



Trinity First School
Calculation Policy
2023



Flourishing together through
kindness, curiosity, respect, resilience and teamwork.



At Trinity First we believe that children should be introduced to the processes of calculation through practical, oral and mental activities. As children begin to understand the underlying ideas they develop ways of recording to support their thinking and calculation methods, use particular methods that apply to special cases, and learn to interpret and use the signs and symbols involved.

Please note that early learning in number and calculation in the Early Years Foundation Stage follows the 'Statutory framework for the early years foundation stage' (September 2021) document and this calculation policy is designed to build on progressively from the content and methods established in the Early Years.

Choosing the appropriate strategy, recording in mathematics and in calculation in particular is an important tool both for furthering the understanding of ideas and for communicating those ideas to others. A useful written method is one that helps children carry out a calculation and can be understood by others. Written methods are complementary to mental methods and should not be seen as separate from them. The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately and with confidence. It is important children acquire secure mental methods of calculation and efficient written methods of calculation for addition, subtraction, multiplication and division which they know they can rely on when mental methods are not appropriate. Throughout the school children are encouraged to follow a Concrete, Pictorial & Abstract (C.P.A.) approach to aid their calculation and deepen their understanding.

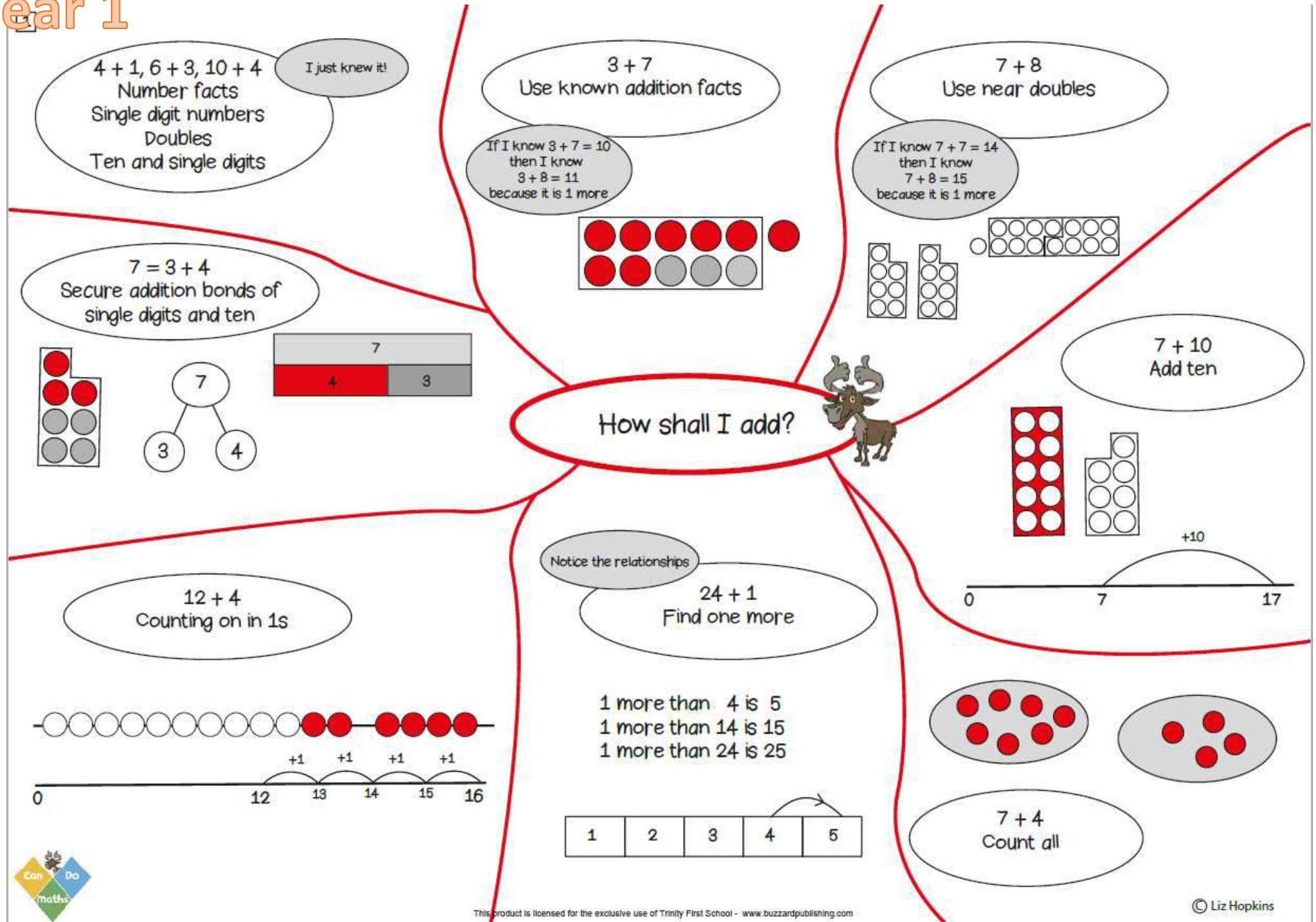
This document identifies progression in calculation strategies and whilst year groups are identified these are suggestions rather than a prescriptive method of what should be taught in a particular year group. Children should not be made to go onto the next stage if they are not ready or not confident to do so.

By the end of Year 4, children should be able to choose an appropriate approach to solve a problem: making a choice between using jottings (an extended written method), an efficient written method or a mental method.

This policy contains the key pencil and paper procedures that will be taught within our school alongside practical resources. It has been written to ensure consistency and progression throughout the school and reflects a whole school agreement.

ADDITION

Year 1



Year 2

How shall I add?

8 + 7, 9 + 9, 14 + 3
 Number facts
 Single digit numbers
 Doubles
 Teens and single digits

I just knew it!

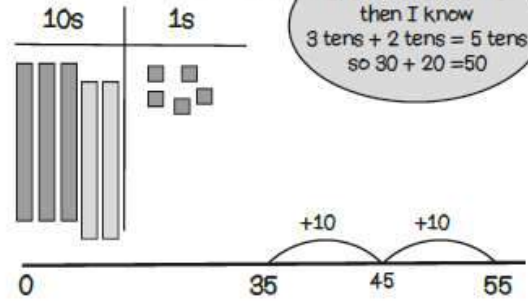
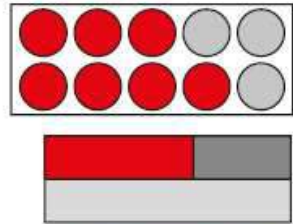
13 + 17
 Use known facts
 $30 + 70$

If I know $3 + 7 = 10$
 then I know
 $3 \text{ tens} + 7 \text{ tens} = 10 \text{ tens}$

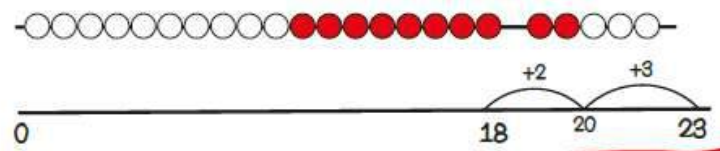
If I know $3 + 7 = 10$
 then I know
 $13 + 17$ is 2 tens more

35 + 20
 Add multiples of ten

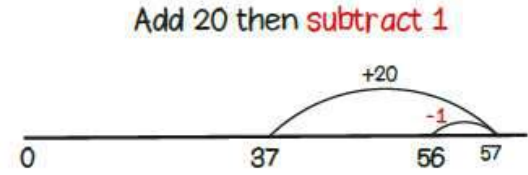
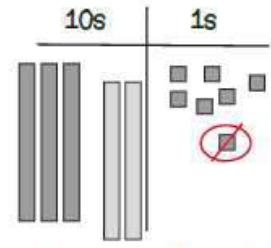
If I know $3 + 2 = 5$
 then I know
 $3 \text{ tens} + 2 \text{ tens} = 5 \text{ tens}$
 so $30 + 20 = 50$



5 + 18
 Greatest number first
 then bridge



37 + 19
 Round then adjust

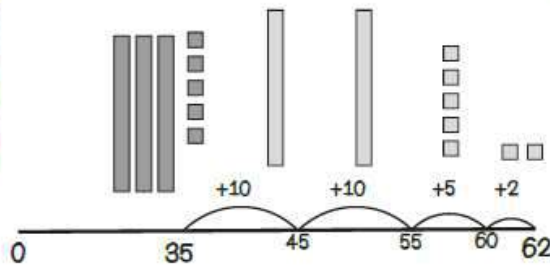
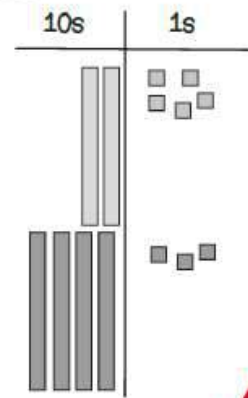


25 + 43
 Partition and recombine

$$25 + 43$$

$$(20 + 5) + (40 + 3)$$

$$(60 + 8) = 68$$



35 + 27
 Count on in tens then ones



Year 3

How shall I add?

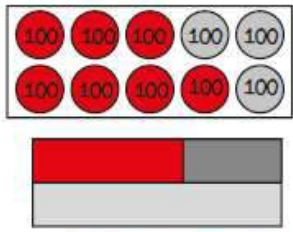
8 + 7, 9 + 9, 14 + 3
Number facts
Single digit numbers
Doubles
Tens to make 100

I just knew it!

243 + 7
Use known facts
300 + 700

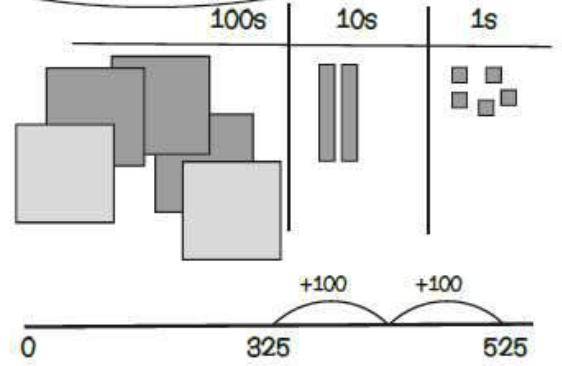
If I know 3 + 7 = 10
then I know
3 hundreds + 7 hundreds
= 10 hundreds

If I know 3 + 7 = 10
then I know
243 + 7 makes the
next multiple of 10

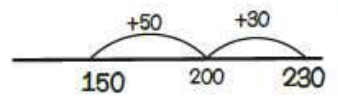
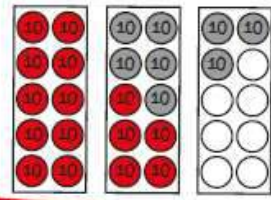


325 + 200
Add multiples of ten and hundred

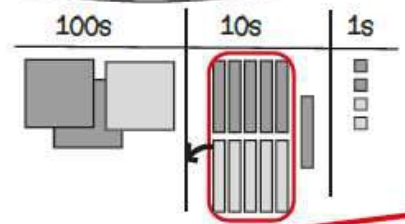
If I know 3 + 2 = 5
then I know
3 hundreds + 2 hundreds
= 5 hundreds



150 + 80
Bridging boundaries

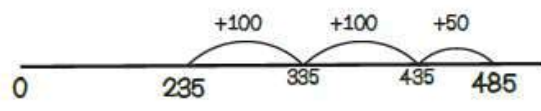
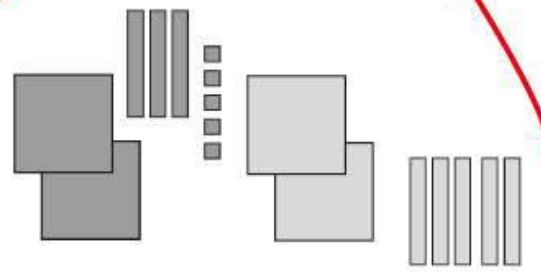


262 + 152
Formal written method

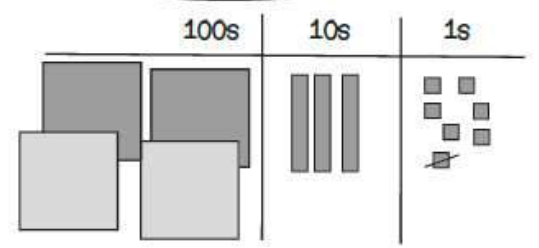


6 tens add 5 tens
= 11 tens or 110

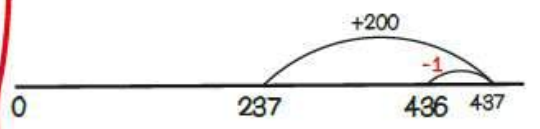
$$\begin{array}{r} 262 \\ + 152 \\ \hline 414 \\ \hline 1 \end{array}$$



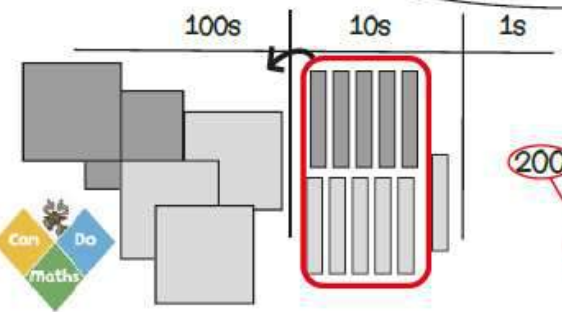
237 + 199
Round then adjust



Add 200 then subtract 1



250 + 360
Partition and recombine



$$\begin{array}{l} 200 + 50 + 300 + 60 \\ 500 + 110 = 610 \end{array}$$

235 + 250
Count on in hundreds then tens



Year 4

How shall I add?

0.9 + 0.9, 74 + 26
Number facts
Single digit decimals
Doubles
Bonds of 100

I just knew it!

7 + 8
Use known facts

If I know 7 + 8 = 15
then I know
0.7 + 0.8 = 1.5

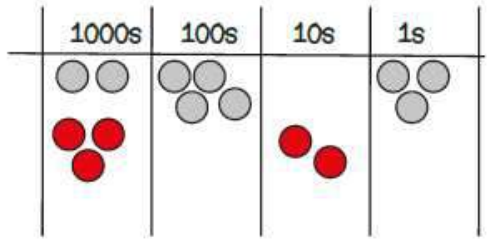
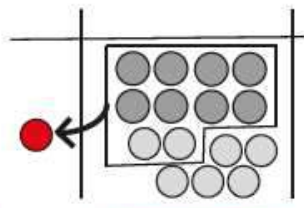
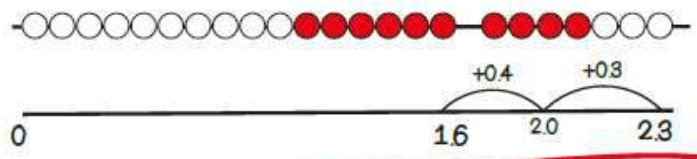
70 + 80 = 150
700 + 800 = 1,500

2,403 + 3,020
Use place value to add

If I know 2 + 3 = 5
then I know
2000 + 3000 = 5 000

I have noticed,
one number has no
hundreds or ones, the
other has no tens

1.6 + 0.7
Bridge through boundaries
by counting in efficient steps

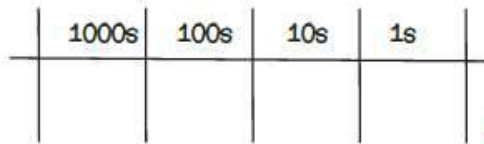


5,748 + 3,374
Formal written method

Exchange ten of these for one of those!

$$\begin{array}{r} 5,748 \\ + 3,374 \\ \hline 9,122 \\ \hline 1\ 1\ 1 \end{array}$$

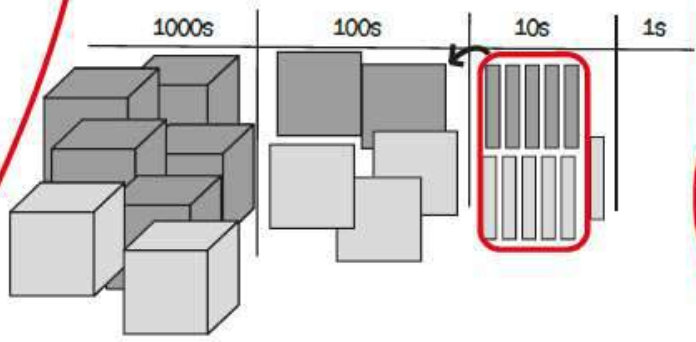
Regroup and rename



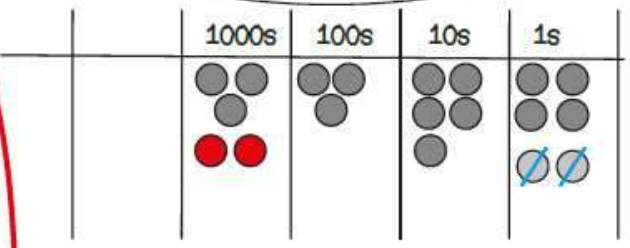
5,250 + 2,360
Partition and recombine

5000 + 200 + 50 + 2000 + 300 + 60

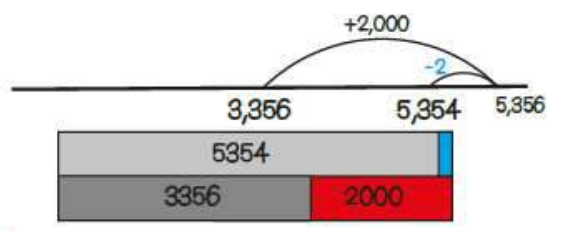
7000 + 500 + 110 = 7610



3,356 + 1,998
Round then adjust



Add 2,000 then take away 2



SUBTRACTION

Year 1

How shall I subtract?

5 - 1, 7 - 3, 10 - 6
Number facts
Single digit numbers
Teens subtract single digits

I just knew it!

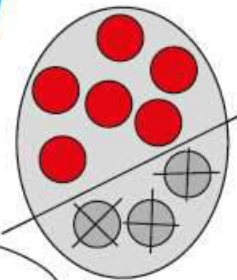
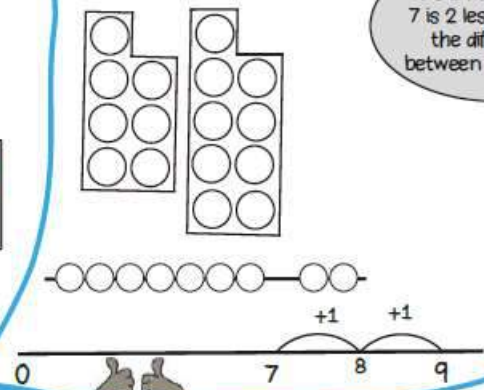
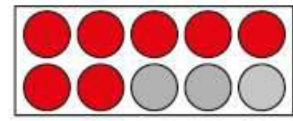
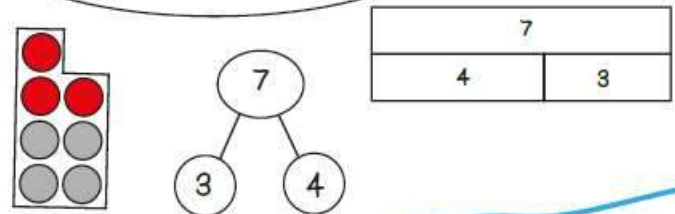
3 + 7
Use known addition facts
to derive subtraction facts

If I know 3 + 7 = 10
then I know
10 - 3 = 7

9 - 7
Find the difference between
two numbers

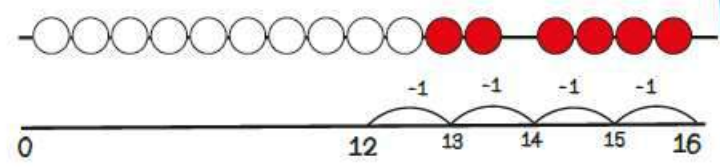
9 is 2 more than 7
7 is 2 less than 9 so
the difference
between 7 and 9 is 2

7 - 3 = 4
Secure subtraction facts of
single digits and ten



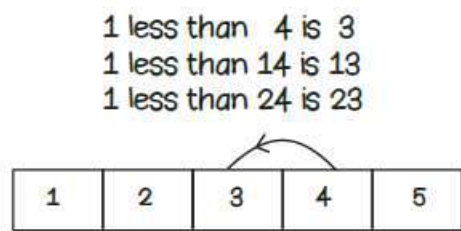
9 - 3
Take away

16 - 4
Counting back in 1s

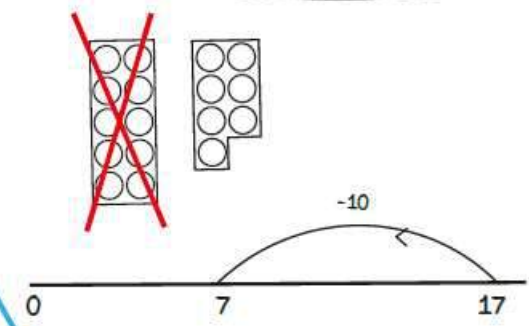


Notice the relationships

23 - 1
Find one less



17 - 10
Take away ten



Year 2

9 - 4, 13 - 5, 18 - 9
 Number facts
 Single digit numbers
 Halves
 Teens and single digits

I just knew it!

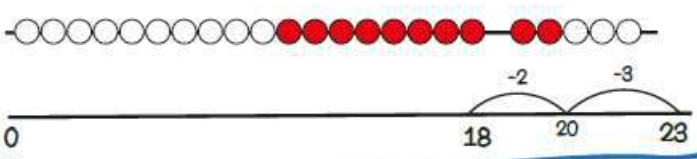
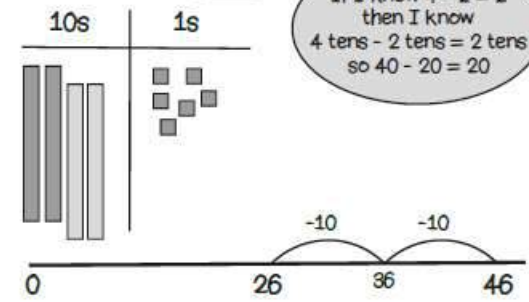
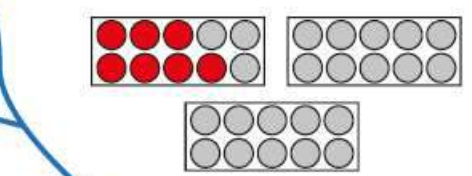
30 - 7
 Use known facts
 100 - 70

If I know 10 - 7 = 3
 then I know
 30 - 7 is 2 tens and 3

46 - 20
 Count back: multiples of ten

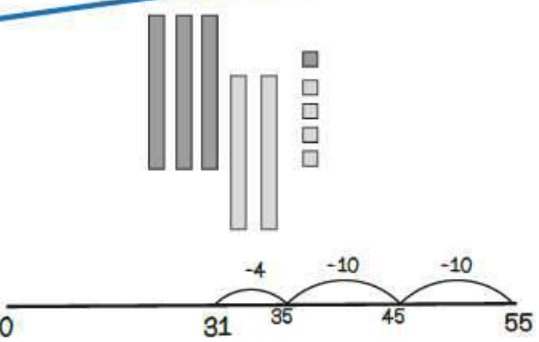
If I know 4 - 2 = 2
 then I know
 4 tens - 2 tens = 2 tens
 so 40 - 20 = 20

23 - 5
 Count back: bridge through
 a multiple of ten



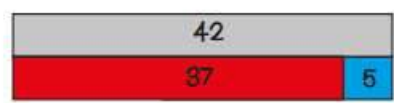
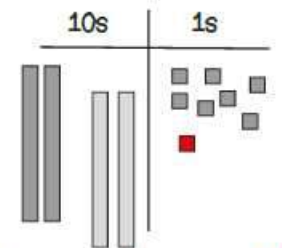
How shall I subtract?

47 - 19
 Round then adjust



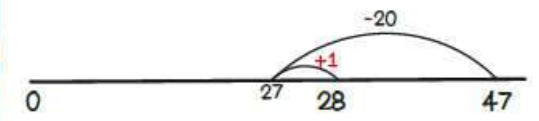
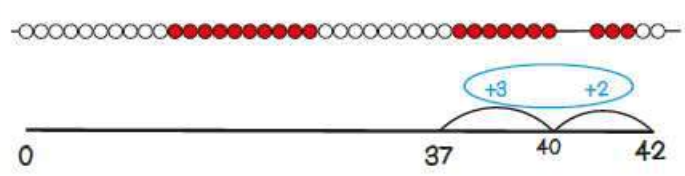
42 is 5 more than 37,
 37 is 5 less than 42 so
 the difference between
 37 and 42 is 5

42 - 37
 Find the difference between
 two numbers



Take away 20 then **add 1**

55 - 24
 Count back in tens then ones



Year 3

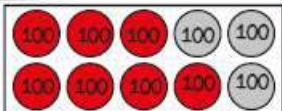
How shall I subtract?

15 - 8, 18 - 5
Number facts
Single digit numbers
Teens and single digits

I just knew it!

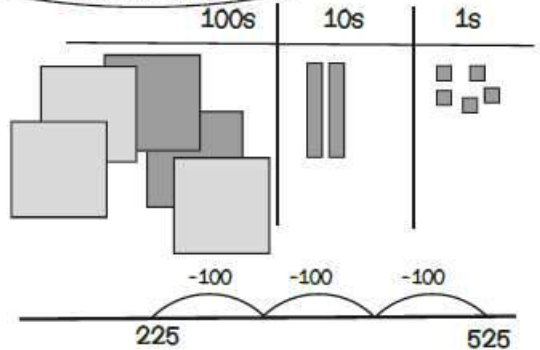
240 - 7
Use known facts
1000 - 700

If I know 10 - 7 = 3
then I know
10 hundreds - 7 hundreds
= 3 hundreds

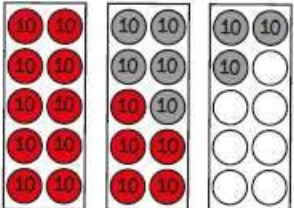


525 - 300
Take away multiples of ten
and a hundred


If I know 5 - 3 = 2
then I know
5 hundreds - 3 hundreds
= 2 hundreds



230 - 80
Bridging boundaries
by counting back in efficient steps




230 - 30 - 50 = 150

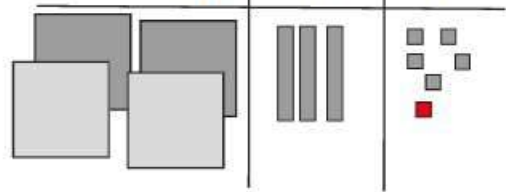


10 - 7 = 3

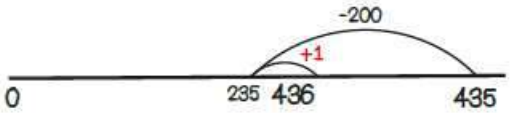
If I know 10 - 7 = 3
then I know
any multiple of 10,
take away 7 leaves
3 in the ones



435 - 199
Round then adjust



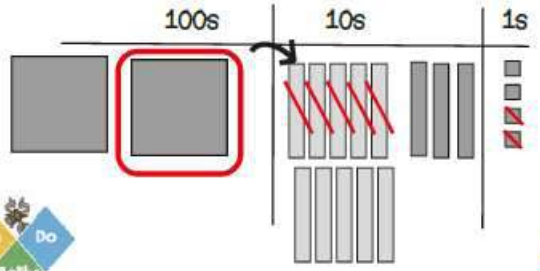
Take away 200 then **add 1**



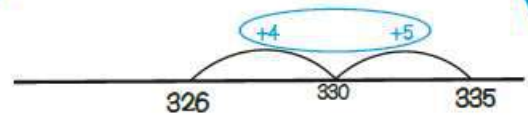
234 - 152
Formal written method

$$\begin{array}{r} 234 \\ -152 \\ \hline 182 \end{array}$$

234 = 100 + 130 + 4

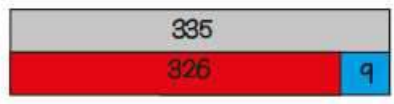


326 + 4 = 330 + 5 = 335




335 - 326
Find the difference
between two numbers

335 is 9 more than 326
326 is 9 less than 335
so the difference between
them is 9



Year 4

How shall I subtract?



13 - 5, 18 - 08
Number facts
Single digit numbers
Halves
Wholes and tenths

I just knew it!

15 - 8 = 7
Use known facts

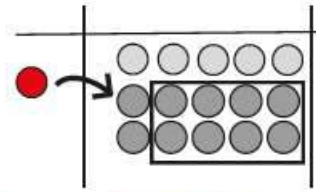
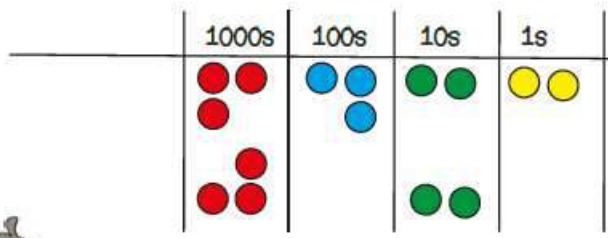
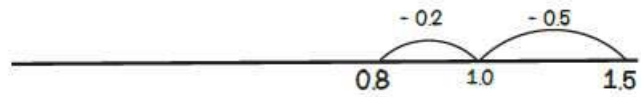
If I know 15 - 8 = 7
then I know
15 - 08 = 07

150 - 80 = 70
1500 - 800 = 700

6,342 - 3,020
Use place value to subtract

By using place value counters it is easy to see how to take away

15 - 0.7
Bridge through boundaries
by counting in efficient steps

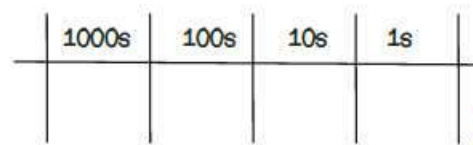


5,352 - 2,136
Formal written method

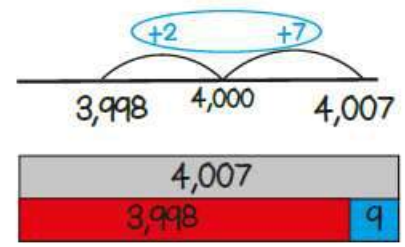
Exchange ten of these for one of those!

Regroup and rename

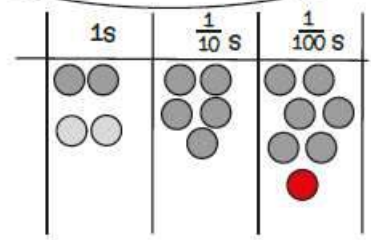
$$\begin{array}{r} 4 \quad 1 \quad 1 \quad 1 \\ 5,352 \\ - 2,136 \\ \hline 2,916 \end{array}$$



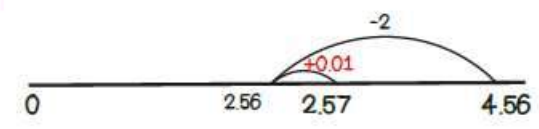
4007 - 3998
Find the difference between two numbers



4.56 - 1.99
Round then adjust



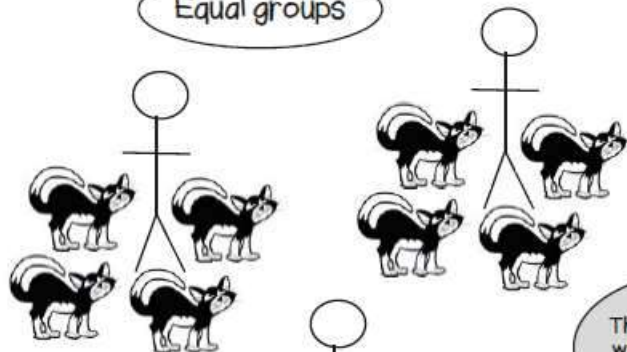
Take away 2 then add one hundredth



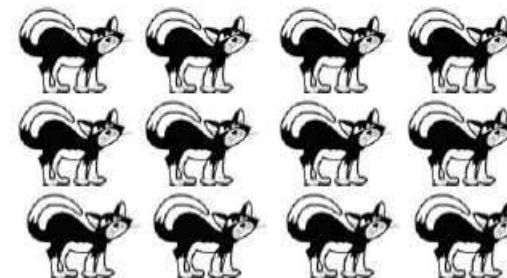
MULTIPLICATION

Year 1

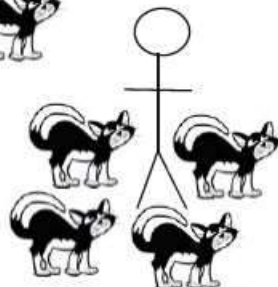
Equal groups



3 people each have 4 cats.
How many cats are there in total?

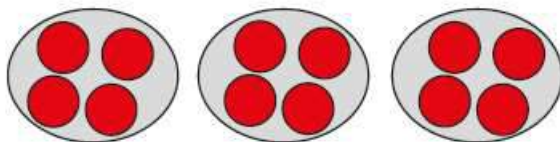


There are 3 groups with 4 cats in each group



Count in ones

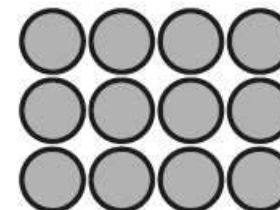
1,2,3,4,5,6,7,8,9,10,11,12



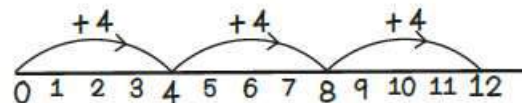
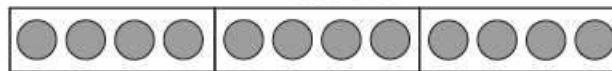
How shall I multiply?



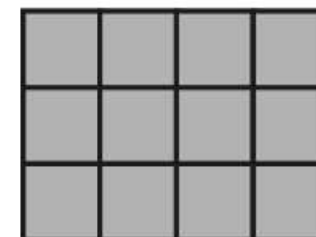
Arrays



Repeated addition



$$4 + 4 + 4 = 12$$

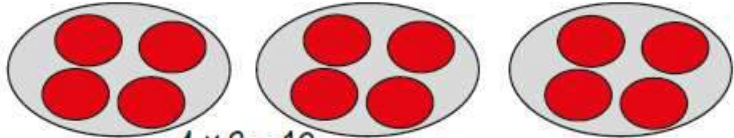


Equal groups

There are 3 groups with 4 cats in each group



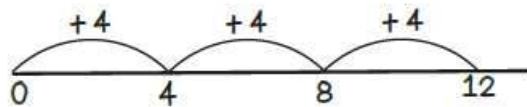
Four cats, multiplied by 3



$$4 \times 3 = 12$$



Repeated addition



$$4 + 4 + 4 = 12$$

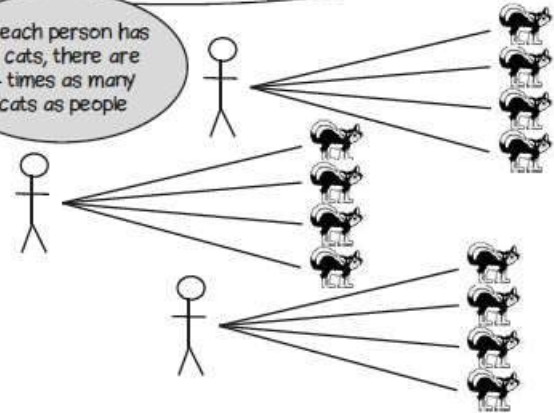
3 people each have 4 cats.
How many cats are there in total?

Recall of 2x, 5x and 10x tables

People	Cats
1	4
2	8
3	12

One to many correspondence

If each person has 4 cats, there are 4 times as many cats as people



How shall I multiply?

Count in ones

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

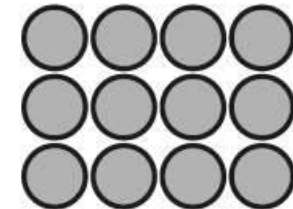
Count in twos

2, 4, 6, 8, 10, 12

Use a known fact

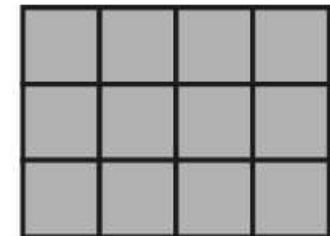
If 2×3 is 6, then
 4×3 is double 6.

Arrays



$$4 \times 3 = 12$$

$$3 \times 4 = 4 \times 3$$

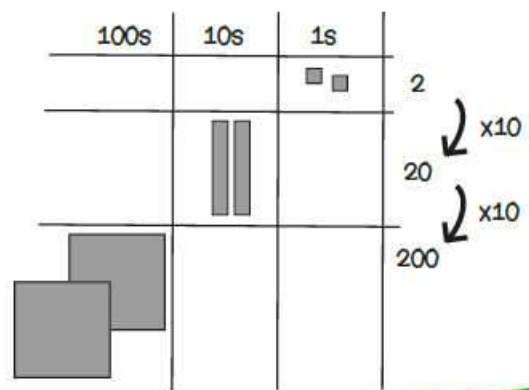


Year 3

How shall I multiply?

Rapid recall of
2x, 5x, 10x (year 2)
3x, 4x, 8x (year 3)
multiplication tables

Multiply by 10



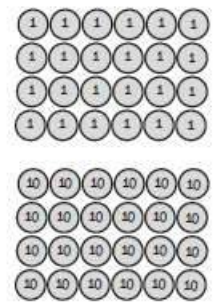
6 x 4
Use known facts
and place value

$$6 \times 4 = 24$$

$$60 \times 4 = 240$$

$$6 \times 40 = 240$$

40 is ten times
greater than 4

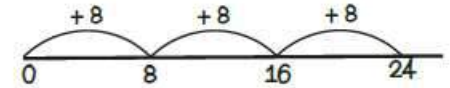
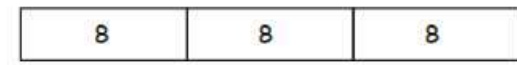
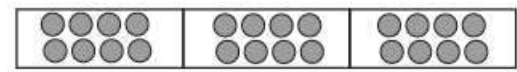


$$6 \times 10 \times 4$$

$$= 24 \times 10$$

8 x 3
Repeated addition

$$8 + 8 + 8 = 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$$



If I know 3 x 8
then I know 8 x 3

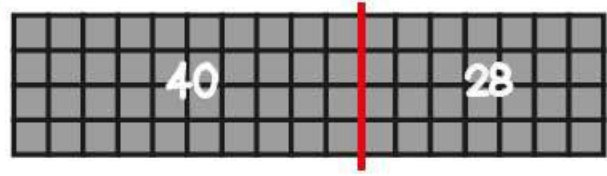
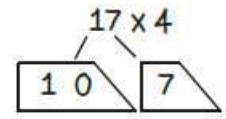
Arrays



17 x 4
Partition and recombine

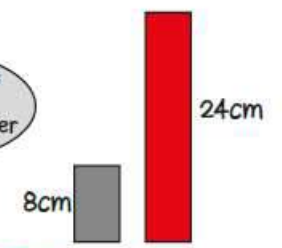
$$10 \times 4 + 7 \times 4$$

$$40 + 28 = 68$$



Scaling

The red tower is
3 times taller
than the grey tower



17 x 4
Formal written method

	10	7
4	40	28

$$\begin{array}{r} 17 \\ \times 4 \\ \hline 68 \\ \hline \end{array}$$

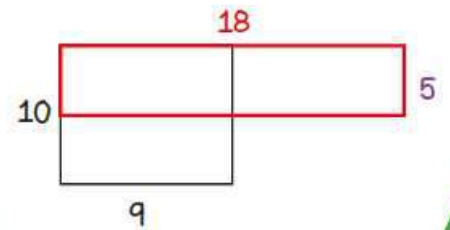
5 x 18
Double and halve

$$5 \times 18$$

$$= 5 \times 2 \times 18 \div 2$$

$$= 10 \times 9$$

$$= 90$$



Year 4

Known facts:
Rapid recall of all multiplication tables up to 12 x 12

6 x 4
Use known facts and place value

40 is ten times greater than 4

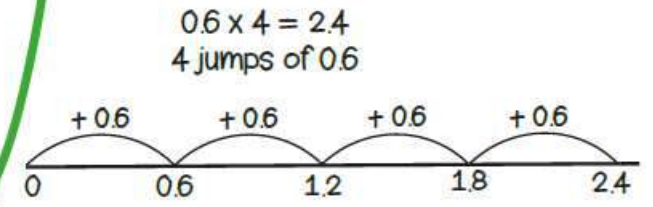
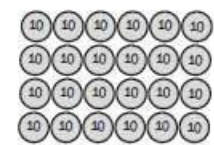
0.6 is ten times smaller than 6

6 x 4
Use known facts and place value

$$6 \times 4 = 24$$

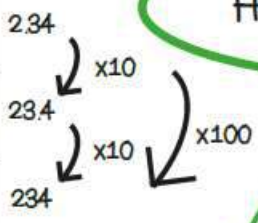
$$60 \times 4 = 240$$

$$60 \times 40 = 2400$$



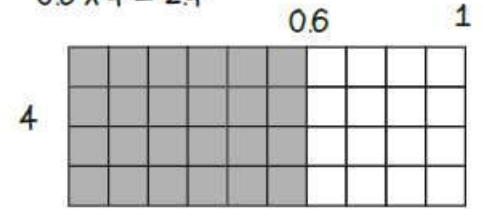
2.34 x 100
Multiply by 10, 100

1000s	100s	10s	1s	1/10 s	1/100 s
			● ●	● ● ● ●	● ● ● ●
		● ●	● ● ● ●	● ● ● ●	
● ●	● ●	● ● ● ●	● ● ● ●		



How shall I multiply?

0.6 x 4 = 24 tenths
0.6 x 4 = 2.4

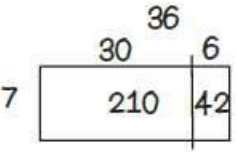


7 x 36
Use the distributive law

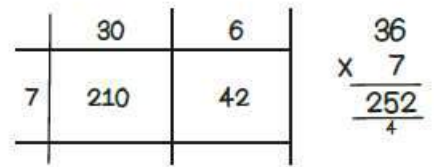
$$7 \times 36 = 7 \times 30 + 7 \times 6$$

$$= 210 + 42$$

$$= 252$$



36 x 7
Formal written method



45 x 6
Use factors and commutativity

Write as factors then re-order

$$2 \times (5 \times 6) = (2 \times 5) \times 6$$

$$2 \times 30 = 10 \times 6$$

$$45 \times 6 = 5 \times 9 \times 6$$

$$= 5 \times 6 \times 9$$

$$= 30 \times 9$$

$$= 270$$

236 x 7

200	30	6
x7	x7	x7
1400	210	42

$$1400 + 210 + 42 = 1652$$



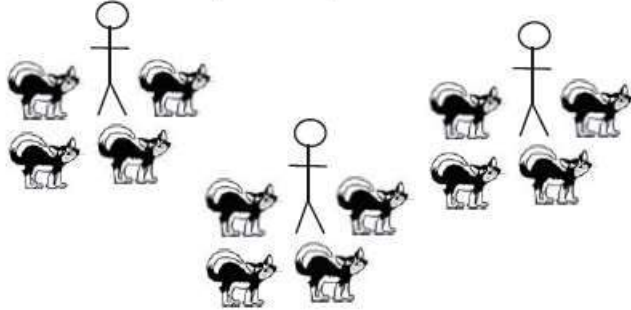
DIVISION

Year 1

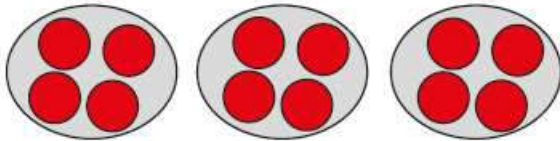
Sharing

12 shared into
3 equal groups

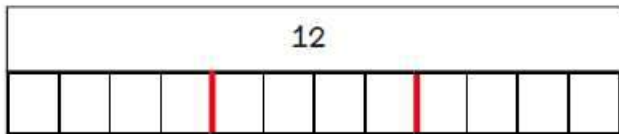
There are 12 cats.
Three people each have the same number of cats.
How many do they have each?



1 for you, 1 for you,
1 for you...



Bar model

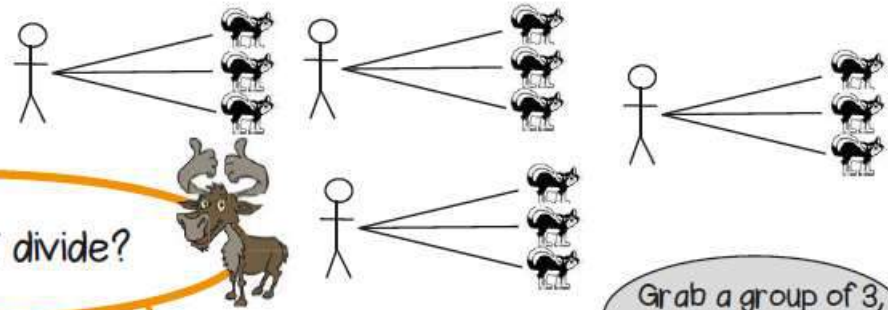


$$12 \div 3 = 4$$

Grouping

How many groups
of 3 are there in 12?

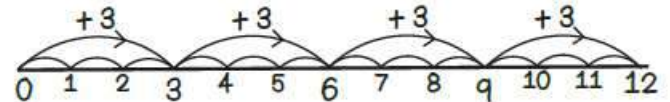
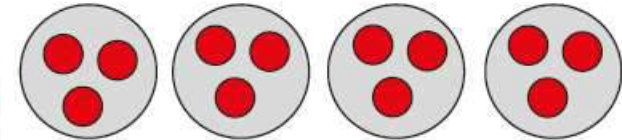
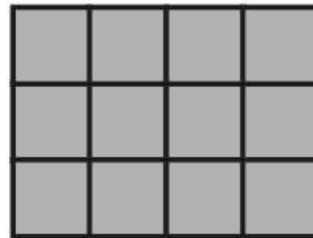
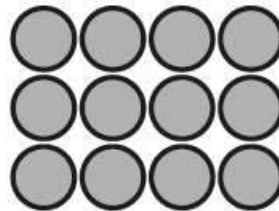
There are 12 cats.
Each person owns 3 cats.
How many people are there?



Grab a group of 3,
grab a group of 3...

How shall I divide?

12 can be described as
3 columns of 4
or 4 rows of three

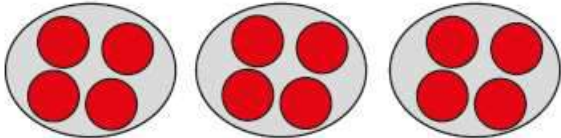


Year 2

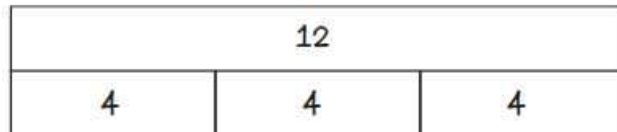
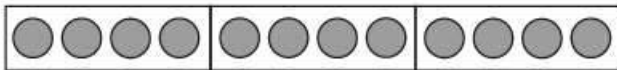
Sharing

12 shared into 3 equal groups

There are 12 cats.
Three people each have the same number of cats.
How many do they have each?



Bar model



Link to fractions.
One third of 12 is 4

$$12 \div 3 = 4$$

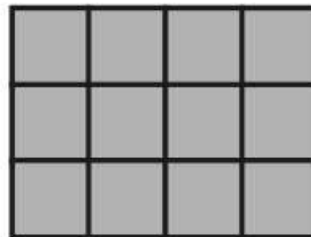
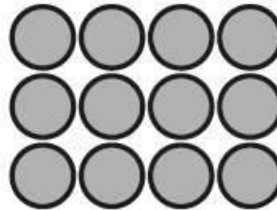
Recall and use 2x, 5x and 10x tables

1 for you, 1 for you,
1 for you...

Grab a group of 3,
grab a group of 3...

How shall I divide?

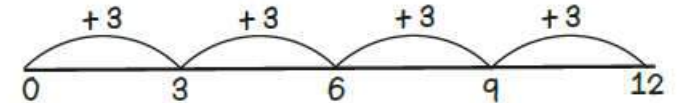
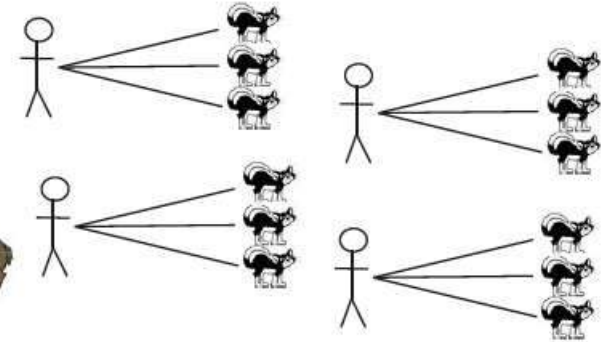
12 can be described as
3 columns of 4
or 4 rows of three



Grouping

How many groups of 3 are there in 12?

There are 12 cats.
Each person owns 3 cats.
How many people are there?



If I know $3 \times 4 = 12$
then I know $12 \div 3 = 4$



Year 3

How shall I divide?

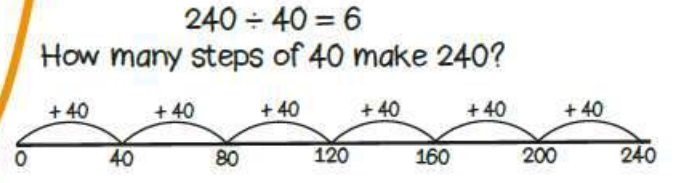
Known facts:
Use 2x, 5x, 10x (year 2)
3x, 4x, 8x (year 3)
multiplication tables to
derive division facts

$24 \div 4$
Use known facts
and place value

$24 \div 4 = 6$
 $240 \div 40 = 6$
 $240 \div 4 = 60$

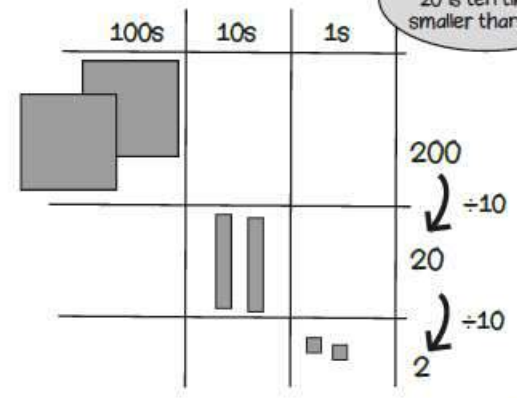
24 biscuits shared between
4 people means they will get
6 biscuits each.
If there are 10 times as many
people and 10 times as many
biscuits, how many biscuits
each now?

How many 40s
are there in 240?
 $240 \div 40$
Repeated addition



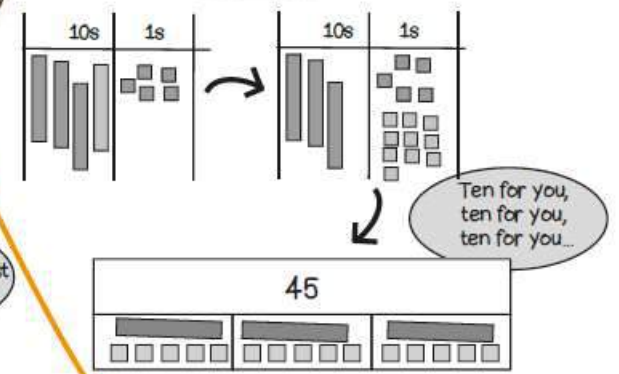
$200 \div 10$
Divide by 10

$200 \div 10 = 20$ so
20 is ten times
smaller than 200



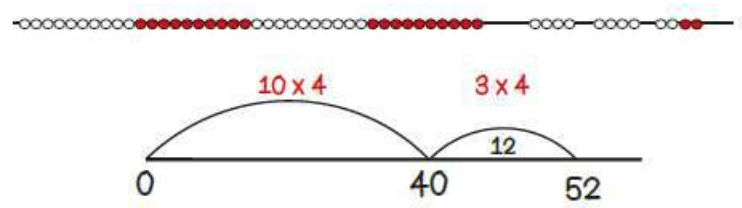
A tenth of \square is \square
A tenth of 1 is 1 tenth
so $1 \div 10 = \frac{1}{10}$

$45 \div 3$
Sharing equally



$52 \div 4$
Partition and recombine
ten lots and the rest

$52 \div 4$
40 12
÷ 4 ÷ 4
10 + 3 = 13



$42 \div 6$
Double and halve
If there are half as many
biscuits and half as many
people...
 $42 \div 6 = 21 \div 3$

42					
7	7	7	7	7	7
21					
7	7	7			

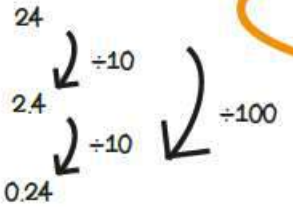
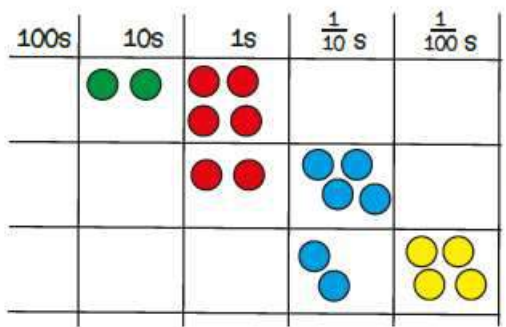
Link to fractions



Year 4

Known facts:
Use recall of all multiplication tables up to 12 x 12 to derive division facts

$24 \div 100$
Divide by 10, 100



$24 \div 4$
Use known facts and place value

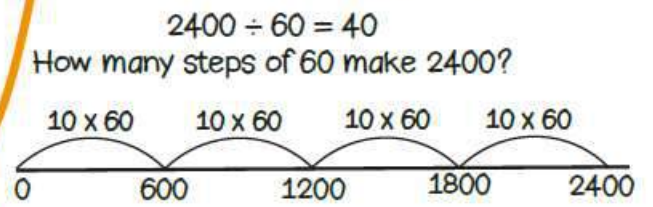
$24 \div 4 = 6$
 $240 \div 40 = 6$
 $2400 \div 400 = 6$

$2400 \div 400 = \frac{24 \times 100}{4 \times 100}$
 $\frac{24}{4} = 6$


240 is ten times greater than 24

24 biscuits shared between 4 people means they will get 6 biscuits each.
If there are 100 times as many people and 100 times as many biscuits, how many biscuits each now?

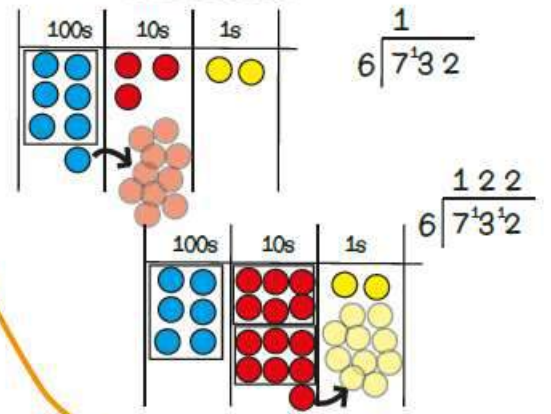
$2400 \div 60$
Use known facts and place value



How shall I divide?



$732 \div 6$
Formal written method



$516 \div 12$
Using factors

$516 \div 3 \div 4$

516											
172				172				172			
43	43	43	43								

$496 \div 8$
Partition and recombine

$496 \div 8$

480	16	
÷ 8	÷ 8	
60	+ 2	= 62

