How do we teach fluency at Stapleford Primary School?

Friday 9th November 2018
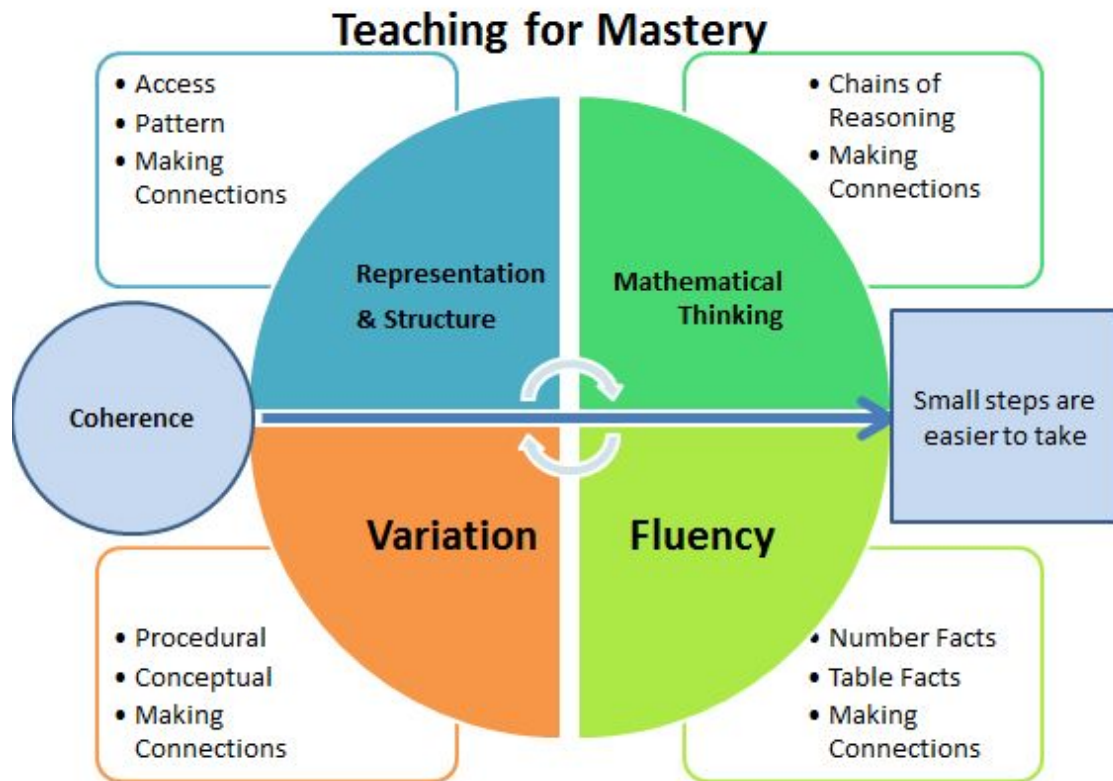
What do we mean by Mastery?

- **Deep and sustainable learning – for all**

  Depth is the key to avoiding the need to repeat teaching.

  It doesn't feel like we're starting again each term.

- **The ability to build on something that has already been sufficiently mastered**

  …for this stage of learning - Mastery is a continuum

What do we mean by Mastery?

- **The ability to reason about a concept and make connections**
  - Cuts down on the amount I need to learn
    eg relating concepts of division, fractions and ratio
  - Deepens conceptual understanding.
- **Conceptual and procedural fluency**
  - Move maths from one context to another. Recognise concepts in unfamiliar situations.
  - Know number facts and tables, have efficient procedures

The 5 Big Ideas

Teaching for Mastery

- Access
- Pattern
- Making Connections

Representation & Structure

- Chains of Reasoning
- Making Connections

Mathematical Thinking

Coherence

Small steps are easier to take

- Procedural
- Conceptual
- Making Connections

Variation

Fluency

- Number Facts
- Table Facts
- Making Connections

Fluency

- Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Fluency in this area will draw in elements of mathematical thinking.

Fluency

Big Ideas of Mastery: Fluency

Messages
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.

For example:

Quick and accurate recall of all multiplication facts up to 12×12 is important in order to free working memory to see the big picture and make decisions about when to use this knowledge to solve certain problems.

However, if a pupil only knows these facts as an unconnected collection of memorised phrases and does not know:

- that 8×6 is the same as 6×8 or twice 4×6 or 12 less that 10×8;
  or
- does not know the connection between 6×8 and 16×8 or 6×80 or 0.6×8;
  or
- when faced with a problem of finding how many books are in a bookcase with 8 shelves and 6 books on each shelf, does not know what mathematics to use

… then they have not attained fluency.

Fluency

What curriculum areas are these topics important in?

Number bonds

Doubling and Halving

Times tables

Fluency

Converting units

What curriculum areas are these topics important in?

Number bonds

Addition and subtractions

Fractions

Doubling and Halving

Area and perimeter

Times tables

Times tables

Measure

Related facts - half of 1, 3000 etc

Multiplying and dividing by 10

Times tables

- Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Fluency in this area will draw in elements of mathematical thinking.

From the 2019 to 2020 academic year onwards, schools in England will be required to administer an online multiplication tables check (MTC) to year 4 pupils. **(The current year 3s)**

Try out some activities!

Table 1 - Learn the seventeen times table

Table 2 - Multiplication patterns

Table 3 - Building times tables

Table 4 - If I know ...
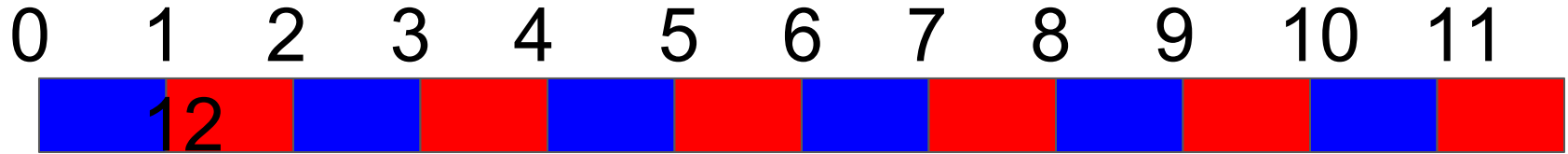
Table 5 - Making links

Table 6 - Grid game (three in a row)

Table 7 - Memory games and counting

Table 8 - Mathletics and Times Table Rockstars

Table 9 - Games (totality, 100 square)

Times tables

0   1   2   3   4   5   6   7   8   9   10   11
12

The seventeen times table!

Times tables

Looking for patterns

Which times tables could be learnt together?

Times tables
Looking for patterns

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Times tables

Looking for patterns

ALL, SOME, NONE

Write three or four random numbers on the board.

Pupils talk with a partner, using a whiteboard and pen if that helps, to construct three sentences about those numbers, using the words 'all, some, none?'

E.g. 2, 7, 11

"All of the numbers are prime"

"Some of the numbers are odd"

"None of the numbers are factors of 15"

Numbers can be specifically selected to link to certain tables

4, 48, 16
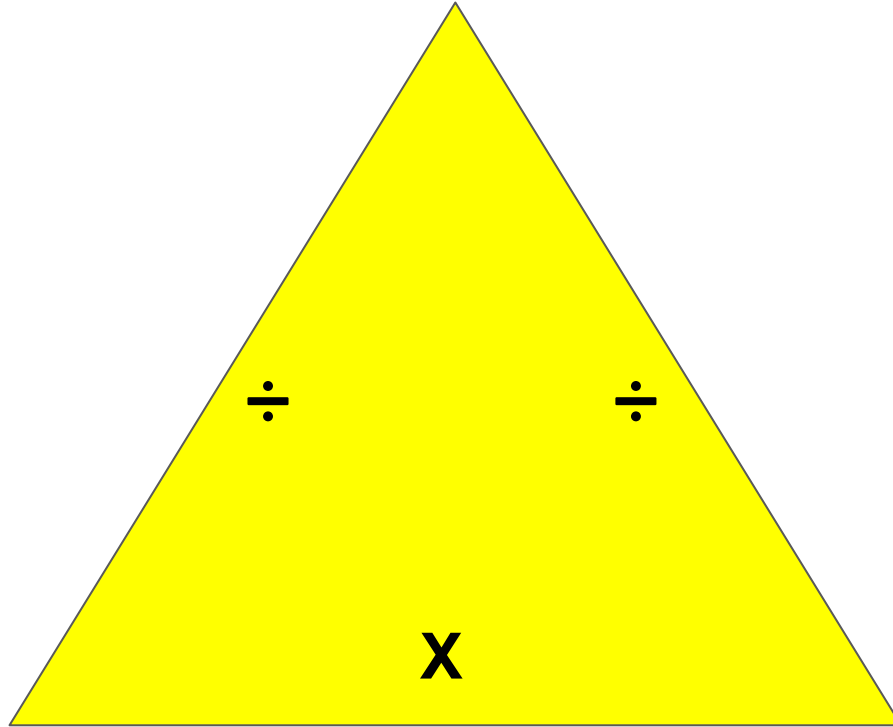
"All are multiples of 4"

"Some are multiples of eight"

"None have 5 as a factor"

Times tables

	23
1 x	
2 x	
3 x	
4 x	
5 x	
10 x	

If I know 6 x 7 = 42, I also know …

The inverse - family of four

Continuous counting

Related facts

Division facts

Try out some activities!

Table 1 - Learn the seventeen times table

Table 2 - Multiplication patterns

Table 3 - Building times tables

Table 4 - If I know ...

Table 5 - Making links

Table 6 - Grid game (three in a row)

Table 7 - Applying knowledge and making links

Table 8 - Matching cards and quick recall (number cards, round robin, tennis counting)

Table 9 - Games (totality, 100 square)

Table 10 - Mathletics