Hamsey Green Primary School
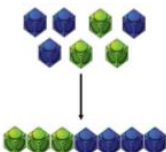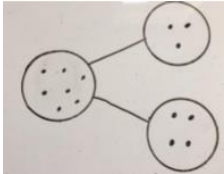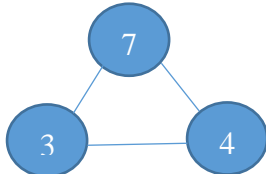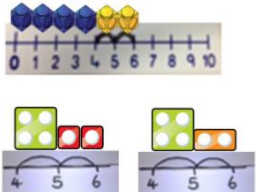
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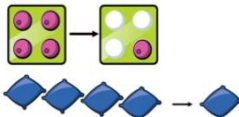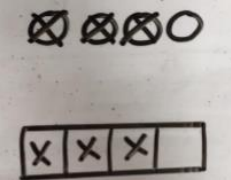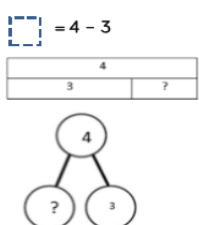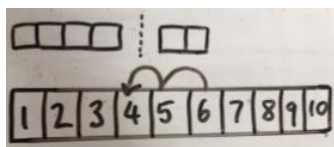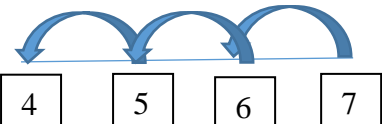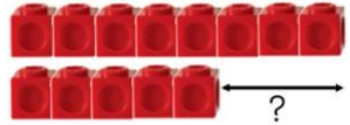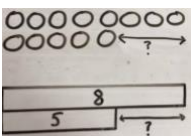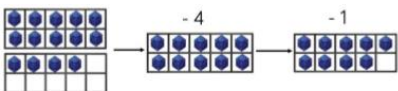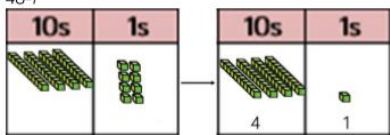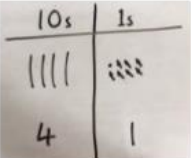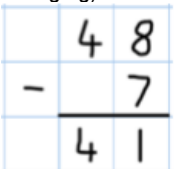
Addition
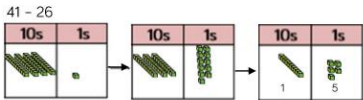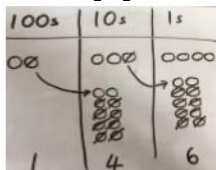
Concrete	Pictorial	Abstract
Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars).	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too	4 + 3 = 7 Four is a part, 3 is a part and the whole is seven
Counting on using number lines using cubes or Numicon.	A bar model which encourages the children to count on, rather than count all.	The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? 4 + 2
Regrouping to make 10; using ten frames and counters/cubes or using Numicon. 6 + 5	Children to draw the ten frame and counters/cubes.	Children to develop an understanding of equality e.g. $$6 + \square = 11$$ $$6 + 5 = 5 + \square$$ $$6 + 5 = \square + 4$$
Partitioning. Continue to develop understanding of partitioning and place value. 41 + 8	Children to represent the base 10 e.g. lines for tens and dot/crosses for ones	41 + 8 $1 + 8 = 9$ $40 + 9 = 49$
Continue to develop understanding of partitioning and place value. 36 + 25 Use columns	Children to represent the base 10 in a place value chart. (Carrying)	Expanded 36 + 25 = $30 + 20 = 50$ $5 + 5 = 10$ $50 + 10 + 1 = 61$ Formal method: 36 +25 61

2

		Column: Carrying is done at the bottom
Continue as above moving into 100s	*Continue as above moving into 100s*	243 +368 ___ 6 11 1 1

Addition	sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'.
Subtraction	**take away, less than, the difference, subtract, minus, fewer, decrease.**
Multiplication	**double, times, multiplied by, the product of, groups of, lots of, equal groups.**
Division	**share, group, divide, divided by, half.**
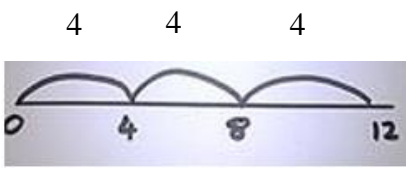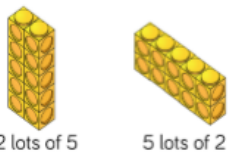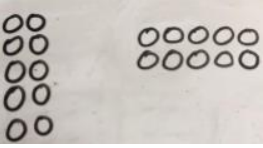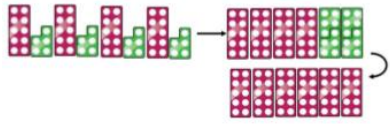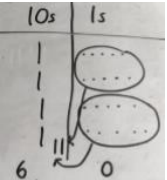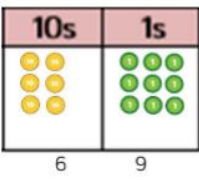
Subtraction

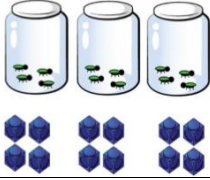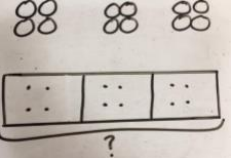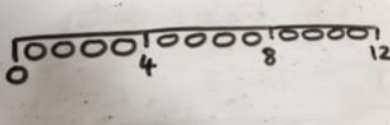| Concrete	Pictorial	Abstract
Physically taking away and removing objects from a whole (ten frames, Numicon, cubes and other items such as beanbags could be used). 4 – 3 = 1	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used.	4 - 3 = $\boxed{}$ = 4 – 3
Counting back (using number lines or number tracks) children start with 6 and count back 2. 6 – 2 = 4	Children to represent what they see pictorially e.g.	Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line 4 5 6 7
Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used).	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate.	Find the difference between 8 and 5 8 – 5, the difference is $\boxed{}$ Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference.
Making 10 using ten frames. 14 – 5	Children to present the ten frame pictorially and discuss what they did to make 10.	Children to show how they can make 10 by partitioning then subtract each part. 14 - 5 = 9 $\diagdown$ $\diagup$ 4 1 14 – 4 = 10 10 – 1 = 9
Column method using base 10. 48-7 48-7	Children to represent the base 10 pictorially.	Column method or children could count back (No Exchanging) $\begin{array}{r} 4\ 8 \\ -\quad 7 \\ \hline 4\ 1 \end{array}$
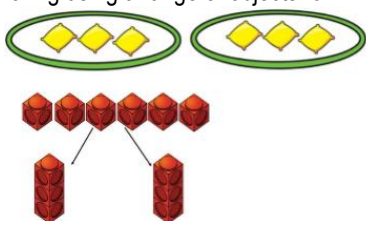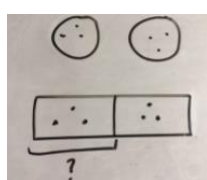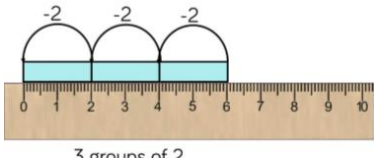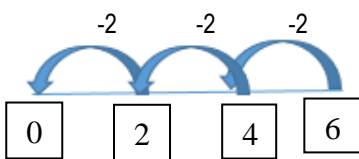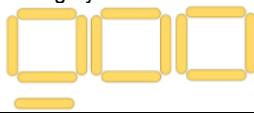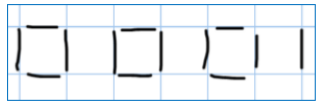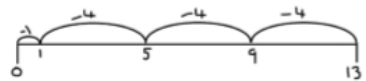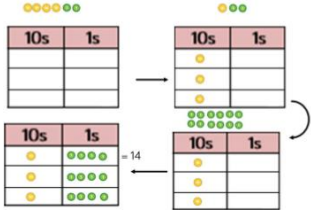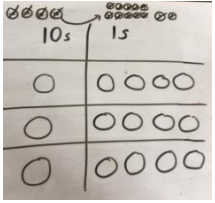
Column method using base 10 and having to exchange. 41 – 26	Writing out the columns and remembering to show the exchanging	Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11.
41 – 26		$2\overset{2}{\cancel{3}}\overset{1}{4}$ $-\ \ 88$ $\underline{\qquad 6}$

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Subtraction	take away, less than, the difference, subtract, minus, fewer, decrease.
Multiplication	double, times, multiplied by, the product of, groups of, lots of, equal groups.
Division	share, group, divide, divided by, half.

Multiplication

Concrete	Pictorial	Abstract
Repeated grouping/repeated addition 3 × 4 4 + 4 + 4 There are 3 equal groups, with 4 in each group.	Children to represent the practical resources in a picture and use a bar model.	Mental strategies 3x4 = 12 3 + 3 + 3 = 12
Number lines to show repeated groups- 3 × 4	Represent this pictorially alongside a number line e.g.:	Number line showing repeated addition
Use arrays: counters and other objects can also be used. 2 × 5 = 5 × 2 2 lots of 5 5 lots of 2	Children to represent the arrays pictorially.	Children to be able? to write a range of calculations e.g. $10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$
Partition to multiply using Numicon, base 10 or Cuisenaire rods. 4 × 15	Children to draw out the number they are multiplying moving numbers into the new columns E.g. 15 x 4 =	**Grid method** **34 x 3 =** <table><tr><td>x</td><td>30</td><td>4</td></tr><tr><td>3</td><td>90</td><td>12</td></tr></table> **90 + 12 = 102**

Formal column method with place value counters
 3 × 23
 	
10s   1s
6   9
	Same as above	Children to record what it is they are doing to show understanding.
		
		6 x 23 =
		
		   23
		× 6
		──────
		  138
		   1 1

Division

Concrete	Pictorial	Abstract
Sharing using a range of objects. 6 ÷ 2	Represent the sharing pictorially.	Mental strategies Children should be encouraged to use their multiplication facts
Repeated subtraction using Cuisenaire rods above a ruler. 6 ÷ 2 3 groups of 2	Children to represent repeated subtraction pictorially. 	
2d ÷ 1d with remainders using lollipop sticks. Cuisenaire rods, above a ruler can also be used. 13 ÷ 4 Use of lollipop sticks to form wholes-squares are made because we are dividing by 4.	Children to represent the lollipop sticks pictorially. There are 3 whole squares, with 1 left over. 	13 ÷ 4 – 3 remainder 1 Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line. '3 groups of 4, with 1 left over'
Sharing using place value counters. 42 ÷ 3 = 14	Children to represent the place value counters pictorially.	Be able to write a variety of calculations. $42 ÷ 3$ $42 = 30 + 12$ $30 ÷ 3 = 10$ $12 ÷ 3 = 4$ $10 + 4 = 14$
Same as above	*Same as above*	Short division method

Long Division

$$12\overline{)2544}$$
$$02$$
$$24$$
$$1$$

Key Language

Addition	**sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'.**
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