National curriculum requirements for number and calculation

Å Progression from year 1 through to year 6

Year 1

- Addition and subtraction to 20
- Counting up to and across 100
- count in multiples of 2, 5, 10

Year 2

- counting in steps of 2, 3 and 5
- recall and use addition and subtraction facts to 20 fluently and use related facts up to 100
- add and subtract - 2 digit + 1 digit, 2 digit + tens, 2 digit +2 digit, 3 x 1 digit
- 2, 5, 10 x tables

Year 3

- Numbers to 1000 – place value of 3 digit numbers
- adding and subtracting mentally – 3 digit and 1 digit, 3 digit and tens, 3 digit and hundreds
- Written addition and subtraction of 3 digit numbers
- 3, 4, 8 times tables

Year 4

- Place value of 4-5 digit numbers
- Written addition and subtraction using 4 digit numbers
- Multiplication and division facts to 12x12
- Multiplying 2 and 3 digit numbers by 1 digit number

Year 5

- Place value of 6 digit numbers
- Written methods to add and subtract whole numbers with more than 4 digits
- Long multiplication of 4 digit numbers by one or 2 digit numbers
- Division of a 4 digit number by a one digit number

Year 6

- Place value of numbers to 10,000,000
- Written addition and subtraction of all numbers including decimals and money
- Multiplication of numbers with at least 4 digits by a 2 digit number
- Division of number with at least 4 digits by a 2 digit number

Addition

Year 1

Å ***National Curriculum requirements:***

Å *Add 1 digit and 2 digit numbers to 20, including 0.*

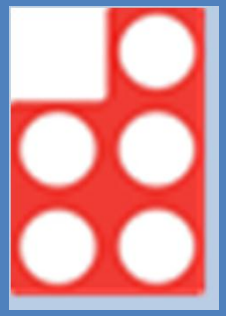
Recalling number bonds to 20

4 + 5 = 9

4 + = 9

 + 5 = 9

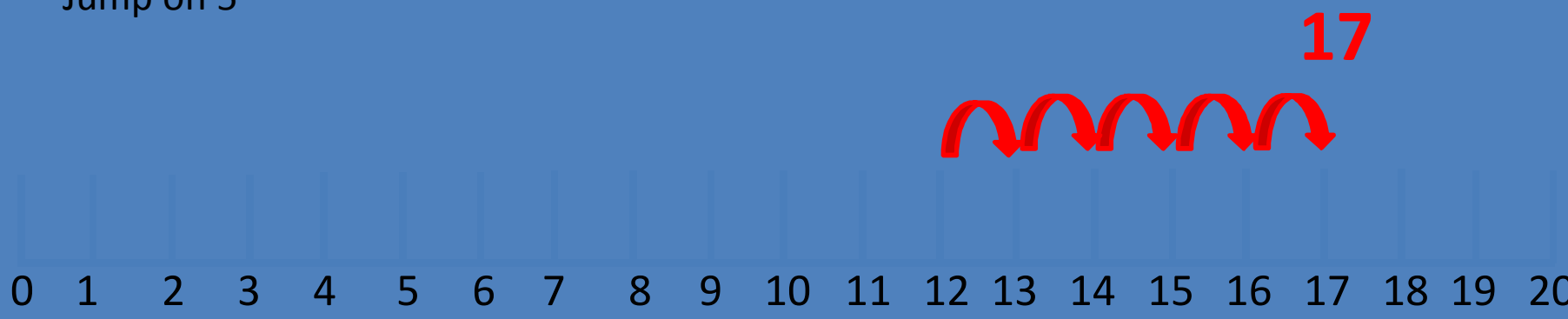
 + = 9



Numberlines

12 + 5 =

Find 12 on the numberline
Jump on 5

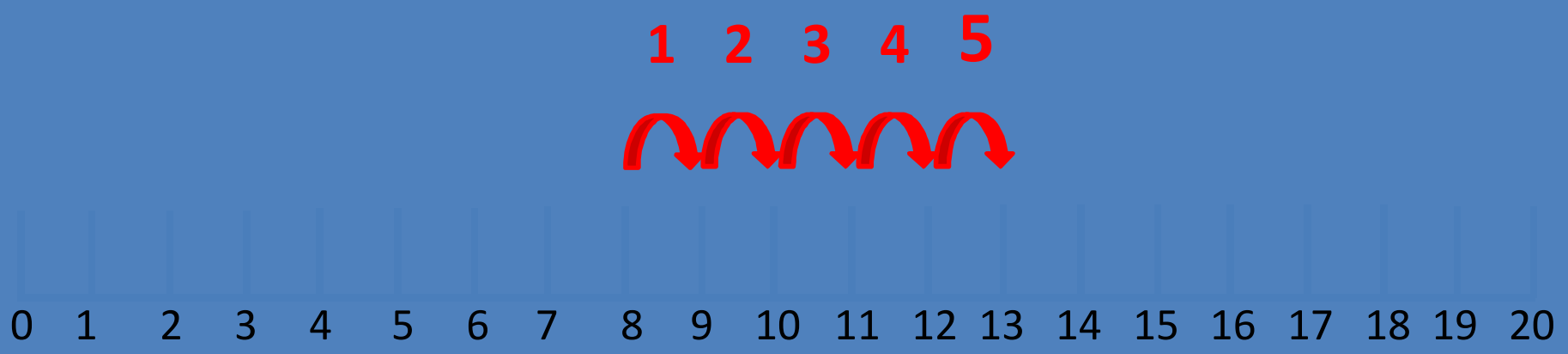


Numberline with missing numbers

☐ + 8 = 13

What number would you add to 8 to get to 13?

Start at 8 and count on until you get to 13



Year 2

National Curriculum requirements:

Å *Add 2 digit numbers and ones.*

Å *Add 2 digit number and tens.*

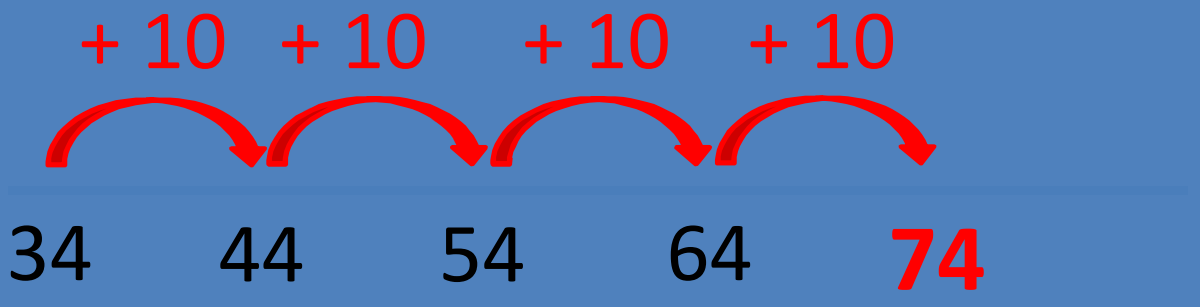
Å *Add two 2 digit numbers.*

Å *Add three 1 digit numbers.*

Children continue with the use of a numberline, however extend understanding to an empty numberline

23 + 8 =

34 + 40 =



23 + 16 =

23 29 39

$$\begin{array}{r} 20 + 3 \\ +\ 10 + 6 \\ \hline 30 + 9 \end{array} = 39$$

Using the partitioned column method

54 + 35

$$
\begin{array}{rr}
 & 50 + 4 \\
+ & 30 + 5 \\
\hline
 & 80 + 9 = 89
\end{array}
$$

Year 3

National Curriculum requirements:

Add numbers with up to 3 digits, using the formal written method of column addition.

$$342 + 256$$

$$\begin{array}{rr} & 300 + 40 + 2 \\ + & 200 + 50 + 6 \\ \hline & 500 + 90 + 8 = 598 \end{array}$$

$$
\begin{array}{rl}
 & 417 \\
+ & 266 \\
\hline
 & 13 \quad (6 + 7) \\
 & 70 \quad (10 + 60) \\
 & 600 \quad (400 + 200) \\
\hline
 & 683
\end{array}
$$

Using the compact column method

743 + 87

	7 4 3	
+	8 7	
	1 0	(3 + 7)
	1 2 0	(40 + 80)
	7 0 0	(700 + 0)
	8 3 0	

Year 4

National Curriculum requirements:

Add numbers with up to 4 digits, using the formal written method of column addition.

7535 + 506

$$\begin{array}{r} 7\,5\,3\,5 \\ +\quad 5\,0\,6 \\ \hline 8\,0\,4\,1 \\ \hline \end{array}$$

1 1

Year 5

National Curriculum requirements:

Add whole numbers with more than 4 digits, using the formal written method of column addition.

Year 6

National Curriculum requirements:

Add whole numbers and decimals with more than 4 digits, using the formal written method of column addition.

$$465.89 + 48.03$$

$$\begin{array}{r} 465.89 \\ +\ 48.03 \\ \hline 513.92 \\ \hline 11 \quad\ 1 \end{array}$$

Using column methods

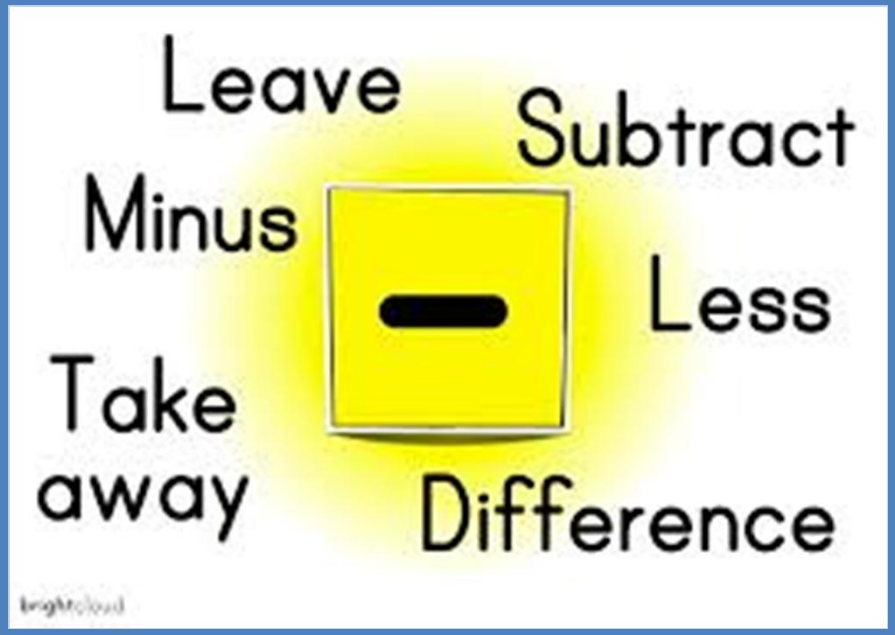
£34.19 + £2.87

576.902 + 54.63

$$
\begin{array}{r}
£34.19 \\
+\ £\ \ 2.87 \\
\hline
£37.06
\end{array}
$$

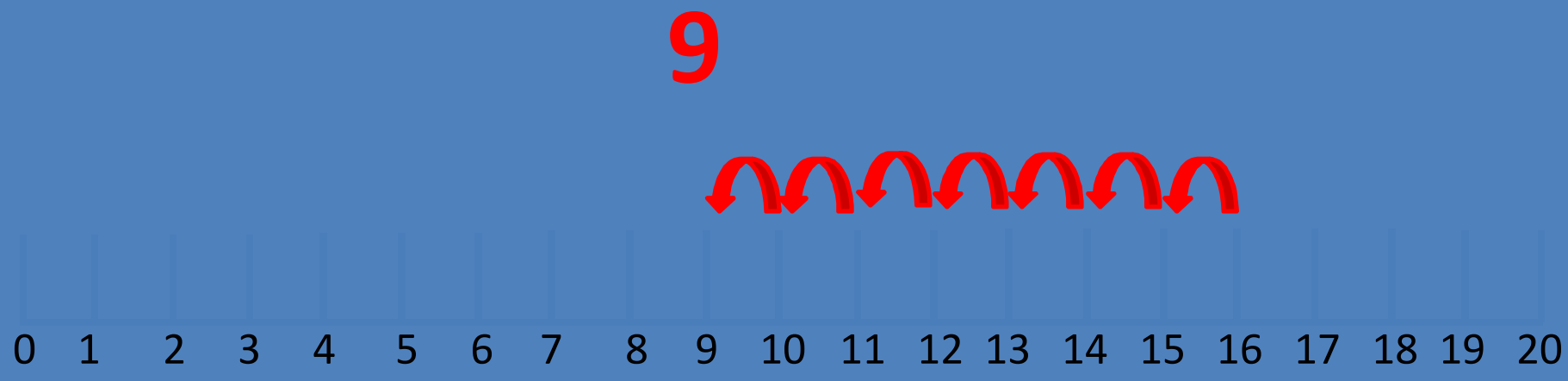
$$
\begin{array}{r}
576.902 \\
+\ \ 54.63 \\
\hline
631.532
\end{array}
$$

Subtraction



Year 1

- ***National Curriculum requirements:***
- *Subtract 1 digit and 2 digit numbers up to 20, including 0.*
- *Represent and use number bonds and related subtraction facts.*



16 – 7 =

Year 2

National Curriculum requirements:

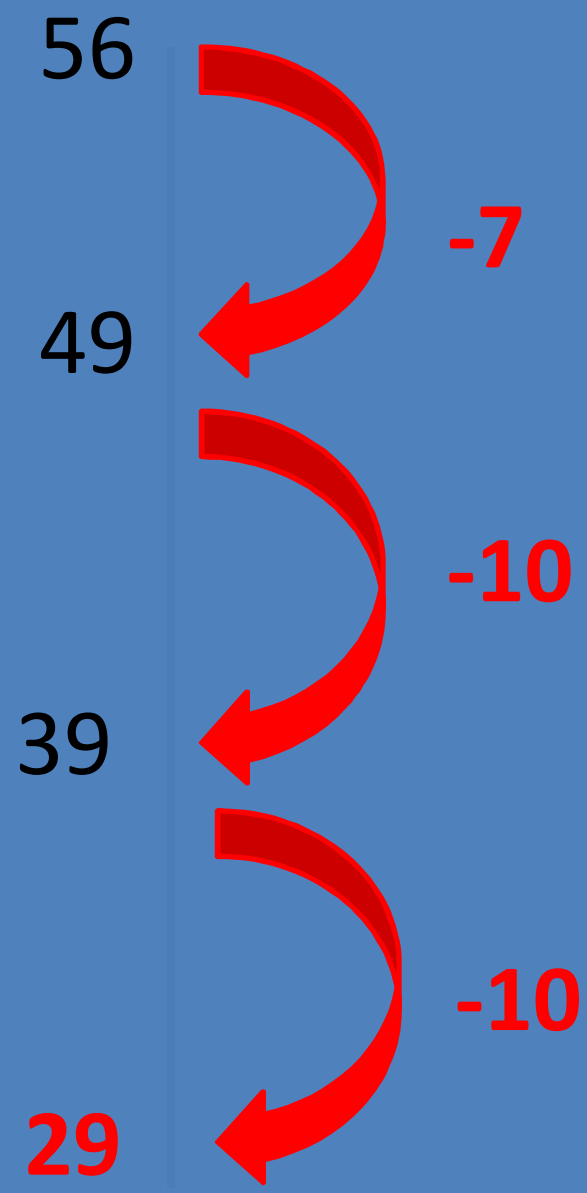
Subtract 2 digit numbers and ones.

Subtract 2 digit number and tens.

Subtract two 2 digit numbers.

Subtract three 1 digit numbers.

56 – 27 =



Year 3

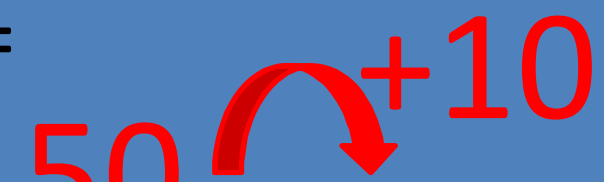
National Curriculum requirements:

Subtract numbers with up to 3 digits using the formal written method of column subtraction.

78 – 35 =

$$
\begin{array}{rl}
 & 70 + 8 \\
- & 30 + 5 \\
\hline
 & 40 + 3 \quad = \mathbf{43}
\end{array}
$$

64 – 27 =



60 + 4

\- 20 + 7

---

50 + 14

\- 20 + 7

---

30 + 7 = 37

Using expanded column method

248 - 92

248 - 92

100 1

~~200~~ + 40 + 8

\- 90 + 2

---

100 + 50 + 6 = 156

Year 4

National Curriculum requirements:

Subtract numbers up to 4 digits using the formal written method of columnar subtraction.

5,734 - 477

$$\begin{array}{r} {}^{6}\cancel{5}\,{}^{12}\cancel{7}\,{}^{1}\cancel{3}\,4 \\ -\quad 4\,7\,7 \\ \hline 5\,2\,5\,7 \end{array}$$

Year 5 and Year 6

National Curriculum requirements:

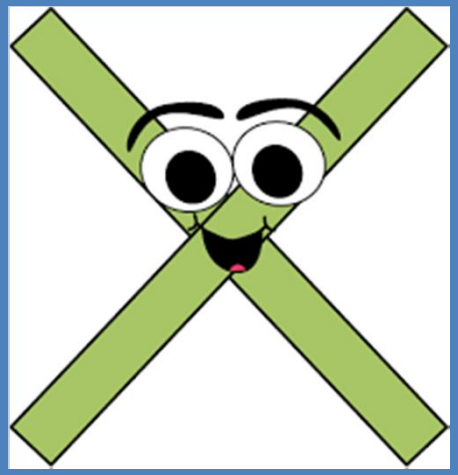
Subtract numbers with more than 4 digits.

Using compact column method

354.07 – 163.6

$$
\begin{array}{r}
{}^{2}\cancel{3}\,{}^{3}1\,5\,\cancel{4}.10\;\;7 \\
-\,1\;\;6\;\;3.\;\;6 \\
\hline
1\;\;9\;\;0.\;\;4\;\;7
\end{array}
$$

Multiplication



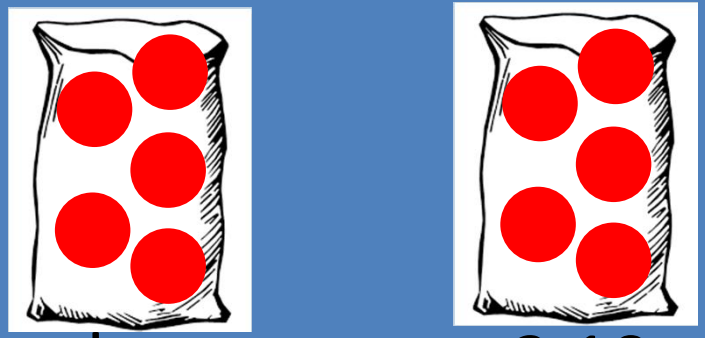
Times tables

Year 1	**counting in 2s, 5s, 10s**
Year 2	**knowing multiplication and division facts for the 2s, 5s, 10 times tables up to x12**
Year 3	**knowing multiplication and division facts for the 3s, 4s, 8 times tables up to x12**
Year 4	**all multiplication and division facts to 12x12**

Year 1

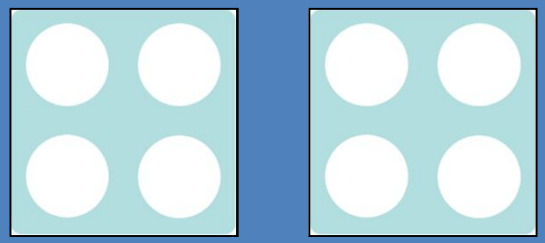
- Counting in multiples of 2, 5 and 10
- *Solve one step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays*

There are 5 sweets in a bag, how many will be in 2 bags?



How much money are 3 10p coins worth?

What is double 4?



Year 2

National Curriculum requirements:

Solve problems involving multiplication using materials, arrays, mental methods and multiplication facts.

Although the curriculum refers to pupils needing to know their 2, 5 and 10 times multiplication tables, questions using the 3 times multiplication table may also be included.

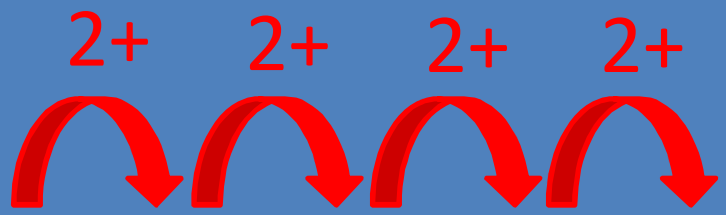
The inclusion of this area reflects the expectation that pupils are able to solve multiplication by repeated addition, as well as meeting the requirement to count in multiples of 3 by the end of year 2.

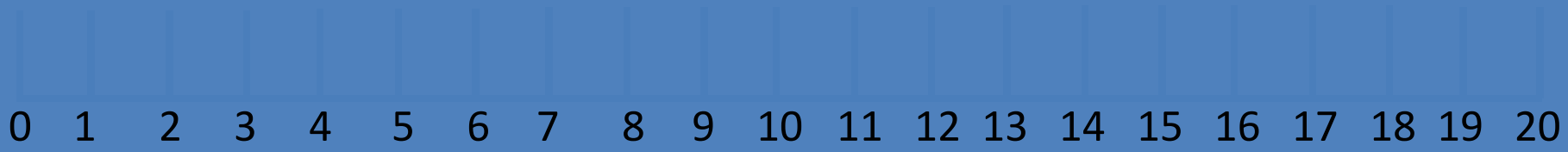
Repeated addition

2 x 4 =

4 lots of 2

2 4 times





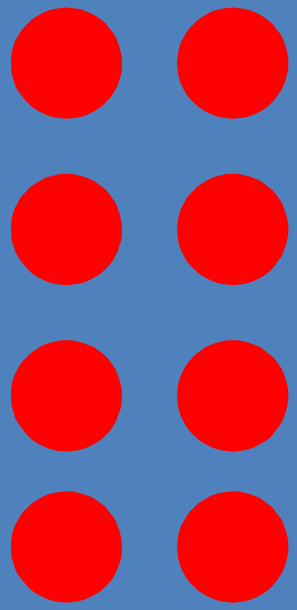
8

arrays

2 x 4 =

4 lots of 2

2 4 times

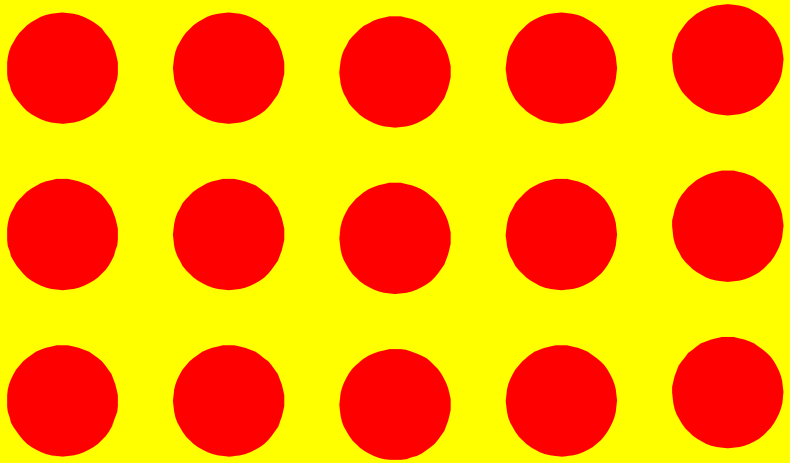


Draw an array to show 5 x 3

5 x 3

5, 3 times

3 lots of 5



Year 3

National Curriculum requirements:

Multiply 2 digits by 1 digit, using mental and progressing to formal written methods.

Continued use of arrays to show understanding of multiplication facts.

Use understanding of known facts to multiply a 2 digit number by a one digit number.

Use of partitioning through the grid method.

15 x 4

(10 x 4) + (5 x 4)

X	10	5
4	40	20

40 + 20 = 60

Use the grid method to solve

23 x 5

X	20	3	
5	100	+ 15	= 115

Expanded column method

15 x 4 =

1	5	
X	4	
2	0	(5 x 4)
4	0	(10 x 4)
6	0	

Year 4

- ***National Curriculum requirements:***
- *Multiply 2 digits by 1 digit using formal written layout.*
- *Multiply 3 digits by 1 digit using formal written layout.*

263 x 4

X	200	60	3
4	800	+ 240	+ 12 = 1052

2 6 3

x 4

---

1 2 (3 x 4)

2 4 0 (60 x 4)

8 0 0 (200 x 4)

---

1 0 5 2

Use both the grid method and the expanded column method to solve :

467 x 3

x	400	60	7	
3	1200	+180	+ 21	= 1401

4 6 7

x 3

---

2 1

1 8 0

1 2 0 0

---

1 4 0 1

Year 5

National Curriculum requirements:

Multiply numbers up to 4 digits by a 1 digit number using the formal written method of short multiplication.

Multiply numbers up to 4 digits by a 2 digit number using the formal written method of long multiplication.

732 x 6

$$\begin{array}{r} 7\ 3\ 2 \\ \times\quad 6 \\ \hline 4\ 3\ 9\ 2 \\ \ 1\ 1\ \end{array}$$

45 x 23

x	40	5
20	800	100
3	120	15

800 + 100 = 1000

120 + 15 = 135

1000 + 135 = 1135

462 x 25

	4	6	2
	x	2	5
2	3	1	0
	3	1	
9	2	4	0
1			
1 1	5	5	0

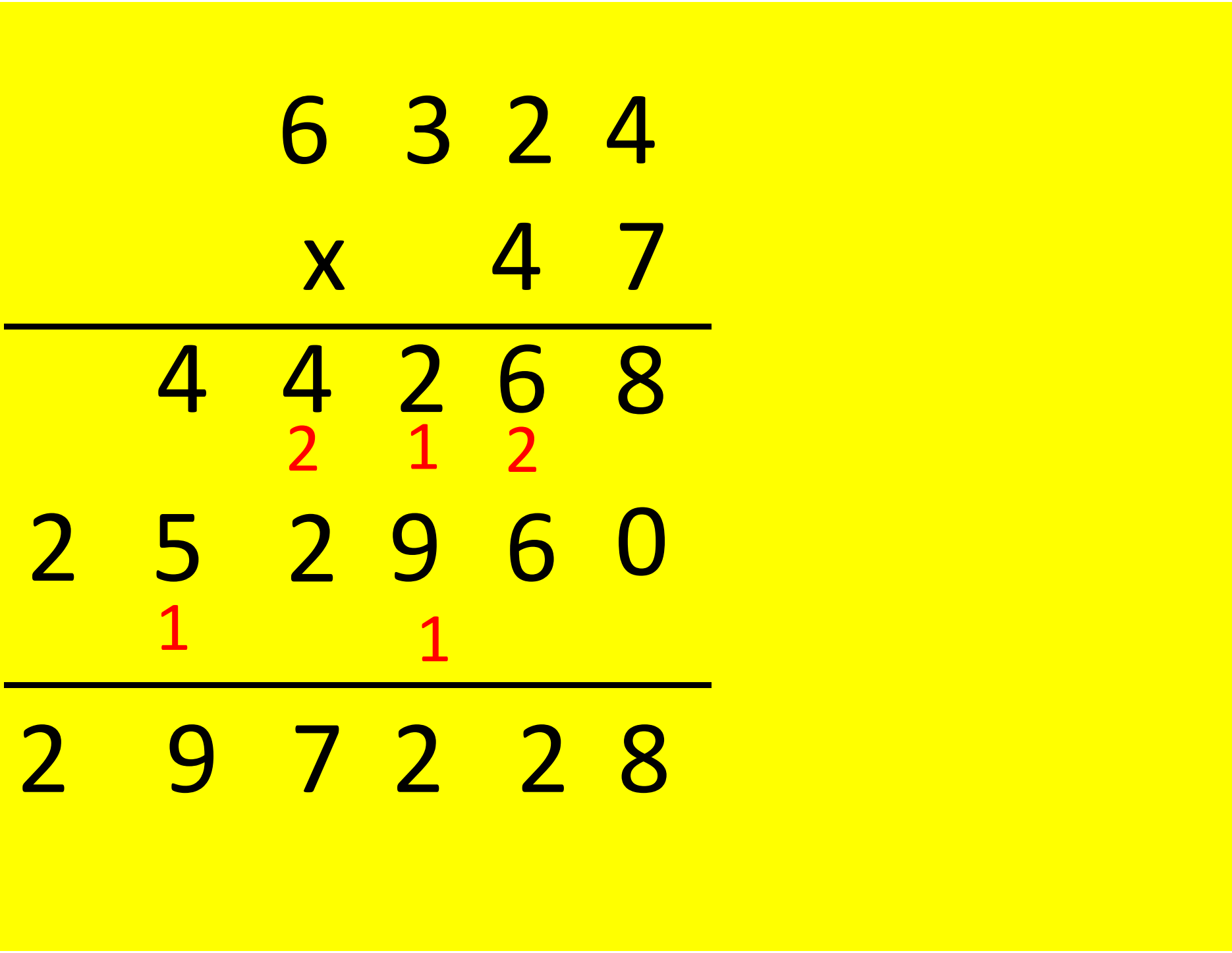
Year 6

National Curriculum requirements:

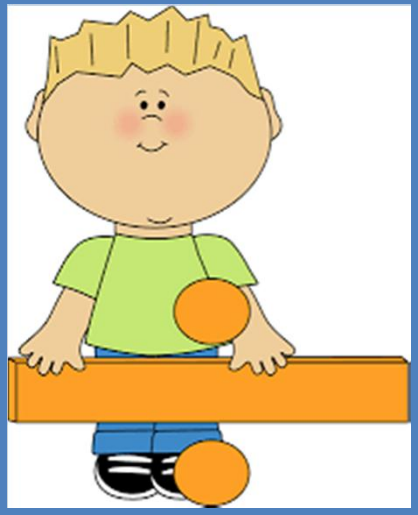
Multiply up to 4 digits by 2 digits using the formal written method of long multiplication.

Use column multiplication to solve :

6324 x 47


6 3 2 4
x 4 7
4 4 2 6 8
2 1 2
2 5 2 9 6 0
1 1
2 9 7 2 2 8

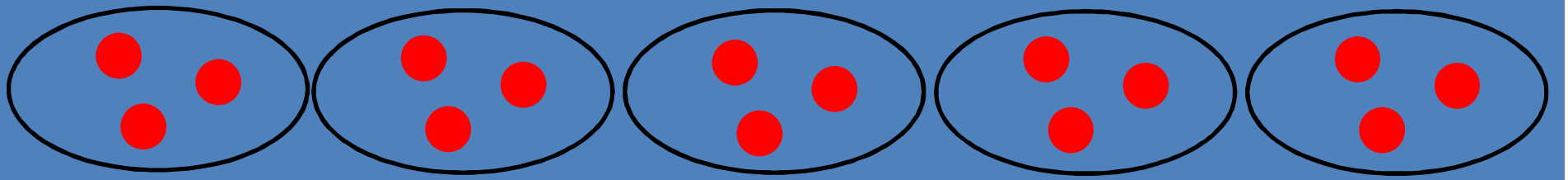
Division



Year 1

- Division as sharing.
- Emphasise the importance of sharing equally.

15 shared between 5 is 3



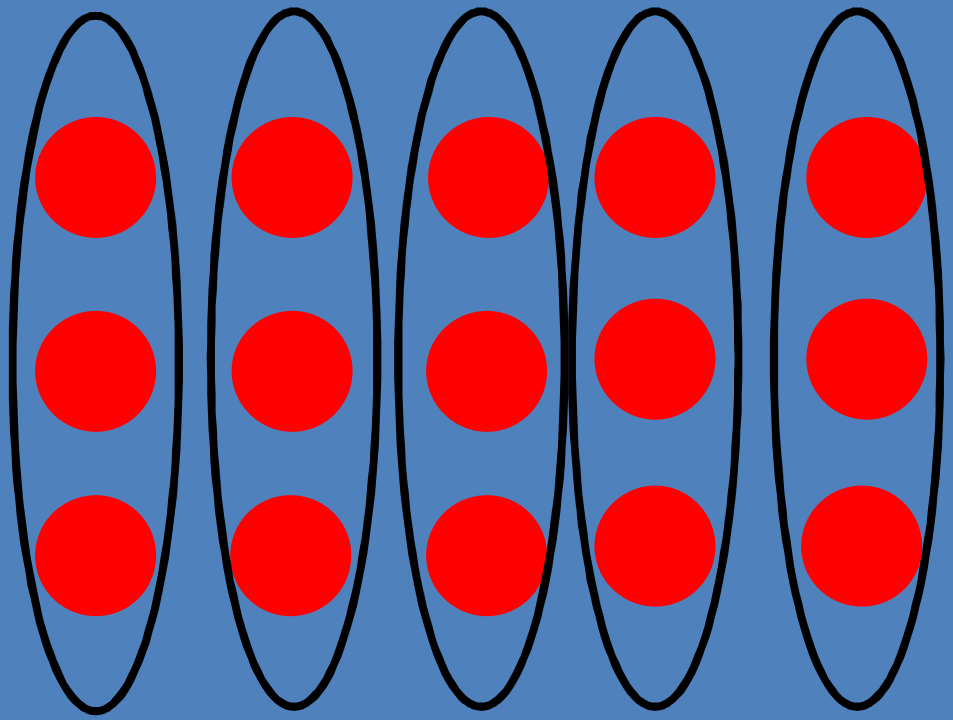
- Halving of even numbers

Year 2

- Recall and use division facts for 2, 5 and 10 times tables.
- Continue to use division as sharing.
- Division as grouping.

Division as grouping

Å How many 3s are in 15?

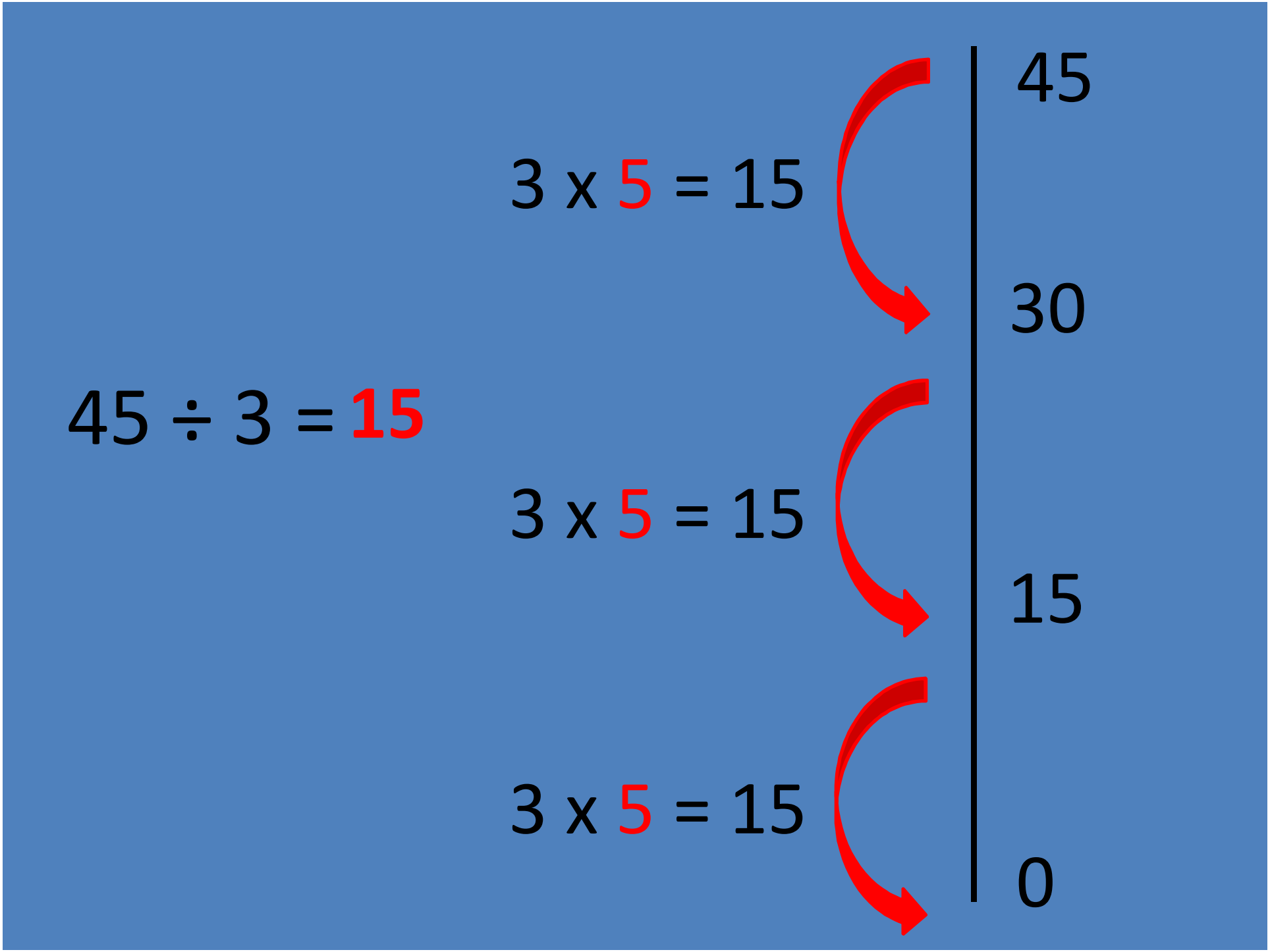


Repeated subtraction

$14 \div 2 = 7$

Year 3

- *Division questions based on multiplication tables they know.*
- *Divide 2 digits by 1 digit, progressing to formal written methods.*


45
3 x 5 = 15
30
45 ÷ 3 = 15
3 x 5 = 15
15
3 x 5 = 15
0

Grouping method

$92 \div 4$

$2 \times 4 = 8$

$5 \times 4 = 20$

$10 \times 4 = 40$

$20 \times 4 = 80$

$$
\begin{array}{r}
23 \\
4\overline{)92} \\
-80 \quad (20 \times 4) \\
\hline
12 \\
-12 \quad (3 \times 4) \\
\hline
0
\end{array}
$$

Use grouping to solve:

$$72 \div 3$$

$$
\begin{array}{r}
2\ 4 \\
\hline
3\,\overline{)\,7\ 2} \\
-\,6\ 0 \quad (20 \times 3) \\
\hline
1\ 2 \\
-\,1\ 2 \quad (4 \times 3) \\
\hline
0
\end{array}
$$

$2 \times 3 = 6$

$10 \times 3 = 30$

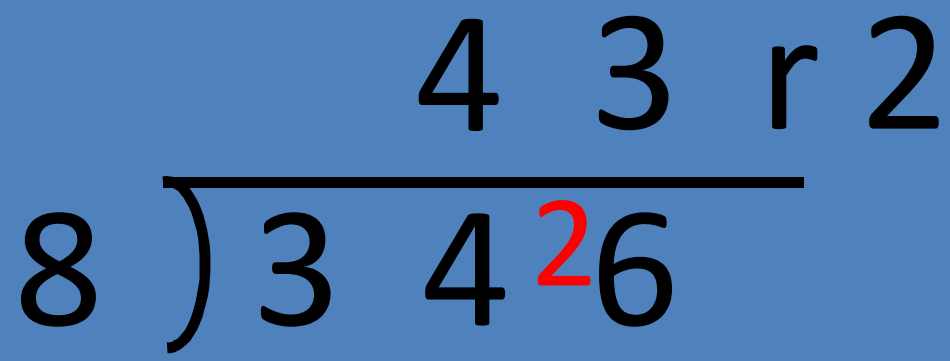
$20 \times 3 = 60$

Short division with exact answers

$$\begin{array}{r} 2\ 1 \\ \hline 4\,\overline{)\,8\ 4} \end{array}$$

Year 4

- ***National Curriculum requirements:***
- *Divide 2 digits by 1 digit and 3 digits by 1 digit becoming fluent with formal written method of short division with exact answers and progressing to remainders.*


4 3 r 2
8) 3 4 2 6

Year 5

- ***National Curriculum requirements:***
- *Divide 2 digits by 1 digit.*
- *Divide 3 digits by 1 digit.*
- *Divide 4 digits by 1 digit.*

$$
\begin{array}{r}
1\ 7\ 1\ 2\ \text{r}\,1 \\
\hline
4\ \big)\ 6\ {}^{2}8\ 4\ 9
\end{array}
$$

Use short division to solve:

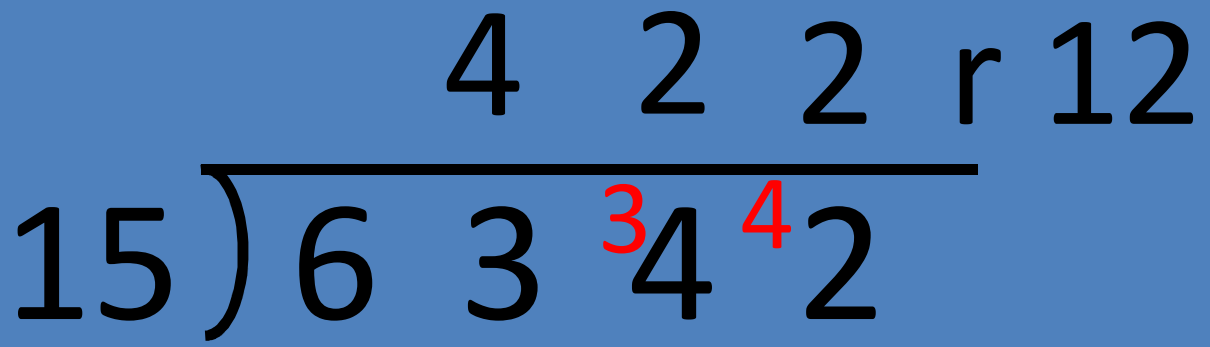
$$7436 \div 5$$

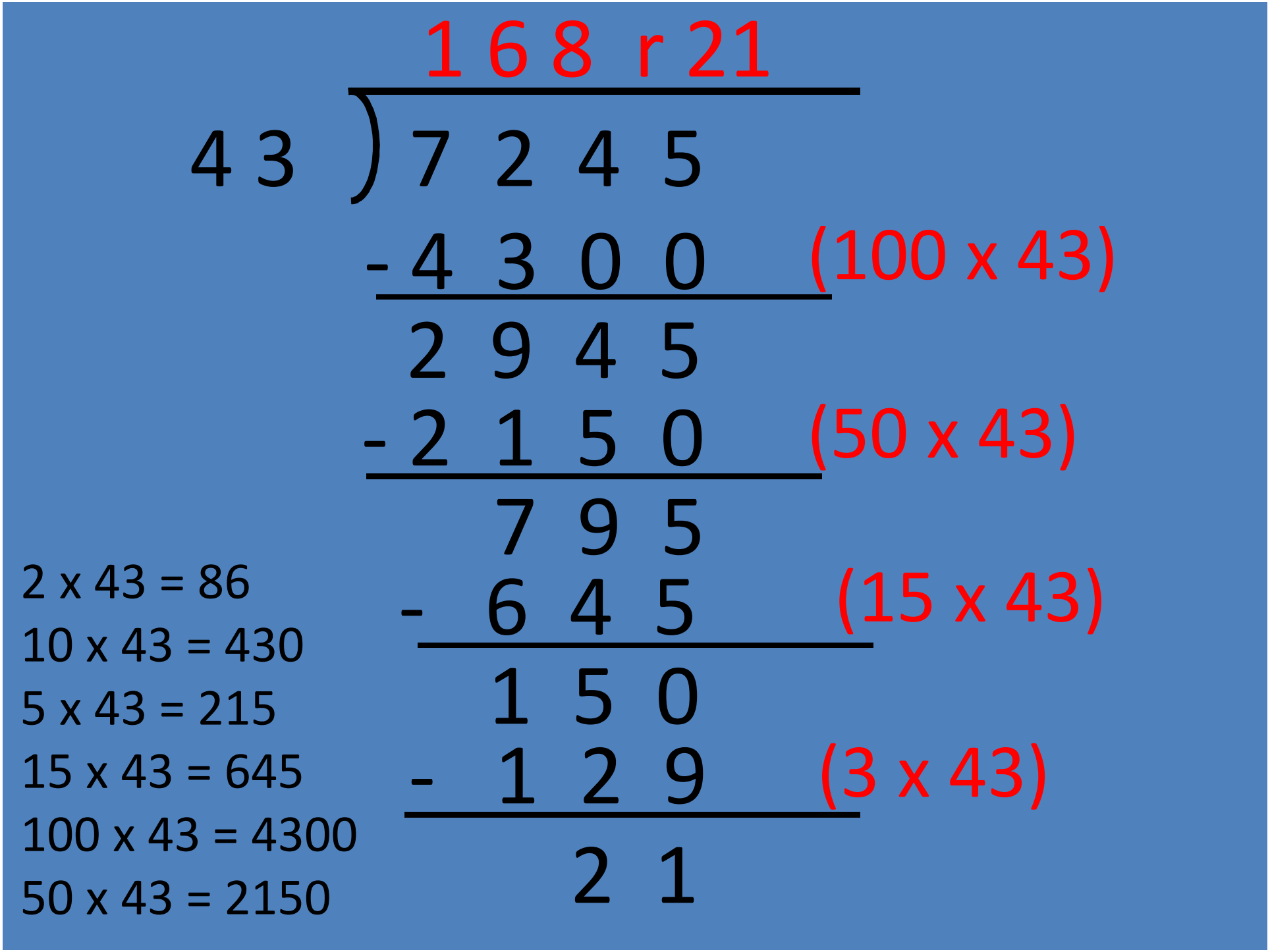
$$
\begin{array}{r}
1\ 4\ \ 8\ \ 7\ \text{r}\ 1 \\
\hline
5\ \big)\ 7^{2}4^{4}3^{3}6
\end{array}
$$

Year 6

- ***National Curriculum requirements:***
- *Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate.*

- *Divide up to 4 digits by a 2 digits whole number using the formal written method of long division.*


4 2 2 r 12
15) 6 3 3 4 4 2


1 6 8 r 21
43) 7 2 4 5
- 4 3 0 0 (100 x 43)
2 9 4 5
- 2 1 5 0 (50 x 43)
7 9 5
- 6 4 5 (15 x 43)
1 5 0
- 1 2 9 (3 x 43)
2 1
2 x 43 = 86
10 x 43 = 430
5 x 43 = 215
15 x 43 = 645
100 x 43 = 4300
50 x 43 = 2150

Use formal long division to calculate :

$$4237 \div 52$$

$$
\begin{array}{r}
8\ 1\ r\ 25 \\
52\overline{)\,4\ 2\ 3\ 7} \\
-\ 2\ 6\ 0\ 0 \quad (50 \times 52) \\
\hline
1\ 6\ 3\ 7 \\
-\ 1\ 0\ 4\ 0 \quad (20 \times 52) \\
\hline
5\ 9\ 7 \\
-\ 5\ 2\ 0 \quad (10 \times 52) \\
\hline
7\ 7 \\
-\ 5\ 2 \quad (1 \times 52) \\
\hline
2\ 5
\end{array}
$$

2 x 52 = 104
10 x 52 = 520
50 x 52 = 2600
20 x 52 = 1040