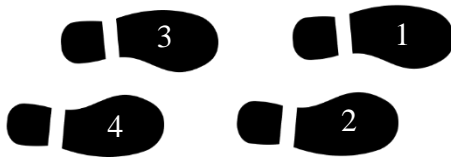


Big Ideas in Mastery: Coherence

Messages

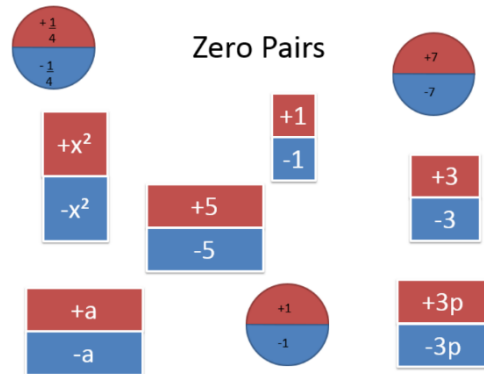
1. Small steps are easier to take.
2. Focussing on one key point each lesson allows for deep and sustainable learning.
3. Certain images, techniques and concepts are important pre-cursors to later ideas. Getting the sequencing of these right is an important skill in planning and teaching for mastery.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

For example: Subtracting Negative Numbers



Pupils should already know about hot and cold blocks and zero pairs.

Each step is narrow but taught in greater depth. Each step ends with a generalisation.

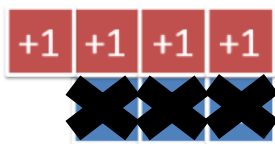


1 Subtract a negative number from 0

$$0 - -3 = \text{zero subtract negative three} = \begin{array}{|c|c|c|} \hline +1 & +1 & +1 \\ \hline \end{array} = +3$$

2 Subtracting a negative number using zero pairs

$$1 - -3 = 1 + 3 = +4$$

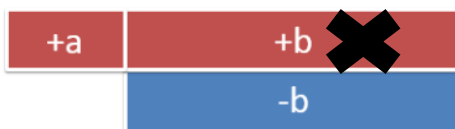


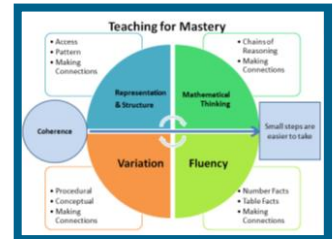
$$a - -b = a + b$$



3 Subtracting a positive number using zero pairs

$$a - +b = a + -b$$





4 Change subtraction to addition

$3 - -1 = 4$	$3 + 1 = 4$	$-a - -b$	$-a + b$
$a - -b$	$a + b$	$-a - -b$	$-a + b$
$a - +b$	$a + -b$		
$a - +b$	$a + -b$	$-a - +b$	$-a + -b$

$a - +b$	$-a + b$
$-a - +b$	$a + b$
$a - -b$	$-a + -b$
$-a - -b$	$a + -b$
$a - b$	
$-a - b$	

5 Collect like terms and simplify expressions

Collect like terms and simplify expressions

$$3a + 5b - 2a - 4b = 3a + 5b + -2a + -4b$$

$$= 3a + -2a + 5b + -4b$$

$$= a + b$$

