Mathematics Mastery

Miss Goreham

A Little Bit of Maths!

Aims

* To explain what Mathematics Mastery is.
* To explain our Mathematics Mastery Curriculum.

What is Mathematics Mastery?

What is Mathematics Mastery?

Drury 2014

– A mathematical concept or skill has been **mastered** when, through exploration, clarification, practice and application over time, a person can represent it in multiple ways, has the mathematical language to be able to communicate related ideas, and can think mathematically with the concept so that they can independently apply it to a totally new problem in an unfamiliar situation.

What is Mathematics Mastery?

NCETM 2014

- The focus is on the development of **deep structural knowledge** and the ability to **make connections**. Making connections in mathematics deepens **knowledge of concepts and procedures**, ensures what is learnt is sustained over time, and cuts down the time required to assimilate and master later concepts and techniques.

What is Mathematics Mastery?

- Deep and sustainable learning

- Ability to build on something already mastered

- Ability to reason about a concept and make connections to other concepts

- Procedural fluency with conceptual understanding, *i.e. the understanding of how and why it works*

Mastery is a continuum… mastery at a particular point of time that is sufficient mastery for that stage of learning and then built on at a later stage.

Mindset

Hollywood Hates Maths

Fixed vs. Growth Mindset

Learners with a fixed mindset:

- Believe that you either have ability or you don't.
- Are reluctant to take on challenges.
- Are worried about making mistakes.
- Prefer to stay in their comfort zones.
- Think it is important to seem intelligent in front of others.

Fixed vs. Growth Mindset

Learners with a growth mindset:

- Believe that effort creates success
- Believe that a skill and ability can be increased over time
- View mistakes as an opportunity to develop
- Are resilient
- Thinks about how they learn

Growth Mindset: No labels

* We have removed ability grouping!
* Change from having 'preconceived ideas about who have more or less potential… [to thinking] carefully about how to support pupils who find a concept difficult, and how to challenge pupils who find it more accessible, but there is no need to decide in advance which pupils this will be.' Drury, 2014

Week of Inspirational Maths

* First week back after Christmas the whole school took part in a Week of Inspirational Maths.
* Each lesson started with a video that explained an important message to encourage the children to have a Growth Mindset.

Week of Inspirational Maths

Woodside's Mathematics Mastery Curriculum

The Three Aims!

The National Curriculum Aims

* 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.

The National Curriculum Aims

* 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 simple steps and preserving in seeking solutions.

The National Curriculum states:

* The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace.

Effective Planning

New scheme of work enables longer to be spent on topics.

September 2016 – July 2017 Maths Mastery Long Term Planning (Year 1)

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Autumn Term	1st Half	wb: 05.09.16	wb: 12.09.16	wb: 19.09.15	wb: 26.09.16	wb: 03.10.16	wb: 10.10.16	wb: 17.10.16	
		Numbers to 10			Addition and Subtraction Within 10			Time	
	2nd Half	wb: 31.10.16	wb: 07.11.16	wb: 14.11.16	wb: 21.11.16	wb: 28.11.16	wb: 05.12.16	wb: 12.12.16	
		Shapes and Patterns		Numbers to 20	Addition and Subtraction Within 20		Money		
Spring Term	1st Half	wb: 02.01.17	wb: 09.01.17	wb: 16.01.17	wb: 23.01.17	wb: 30.01.17	wb: 06.02.17		
		Exploring Calculation Strategies Within 20		Time		Numbers to 40			
	2nd Half	wb: 20.02.17	wb: 27.02.17	wb: 06.03.17	wb: 13.03.17	wb: 20.03.17	wb: 27.03.17		
		Adding and Subtracting Within 40			Length, Weight and Volume				
Summer Term	1st Half	wb: 17.04.17	wb: 24.04.17	wb: 01.05.17 (4 days)	wb: 08.05.17	wb: 08.05.17	wb: 15.05.17	wb: 22.05.17	
		Numbers to 100		Adding and Subtracting Within 100		Graphs		Shapes and Patterns	
	2nd Half	wb: 05.06.17	wb: 12.06.17	wb: 19.06.17	wb: 26.06.17	wb: 03.07.17	wb: 10.07.17	wb: 17.07.17	
		Money		Multiplication, Division and Fractions		Length, Weight and Volume			

September 2016 – July 2017 Maths Mastery Long Term Planning (Year 2)

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	
Autumn Term	1st Half	wb: 05.09.16	wb: 12.09.16	wb: 19.09.15	wb: 26.09.16	wb: 03.10.16	wb: 10.10.16	wb: 17.10.16	
		Numbers Within 100			Addition and Subtraction With 2-digit Numbers			Time	
	2nd Half	wb: 31.10.16	wb: 07.11.16	wb: 14.11.16	wb: 21.11.16	wb: 28.11.16	wb: 05.12.16	wb: 12.12.16	
		Addition and Subtraction Word Problems		Multiplication and Division	Multiplication Tables of 2, 5 and 10		Shape and Pattern		
Spring Term	1st Half	wb: 02.01.17	wb: 09.01.17	wb: 16.01.17	wb: 23.01.17	wb: 30.01.17	wb: 06.02.17		
		Exploring Calculation Strategies		Money		Measuring Length			
	2nd Half	wb: 20.02.17	wb: 27.02.17	wb: 06.03.17	wb: 13.03.17	wb: 20.03.17	wb: 27.03.17		
		Measuring Mass		Fractions		Time			
Summer Term	1st Half	wb: 17.04.17	wb: 24.04.17	wb: 01.05.17 (4 days)	wb: 08.05.17	wb: 08.05.17	wb: 15.05.17	wb: 22.05.17	
		Measuring Capacity and Volume and Temperature		Multiplication and Division		Fractions	Exploring Calculation Strategies		
	2nd Half	wb: 05.06.17	wb: 12.06.17	wb: 19.06.17	wb: 26.06.17	wb: 03.07.17	wb: 10.07.17	wb: 17.07.17	
		Faces, Shape and Patterns; Lines and Turns		Graphs		Numbers Within 1000			

Number sense and place value come first.

Planning for Depth - Differentiation

* The Three Dimensions of Depth
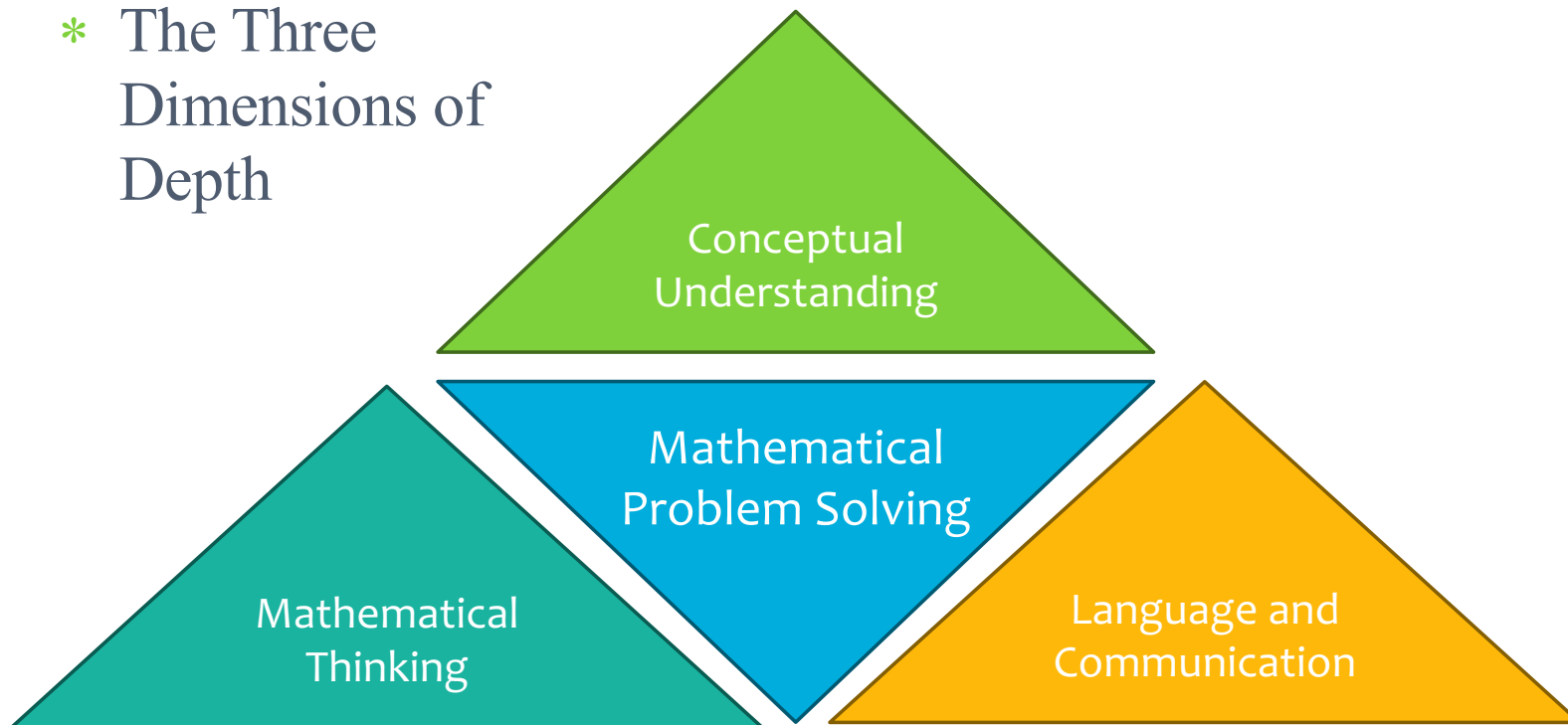
Mastering Mathematical Understanding

* Concrete-Pictorial-Abstract
  * From the work of Bruner – reaches out to a variety of learners.
  * Concrete allows discovery
  * Pictorial allows conceptual understanding
  * Abstract allows a shorted and more efficient way to represent numerical ideas using symbols.
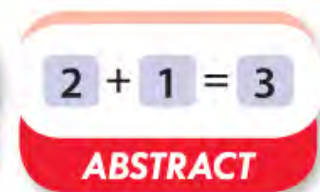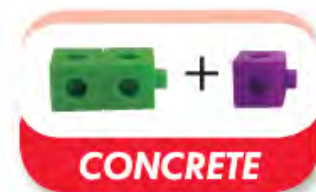
Role of Parent

Clear Message

* EVERYBODY IS A MATHS PERSON!