

Mathematics Progression in Calculations Document

Advance Learning Partnership Multi Academy Trust

Contents

- Representations
- Addition Progression
- Subtraction Progression
- Multiplication Progression
- Times Tables Progression
- Division Progression

Representations

Children will be exposed to a variety of models and images that can support the teaching of different concepts:

- Part-whole model
- Bar model (single and multiple)
- Number shapes
- Cubes
- Tens frames
- Bead strings
- Number tracks
- Number lines (labelled and blank)
- Straws
- Base 10
- Place Value Counters

Year 1

Add 1-digit numbers within 10

$4 + 3 = 7$

Year 2

Add three 1-digit numbers

$7 + 6 + 3 = 16$

Year 1 / 2

Add 1 and 2-digit numbers to 20

$8 + 7 = 15$

Year 2/3

Add 1-digit and 2-digit numbers to 100

$38 + 5 = 43$

Year 1

Add 1-digit numbers within 10

$4 + 3 = 7$

Year 2

Add three 1-digit numbers

$7 + 6 + 3 = 16$

Year 1 / 2

Add 1 and 2-digit numbers to 20

$8 + 7 = 15$

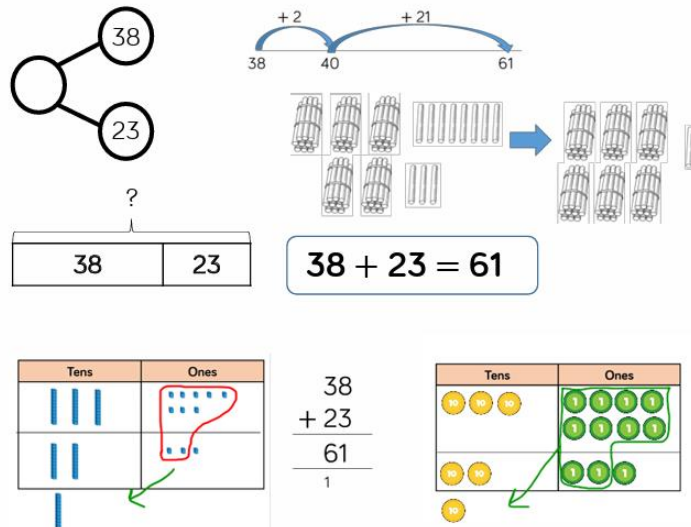
Year 2/3

Add 1-digit and 2-digit numbers to 100

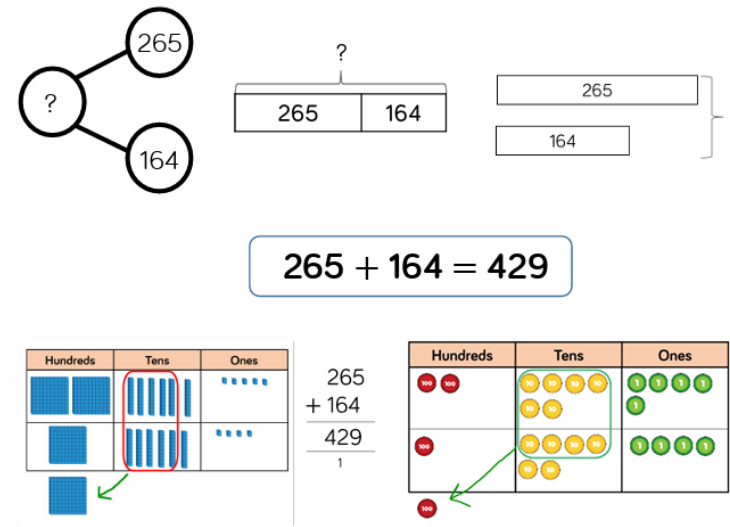
$38 + 5 = 43$

Year 2/3

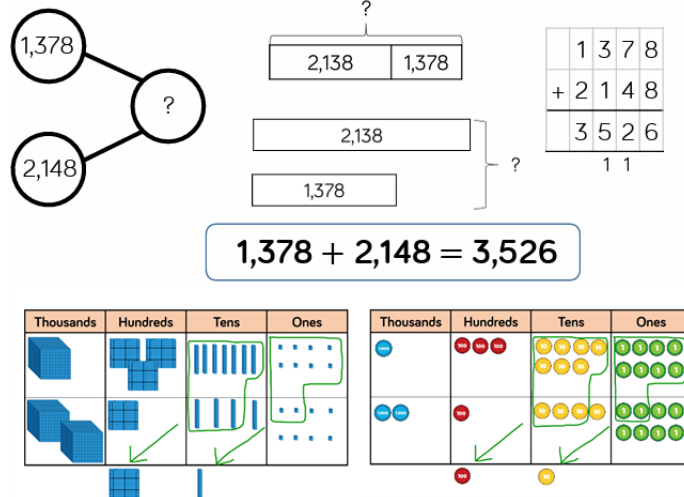
Add two 2-digit numbers to 100

**Year 3**

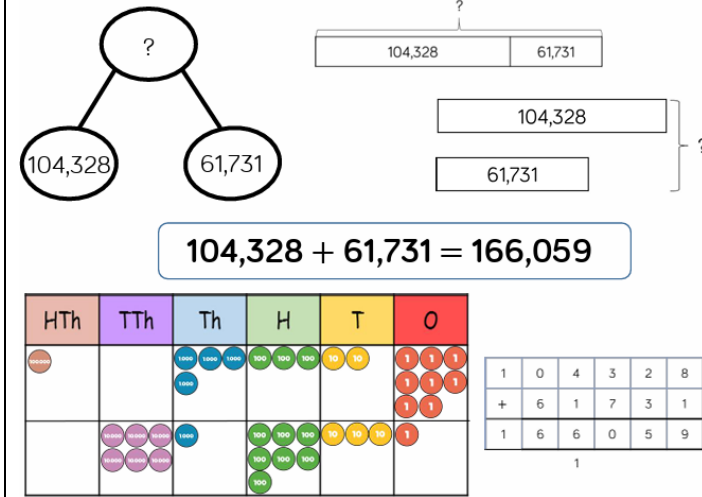
Add numbers with up to 3 digits

**Year 4**

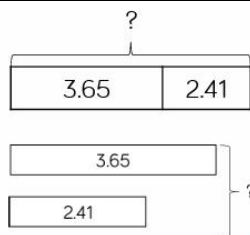
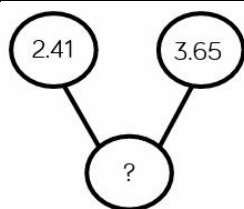
Add numbers with up to 4 digits

**Year 5/6**

Add numbers with more than 4 digits

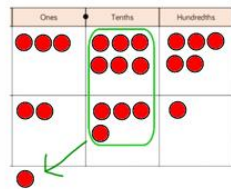
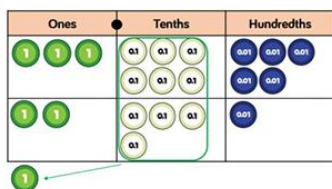
**Year 5**

Add with up to 3 decimal places



$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ 1 \end{array}$$

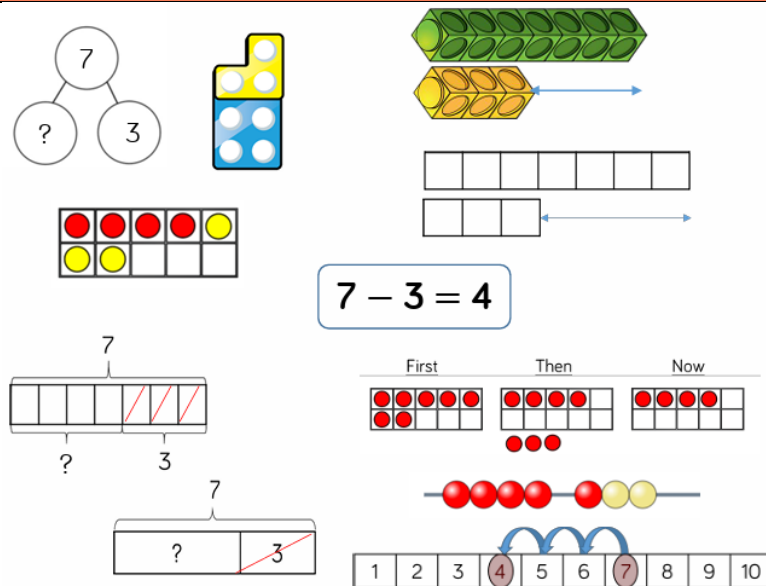
$$3.65 + 2.41 = 6.06$$



Subtraction

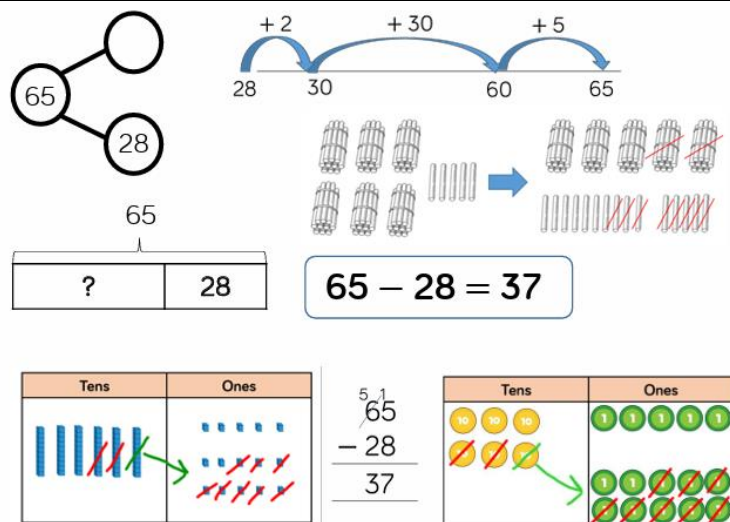
Year 1

Subtract 1-digit numbers within 10

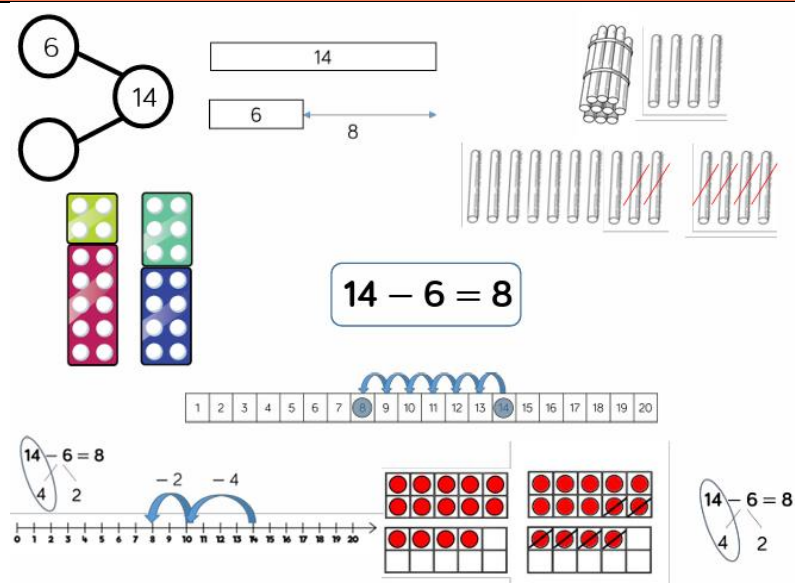


Year 2 /3

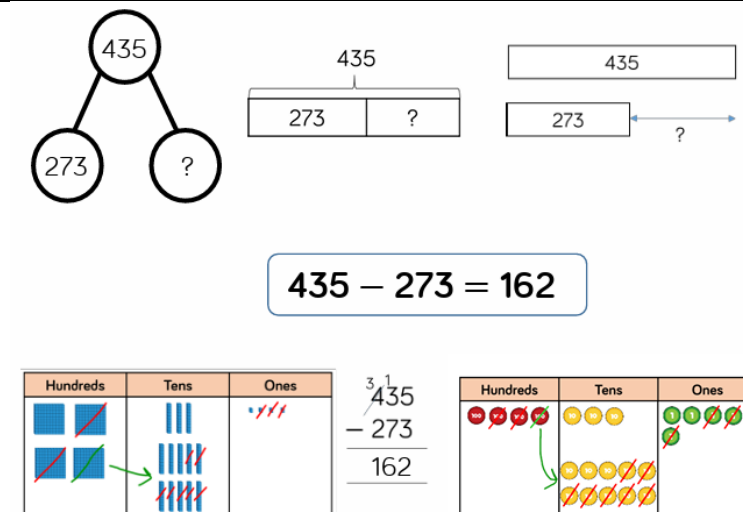
Subtract 1 and 2-digit numbers to 100

Year 1 / 2

Subtract 1 and 2-digit numbers to 20

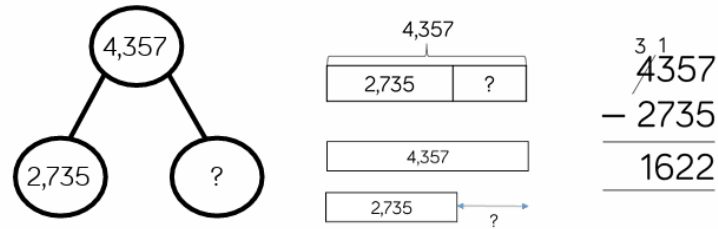
Year 3

Subtract numbers with up to 3 digits

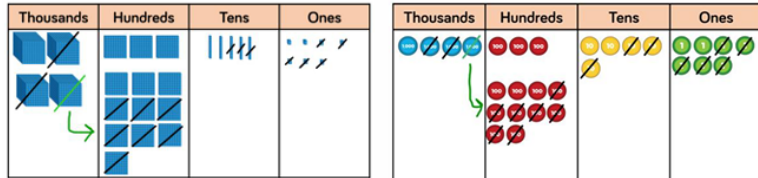


Year 4

Subtract numbers with up to 4 digits

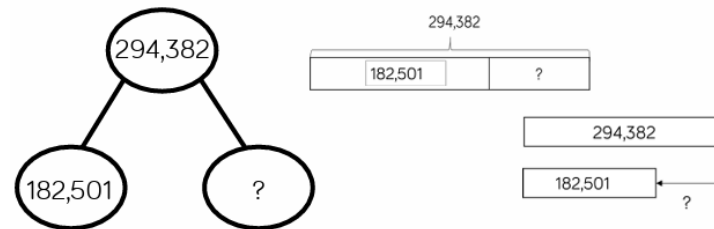


$$4,357 - 2,735 = 1,622$$

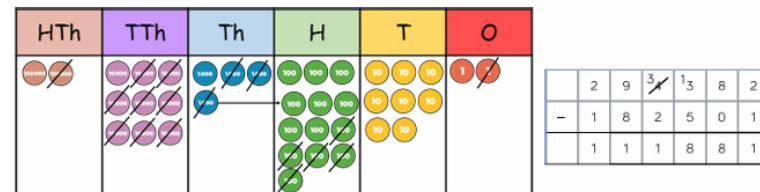


Year 5/6

Subtract numbers with more than 4 digits

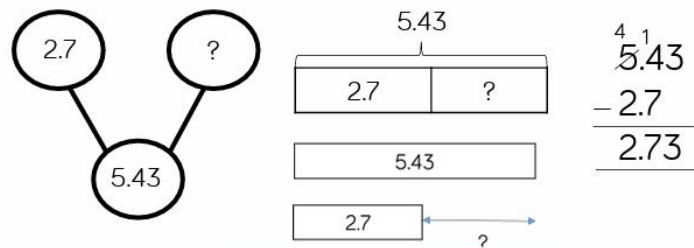


$$294,382 - 182,501 = 111,881$$

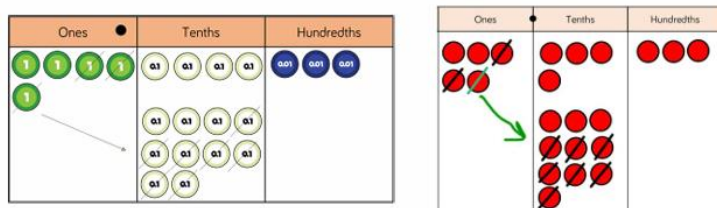


Year 5/6

Subtract with up to 3 decimal places



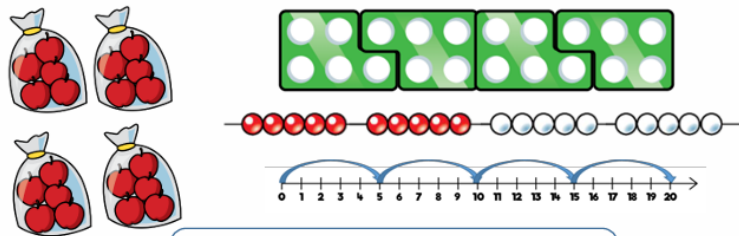
$$5.43 - 2.7 = 2.73$$



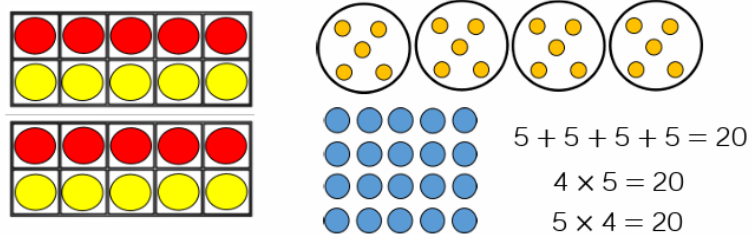
Multiplication

Year 1 /2

Solve 1-step problems using multiplication

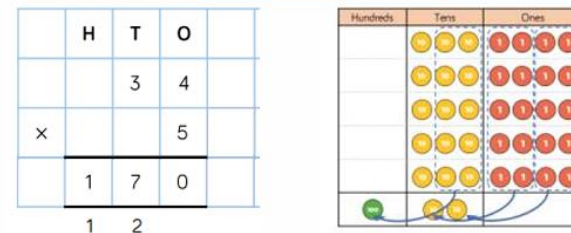
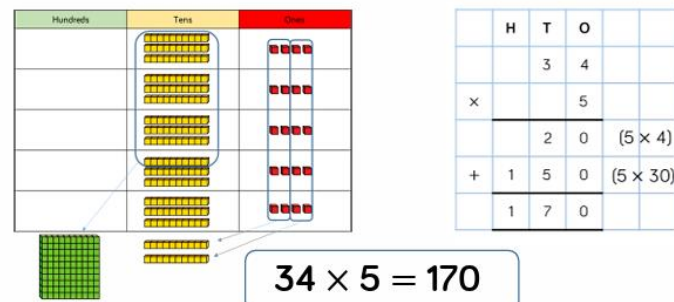


One bag holds 5 apples.
How many apples do 4 bags hold?



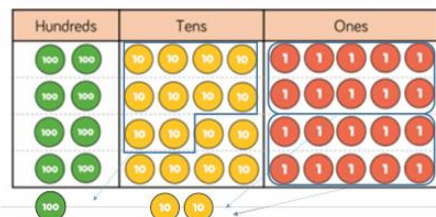
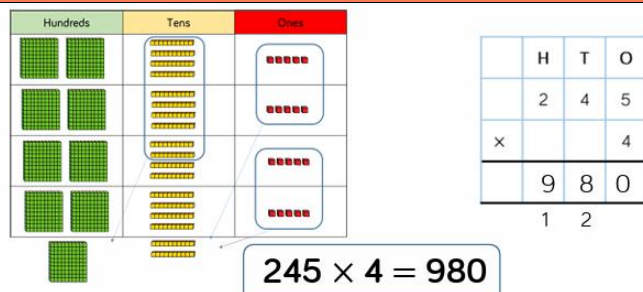
Year 3/4

Multiply 2-digit numbers by 1-digit numbers



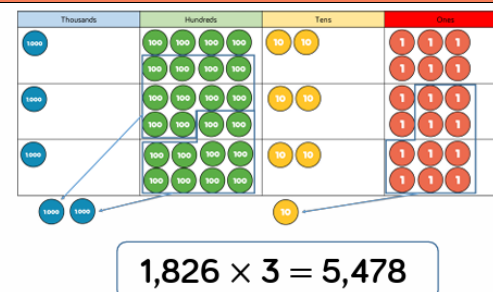
Year 4

Multiply 3-digit numbers by 1-digit numbers



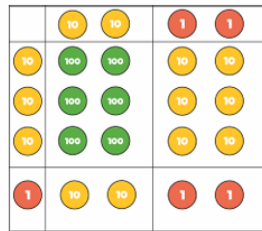
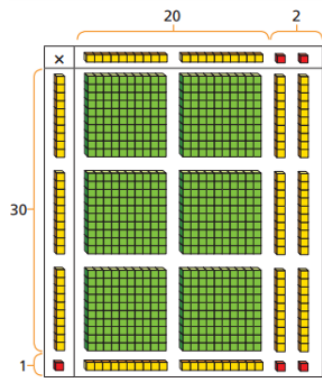
Year 5

Multiply 4-digit numbers by 1-digit numbers



Year 5

Multiply 2-digit numbers by 2-digit numbers

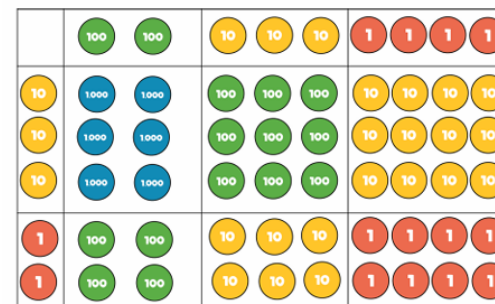


	H	T	O
		2	2
x		3	1
		2	2
	6	6	0
	6	8	2

$$22 \times 31 = 682$$

Year 5

Multiply 3-digit numbers by 2-digit numbers



Th	H	T	O
	2	3	4
x		3	2
	4	6	8
1 7	1 0	2	0
7	4	8	8

$$234 \times 32 = 7,488$$

Year 6

Multiply 4-digit numbers by 2-digit numbers

TTh	Th	H	T	O
	2	7	3	9
x			2	8
2	1	9	1	2
2	5	3	7	
5	4	7	8	0
1		1		
7	6	6	9	2

$$2,739 \times 28 = 76,692$$

Times Tables

Year	Number Fact
Year 2	Recall and use multiplication and division facts for the 2-times table
	Recall and use multiplication and division facts for the 5-times table
	Recall and use multiplication and division facts for the 10-times table
Year 3	Recall and use multiplication and division facts for the 3-times table
	Recall and use multiplication and division facts for the 4-times table
	Recall and use multiplication and division facts for the 8-times table
Year 4	Recall and use multiplication and division facts for the 6-times table
	Recall and use multiplication and division facts for the 7-times table
	Recall and use multiplication and division facts for the 9-times table
	Recall and use multiplication and division facts for the 11-times table
	Recall and use multiplication and division facts for the 12-times table
Year 5 / 6	Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts with growing fluency.

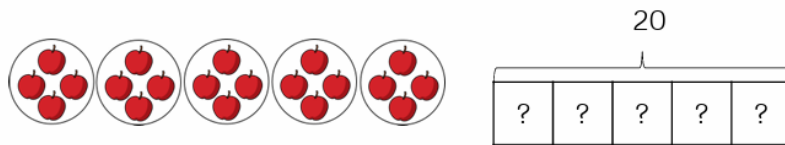
A variety of teaching methodologies will be used:

- Count pairs / groups of objects (5,10,3,4,6,etc)
- Count straws bundles in tens
- Sing counting songs
- Hundred square
- Number lines
- Pictorial representations on display
- Arrays with concrete resources
- Use of Big Maths resources and weekly Beat That relevant to the year group
- TimesTables Rockstars and supporting materials
- Times tables games

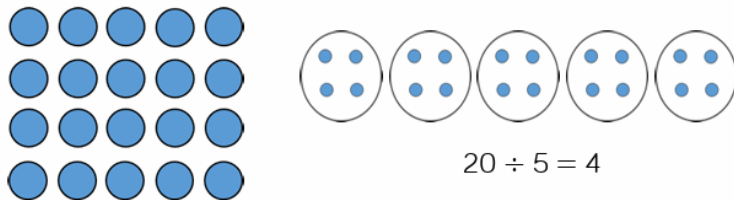
Division

Year 1 /2

Solve 1-step problems using multiplication (sharing)

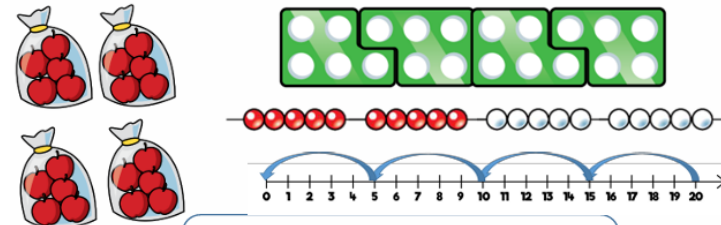


There are 20 apples altogether.
They are shared equally between 5 bags.
How many apples are in each bag?

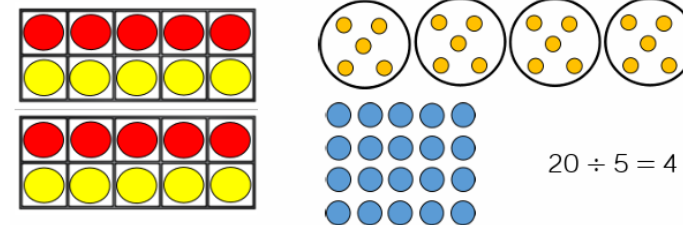


Year 1/2

Solve 1-step problems using division (grouping)

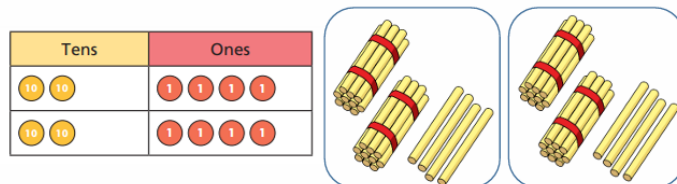


There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?

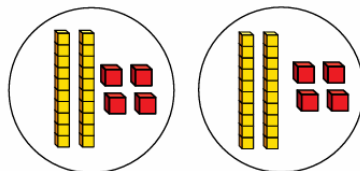
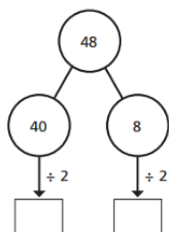


Year 3

Divide 2-digits by 1-digit (sharing with no exchange)

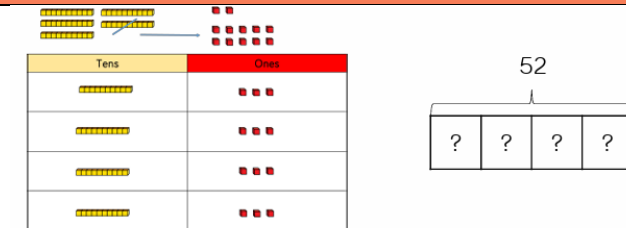


$$48 \div 2 = 24$$

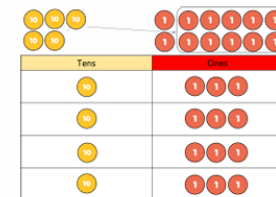
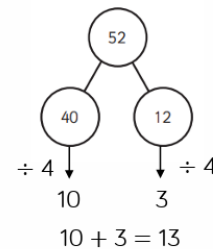


Year 3/4

Divide 2-digits by 1-digit (sharing with exchange)

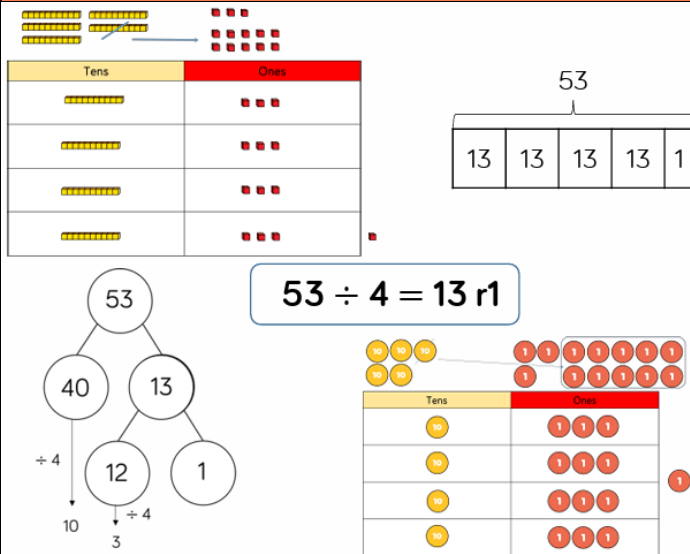


$$52 \div 4 = 13$$



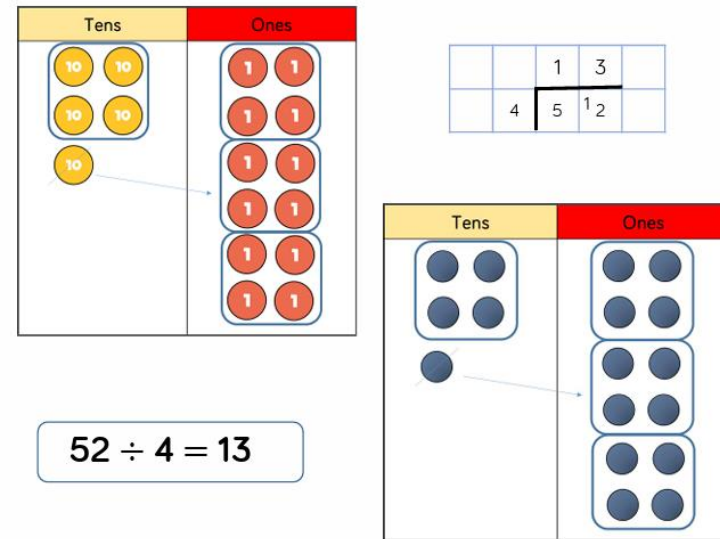
Year 3/4

Divide 2-digits by 1-digit (sharing with remainders)



Year 5

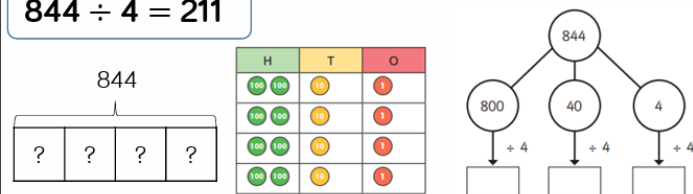
Divide 2-digits by 1-digit (grouping)



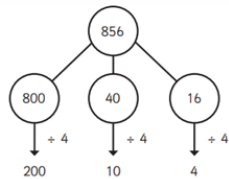
Year 4

Divide 3-digits by 1-digit (sharing)

$$844 \div 4 = 211$$

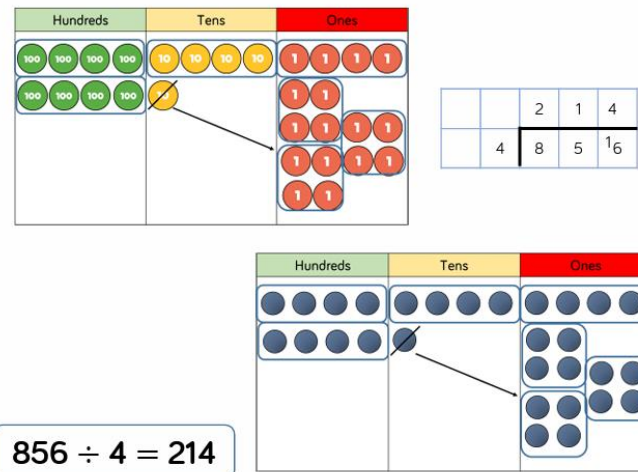


$$856 \div 4 = 214$$



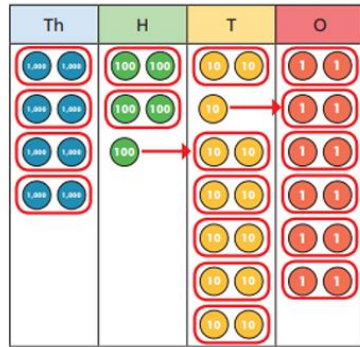
Year 5

Divide 3-digits by 1-digit (grouping)



Year 5

Divide 4-digits by 1-digit (grouping)



	4	2	6	6
2	8	5	13	12

$$8,532 \div 2 = 4,266$$

Year 6

Divide multi digits by 2-digits (short division)

		0	3	6
	12	4	43	72

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

		0	4	8	9
15	7	73	133	135	

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

Year 6

Divide multi digits by 2-digits (long division)

$$372 \div 15 = 24 \text{ r}12$$

			2	4	r	1	2
1	5	3	7	2			
	-	3	0	0			
			7	2			
	-		6	0			
			1	2			

- $1 \times 15 = 15$
- $2 \times 15 = 30$
- $3 \times 15 = 45$
- $4 \times 15 = 60$
- $5 \times 15 = 75$
- $10 \times 15 = 150$

			2	4	$\frac{4}{5}$
1	5	3	7	2	
	-	3	0	0	
			7	2	
	-		6	0	
			1	2	

$$372 \div 15 = 24 \frac{4}{5}$$

