STRATEGIES AND METHODS OF WRITTEN SUBTRACTION

INSPIRE our children to succeed
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ACHIEVE EXCELLENCE

YEAR 5

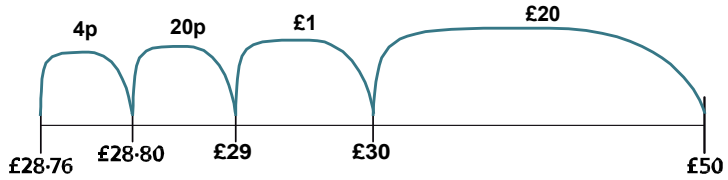
Compact column subtraction for numbers with up to 5 digits

e.g. *16 324 – 8516*

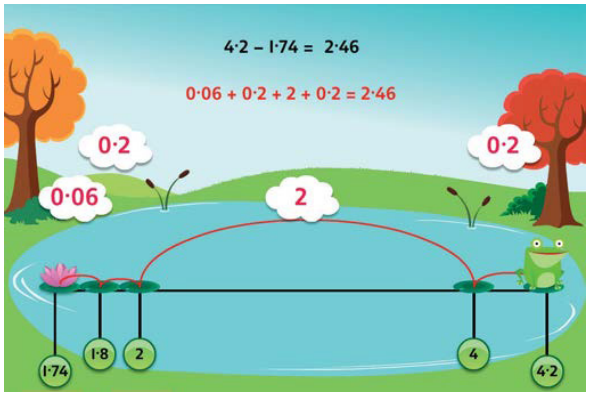
$$\begin{array}{r} {}^{1}{}^{5}\,{}^{1}\,{}^{1}\,{}^{1} \\ 16324 \\ -\ 8516 \\ \hline 7808 \end{array}$$

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

e.g. *£50 – £28·76*



Use counting up subtraction to subtract decimal numbers



e.g. *4·2 – 1·74*

Subtract related fractions

e.g. *3/4 – 1/8 = 5/8*

NB Counting up subtraction provides a default method for ALL children

YEAR 6

Compact column subtraction for large numbers

e.g. *34 685 – 16 458*

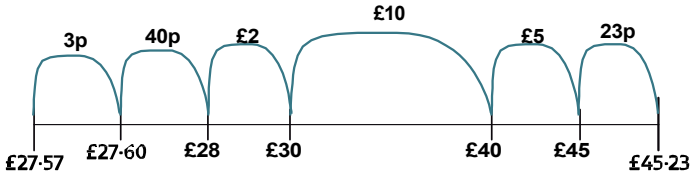
$$\begin{array}{r} {}^{2}\,{}^{1}\,{}^{7}\,{}^{1} \\ 34685 \\ -\ 16458 \\ \hline 18227 \end{array}$$

Use counting up for subtractions where the larger number is a multiple or near multiple of 1000 or 10 000

Use counting up subtraction when dealing with money

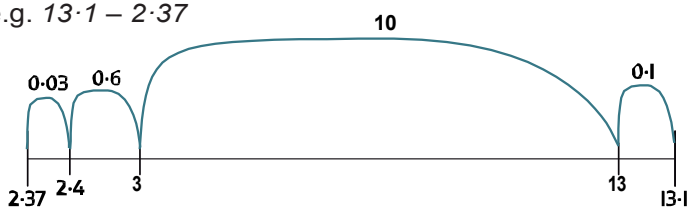
e.g. *£100 – £78·56*

e.g. *£45·23 – £27·57*



Use counting up subtraction to subtract decimal numbers

e.g. *13·1 – 2·37*



Subtract unlike fractions, including mixed numbers

e.g. *3/4 – 1/3 = 5/12*

e.g. *2 3/4 – 1 1/3 = 1 5/12*

NB Counting up subtraction provides a default method for ALL

STRATEGIES AND METHODS OF MENTAL MULTIPLICATION

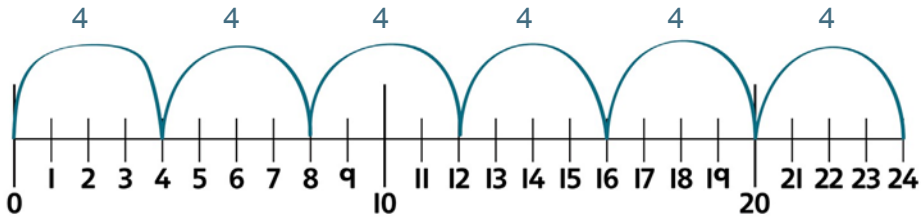
INSPIRE our children to succeed
CREATE excitement for learning
ACHIEVE EXCELLENCE

YEAR 3

Counting in steps ('clever' counting)

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

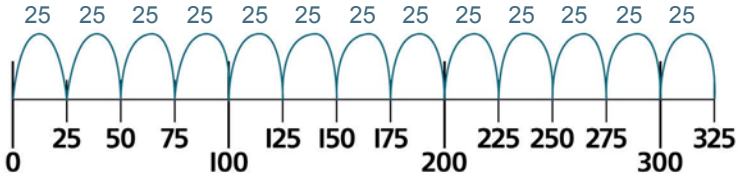
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



YEAR 4

Counting in steps (sequences)

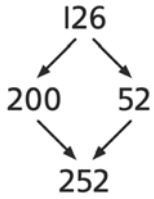
Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



Doubling and halving

Find doubles to double 100 and beyond using partitioning

e.g. *double 126*



Begin to double amounts of money

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*

STRATEGIES AND METHODS OF MENTAL MULTIPLICATION

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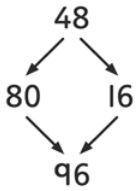
YEAR 3

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 × 8 = 8 × 4*

Multiply multiples of 10 by 1-digit numbers

e.g. *30 × 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*

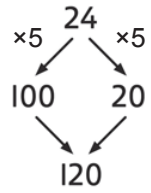
Know ×2, ×3, ×4, ×5, ×8, ×10 tables facts

YEAR 4

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 × 8 = 3200*

Multiply near multiples by rounding e.g.

24 × 19 as (24 × 20) – 24 = 456

Using number facts

Know times-tables up to 12 × 12

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	11	24
3	3	6	9	12	15	18	21	24	27	30	22	36
4	4	8	12	16	20	24	28	32	36	40	33	48
5	5	10	15	20	25	30	35	40	45	50	44	60
6	6	12	18	24	30	36	42	48	54	60	55	72
7	7	14	21	28	35	42	49	56	63	70	66	84
8	8	16	24	32	40	48	56	64	72	80	77	96
9	9	18	27	36	45	54	63	72	81	90	88	108
10	10	20	30	40	50	60	70	80	90	100	99	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

STRATEGIES AND METHODS OF MENTAL MULTIPLICATION

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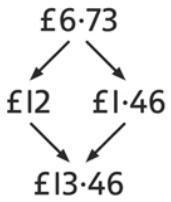
YEAR 5

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*

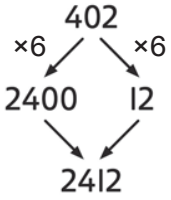
Grouping

Multiply whole numbers and decimals by 10, 100, 1000

e.g. *3·4 × 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.

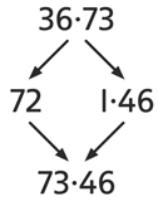
32 × 29 as (32 × 30) – 32 = 928

YEAR 6

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 (12 000) and 60 × 4 (240) = 12 240*

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 = 2526*

e.g. *3·42 × 5 as half of 3·42 × 10 = 17·1*

Multiply decimal numbers using near multiples by rounding

e.g. *4·3 × 19 as (4·3 × 20) – 4·3 = 81·7*

STRATEGIES AND METHODS OF WRITTEN MULTIPLICATION

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YEAR 3

Build on partitioning to develop grid multiplication
e.g. *23 × 4*

×	20	3	
4	80	12	= 92

YEAR 4

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 a vertical written algorithm (ladder) to multiply 3-digit numbers by 1-digit numbers
e.g. *253 × 6*

```
  2 5 3
      6
    1 8  ←— 6 x 200
  3 0 0  ←— 6 x 50
x 1 2 0 0  ←— 6 x 3
---------
  1 5 1 8
---------
```

Use grid multiplication to multiply 2-digit numbers by 2-digit numbers
e.g. *16 × 48*

×	10	6	
40	400	240	= 640
8	80	48	= 128
			768

STRATEGIES AND METHODS OF WRITTEN MULTIPLICATION

YEAR 5

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

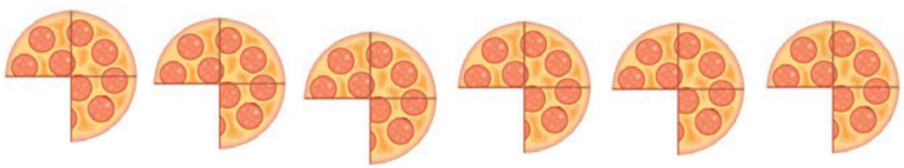
e.g. *1·34 × 6*

×	1	0·3	0·04
6	6	1·8	0·24

= 8·04

Multiply fractions by 1-digit numbers

e.g. *3/4 × 6 = 18/4 = 4 2/4 = 4 1/2*



NB Grid multiplication provides a default method for ALL children

YEAR 6

Short multiplication of decimal numbers using × 100 and ÷ 100

e.g. *13·72 × 6 as (1372 × 6) ÷ 100 = 82·32*

Short multiplication of money

e.g. *£13·72 × 6*

```
  £ 1 3.7 2
×         6
    2 4 1
-----------
  £ 8 2.3 2
-----------
```

```
  £ 1 3.7 2
x         6
-----------
  £ 8 2.3 2
-----------
    2 4.1
```

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

e.g. *6·76 × 4*

×	6	0·7	0·06
4	24	2·8	0·24

= 27·04

Multiply simple pairs of proper fractions

e.g. 1/2 × 1/4 = 1/8

NB Grid multiplication provides a default method for ALL children

STRATEGIES AND METHODS OF WRITTEN MULTIPLICATION

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YEAR 5

Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers
e.g. *435 × 8*

```
   4 3 5
x      8
-------
 3 4 8 0
-------
   2 4
```

Long multiplication of 2-, 3-and 4-digit numbers by 'teen' numbers
e.g. *48 × 16*

```
    4 8
x   1 6
-------
  2 8 8
  4 8 0
-------
  7 8 8
-------
  1
```

YEAR 6

Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers
e.g. *3743 × 6*

```
   3 7 4 3
x        6
---------
 2 2 4 5 8
---------
   4 2 1
```

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

```
    4 5 6
x     3 8
---------
  3 6 4 8
  1 3 6 8 0
---------
  1 7 3 2 8
---------
    1 1
```

e.g. *456 × 38*

STRATEGIES AND METHODS OF MENTAL MULTIPLICATION

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YEAR 5

Using number facts

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

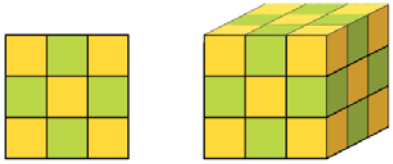
e.g. *4 × 6 = 24 so 40 × 6 = 240 and 400 × 6 = 2400*

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



YEAR 6

Using number facts

Use times-tables facts up to 12 × 12 in mental multiplication of large numbers or numbers with up to 2 decimal places

e.g. *6 × 4 = 24 and 0·06 × 4 = 0·24*

STRATEGIES AND METHODS OF MENTAL DIVISION

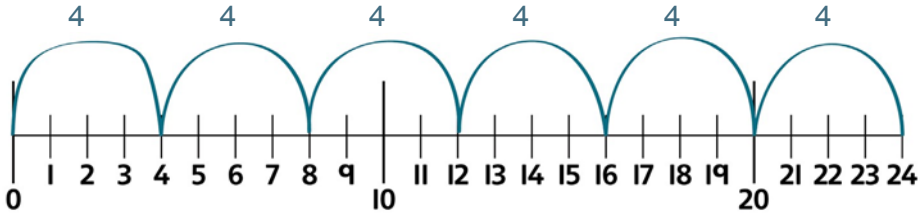
INSPIRE our children to succeed
CREATE excitement for learning
ACHIEVE EXCELLENCE

YEAR 3

Counting in steps ('clever' counting)

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

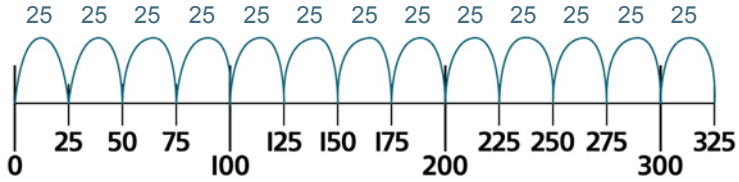
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



YEAR 4

Counting in steps (sequences)

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



STRATEGIES AND METHODS OF MENTAL DIVISION

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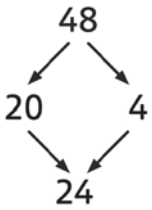
YEAR 3

Doubling and halving

Find half of even numbers to 100 using partitioning
e.g. *find half of 48*

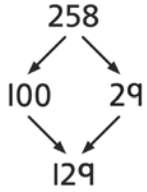


Use halving as a strategy in dividing by 2
e.g. *36 ÷ 2 is half of 36 = 18*
Find half of odd numbers

YEAR 4

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. *£9 halved is £4·50*

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

STRATEGIES AND METHODS OF MENTAL DIVISION

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ACHIEVE EXCELLENCE

YEAR 3

Grouping

Recognise that division is not commutative

e.g. *16 ÷ 8 does not equal 8 ÷ 16*

Relate division to multiplications 'with holes in'

e.g.
count in 5s to find the answer

_ × £5 = £30

Divide multiples of 10 by 1-digit numbers

e.g. *240 ÷ 8 = 30*

Begin to use subtraction of multiples of 10 of the divisor to divide numbers above the 10th multiple

e.g. *52 ÷ 4 is 10 × 4 (40) and 3 × 4 (12) = 13*

YEAR 4

Grouping

Use multiples of 10 times the divisor to divide by 1-digit numbers above the tables facts

e.g. *45 ÷ 3 as 10 × 3 (30) and 5 × 3 (15)*

$$
\begin{array}{r|l}
3 & 45 \\
 & \underline{30} \quad \leftarrow 10 \times 3 \\
 & 15 \\
 & \underline{15} \quad \leftarrow \underline{5 \times 3} \\
 & 0 \qquad\quad 15
\end{array}
$$

Divide multiples of 100 by 1-digit numbers using division facts

e.g. *3200 ÷ 8 = 400*