



Cheadle Hulme School
Juniors and Infants Calculation Policy

LOWER KEY STAGE 2

In Lower Key Stage 2, children build on the concrete and conceptual understandings they have gained in Key Stage 1 to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers.

Addition and subtraction: Children are taught to use place value and number facts to add and subtract numbers mentally and they will develop a range of strategies to enable them to discard the 'counting in 1s' or fingers-based methods of Key Stage 1. In particular, children will learn to add and subtract multiples and near multiples of 10, 100 and 1000, and will become fluent in complementary addition as an accurate means of achieving fast and accurate answers to 3-digit subtractions. Standard written methods for adding larger numbers are taught, learned and consolidated, and written column subtraction is also introduced.

Multiplication and division: This key stage is also the period during which all the multiplication and division facts are thoroughly memorised, including all facts up to 12×12 . Efficient written methods for multiplying or dividing a 2-digit or 3-digit number by a 1-digit number are taught, as are mental strategies for multiplication or division with large but 'friendly' numbers, e.g. when dividing by 5 or multiplying by 20.

Year 3

ADDITION

	Learning Outcome	Methods and Strategies for Children
Y3 +	<ul style="list-style-type: none"> Know pairs with each total to 20 e.g. $2 + 6 = 8$, $12 + 6 = 18$, $7 + 8 = 15$ Know pairs of multiples of 10 with a total of 100 Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning 	<p>Using place value Count in 100s e.g. Know $475 + 200$ as 475, 575, 675</p>

- Add multiples and near multiples of 10 and 100
- Perform place-value additions without a struggle
e.g. $300 + 8 + 50 = 358$
- Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number
e.g. $104 + 56$ is 160 since $104 + 50 = 154$ and $6 + 4 = 10$
- $676 + 8$ is 684 since $8 = 4 + 4$ and
 $76 + 4 + 4 = 84$
- Add pairs of 'friendly' 3-digit numbers
e.g. $320 + 450$
- Begin to add amounts of money using partitioning
- Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers
- Begin to use compact column addition to add numbers with 3 digits

Add multiples of 10, 100 and £1

e.g. $746 + 200$

e.g. $746 + 40$

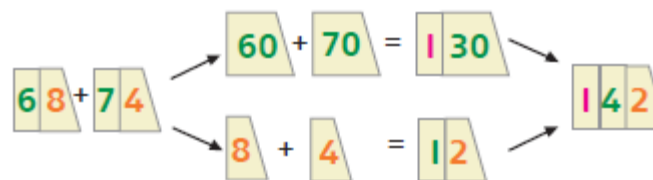
e.g. $£6.34 + £5$ as $£6 + £5$ and $34p$

Partitioning

e.g. $£8.50 + £3.70$ as $£8 + £3$ and $50p + 70p$ and combine the totals: $£11 + £1.$

e.g. $347 + 36$ as 300 and $40 + 30$ and $7 + 6$ and combine the totals: $370 + 13 =$

e.g. $68 + 74$ as $60 + 70$ and $8 + 4$ and combine the totals: $130 + 12 = 142$



Counting on

Add two 2-digit numbers by adding the multiple of 10, then the 1s

e.g. $67 + 55$ as $67 + 50$ (117) + 5 = 122

Add near multiples of 10 and 100

e.g. $67 + 39$

e.g. $364 + 199$

Add pairs of 'friendly' 3-digit numbers

e.g. $548 + 120$

Count on from 3-digit numbers

e.g. $247 + 34$ as $247 + 30$ (277) + 4 = 281

Using number facts

Know pairs which total each number to 20

e.g. $7 + 8 = 15$

e.g. $12 + 6 = 18$

Number bonds to 100

e.g. $35 + 65$

e.g. $46 + 54$

e.g. $73 + 27$



Add to the next 10 and the next 100

e.g. $176 + 4 = 180$

e.g. $435 + 65 = 500$

Build on partitioning to develop expanded column addition with two 3-digit numbers

e.g. $466 + 358$

$$\begin{array}{r} 400 \quad 60 \quad 6 \\ + 300 \quad 50 \quad 8 \\ \hline 700 \quad 110 \quad 14 = 824 \end{array}$$

Use expanded column addition where digits in a column add to more than the column value

e.g. $466 + 358$

$$\begin{array}{r} 400 \quad 60 \quad 6 \\ 300 \quad 50 \quad 8 \\ + 100 \quad 10 \quad \\ \hline 800 \quad 20 \quad 4 \end{array}$$

Compact column addition with two or more 3-digit numbers or towers of 2-digit numbers

e.g. $347 + 286 + 495$

$$\begin{array}{r}
 347 \\
 286 \\
 + 495 \\
 21 \\
 \hline
 1128
 \end{array}$$

Compact column addition with 3- and 4-digit numbers

SUBTRACTION

Learning Outcome

Methods and Strategies for Children

Y3
-

- Know pairs with each total to 20
e.g. $8 - 2 = 6$
e.g. $18 - 6 = 12$
e.g. $15 - 8 = 7$
- Subtract any two 2-digit numbers
- Perform place-value subtractions without a struggle
e.g. $536 - 30 = 506$
- Subtract 2-digit numbers from numbers > 100 by counting up
e.g. $143 - 76$ is done by starting at 76. Then add 4 (80), then add 20 (100), then add 43, making the difference a total of 67
- Subtract multiples and near multiples of 10 and 100

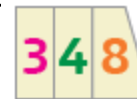
Taking away

Use place value to subtract

e.g. $348 - 300$

e.g. $348 - 40$

e.g. $348 - 8$



Take away multiples of 10, 100 and £1

e.g. $476 - 40 = 436$

e.g. $476 - 300 = 176$

e.g. $£4.76 - £2 = £2.76$

Partitioning

e.g. $68 - 42$ as $60 - 40$ and $8 - 2$

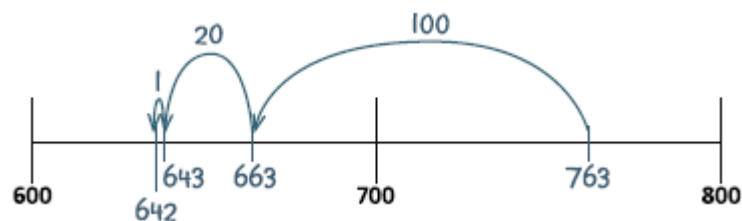
e.g. $£6.84 - £2.40$ as $£6 - £2$ and $80p - 40p$



- Subtract, when appropriate, by counting back or taking away, using place value and number facts
- Find change from £1, £5 and £10
- Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers
e.g. $423 - 357$

Count back in 100s, 10s then 1s

e.g. $763 - 121$ as $763 - 100$ (663) $- 20$ (643) $- 1 = 642$



Subtract near multiples of 10 and 100

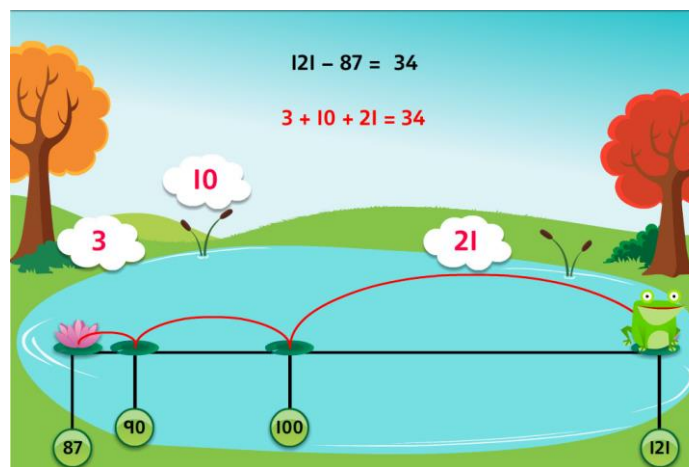
e.g. $648 - 199$

e.g. $86 - 39$

Counting up

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

e.g. $121 - 87$



Using number facts

Know pairs which total each number to 20

e.g. $20 - 14 = 6$

Number bonds to 100

e.g. $100 - 48 = 52$

e.g. $100 - 35 = 65$

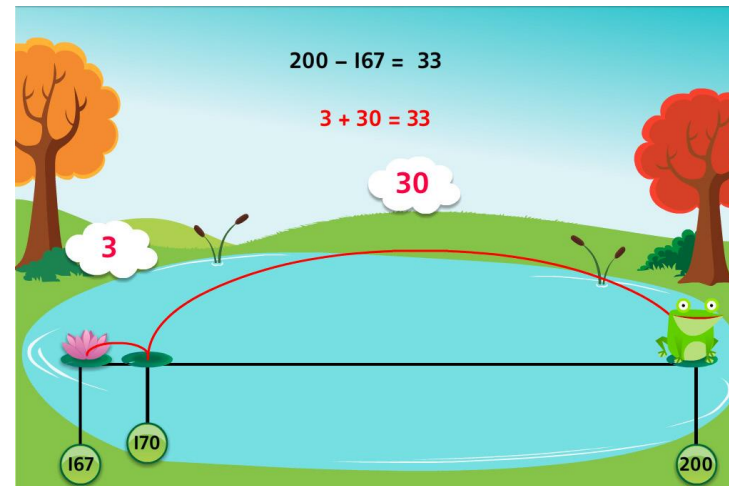


Subtract using number facts to bridge back through a 10

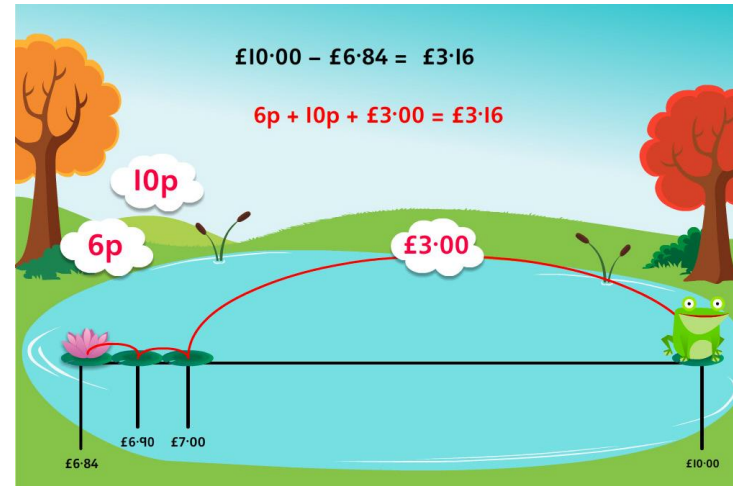
e.g. $42 - 5 = 42 - 2 (40) - 3 = 37$

Develop counting up subtraction

e.g. $200 - 167$



Use counting up subtraction to find change from £1, £5 and £10
 e.g. $£10.00 - £6.84$



MULTIPLICATION

Learning Outcome

Methods and Strategies for Children

- Know by heart all the multiplication facts in the $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$ and $\times 10$ tables
- Multiply whole numbers by 10 and 100
- Recognise that multiplication is commutative
- Use place value and number facts in mental multiplication e.g. 30×5 is 15×10
- Partition teen numbers to multiply by a 1-digit number e.g. 3×14 as 3×10 and 3×4
- Double numbers up to 50
- Double given tables facts to get

Counting in steps

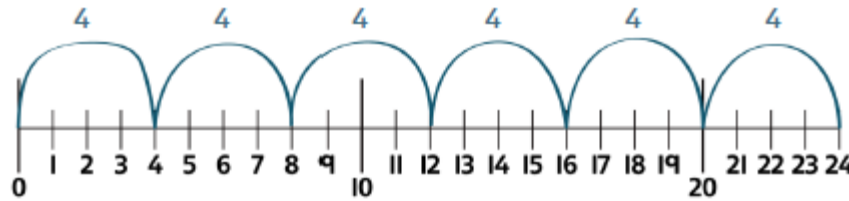
Count in 2s, 3s, 4s, 5s, 8s and 10s

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Y3
x

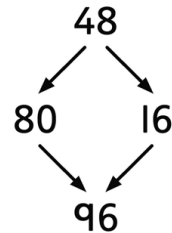
others

- Double numbers up to 25 and multiples of 5 to 50



Doubling and halving

Find doubles of numbers to 50 using partitioning
e.g. *double 48*



Use doubling as a strategy in multiplying by 2
e.g. 18×2 is *double 18 = 36*

Grouping

Recognise that multiplication is commutative

e.g. $4 \times 8 = 8 \times 4$

Multiply multiples of 10 by 1-digit numbers

e.g. $30 \times 8 = 240$

Multiply 'friendly' 2-digit numbers by 1-digit numbers

e.g. 13×4

Using number facts

Know doubles to double 20

e.g. *double 15 is 30*

Know doubles of multiples of 5 to 100

e.g. *double 85 is 170*

Know $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$, $\times 10$ tables facts

Build on partitioning to develop grid multiplication

×	20	3	
4	80	12	= 92

DIVISION

Learning Outcome

Methods and Strategies for Children

Y3
÷

- Know by heart all the division facts derived from the $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$ and $\times 10$ tables
- Divide whole numbers by 10 or 100 to give whole number answers
- Recognise that division is not commutative
- Use place value and number facts in mental division
e.g. $84 \div 4$ is half of 42
- Divide larger numbers mentally by subtracting the 10th multiple as appropriate, including those with remainders
e.g. $57 \div 3$ is $10 + 9$ as $10 \times 3 = 30$ and $9 \times 3 = 27$
- Halve even numbers to 100, halve odd numbers to 20
- Perform divisions just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number
- Halve even numbers up to 50 and multiples of 10 to 100
- Perform divisions within the

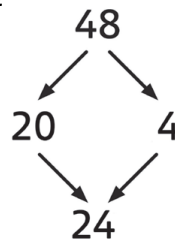
Counting in steps

Count in 2s, 3s, 4s, 5s, 8s and 10s

Doubling and halving

Find half of even numbers to 100 using partitioning

e.g. *find half of 48*



Use halving as a strategy in dividing by 2

e.g. $36 \div 2$ is half of 36 = 18

Find half of odd numbers

Using number facts

Know half of even numbers to 40

Know half of multiples of 10 to 200

e.g. *half of 170 is 85*

Know $\times 2$, $\times 3$, $\times 4$, $\times 5$, $\times 8$, $\times 10$ division facts

Recognise that division is not commutative

e.g. $16 \div 8$ does not equal $8 \div 16$

tables including those with remainders
e.g. $38 \div 5$

Relate division to multiplications 'with holes in'
e.g. $_ \times 5 = 30$ is the same calculation as $30 \div 5 = _$ thus we can count in 5s to find the answer



Year 4

ADDITION

Learning Outcome

Methods and Strategies for Children

Y4
+

- Add any two 2-digit numbers by partitioning or counting on
- Know by heart/quickly derive number bonds to 100 and to £1
- Add to the next 100, £1 and whole number
e.g. $234 + 66 = 300$
e.g. $3.4 + 0.6 = 4$
- Perform place-value additions without a struggle
e.g. $300 + 8 + 50 + 4000 = 4358$
- Add multiples and near multiples of 10, 100 and 1000
- Add £1, 10p, 1p to amounts of money
- Use place value and number facts to add 1-, 2-, 3- and 4-digit numbers where a mental calculation is appropriate

e.g. $4004 + 156$ by knowing that $6 + 4 = 10$ and that $4004 + 150 = 4154$ so the total is 4160

Using place value

Count in 1000s

e.g. Know $3475 + 2000$ as $3475, 4475, 5475$

Partitioning

e.g. $746 + 40$

e.g. $746 + 203$ as $700 + 200$ and $6 + 3$

e.g. $134 + 707$ as $100 + 700$ and $4 + 7$

Counting on

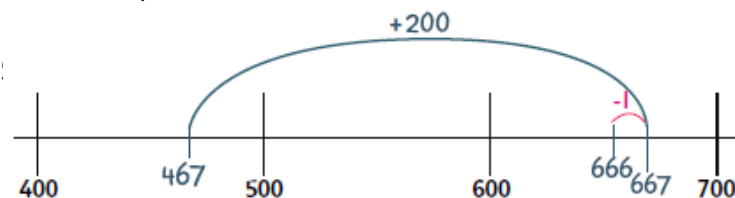
Add 2-digit numbers to 2-, 3- and 4-digit numbers by adding the multiple of 10 then the 1s

e.g. $167 + 55$ as $167 + 50 (217) + 5 = 222$

Add near multiples of 10, 100 and 1000

e.g. $467 + 199$

e.g. $3462 + 29$



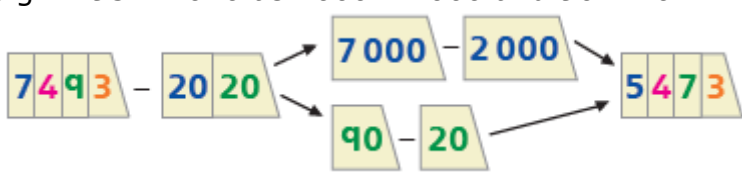
Count on to add 3-digit numbers and money

e.g. $463 + 124$ as $463 + 100 (563) + 20 (583) + 4 = 587$

e.g. $£4.67 + £5.30$ as $£9.67 + 30p$

	<ul style="list-style-type: none"> • Add any 2-digit numbers by partitioning or counting on • Use expanded column addition to add 3-digit numbers • 	<p>Build on expanded column addition to develop compact column addition with larger numbers</p> <p>e.g. $1466 + 4868$</p> $ \begin{array}{r} 1000 \quad 400 \quad 60 \quad 6 \\ 4000 \quad 800 \quad 60 \quad 8 \\ + 1000 \quad 100 \quad 10 \\ \hline 6000 \quad 300 \quad 30 \quad 4 \end{array} $ <p>Develop compact column addition for 3-digit and 4-digit numbers</p> <p>e.g.</p> $ \begin{array}{r} 5347 \\ 2286 \\ + 1495 \\ \hline 121 \\ \hline 9128 \end{array} $
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SUBTRACTION

	Learning Outcome	Methods and Strategies for Children
<p>Y4 -</p>	<ul style="list-style-type: none"> • Subtract any two 2-digit numbers • Know by heart/quickly derive number bonds to 100 • Perform place-value subtractions without a struggle • e.g. $4736 - 706 = 4030$ • Subtract multiples and near multiples of 10, 100, 1000, £1 and 10p • Subtract multiples of 0.1 • Subtract by counting up e.g. $503 - 368$ is done by adding $368 + 2 + 30 + 100 + 3$ (so we added 135) • Subtract, when appropriate, by counting back or taking away, using place value and number 	<p>Taking away</p> <p>Use place value to subtract</p> <p>e.g. $4748 - 4000$</p> <p>e.g. $4748 - 8$</p> <p>Take away multiples of 10, 100, 1000, £1, 10p or 0.1</p> <p>e.g. $8392 - 50$</p> <p>e.g. $6723 - 3000$</p> <p>e.g. $£3.74 - 30p$</p> <p>e.g. $5.6 - 0.2$</p> <p>Partitioning</p> <p>e.g. $£5.87 - £3.04$ as $£5 - £3$ and $7p - 4p$</p> <p>e.g. $7493 - 2020$ as $7000 - 2000$ and $90 - 20$</p> 

facts

- Subtract £1, 10p, 1p from amounts of money
 - Find change from £10, £20 and £50
 - Use expanded column subtraction for 3- and 4-digit numbers
 - Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100
- e.g. $2002 - 1865$

Count back

e.g. $6482 - 1301$ as $6482 - 1000$ (5482) $- 300$ (5182) $- 1 = 5181$

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

e.g. $3522 - 1999$

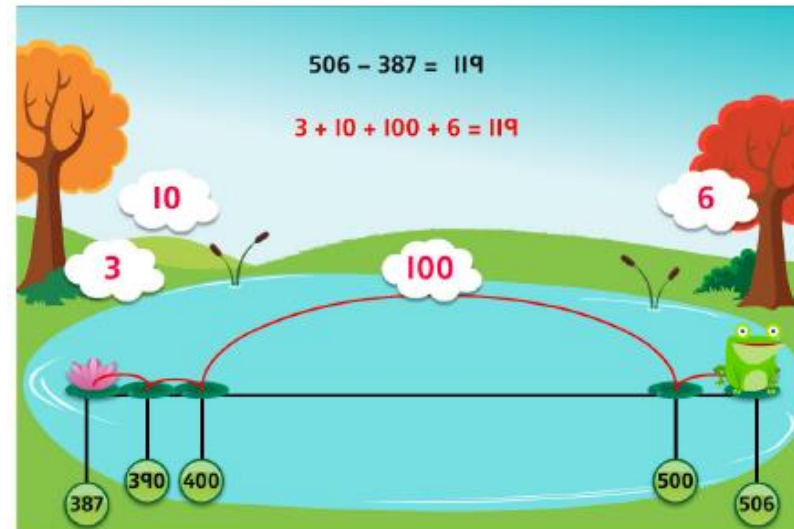
e.g. $£34.86 - £19.99$

Counting up

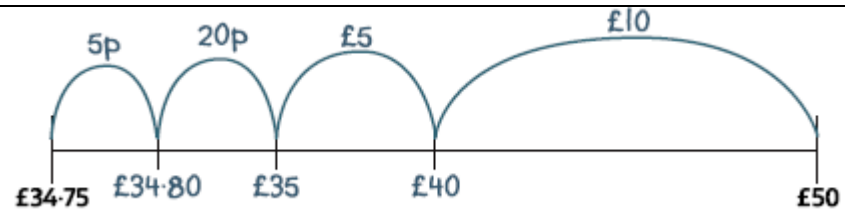
Find a difference between two numbers by counting up from the smaller to the larger

e.g. $506 - 387$

e.g. $4000 - 2693$



Use counting up subtraction to find change from £10, £20, £50 and £100
e.g. Buy a computer game for £34.75 using £50

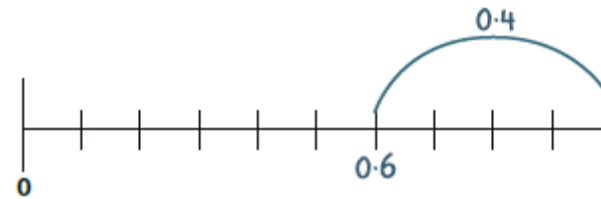


Using number facts

Number bonds to 10 and 100 and derived facts

e.g. $100 - 76 = 24$

e.g. $1 - 0.6 = 0.4$



Number bonds to £1 and £10

e.g. $£1.00 - 86p = 14p$

e.g. $£10.00 - £3.40 = £6.60$

Expanded column subtraction with 3- and 4-digit numbers

e.g. $726 - 358 =$

$$\begin{array}{r}
 600 \quad 110 \quad 16 \\
 \cancel{700} \quad \cancel{20} \quad \cancel{8} \\
 - 300 \quad 50 \quad 8 \\
 \hline
 300 \quad 60 \quad 8
 \end{array}$$

Begin to develop compact column subtraction

e.g. $726 - 358 =$

$$\begin{array}{r} 6 \quad || \quad 16 \\ 7 \quad \cancel{2} \quad \cancel{8} \\ - 3 \quad 5 \quad 8 \\ \hline 3 \quad 6 \quad 8 \end{array}$$

Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100

e.g. $2002 - 1865$

MULTIPLICATION

Learning Outcome

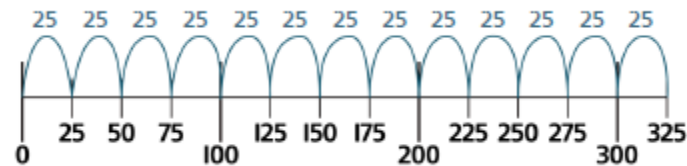
Methods and Strategies for Children

Y4
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- Know by heart all the multiplication facts up to 12×12
- Recognise factors up to 12 of 2-digit numbers
- Multiply whole numbers and 1-place decimals by 10, 100, 1000
- Multiply multiples of 10, 100 and 1000 by 1-digit numbers
e.g. 300×6
e.g. 4000×8
- Use understanding of place value and number facts in mental multiplication
e.g. 36×5 is half of 36×10
e.g. $50 \times 60 = 3000$

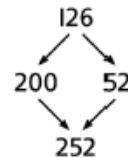
Counting in steps (sequences)

Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



Doubling and halving

Find doubles to double 100 and beyond using partitioning
e.g. *double 126*



Begin to double amounts of money

- Partition 2-digit numbers to multiply by a 1-digit number mentally
e.g. 4×24 as 4×20 and 4×4
- Multiply near multiples by rounding
e.g. 33×19 as $(33 \times 20) - 33$
- Find doubles to double 100 and beyond using partitioning
- Begin to double amounts of money
e.g. $£35.60$ doubled is $£71.20$

e.g. $£3.50$ doubled is $£7$

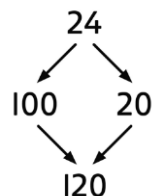


Use doubling as a strategy in multiplying by 2, 4 and 8
e.g. 34×4 is double 34 (68) doubled again = 136

Grouping

Use partitioning to multiply 2-digit numbers by 1-digit numbers

e.g. 24×5



Multiply multiples of 100 and 1000 by 1-digit numbers using tables facts

e.g. $400 \times 8 = 3200$

Multiply near multiples by rounding

e.g. 24×19 as $(24 \times 20) - 24 = 456$

Using number facts

Know times-tables up to 12×12

Use grid multiplication to multiply 3-digit numbers by 1-digit numbers

e.g. 253×6

×	200	50	3	
6	1200	300	18	= 1518

Use ladder multiplication to multiply 3-digit numbers by 1-digit numbers

e.g. 253×6

$$\begin{array}{r}
 253 \\
 \times 6 \\
 \hline
 18 \leftarrow 6 \times 3 \\
 300 \leftarrow 6 \times 50 \\
 + 1200 \leftarrow 6 \times 200 \\
 \hline
 1518
 \end{array}$$

Use grid multiplication to multiply 2-digit numbers by 2-digit numbers

e.g. 16×48

\times	10	6	
40	400	240	= 640
8	80	48	= 128
			<hr/> 768

DIVISION

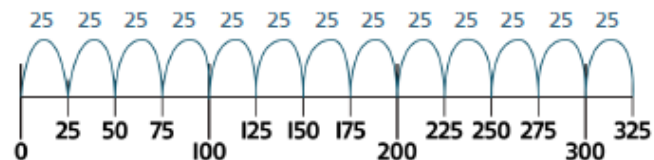
Learning Outcome

- Know by heart all the division facts up to $144 \div 12$
- Divide whole numbers by 10, 100, to give whole number answers or answers with 1 decimal place
- Divide multiples of 100 by 1-digit numbers using division facts
e.g. $3200 \div 8 = 400$
- Use place value and number facts in mental division
e.g. $245 \div 20$ is half of $245 \div 10$
- Divide larger numbers mentally

Methods and Strategies for Children

Counting in steps (sequences)

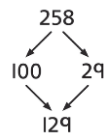
Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



Doubling and halving

Find half of even numbers to 200 and beyond using partitioning

e.g. *find half of 258*



Begin to halve amounts of money

e.g. $\pounds 9$ halved is $\pounds 4.50$

Y4
÷

by subtracting the 10th or 20th multiple as appropriate

e.g. $156 \div 6$ is $20 + 6$ as $20 \times 6 = 120$ and $6 \times 6 = 36$

- Find halves of even numbers to 200 and beyond using partitioning
- Begin to halve amounts of money
e.g. *half of £52.40 is £26.20*



Use halving as a strategy in dividing by 2, 4 and 8
e.g. $164 \div 4$ is *half of 164 (82) halved again = 41*

Using number facts

Know times-tables up to 12×12 and all related division facts

"Bus stop" (short division)

Use a written method to divide a 2-digit or a 3-digit number by a 1-digit number

e.g. $645 \div 3 = 215$

	2	1	5
3	6	4	5

Give remainders as whole numbers

Children move on from dealing mainly with whole numbers to performing arithmetic operations with both decimals and fractions.

Addition and subtraction: Children will consolidate their use of written procedures in adding and subtracting whole numbers with up to 6 digits and also decimal numbers with up to 2 decimal places. Mental strategies for adding and subtracting increasingly large numbers will also be taught. These will draw upon children's robust understanding of place value and knowledge of number facts. Negative numbers will be added and subtracted.

Multiplication and division: Efficient and flexible strategies for mental multiplication and division are taught and practised, so that children can perform appropriate calculations even when the numbers are large, such as $40\,000 \times 6$ or $40\,000 \div 8$. In addition, it is in Years 5 and 6 that children extend their knowledge and confidence in using written algorithms for multiplication and division.

Year 5

ADDITION

	Learning Outcomes	Methods and Strategies for Children								
Y5 +	<ul style="list-style-type: none"> Know number bonds to 1 and to the next whole number Add to the next 10 from a decimal number e.g. $13.6 + 6.4 = 20$ Add numbers with 2 significant digits only, using mental strategies e.g. $3.4 + 4.8$ e.g. $23\,000 + 47\,000$ Add 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000 e.g. $8000 + 7000$ e.g. $600\,000 + 700\,000$ Add near multiples of 10, 100, 1000, 10 000 and 100 000 to other numbers e.g. $82\,472 + 30\,004$ Add decimal numbers which are near multiples of 1 or 10, including money 	<p>Using place value Count in 0.1s, 0.01s e.g. Know what 0.1 more than 0.51 is</p> <table border="1" data-bbox="1458 699 2000 882"> <tr> <td>10s</td> <td>1s</td> <td>0.1s</td> <td>0.01s</td> </tr> <tr> <td></td> <td>0</td> <td>5</td> <td>1</td> </tr> </table> <p>Partitioning e.g. $2.4 + 5.8$ as $2 + 5$ and $0.4 + 0.8$ and combine the totals: $7 + 1.2 = 8.2$</p> <p>Counting on Add two decimals 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 $9834 + 5$</p>	10s	1s	0.1s	0.01s		0	5	1
10s	1s	0.1s	0.01s							
	0	5	1							

e.g. $6.34 + 1.99$
e.g. $£34.59 + £19.95$

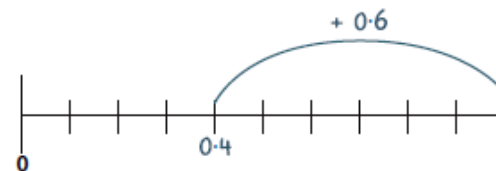
- Use place value and number facts to add two or more 'friendly' numbers, including money and decimals
e.g. $3 + 8 + 6 + 4 + 7$
e.g. $0.6 + 0.7 + 0.4$
e.g. $2056 + 44$
- Use column addition to add two or three whole numbers with up to 5 digits
- Use column addition to add any pair of 2-place decimal numbers, including amounts of money
- Choose the most efficient method in any given situation

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 form a decimal number

e.g. $7.8 + 2.2 = 10$

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

e.g. $£14.64 + £28.78 + £12.16$

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

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. $15.68 + 27.86$

$$\begin{array}{r} 15.68 \\ + 27.86 \\ \hline 11.1 \\ \hline 43.54 \end{array}$$

SUBTRACTION

Learning Outcomes

- Subtract numbers with 2 significant digits only, using mental strategies
e.g. $6.2 - 4.5$
e.g. $72\ 000 - 47\ 000$
- Subtract 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000
e.g. $8000 - 3000$
e.g. $60\ 000 - 200\ 000$
- Subtract 1- or 2-digit near multiples of 10, 100, 1000, 10 000 and 100 000 from other numbers
e.g. $82\ 472 - 30\ 004$
- Subtract decimal numbers which are near multiples of 1 or 10, including money
e.g. $6.34 - 1.99$
e.g. $£34.59 - £19.95$
- Use counting up subtraction, with knowledge of number bonds to 10, 100 or £1, as a strategy to perform mental subtraction
e.g. $£10 - £3.45$
e.g. $1000 - 782$
- Recognise fraction complements to 1 and to the next whole number
e.g. $1\frac{2}{5} + \frac{3}{5} = 2$
- Use compact or expanded column subtraction to subtract

Methods and Strategies for Children

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 new multiples of 1, 10, 100, 1000, 10,000 or £1

e.g. $86456 - 9999$

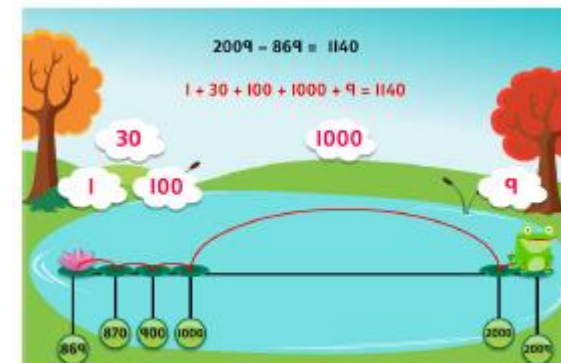
e.g. $3.58 - 1.99$

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. $£2009 - 869$



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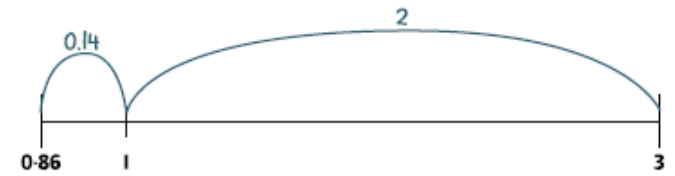
- numbers with up to 5 digits
- Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000
- Use complementary addition for subtractions of decimal numbers with up to 2 places, including amounts of money
- Choose the most efficient method in any given situation

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 $66 + 34 + 100$

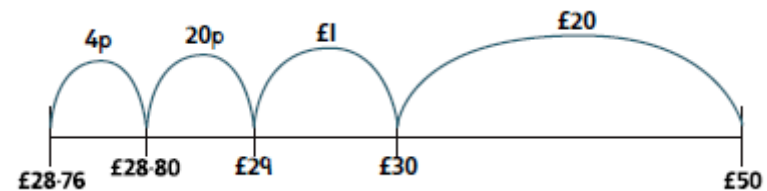
Compact column subtraction for numbers with up to 5 digits

e.g. $16324 - 8516$



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

e.g. £50 - £28.76



MULTIPLICATION

Learning Outcomes

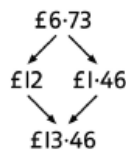
- Know by heart all the multiplication facts up to 12×12
- Multiply whole numbers and 1- and 2-place decimals by 10, 100, 1000, 10 000

Methods and Strategies for Children

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, 16, and 20

Y5
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- Use knowledge of factors and multiples in multiplication
e.g. 43×6 is double 43×3
e.g. 28×50 is $\frac{1}{2}$ of $28 \times 100 = 1400$
- Use knowledge of place value and rounding in mental multiplication
e.g. 67×199 as $67 \times 200 - 67$
- Use doubling and halving as a strategy in mental multiplication
e.g. 58×5 is half of 58×10
e.g. 34×4 is 34 doubled twice
- Partition 2-digit numbers, including decimals, to multiply by a 1-digit number mentally
e.g. 6×27 as 6×20 (120) plus 6×7 (42)
e.g. 6.3×7 as 6×7 (42) plus 0.3×7 (2.1)
- Double amounts of money by partitioning
e.g. $\pounds 37.45$ doubled is $\pounds 37$ doubled ($\pounds 74$) plus $45p$ doubled (90p) giving a total of $\pounds 74.90$
- Use short multiplication to multiply a 1-digit number by a number with up to 4 digits
- Use long multiplication to multiply 3-digit and 4-digit numbers by a 2-digit number
- Choose the most efficient method in any given situation

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

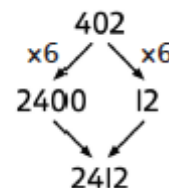
Grouping

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 or the multiplier

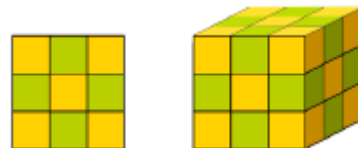
e.g. $4 \times 6 = 24$ so $40 \times 6 = 240$ and $400 \times 6 = 2400$

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



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

\times	1	0.3	0.04
6	6	1.8	0.24

 = 8.04

DIVISION

Learning Outcomes

Methods and Strategies for Children

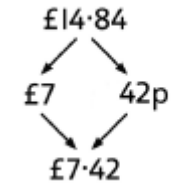
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- Know by heart all the division facts up to $144 \div 12$
- Divide whole numbers by 10, 100, 1000, 10 000 to give whole number answers or answers with 1, 2 or 3 decimal places
- Use doubling and halving as mental division strategies
e.g. $34 \div 5$ is $(34 \div 10) \times 2$
- Use knowledge of multiples and factors, as well as tests for divisibility, in mental division
e.g. $246 \div 6$ is $123 \div 3$
e.g. *We know that 525 divides by 25 and by 3*
- Halve amounts of money by partitioning
- e.g. $\frac{1}{2}$ of $\pounds 75.40 = \frac{1}{2}$ of $\pounds 75$ ($\pounds 37.50$) plus half of 40p (20p) which is $\pounds 37.70$
- Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate
e.g. $96 \div 6$ is $10 + 6$, as $10 \times 6 = 60$ and $6 \times 6 = 36$
e.g. $312 \div 3$ is $100 + 4$ as $100 \times 3 = 300$ and $4 \times 3 = 12$
- Know tests for divisibility by 2, 3, 4, 5, 6, 9 and 25

Doubling and halving

Halve amounts of money using partitioning

e.g. half of $\pounds 14.84$ is half of $\pounds 14$ ($\pounds 7$) plus half of 84p (42p)



Using 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, 100 to 3 decimal places

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

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

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

e.g. $139 \div 3$

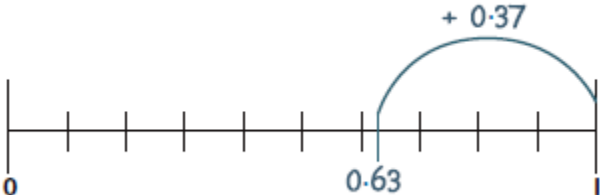
$$\begin{array}{r} 46 \text{ r}1 \\ 3 \overline{) 139} \end{array}$$

Give remainders as whole numbers or as fractions

	<ul style="list-style-type: none"> • Know square numbers and cube numbers • Use short division (“bus stop”) to divide a number with up to 4 digits by a number ≤ 12 • Give remainders as whole numbers or as fractions • Choose the most efficient method in any given situation 	
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Year 6

ADDITION

	Learning outcome	Methods and Strategies for Children
Y6 +	<ul style="list-style-type: none"> • Know by heart number bonds and use these to derive related facts e.g. $3.46 + 0.54$ • Derive, quickly and without difficulty, number bonds to 1000 • Add small and large whole numbers where the use of place value or number facts makes the calculation do-able mentally e.g. $34\ 000 + 8000$ • Add negative numbers in a context such as temperature where the numbers make sense • Add two 1-place or 2-place decimal numbers e.g. $4.5 + 6.3$ e.g. $0.74 + 0.33$ • Add positive numbers to negative numbers e.g. <i>Calculate a rise in</i> 	<p>Using place value Count in 0.1s, 0.01s, 0.001s e.g. Know what 0.001 more than 6.725 is Partitioning e.g. $9.54 + 3.23$ as $9 + 3$, $0.5 + 0.5$ and $0.04 + 0.03$, to give 12.77</p> <p>Using number facts Number bonds to 1 and to the next multiple of 1 e.g. $0.63 + 0.37$</p> 

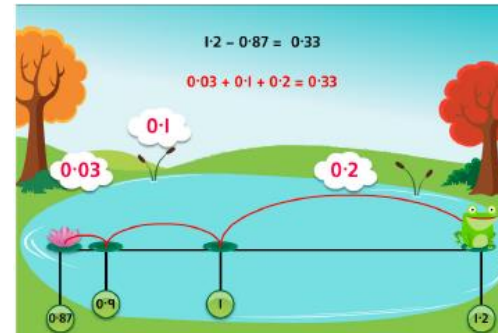
	<p><i>temperature or continue a sequence beginning with a negative number</i></p> <ul style="list-style-type: none"> • Use column addition to add numbers with up to 6 digits • Use column addition to add decimal numbers with up to 3 decimal places 	<p>Compact column addition for adding several large numbers and decimal numbers with up to 2 decimal places Compact column addition with money e.g. £14.64 + £28.78 + £12.26</p> $ \begin{array}{r} £14.64 \\ + £28.78 \\ £12.26 \\ \hline 11.1 \\ \hline £55.68 \end{array} $
SUBTRACTION		
	Learning Outcome	Methods and Strategies for Children
Y6 -	<ul style="list-style-type: none"> • Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition e.g. $1000 - 654$ as $46 + 300$ in our heads • Use number bonds to 1 and 10 to perform mental subtraction of any pair of 1-place or • Subtract 2-place decimal numbers using counting up. Include in the context of money. e.g. $10 - 3.65 = (0.35 + 6)$ e.g. $£10.00 - £3.49 = (51p + £6)$ • Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to 2 places e.g. $467\,900 - 3005$ e.g. $4.63 - 1.02$ 	<p>Taking away Use place value to subtract decimals e.g. $7.782 - 0.08$ e.g. $16.623 - 0.2$ Take away multiples of powers of 10 e.g. $132956 - 400$ e.g. $686109 - 40000$ e.g. $7.823 - 0.5$ Partitioning or counting back e.g. $3964 - 1051$ e.g. $5.72 - 20.1$ Subtract near multiples of powers of 10 e.g. $360078 - 99998$ e.g. $12.831 - 0.99$</p>

- where the numbers make sense
- Use column subtraction to subtract numbers with up to 6 digits
- Subtract mentally simple fractions with common denominators

Counting up

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

e.g. $1.2 - 0.87$

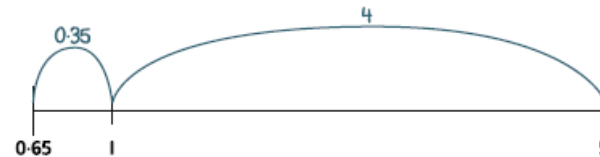


Using number facts

Derived facts from number bonds to 10 and 100

e.g. $0.1 - 0.075$ using $75 + 25 + 100$

e.g. $5 - 0.65$ using $65 + 35 + 100$



Compact column subtraction for large numbers and decimals

e.g. $34685 - 16458$

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

MULTIPLICATION

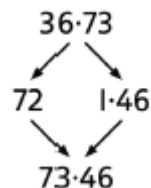
Learning Outcomes

- Know by heart all the multiplication facts up to 12×12
- Multiply whole numbers and decimals with up to 3 places by 10, 100 or 1000
e.g. $234 \times 1000 = 234\ 000$
e.g. $0.23 \times 1000 = 230$
- Identify common factors, common multiples and prime numbers and use factors in mental multiplication
e.g. 326×6 is 652×3 which is 1956
- Use place value and number facts in mental multiplication
e.g. $4000 \times 6 = 24\ 000$
e.g. $0.03 \times 6 = 0.18$
- Use doubling and halving as mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25
e.g. 28×25 is a quarter of $28 \times 100 = 700$
- Use rounding in mental multiplication
e.g. 34×19 as $(34 \times 20) - 34$
- Multiply 1- and 2-place decimals by numbers up to and including 10 using place value and partitioning
e.g. 3.6×4 is $12 + 2.4$

Methods and Strategies for Children

Doubling and halving

Double decimal numbers with up to 2 places using partitioning
e.g. double 36.73



Use doubling and halving as strategies in mental multiplication

Grouping

Use partitioning as a strategy in mental multiplication, as appropriate
e.g. 3060×4 as 3000×4 (12000) and 60×4 (240) = 12240
e.g. 8.4×8 as 8×8 (64) and 0.4×8 (3.2) = 67.2
Use factors in mental multiplication
e.g. 421×6 as 421×3 (1263) doubled = 2536
e.g. 3.42×5 as half of $3.42 \times 10 = 17.1$
Multiply decimal numbers using near multiples by rounding
e.g. 4.3×19 as $(4.3 \times 20) - 4.3 = 81.8$

Using number facts

Use times-tables facts up to 12×12 in mental multiplications of large numbers or numbers with up to 2 decimal places
e.g. $6 \times 4 = 24$ and $0.06 \times 4 = 0.24$

Y6
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e.g. 2.53×3 is $6 + 1.5 + 0.09$

- Double decimal numbers with up to 2 places using partitioning
- e.g. 36.73 doubled is double 36 (72) plus double 0.73 (1.46)
- Use short multiplication to multiply a 1-digit number by a number with up to 4 digits
- Use long multiplication to multiply a 2-digit number by a number with up to 4 digits
- Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money
- Multiply fractions and mixed numbers by whole numbers
- Multiply fractions by proper fractions
- Use percentages for comparison and calculate simple percentages

ation of 2-, 3- and 4-digit numbers by 1-digit numbers

$$\begin{array}{r} 3743 \\ \times \quad 2 \\ \hline 22 \\ \hline \end{array}$$
$$\begin{array}{r} 3743 \\ \times \quad 6 \\ \hline 2242518 \\ \hline \end{array}$$

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

e.g. 456×38

$$\begin{array}{r} 456 \\ \times 38 \\ \hline 3648 \\ 13680 \\ \hline 17328 \\ \hline \end{array}$$

Short multiplication of decimal numbers using $\times 100$ and $\div 100$

e.g. 13.72×6 as $(1372 \times 6) \div 100 = 82.32$

Short multiplication of numbers up to 2 decimal places

$$\begin{array}{r} 13.72 \\ \times \quad 6 \\ \hline 82.32 \\ \hline \end{array}$$

DIVISION

Learning Outcome

Methods and Strategies for Children

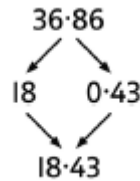
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- Know by heart all the division facts up to $144 \div 12$
- Divide whole numbers by powers of 10 to give whole number answers or answers with up to 3 decimal places
- Identify common factors, common multiples and primes numbers and use factors in mental division
- Use tests for divisibility to aid mental calculation
- Use halving as a mental division strategy, for example to divide by 4, 8, 16 etc.
e.g. $628 \div 8$ is halved three times: 314, 157, 78.5
- Using knowledge of place value divide 1- and 2-place decimals
e.g.
 $24 \div 6 = 4$
 $2.4 \div 6 = 0.4$

e.g.
 $65 \div 5 = 13$
 $6.5 \div 5 = 1.3$
 $0.65 \div 5 = 0.13$
- Halve decimal numbers with up to 2 places using partitioning

Doubling and halving

Halve decimal numbers with up to 2 places using partitioning
e.g. *half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)*



Use doubling and halving as mental strategies in mental division.

Grouping

Use tests for divisibility
e.g. *135 divides by 3, as $1 + 3 + 5 = 9$ and 9 is in the $\times 3$ table*

Using number facts

Use division facts from the times-tables up to 12×12 to divide decimal numbers by
e.g. *$1.17 \div 3$ is $\frac{1}{100}$ of $117 \div 3$ (39)*

Know tests of divisibility for numbers divisible by 2, 3, 4, 5, 9, 10 and 25

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

$$\begin{array}{r} 422 \\ 6 \overline{) 2532} \end{array}$$

e.g. *Half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)*

- Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number
- Use long division to divide 3-digit and 4-digit numbers by 2-digit numbers

Long division of 3- and 4-digit numbers by 2-digit numbers

$$\begin{array}{r} 422 \\ \underline{6 \overline{) 2532}} \\ 24 \\ \underline{4} 13 \\ 12 \\ \underline{1}2 \\ 12 \\ \underline{1}2 \\ 0 \end{array}$$