


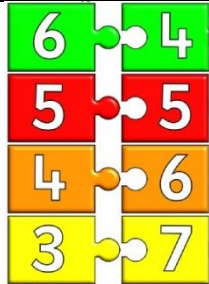
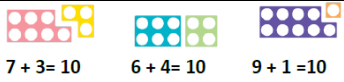
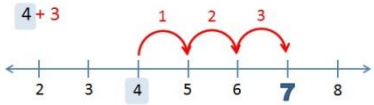

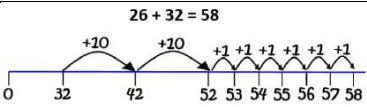


Beechwood Primary School

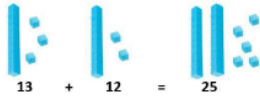
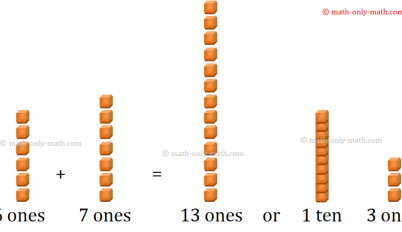


Calculation Policy

Date of Creation: 25th November 2024

Addition

<u>Vocabulary</u>		
add and plus sum	more than count on increase	addition total join bigger together more
Step 1		
	Developing mental methods	Mental addition and fluency is developed through frequent practise of strategies taught, including addition facts to 20 and related facts to 100, and addition of 1 and 2-digit numbers (including three 1-digit numbers).
	Developing knowledge and understanding of number bonds to 10	 $7 + 3 = 10$ $6 + 4 = 10$ $9 + 1 = 10$
	Addition using a number line	 $4 + 3$
Step 2		
	Developing mental methods	Children should have regular practise of mental addition, including multiple numbers. Explore how children visualise numbers in their heads, and encourage them to use a variety of methods for manipulating numbers. They should be able to add 3 1-digit numbers mentally and any pair of 2-digit numbers mentally, using a strategy of their choice.
	Addition using a blank number line (putting biggest number first)	$26 + 32 = 58$ 
Dienes' Apparatus  $13 + 12 = 25$	Counting on in jumps of ten and one using a hundred square	

<p>Dienes' Apparatus</p>  <p>13 + 12 = 25</p>	<p>Adding using column method. Begin with no exchanging.</p>	$\begin{array}{r} \text{ones} \quad \text{tens} \\ 46 \quad 46 \\ +12 \quad +12 \\ \hline 8 \quad 58 \end{array}$
 <p>6 ones + 7 ones = 13 ones or 1 ten 3 ones</p>	<p>Adding using column method with exchanging.</p>	$\begin{array}{r} \text{T} \quad \text{O} \\ 5 \quad 9 \\ + 2 \quad 3 \\ \hline 8 \quad 2 \end{array}$
<p>Children to be shown through practical resources the commutative law. Number can be added in any order and still give the same answer.</p>		

Step 3 and 4		
	<p>Addition using the compact written method involving carrying, adding the ones first.</p>	<p>264 + 148</p> $\begin{array}{r} \text{H} \quad \text{T} \quad \text{O} \\ 2 \quad 64 \\ + 1 \quad 48 \\ \hline 4 \quad 12 \\ \hline 1 \quad 1 \end{array}$

Step 5 & 6		
	<p>Addition using the compact written method progressing to thousands</p>	<p>3364 + 247</p> $\begin{array}{r} \text{T} \quad \text{H} \quad \text{T} \quad \text{O} \\ 3 \quad 3 \quad 64 \\ + \quad \quad 2 \quad 47 \\ \hline 3 \quad 6 \quad 11 \\ \hline 1 \quad 1 \end{array}$
	<p>Addition involving decimals using compact written methods</p>	<p>3.56 + 2.47</p> $\begin{array}{r} 3.56 \\ + 2.47 \\ \hline 6.03 \\ \hline 1 \quad 1 \end{array}$
<p>Use landmarked number lines to support children at the beginning.</p>	<p>Addition with negative numbers</p>	<p>-15 + 6 = -9</p>

Resources


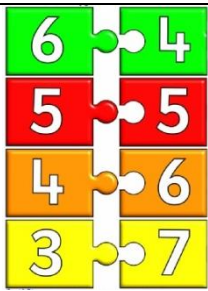
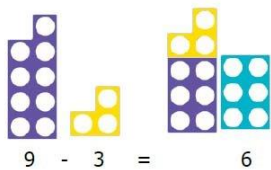
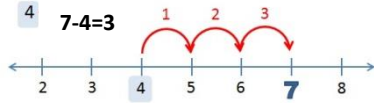
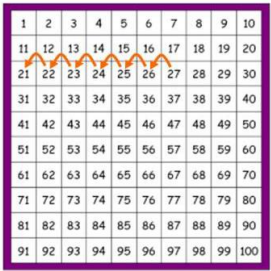
Multi-link, Numicon, Dienes, pegs, landmarked, number line, hundred, square

Subtraction

Vocabulary

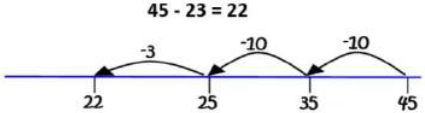
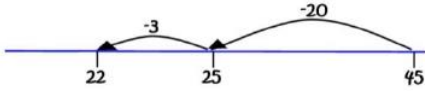


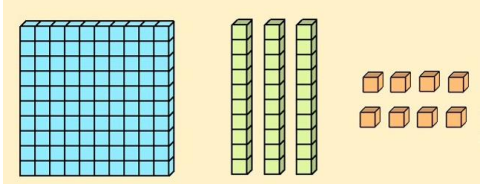
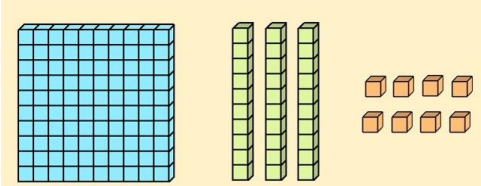
subtract subtraction take away take less less than minus
 reduce fewer count back how many left difference

Step 1

	<p>Developing mental methods</p>	<p>Children should apply their increasing knowledge of mental methods, subtract mentally, recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p>
	<p>Developing knowledge and understanding of number bonds to 10 to solve simple subtraction sums.</p>	 <p style="text-align: center;">$9 - 3 = 6$</p>
	<p>Counting back in jumps of one using a number line.</p>	 <p style="text-align: center;">$7 - 4 = 3$</p>
	<p>Counting back in jumps of one using a hundred square</p>	<p style="text-align: center;">$27 - 6$</p> 

Step 2

	<p>Counting back in jumps of ten and one using a hundred square</p>	
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<p>Children progress to adding groups of 10.</p>	<p>Counting back on a number line.</p>	<p>$45 - 23 = 22$</p>  <p>$45 - 23 = 22$</p> 												
 <p>66 take away 54 leaves</p>	<p>Subtraction using expanded written method using exchange</p>	<p>$81 - 57$</p> <p>T O</p> $\begin{array}{r} 7 \underline{8} 11 \\ - 57 \\ \hline 24 \end{array}$												
<h3>Step 3 and 4</h3>														
	<p>Developing mental methods</p>	<p>Children should have regular practise of mental subtractions. Explore how children visualise numbers in their heads, and encourage them to use a variety of methods for manipulating the numbers.</p> <p>Mental methods include partitioning and compensating: e.g. $31 - 17$ as $31 - 10 - 7$</p>												
	<p>Subtraction using expanded written method without exchanging</p>	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr style="background-color: #90EE90;"> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr style="background-color: #FFFF00;"> <td>6</td> <td>9</td> <td>9</td> </tr> <tr style="background-color: #FFFF00;"> <td>- 3</td> <td>5</td> <td>4</td> </tr> <tr style="background-color: #FFFF00;"> <td>3</td> <td>4</td> <td>5</td> </tr> </tbody> </table>	H	T	O	6	9	9	- 3	5	4	3	4	5
H	T	O												
6	9	9												
- 3	5	4												
3	4	5												
	<p>Subtraction using expanded written method using exchange</p>	$\begin{array}{r} 1 \\ 3 \ 4 \ 1 \\ \cancel{4}50 \\ - 178 \\ \hline 172 \end{array}$												

Step 5 & 6

Subtraction
using compact
written
method
exchanging
across
columns

$$403 - 127 =$$

	H	T	O
	4	0	3
-	1	2	7
	2	7	6

Subtraction
of decimal
numbers to 2
decimal
places using
compact
written
method

$$£2.31 - £1.53 =$$

	1	12	1
	£2	.	31
	£1	.	53
	£0	.	78

Subtraction
using
negative
numbers

$$-12 - 4 = -16$$

Multiplication

Children to be shown through practical resources the commutative law. Numbers can be multiplied in any order and still give the same answer.

Vocabulary

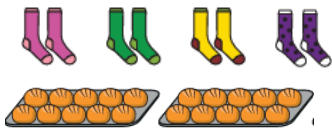
multiply times share group array equal
how many lots of repeated addition arrange total

Step 1 and 2



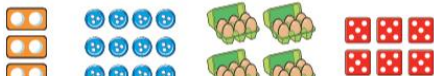
Developing mental methods

Recall and use multiplication facts for the 2, 5 and 10 multiplication tables and begin to solve related problems mentally



Count in 2, 5 and 10.

Use concrete resources to count in 2,5 &10.



Make and use arrays

Understand equal groups to find the total using repeated addition.



Use images to write

Introduce x symbol.

Learn 5, 10 and 10 times table.

multiplication sentences.

a) $5 \times 5 =$

f) = 11×5

Solve multiplication equations using known facts.

b) = 9×5

g) $5 \times$ = 5

Step 3 & 4



Developing
mental
methods

Know by heart multiplication facts for 2x, 3x, 4x, 5x, 6x, 7x, 8x, 9x, 10x, 11x and 12x tables and related division facts.

Grid
Method

Multiplying a 2-digit number by a 1-digit number:

x	20	3	
4	80	12	$80 + 12 = 92$

It is important that children know that when multiplying by ten it is not just a matter of adding a zero! The digits move left, and a place holder (0) may have to be inserted.

Grid
Method

Multiplying a 2-digit number by a 1-digit number:

x	20	3	
8	160	24	$160 + 24 = 184$

Multiplying a 3-digit number by a 1-digit number:

x	100	20	3	
6	600	120	18	$= 738$

Multiplying two 2-digit numbers:

x	20	3	
40	800	120	$\longrightarrow 920$
2	40	6	$\longrightarrow 46$
			<u>966</u>

Step 5 & 6

Expanded
Column
Method

Multiplying a 2-digit number by a 1-digit number:

$$\begin{array}{r}
 23 \\
 \times 7 \\
 \hline
 21 \quad (3 \times 7) \\
 \underline{140} \quad (20 \times 7) \\
 161
 \end{array}$$

Expanded
Column
Method

Multiplying a 3-digit number by a 1-digit number:

$$\begin{array}{r} 246 \\ \times 7 \\ \hline 42 \quad (6 \times 7) \\ 280 \quad (40 \times 7) \\ \underline{1400} \quad (200 \times 7) \\ 1722 \end{array}$$

Contracted
(Compact)
Column
Method

Multiplying a 2-digit number by a 1-digit number:

$$\begin{array}{r} 23 \\ \times 7 \\ \hline 161 \\ 2 \end{array}$$

Contracted
Column
Method

Multiplying a 3 or 4-digit number by a 1-digit number:

$$\begin{array}{r} 246 \\ \times 7 \\ \hline 1722 \\ 34 \end{array}$$

Resources

Everyday items e.g. straws, counters, sorting bears

Multi-link

Numicon

Dienes

Landmarked number line

Hundred square

Division

Vocabulary

divide division share group sort left over
 how many lots of repeated subtraction split remainder

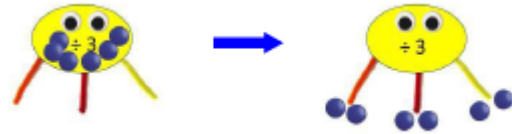
Step 1



Developing mental methods

Recall and use division facts for the 2, 5 and 10 multiplication tables and begin to solve related problems mentally

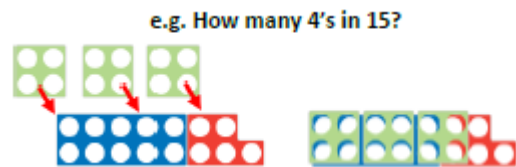
Sharing



Grouping



Division using practical resources



e.g. How many 4's in 15?

Step 2



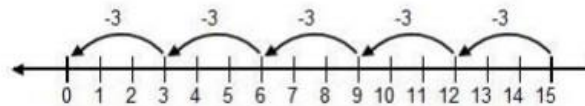
Developing mental methods

Recall and use division facts for the 2, 3, 4, 5 and 10 multiplication tables and begin to solve related problems mentally

Repeated Subtraction

Repeated Subtraction

$15 \div 3 = 5$ is the number of times you can subtract 3 from 15 before you get to 0.



$$15 - 3 - 3 - 3 - 3 - 3 = 0$$

$$15 \div 3 = 5$$

Children begin to record written calculations

$$15 \div 5 = 3$$

$$12 \div 6 = 2$$

$$28 \div 7 = 4$$

Step 3 & 4



Developing mental methods

Recall and use division facts for 2x, 3x, 4x, 5x, 6x, 7x, 8x, 9x, 10x, 11x and 12x tables solve related problems mentally.

Sharing representing remainders

$$14 \div 3 = 4 \text{ r}2$$

Step 5 & 6

Long division

$560 \div 24 =$

$$\begin{array}{r} 23 \\ 24 \overline{) 560} \\ \underline{- 48} \\ 80 \\ \underline{- 72} \\ 8 \end{array} \quad \begin{array}{l} 24 \times 20 \\ 24 \times 3 \end{array}$$

$560 \div 24 = 23 \text{ r}8$

Long division showing answer as a fraction

$432 \div 15 =$

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{- 30} \\ 132 \\ \underline{- 120} \\ 12 \end{array} \quad \begin{array}{l} 15 \times 20 \\ 15 \times 8 \end{array}$$

$\frac{12}{15} = \frac{4}{5}$

$432 \div 15 = 28 \frac{4}{5}$

Long division showing answer as a decimal

$432 \div 15 =$

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{- 30} \\ 132 \\ \underline{- 120} \\ 120 \\ \underline{- 120} \\ 0 \end{array}$$

$432 \div 15 = 28.8$

Compact short division

$318 \div 6$

$$\begin{array}{r} 053 \\ 6 \overline{) 318} \\ \underline{- 3} \\ 11 \\ \underline{- 12} \\ 0 \end{array}$$

$318 \div 6 = 53$

Compact
short
division
showing
answers
with a
remainder

$$560 \div 24$$
$$24 \overline{) 560} \begin{array}{r} 023 \\ 560 \\ \hline \end{array} r8$$
$$318 \div 3 = 53$$

Compact
short
division
showing
answer as a
decimal

$$560 \div 24$$
$$24 \overline{) 560.00} \begin{array}{r} 023.33 \\ 560.00 \\ \hline \end{array}$$
$$318 \div 3 = 53$$

Compact
short
division of
decimal
numbers

$$15.4 \div 4$$
$$4 \overline{) 15.40} \begin{array}{r} 3.85 \\ 15.40 \\ \hline \end{array}$$

Division
involving
negative
numbers

$$-40 \div 8 = -5$$
$$-40 \div -8 = 5$$

Resources

Everyday items e.g. straws, counters, sorting bears

Multi-link

Numicon

Dienes

Landmarked number line

Fraction cards