. The number is shown in a variety of ways: value, number placement, one more one less, odd and evenings, quantities, time, money, 10s frame, arras, bead string, Numicon, and number formation.

Daily Calendar: our calendar is discussed daily and shows: the days of the week, seasons, sequence daily events and events throughout the month.

Year R – Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Autumn	Baseline/ Assessment		Match and sort Compare amounts		Talk about Measure and Patterns		Representing 1, 2 and 3 Comparing 1,2,3 Composition of 1,2,3 <i>NW:1 and 2</i> Time – sequencing school trip		Circles and Triangles <i>NW: 3</i>	Representing numbers to 5. One more and less <i>NW: 4 and 5</i>		Shapes with 4 sides <i>NW: 6</i>	Catch up/Consolidation
Spring	Alive in 5 <i>NW: 7</i>			Growing 7, 8, 9 <i>NW: 8,9, 10</i>				Building 9 and 10 Length and height		Explore 3-D Shapes <i>NW:11 and 12</i>		Catch up/Consolidation <i>NW: 13</i>	
Summer		To 20 and beyond <i>NW: 14, 15 16</i>		How Many Now? <i>NW:17</i>	Manipulate, compose and decompose <i>NW:18</i>		Sharing and Grouping <i>NW: 19 and 20</i>		Visualise, build and map Time			DEST Catch up/consolidation	