

Year 5

Mental addition

In Year Five, the main mental addition strategies taught are:

Using place value

Count in 0·1s, 0·01s

e.g. Know what 0·1 more than 0·51 is

10s	1s	0·1s	0·01s
	0	5	1

Partitioning

e.g. $2\cdot4 + 5\cdot8$ as $2 + 5$ and $0\cdot4 + 0\cdot8$ and combine the totals: $7 + 1\cdot2 = 8\cdot2$

0·1	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9	1
1·1	1·2	1·3	1·4	1·5	1·6	1·7	1·8	1·9	2
2·1	2·2	2·3	2·4	2·5	2·6	2·7	2·8	2·9	3
3·1	3·2	3·3	3·4	3·5	3·6	3·7	3·8	3·9	4
4·1	4·2	4·3	4·4	4·5	4·6	4·7	4·8	4·9	5
5·1	5·2	5·3	5·4	5·5	5·6	5·7	5·8	5·9	6
6·1	6·2	6·3	6·4	6·5	6·6	6·7	6·8	6·9	7
7·1	7·2	7·3	7·4	7·5	7·6	7·7	7·8	7·9	8
8·1	8·2	8·3	8·4	8·5	8·6	8·7	8·8	8·9	9
9·1	9·2	9·3	9·4	9·5	9·6	9·7	9·8	9·9	10

Counting on

Add two decimal numbers by adding the 1s, then the 0-1s/0-01s

e.g. $5.72 + 3.05$ as $5.72 + 3$ (8.72) + $0.05 = 8.77$

Add near multiples of 1

e.g. $6.34 + 0.99$

e.g. $5.63 + 0.9$

Count on from large numbers

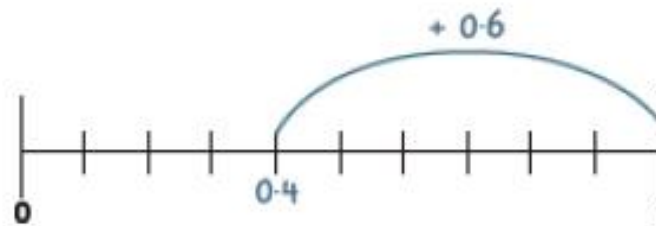
e.g. $6834 + 3005$ as $9834 + 5$

Using number facts

Number bonds to 1 and to the next whole number

e.g. $5.7 + 0.3$

e.g. $0.4 + 0.6$



Add to the next 10 from a decimal number

e.g. $7.8 + 2.2 = 10$

Written addition

Year Five sees bigger numbers introduced to further develop the children's written methods of addition

Expanded column addition for money leading to compact column addition for adding several amounts of money

e.g. $£14.64 + £28.78 + £12.26$

$$\begin{array}{r}
 £14 \quad 60\text{p} \quad 4\text{p} \\
 £28 \quad 70\text{p} \quad 8\text{p} \\
 + \quad £12 \quad 20\text{p} \quad 6\text{p} \\
 \quad \quad \quad £1 \quad 10\text{p} \\
 \hline
 £55 \quad 60\text{p} \quad 8\text{p}
 \end{array}$$

Compact column addition to add pairs of 5-digit numbers

Continue to use column addition to add towers of several larger numbers

Use compact addition to add decimal numbers with up to 2 decimal places

e.g. $15.68 + 27.86$

$$\begin{array}{r}
 15.68 \\
 + 27.86 \\
 \hline
 43.54
 \end{array}$$

Add related fractions

e.g. $\frac{3}{4} + \frac{1}{8} = \frac{7}{8}$

Mental subtraction

In Year Five, the main mental subtraction methods taught are:

Taking away

Use place value to subtract decimals

e.g. $4.58 - 0.08$

e.g. $6.26 - 0.2$

Take away multiples of powers of 10

e.g. $15672 - 300$

e.g. $4.82 - 2$

e.g. $2.71 - 0.5$

e.g. $4.68 - 0.02$

Partitioning or counting back

e.g. $3964 - 1051$

e.g. $5.72 - 2.01$

Subtract near multiples of 1, 10, 100, 1000, 10 000 or £1

e.g. $86456 - 9999$

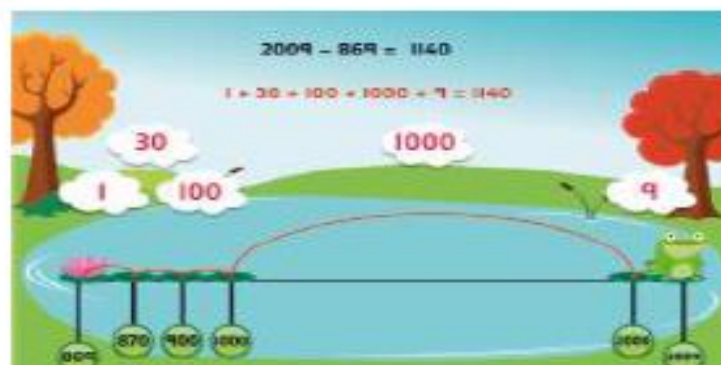
e.g. $3.58 - 1.99$

Counting up

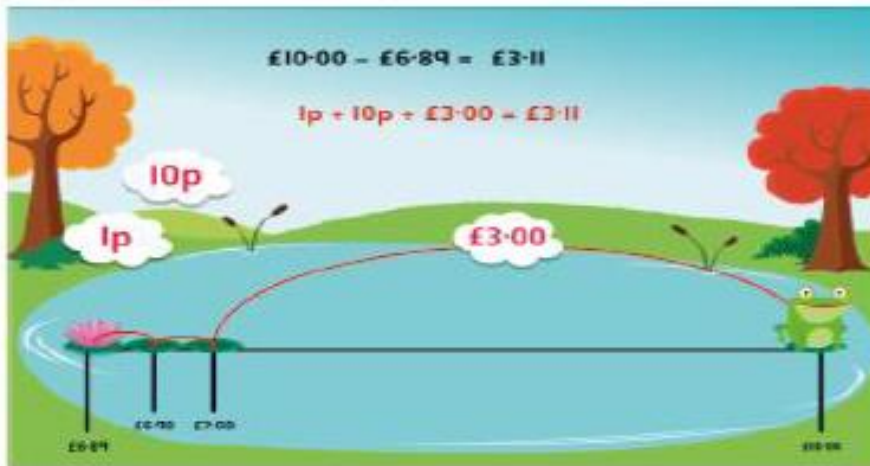
Find a difference between two numbers by counting up from the smaller to the larger

e.g. $£12.05 - £9.59$

e.g. $2009 - 869$



Find change using shopkeepers' addition
e.g. Buy a toy for £6.89 using £10.00



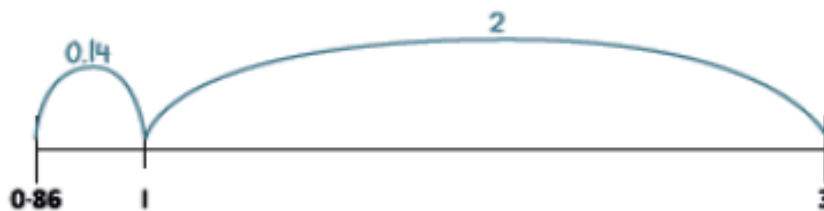
Find a difference between two amounts of money by counting up

Using number facts

Derived facts from number bonds to 10 and 100

e.g. $2 - 0.45$ using $45 + 55 = 100$

e.g. $3 - 0.86$ using $86 + 14 = 100$



Number bonds to £1, £10 and £100

e.g. $£4.00 - £3.86$

e.g. $£100 - £66$ using $66 + 34 = 100$

Written subtraction

In Year Five, the children continue to develop their use of the column method of written subtraction:

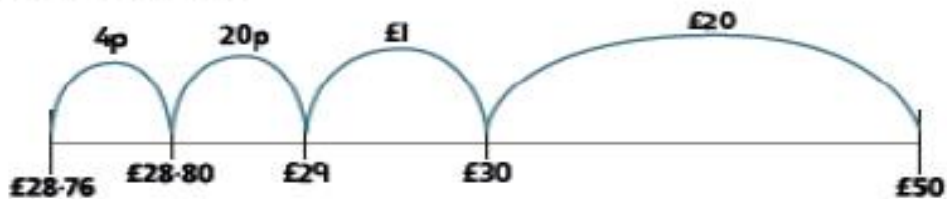
Compact column subtraction for numbers with up to 5 digits

e.g. $16\ 324 - 8516$

$$\begin{array}{r}
 0\ 15\ 13\ 1\ 14 \\
 \cancel{1}\ \cancel{6}\ \cancel{3}\ \cancel{2}\ \cancel{4} \\
 -\quad 8\ 5\ 1\ 6 \\
 \hline
 7\ 8\ 0\ 8
 \end{array}$$

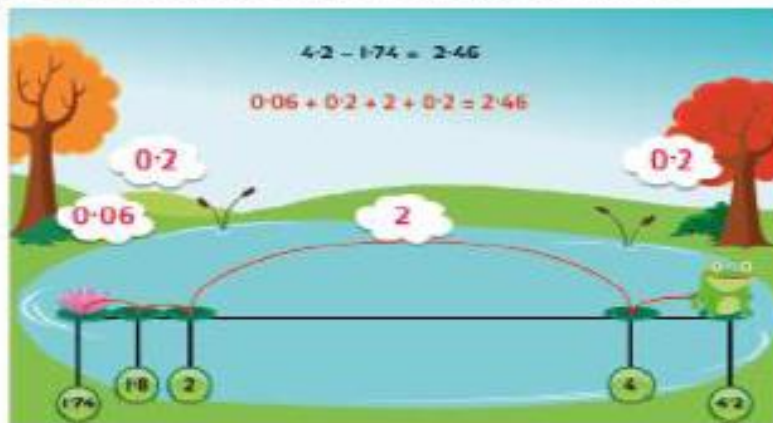
Continue to use counting up subtraction for subtractions involving money, including finding change

e.g. $\pounds 50 - \pounds 28.76$



Use counting up subtraction to subtract decimal numbers

e.g. $4.2 - 1.74$



Subtract related fractions

e.g. $\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$

NB Counting up subtraction provides a default method for ALL children

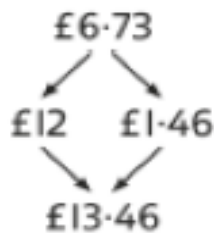
Mental multiplication

The mental multiplication methods taught in Year Five are:

Doubling and halving

Double amounts of money using partitioning

e.g. double £6.73



Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20

e.g. 58×5 is half of 58×10 (580) = 290

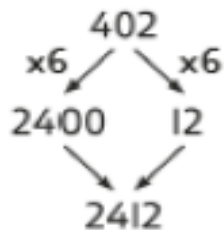
Grouping

Multiply whole numbers and decimals by 10, 100, 1000

e.g. $3.4 \times 100 = 340$

Use partitioning to multiply 'friendly' 2- and 3-digit numbers by 1-digit numbers

e.g. 402×6 as 400×6 (2400) and 2×6 (12) = 2412



Use partitioning to multiply decimal numbers by 1-digit numbers

e.g. 4.5×3 as 4×3 (12) and 0.5×3 (1.5) = 13.5

Multiply near multiples by rounding

e.g. 32×29 as $(32 \times 30) - 32 = 928$

Using number facts

Use times-tables facts up to 12×12 to multiply multiples of 10/100 of the multiplier

e.g. $4 \times 6 = 24$ so $40 \times 6 = 240$ and $400 \times 6 = 2400$

Use knowledge of factors and multiples in multiplication

e.g. 43×6 is double 43×3

e.g. 28×50 is half of 28×100 (2800) = 1400

Know square numbers and cube numbers



Written Multiplication

In Year Five, the children are taught to use short multiplication for sums involving whole numbers and the grid method for sums involving decimal numbers:

Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers

e.g. 435×8

$$\begin{array}{r}
 435 \\
 \times 8 \\
 \hline
 24 \\
 \hline
 3480
 \end{array}$$

Long multiplication of 2-, 3- and 4-digit numbers by 'teen' numbers

e.g. 48×16

$$\begin{array}{r}
 48 \\
 \times 16 \\
 \hline
 480 \\
 288 \\
 \hline
 768
 \end{array}$$

Grid multiplication of numbers with up to 2 decimal places by 1-digit numbers

e.g. 1.34×6

x	1	0.3	0.04	
6	6	1.8	0.24	= 8.04

Multiply fractions by 1-digit numbers

e.g. $\frac{3}{4} \times 6 = \frac{18}{4} = 4\frac{2}{4} = 4\frac{1}{2}$



NB Grid multiplication provides a default method for ALL children

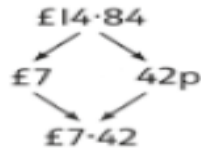
Mental division

Year Five children are taught to divide mentally by:

Doubling and halving

Halve amounts of money using partitioning

e.g. half of £14.84 is half of £14 (£7) plus half of 84p (42p)



Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20

e.g. $115 \div 5$ as double 115 (230) $\div 10 = 23$

Grouping

Divide numbers by 10, 100, 1000 to obtain decimal answers with up to 3 decimal places

e.g. $340 \div 100 = 3.4$

Use the 10th, 20th, 30th ... multiple of the divisor to divide 'friendly' 2- and 3-digit numbers by 1-digit numbers

e.g. $186 \div 6$ as 30×6 (180) and 1×6 (6)

$$186 \div 6 = \square$$

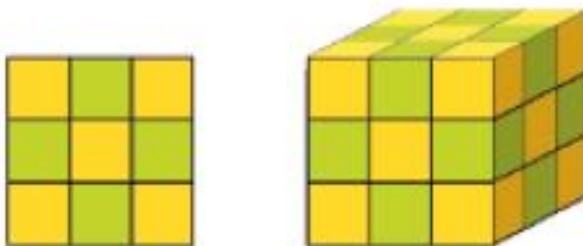
$\square \times 6 = 186$	$186 \div 6 = 31$
$30 \times 6 = 180$	
$1 \times 6 = 6$	6
31	0

Using number facts

Use division facts from the times-tables up to 12×12 to divide multiples of powers of 10 of the divisor

e.g. $3600 \div 9$ using $36 \div 9$

Know square numbers and cube numbers



Written division

In Year Five, the written methods of division become more formal, including the introduction of short divisions :

Use a written version of a mental strategy to divide 3-digit numbers by 1-digit numbers

e.g. $326 \div 6$ as 50×6 (300) and 4×6 (24), remainder 2

$$326 \div 6 = \square$$

$\square \times 6 = 326$	$326 \div 6 = 54 \text{ r}2$
$50 \times 6 = 300$	
26	↑
$4 \times 6 = 24$	↑
2	
54	

Short division of 3- and 4-digit numbers by 1-digit numbers

e.g. $139 \div 3$

$$3 \overline{) 139} \begin{array}{l} 46 \text{ r}1 \\ \underline{139} \end{array}$$

Give remainders as whole numbers or as fractions

Find unit and non-unit fractions of large amounts

e.g. $\frac{3}{5}$ of 265 is $3 \times (265 \div 5) = 159$

Turn improper fractions into mixed numbers and vice versa