

# Helping your child make good progress in mathematics

Parents Workshop  
March 2014



# What do we want for our children?

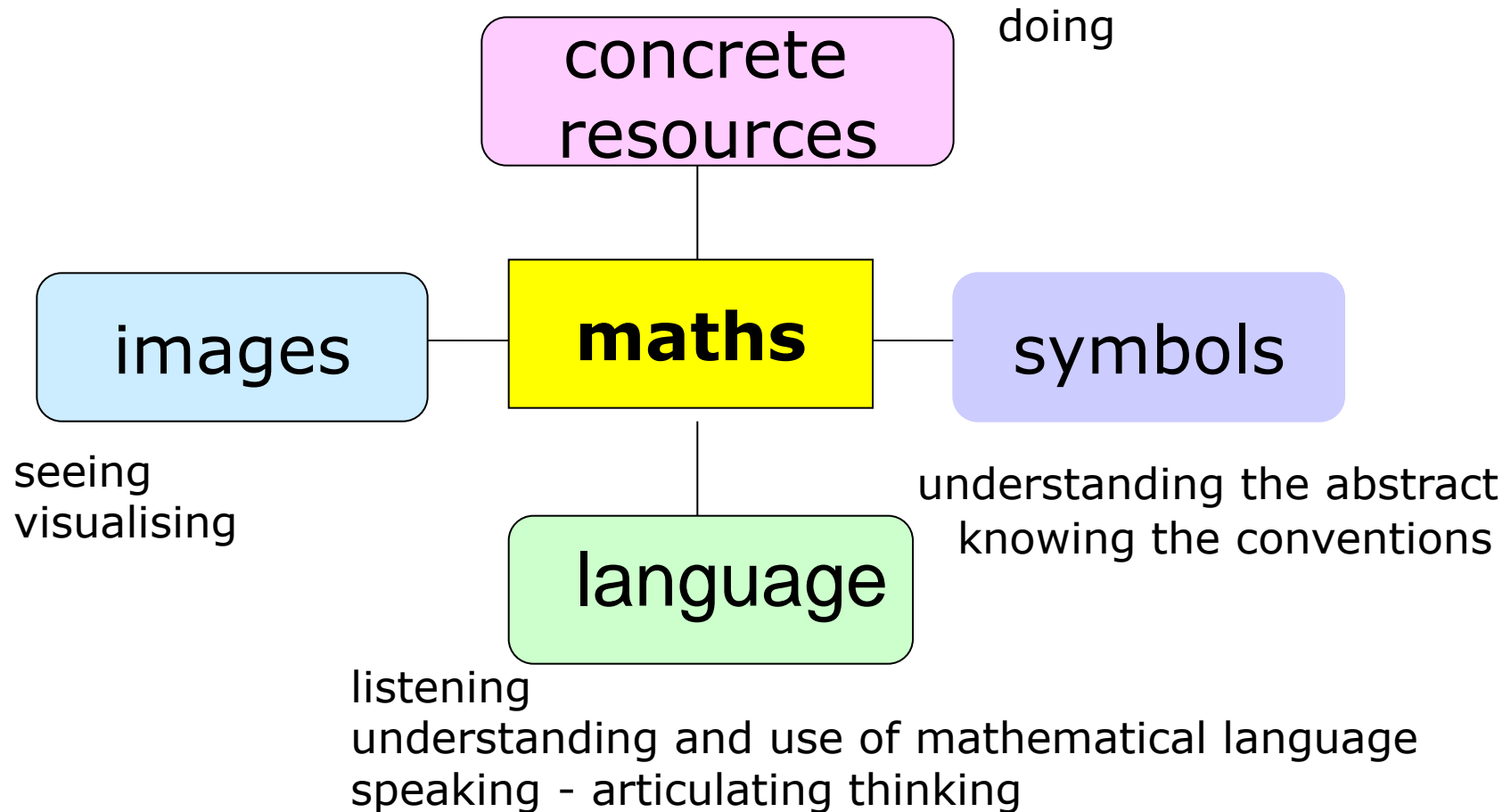
- enjoyable mathematics lessons
- mathematics that is interesting and challenging
- A love of the subject that helps them when they continue to study
- mathematics that is relevant to their lives – a life skill
- confident mathematicians

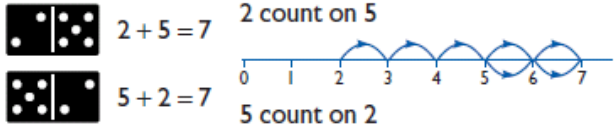
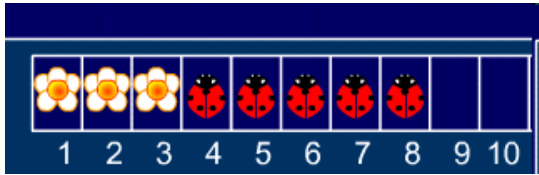
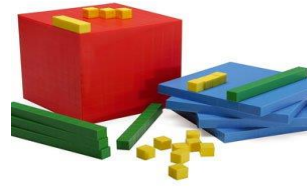
# Mathematics: made to measure

The responsibility of mathematics education is to enable all pupils to develop conceptual understanding of the mathematics they learn, its structures and relationships, and fluent recall of mathematical knowledge and skills to equip them to solve familiar problems as well as tackling creatively the more complex and unfamiliar ones that lie ahead.

Ofsted May 2012

# Developing conceptual understanding – a multi-sensory approach





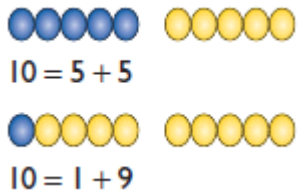
concrete resources



images

addition

10 + =  
symbols



sum plus  
equals  
add language  
add together  
more total

5 8 2



9 and 1 more is 10  
9 add 1 equals 10  
9 + 1 = 10

active learning  
independence  
choices/decisions  
communicating  
reasoning  
questioning  
**thinking**  
'hands-on'

# Our calculation policy



**- *Can I do this mentally?***

*(I may need to do some jottings.)*

**- *Do I need to use a written method?***

*(Perhaps the numbers are too big)*

*(Perhaps there are too many steps to the problem.)*

# Building mental fluency

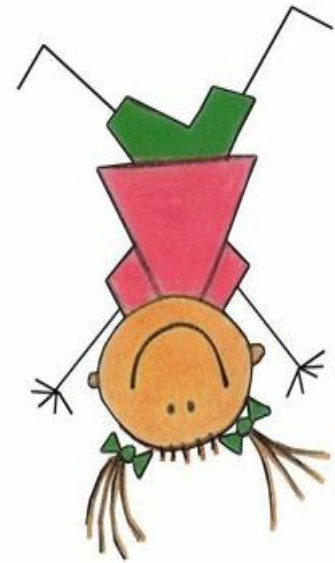
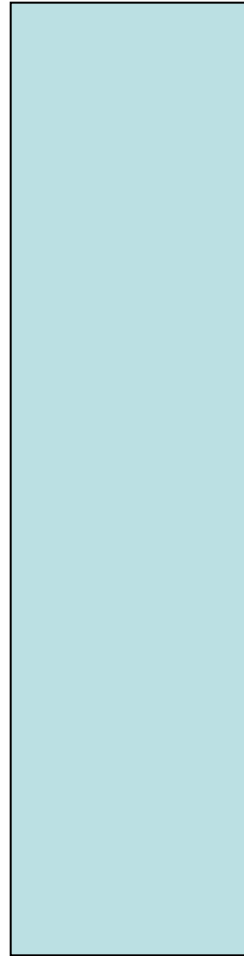
$61 - 4$

$61 - 41$

$61 - 32$

$61 - 58$

$61 - 43$



# Looking at the calculation and making a choice

$$61 - 4$$

$$61 - 41$$

$$61 - 32$$

$$61 - 58$$

$$61 - 43$$

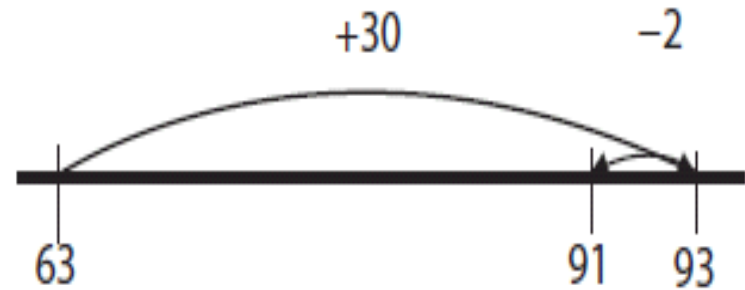
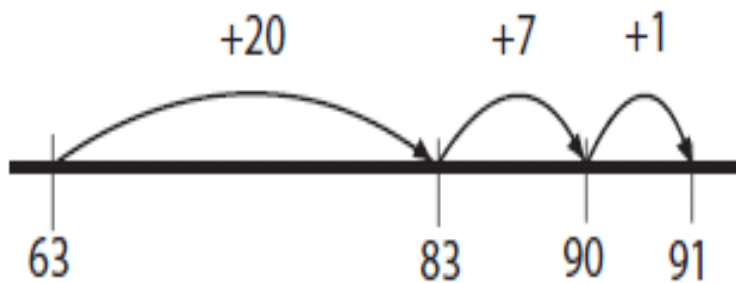




# Number line

The empty number line is a powerful model for developing children's calculation strategies and developing their understanding.

Here are two examples of the calculation  $63 + 28 = 91$  represented on the empty number line.



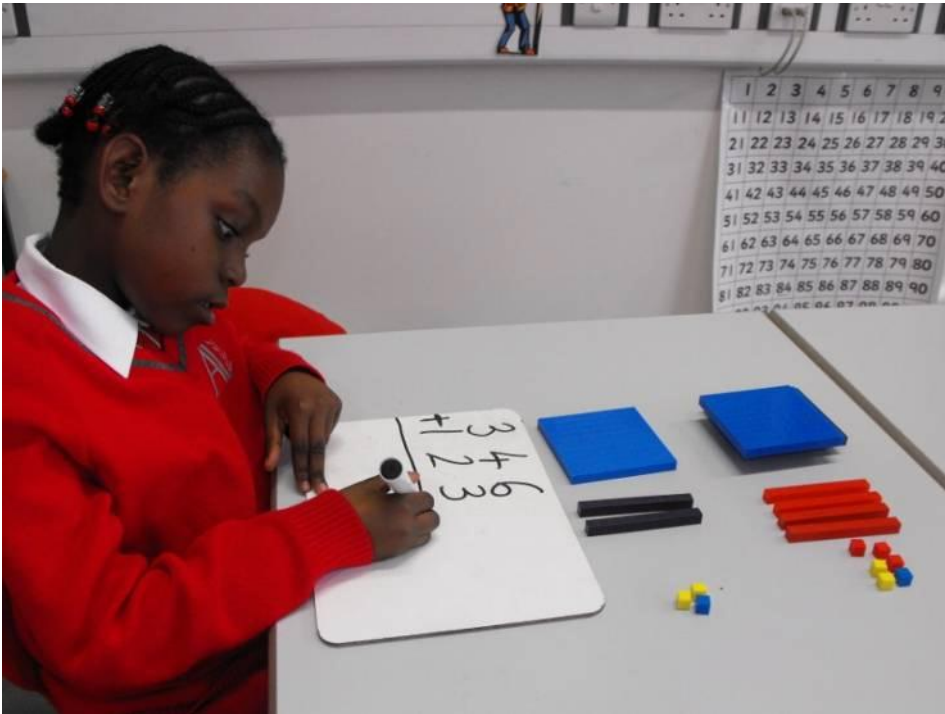
# Partitioning

- The next stage is to record mental methods using partitioning (splitting the numbers in to hundreds, tens and units).

$$\begin{aligned} & 47 + 76 \\ = & 40 + 70 + 7 + 6 \\ = & 110 + 13 \\ = & 123 \end{aligned}$$

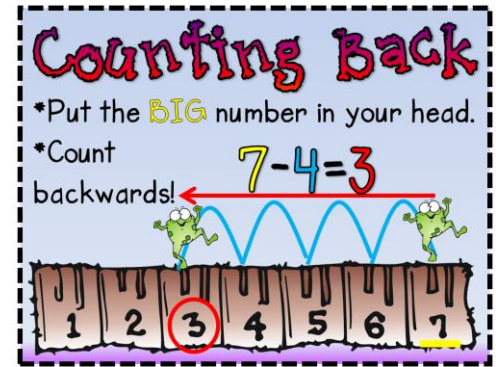
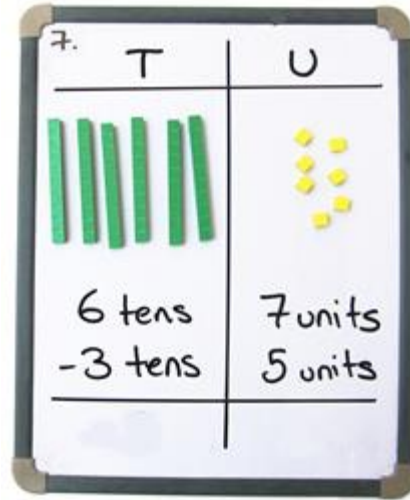
$$\begin{array}{r} 40 + 7 \\ 70 + 6 \\ \hline 110 + 13 = 123 \end{array}$$

# Progression to column methods



$$\begin{array}{r} 47 \\ + 76 \\ \hline 13 \\ 110 \\ \hline 123 \end{array}$$
$$\begin{array}{r} 47 \\ + 76 \\ \hline 123 \\ \hline 11 \end{array}$$

# Subtraction



$$\begin{array}{r} 500 + 60 + 3 \\ - 200 + 70 + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 400 + 160 + 3 \\ - 200 + 70 + 1 \\ \hline 200 + 90 + 2 \end{array}$$

$$\begin{array}{r} \phantom{4}00 \phantom{1}60 \\ \cancel{5}00 + \cancel{6}0 + 3 \\ - 200 + 70 + 1 \\ \hline 200 + 90 + 2 \end{array}$$

$$\begin{array}{r} \phantom{4} \phantom{1}6 \\ \cancel{5} \cancel{6} 3 \\ - 271 \\ \hline 292 \end{array}$$

(Try to use the language 'take' from a neighbour)

# Multiplication

Starting with an array



e.g.  $3 \times 5 = 15$

Progressing to multiplying by partitioning

$$\begin{aligned} 14 \times 3 &= (10 + 4) \times 3 \\ &= (10 \times 3) + (4 \times 3) = 30 + 12 = 42 \end{aligned}$$



# Multiplication

Moving on to the grid method

60	3	x
240	12	4

$$240 + 12 = 252$$

20	7	x
1000	350	50
120	42	6

$$1350 + 162 = 1512$$

Then short multiplication



$$\begin{array}{r} 30 + 8 \\ \times \quad 7 \\ \hline 210 \\ \quad 56 \\ \hline 266 \end{array}$$

$$\begin{array}{l} 30 \times 7 = 210 \\ 8 \times 7 = 56 \end{array}$$

$$\begin{array}{r} 38 \\ \times \quad 7 \\ \hline 266 \\ \hline 5 \end{array}$$

# Division

Starting with partitioning

e.g. Informal recording for  $84 \div 7$  might be:

$$\begin{array}{r} 84 \\ 70 + 14 \\ \downarrow \quad \downarrow \\ 10 + 2 = 12 \end{array} \div 7$$

Then progress to chunking



$$\begin{array}{r} 6 \overline{)196} \\ - \underline{60} \quad 6 \times 10 \\ 136 \\ - \underline{60} \quad 6 \times 10 \\ 76 \\ - \underline{60} \quad 6 \times 10 \\ 16 \\ - \underline{12} \quad 6 \times 2 \\ 4 \quad 32 \\ \text{Answer:} \quad 32 \text{ R } 4 \end{array}$$

# Division

$$\begin{array}{r} 6 \overline{)196} \\ -180 \\ \hline 16 \end{array}$$

$$6 \times 30$$

$$\begin{array}{r} -12 \\ \hline 4 \end{array}$$

$$6 \times 2$$

$$32$$

Answer: 32 R 4

Before short and long division

$$\begin{array}{r} 97 \\ 3 \overline{)297} \\ \hline \end{array}$$

$$\begin{array}{r} 23 \\ 24 \overline{)560} \\ -480 \\ \hline 80 \\ -72 \\ \hline 8 \end{array}$$

Answer: 23 R 8





# How can parents support their children with mathematics?

- exhibit a positive attitude towards mathematics
- be open about your own use of mathematics
- ask children what they have *learnt* in maths rather than what they have done
- value children's mathematical thinking – don't focus solely on correct answers and speed of response
- find ways to engage children with maths in everyday life e.g. finding the heaviest and lightest tin in the food cupboard