

Maths workshop: Calculation

Boughton Monchelsea Primary school

The 2014 National Curriculum

- Increased level of challenge
- Expectations for individual year groups (these have been broken down on our website)
- No levels
- A 'mastery' approach

Mastery approach

- Inspired by teaching methods from successful approaches to the teaching of maths worldwide.
- The aim is that the class learn together, taking time to make sure that concepts are secure.
- Children explore representing maths in lots of different ways, including using numbers, diagrams and manipulatives.

Manipulatives

Models, images and practical apparatus 

All of these play an important part in supporting pupils' conceptual understanding and reasoning skills.

Can you name these?

Whole
?

Part
?

Part
?



Flexibility with different representations

Manipulatives cont...

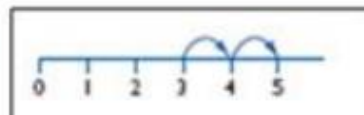
Resources to help build concepts

Ofsted

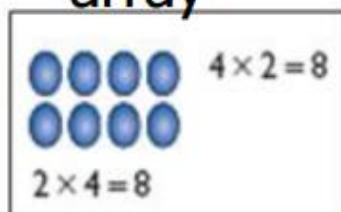
Numicon



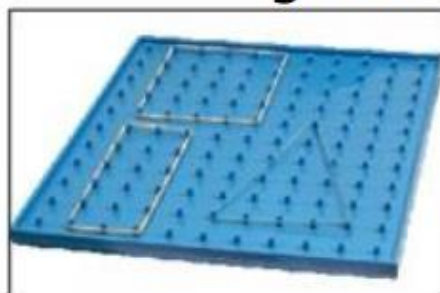
number line



array



geoboard



counting stick or metre rule



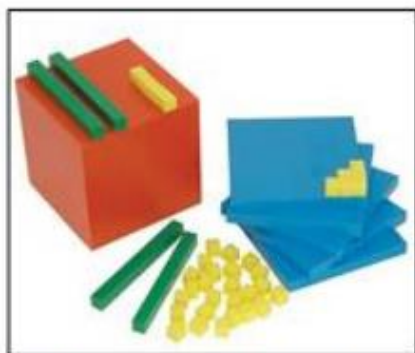
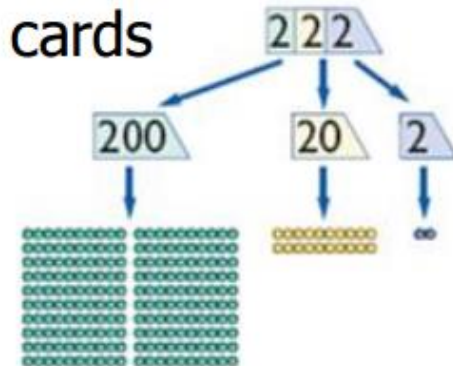
empty number line



hundred square



place value



Dienes blocks

bead string

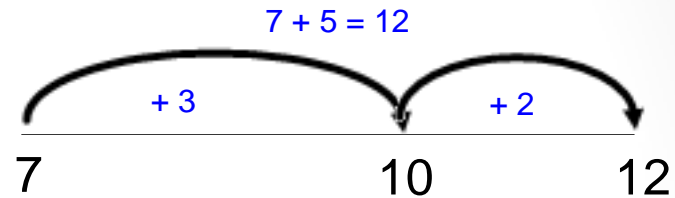
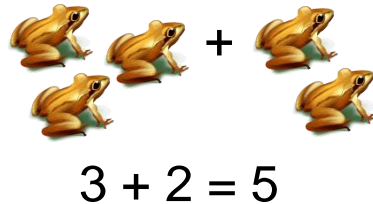


Calculation

- We have adopted the Wandsworth LA calculation policy
- The policy is split in to operations and year groups
- Each section demonstrates all the different ways the children may represent calculations.
- The next four slides outline the key strategies for each operation.

Addition – key strategies

- Counting objects



- Number line

$$54 + 87 =$$



- Partitioning

$$(50 + 80) + (4 + 7) =$$



$$130 + 11 = 141$$

- Expanded method

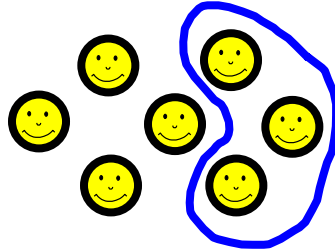
$$\begin{array}{r} 256 \\ + 578 \\ \hline 14 \\ 120 \\ \underline{700} \\ 834 \end{array}$$

- Formal column addition

$$\begin{array}{r} 256 \\ + 578 \\ \hline 833 \\ \hline 11 \end{array}$$

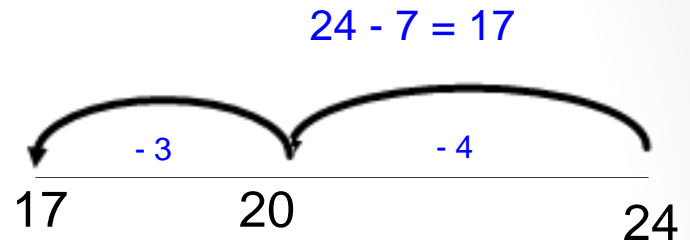
Subtraction – key strategies

- Taking away objects



$$7 - 3 = 4$$

- Number lines (including counting up)

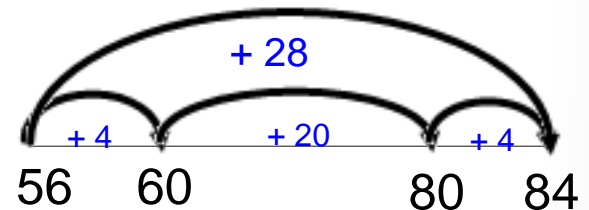


- Expanded column method

$$84 - 56 = 28$$



$$56 + 28 = 84$$



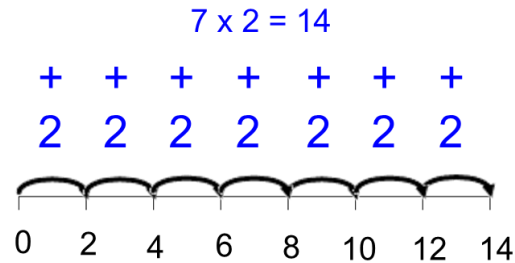
- Formal column method (decomposition)

$$\begin{array}{r} 7 \cancel{8} 49 \\ - 454 \\ \hline 395 \end{array}$$

$$\begin{array}{r} 372 - 147 = \\ 300 + \cancel{70} + \overset{60}{1} 2 \\ - 100 + 40 + \overset{1}{7} \\ \hline 200 + 20 + 5 \end{array}$$

Multiplication – key strategies

- Groups



- Number line



- Arrays

$$5 \times 4 = 20$$

$$4 \times 5 = 20$$

- Grid method

$$23 \times 256 = 5888$$

- Column method

$$\begin{array}{r}
 256 \\
 \times 23 \\
 \hline
 768 \quad (3 \times 256) \\
 5120 \quad (20 \times 256) \\
 \hline
 5888
 \end{array}$$

x	200	50	6	Total
20	4000	1000	120	5120
3	600	150	18	768
				5888

Division – key strategies



- Groups



- Arrays (inverse of multiplication)

- Use of multiplication facts

- Bus stop method (short division)

- Long division.

$$\begin{array}{r}
 28 \text{ r } 12 \\
 15 \overline{)432} \\
 \underline{300} \\
 132 \\
 \underline{120} \\
 12
 \end{array}$$



$$20 \div 4 = 5$$

$$20 \div 5 = 4$$

$$\begin{array}{r}
 36 \text{ r } 4 \\
 7 \overline{)256}
 \end{array}$$

What can you do?

- Encourage a 'growth mindset' attitude to maths. Everyone can improve at maths!
- Talk about applying maths in real-life contexts.
- Invite children to talk about the strategies they are using at school that work for them.
- Refer to the calculation policy and the year group expectations on the school website.