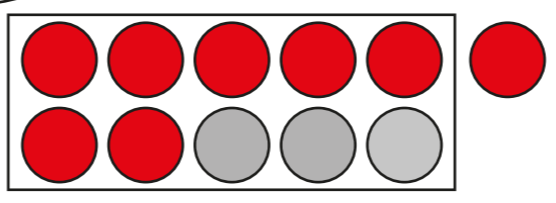**4 + 1, 6 + 3, 10 + 4**
Number facts
Single digit numbers
Doubles
Ten and single digits

I just knew it!
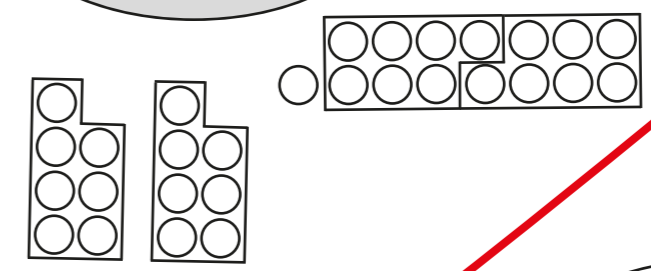
3 + 7
Use known addition facts

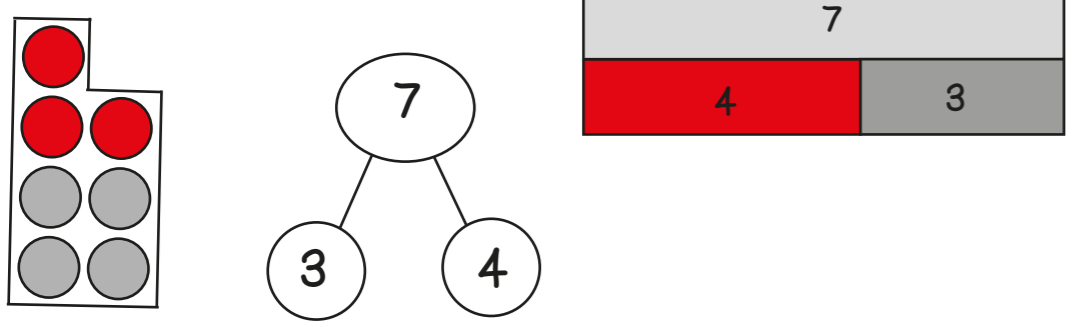If I know 3 + 7 = 10
then I know
3 + 8 = 11
because it is 1 more

7 + 8
Use near doubles

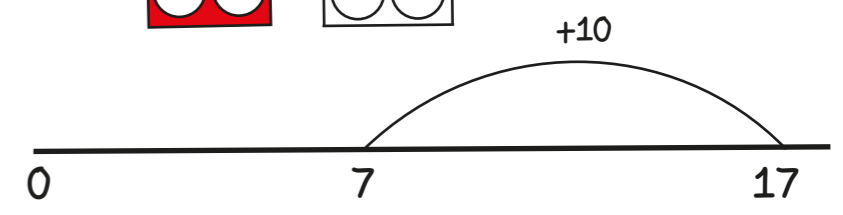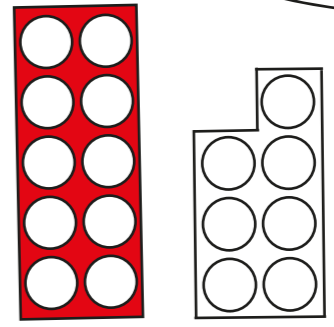If I know 7 + 7 = 14
then I know
7 + 8 = 15
because it is 1 more

7 = 3 + 4
Secure addition bonds of
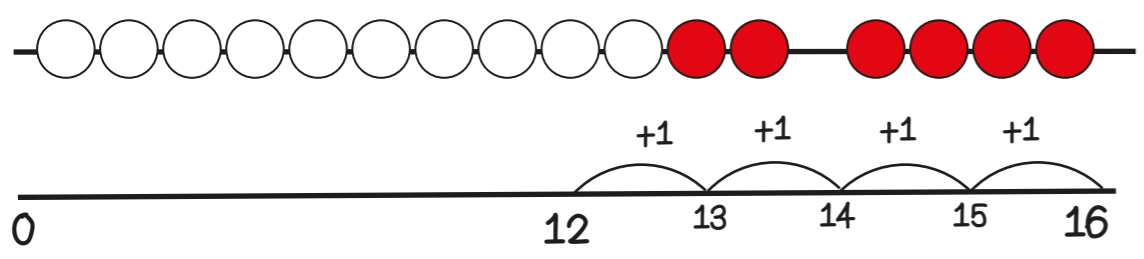single digits and ten

7

7

3   4

7	
4	3

How shall I add?

7 + 10
Add ten

+10

0   7   17

12 + 4
Counting on in 1s

+1   +1   +1   +1

0   12   13   14   15   16

Notice the relationships

24 + 1
Find one more

1 more than 4 is 5
1 more than 14 is 15
1 more than 24 is 25

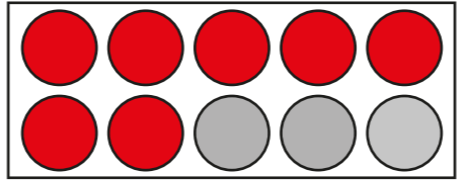| 1	2	3	4	5

7 + 4
Count all

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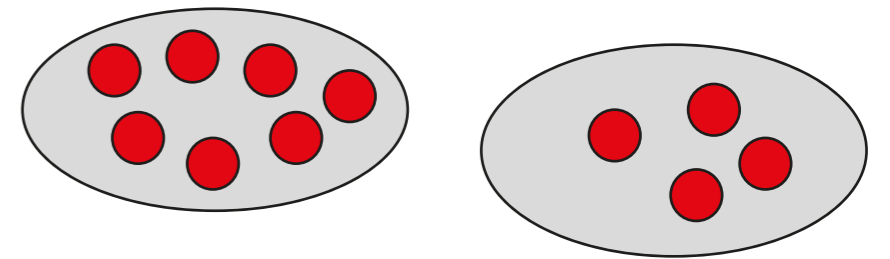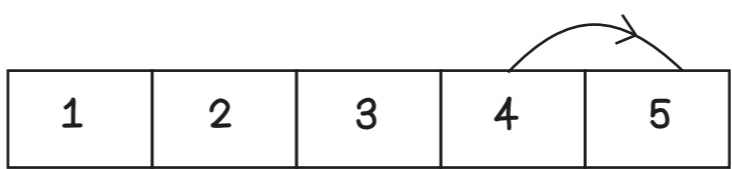
5 - 1, 7 - 3, 10 - 6
Number facts
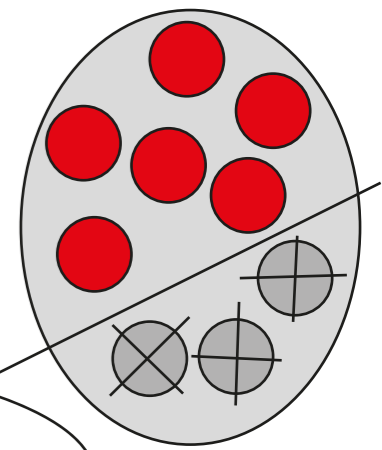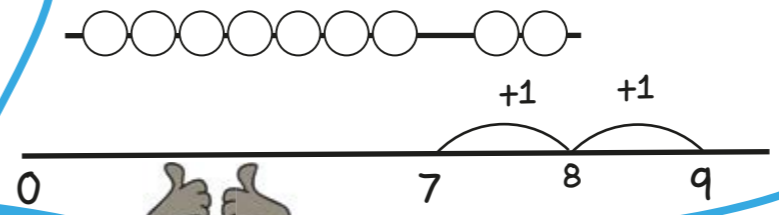Single digit numbers
Teens subtract single digits

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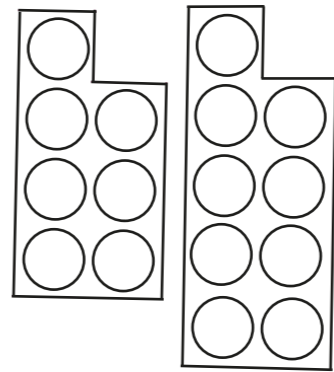
7 - 3 = 4
Secure subtraction facts of
single digits and ten

7	
4	3

7
3 4

+1 +1

0 7 8 9
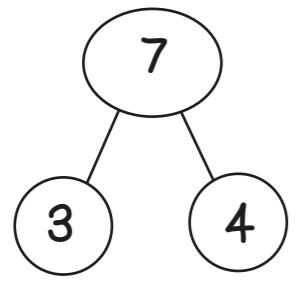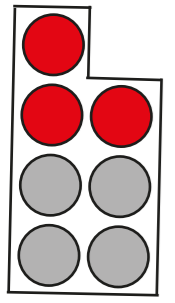
How shall I subtract?

9 - 3
Take away
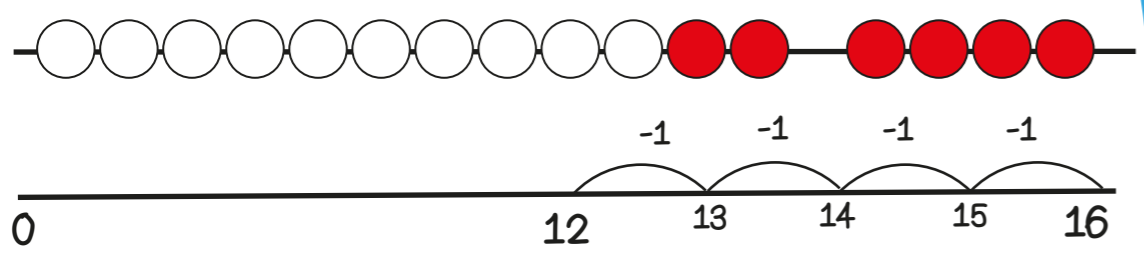
Notice the relationships

23 - 1
Find one less

16 - 4
Counting back in 1s

-1 -1 -1 -1

0 12 13 14 15 16

1 less than 4 is 3
1 less than 14 is 13
1 less than 24 is 23

1	2	3	4	5

17 - 10
Take away ten

-10

0 7 17
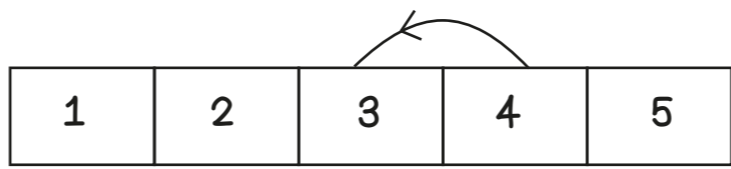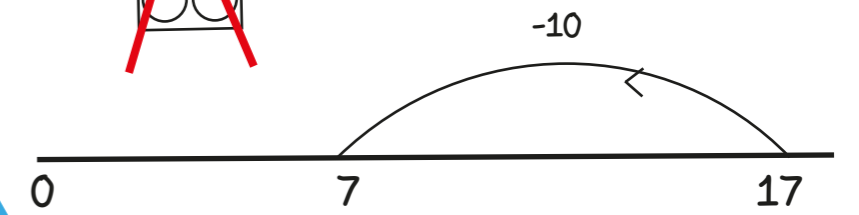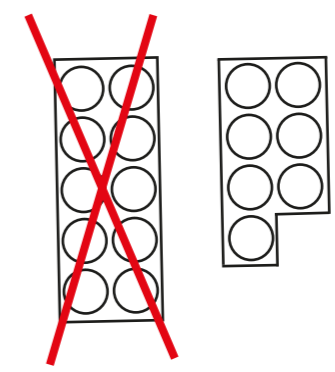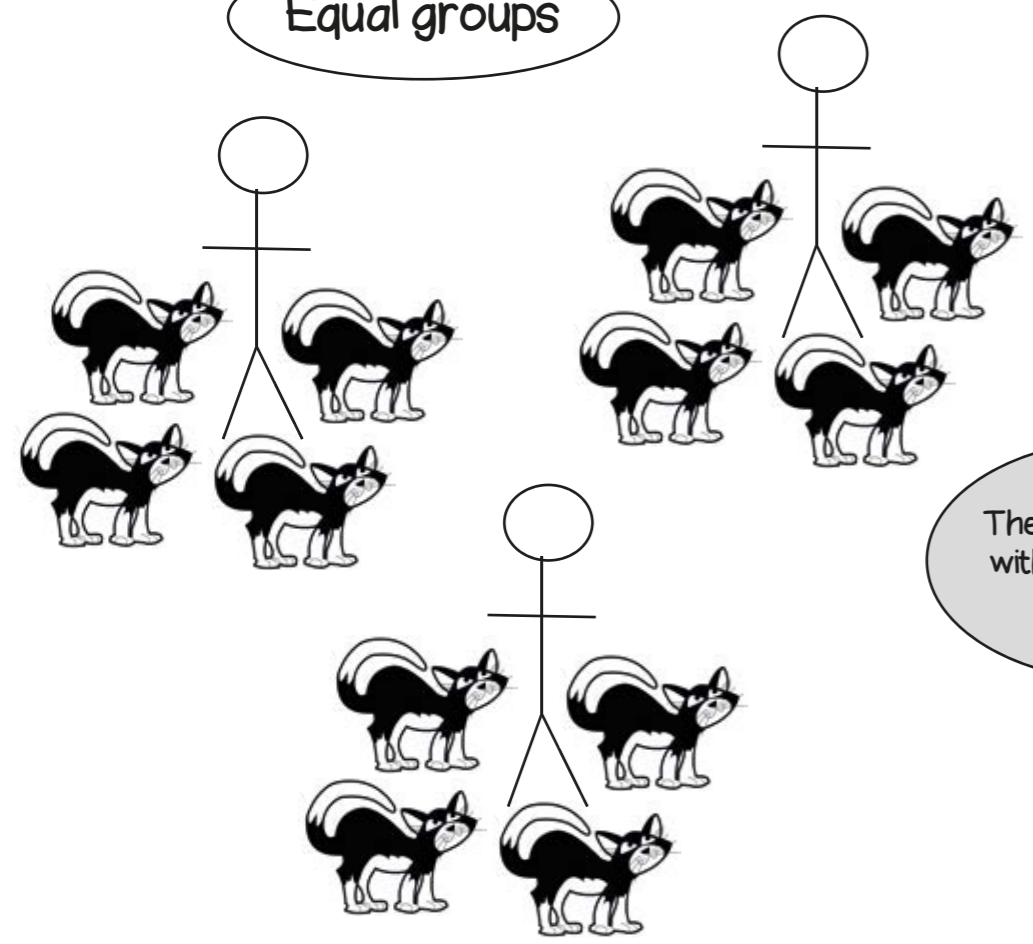
Equal groups

3 people each have 4 cats. How many cats are there in total?
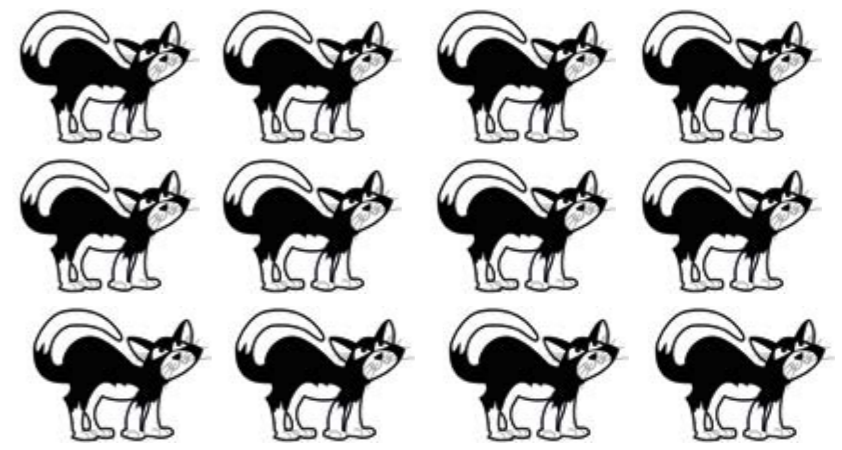
There are 3 groups with 4 cats in each group

Arrays

How shall I multiply?

Count in ones

1,2,3,**4**,5,6,7,**8**,9,10,11,**12**
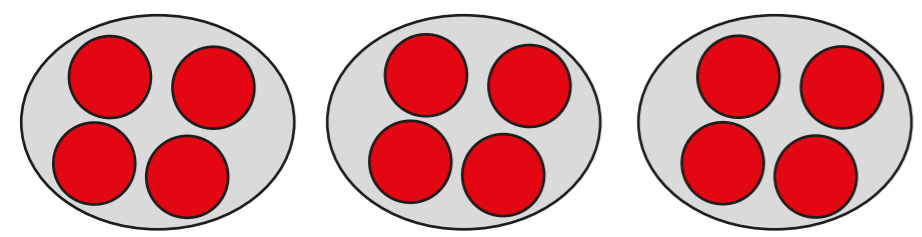
Repeated addition
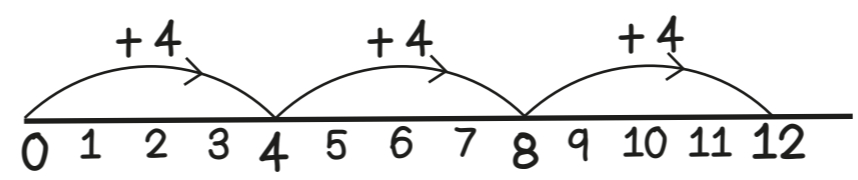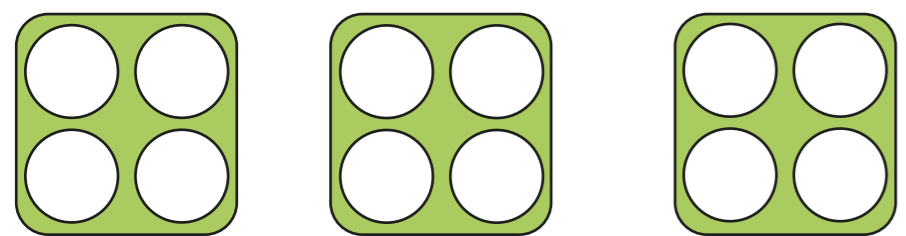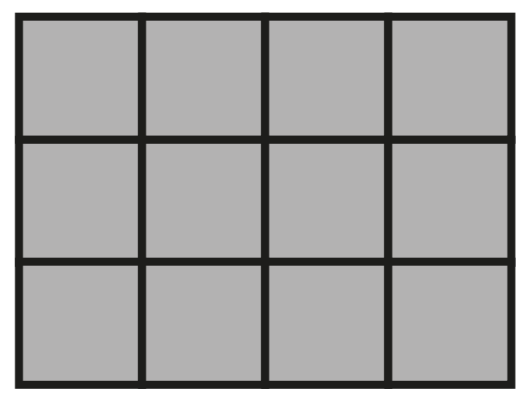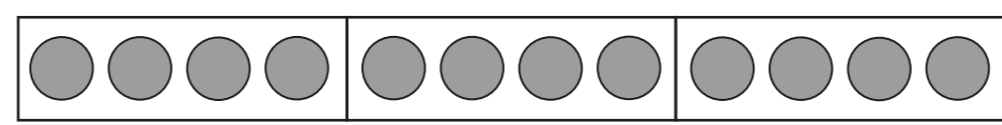
+4   +4   +4

0 1 2 3 4 5 6 7 8 9 10 11 12

4 + 4 + 4 = 12

Sharing

12 shared into 3 equal groups

$$12 \div 3 = 4$$

Grouping

How many groups of 3 are there in 12?

There are 12 cats.
Three people each have the same number of cats.
How many do they have each?
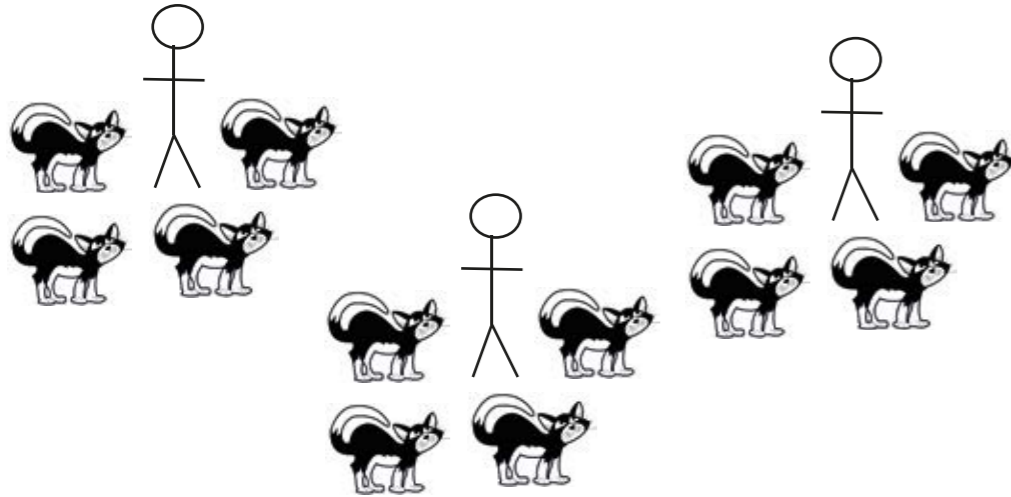
There are 12 cats.
Each person owns 3 cats.
How many people are there?

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

How shall I divide?

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

Bar model

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

12

+3   +3   +3   +3
0 1 2 3 4 5 6 7 8 9 10 11 12
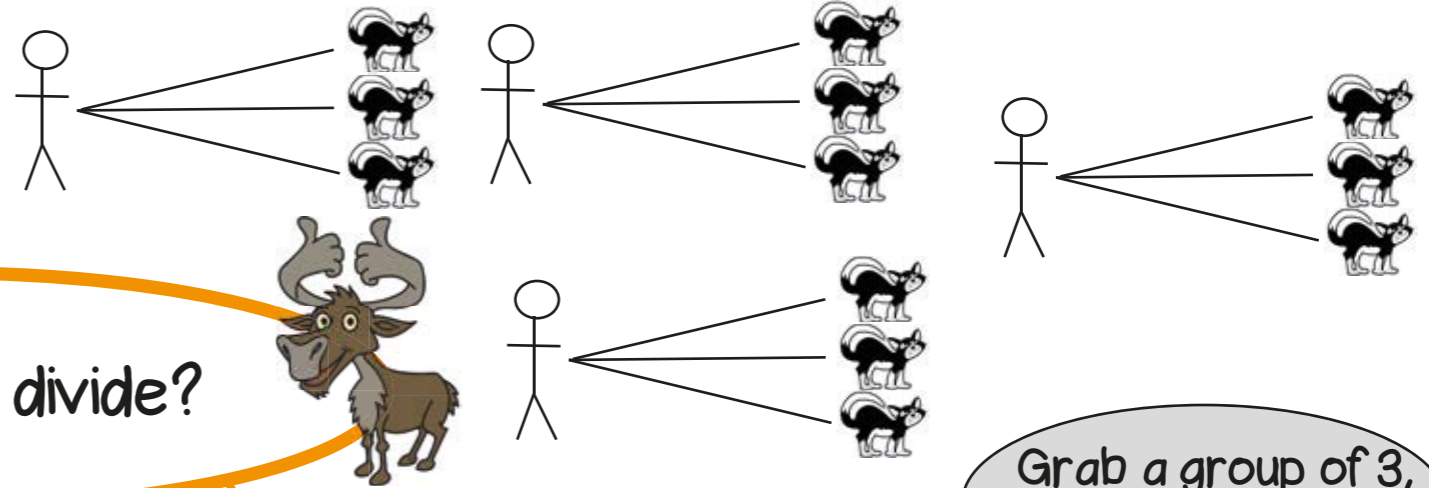
How shall I add?
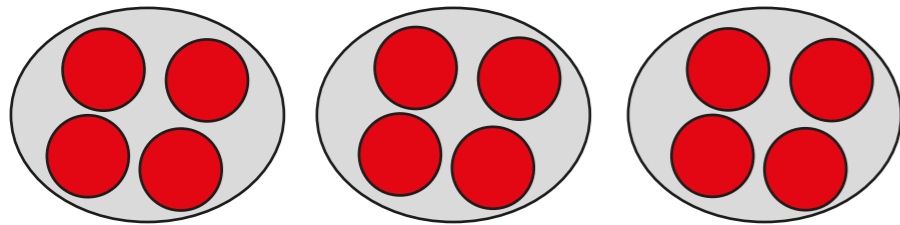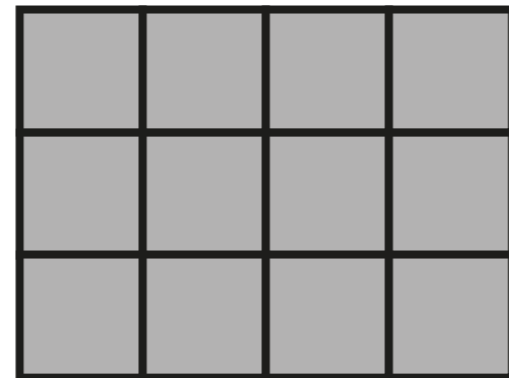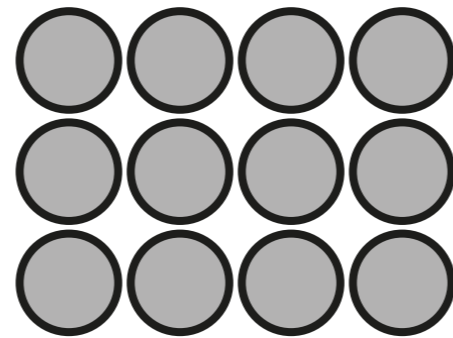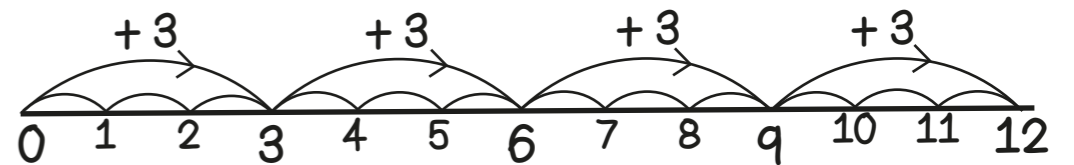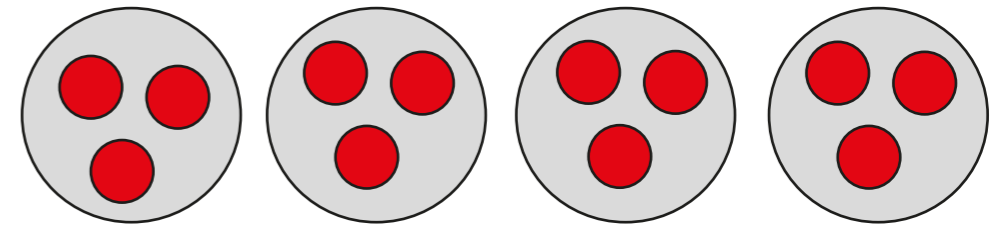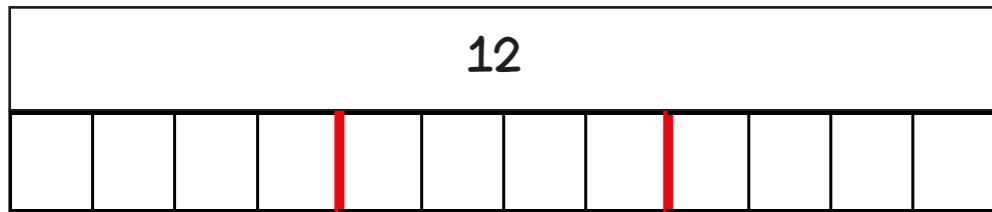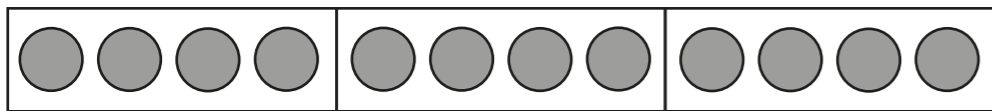
8 + 7, 9 + 9, 14 + 3
Number facts
Single digit numbers
Doubles
Teens and single digits

I just knew it!

13 + 17
Use known facts
30 + 70

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

If I know 3 + 7 = 10
then I know
13 + 17 is 2 tens more
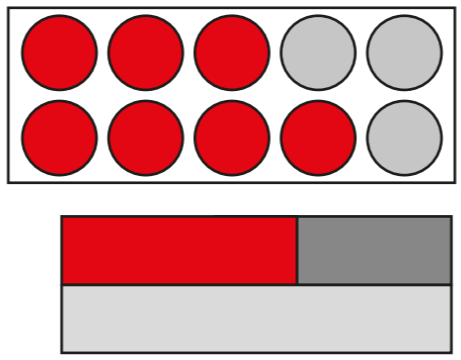
35 + 20
Add multiples of ten

10s   1s

If I know 3 + 2 = 5
then I know
3 tens + 2 tens = 5 tens
so 30 + 20 =50

+10   +10
0   35   45   55
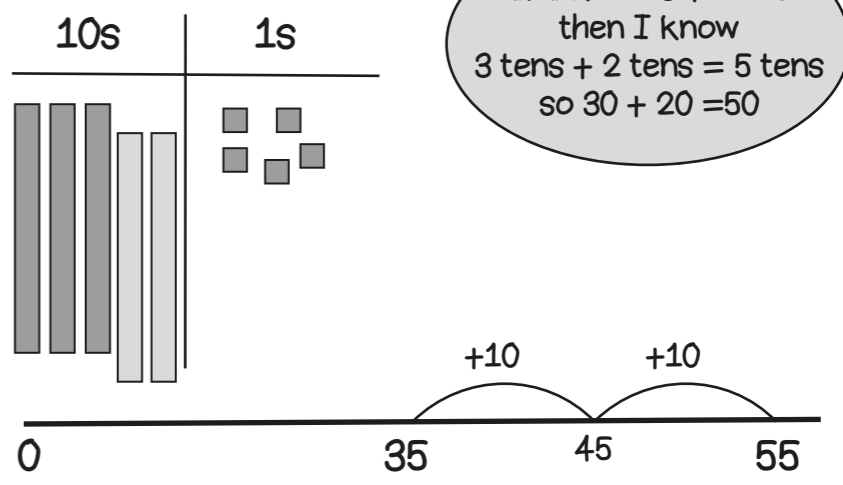
5 + 18
Greatest number first
then bridge

+2   +3
0   18   20   23
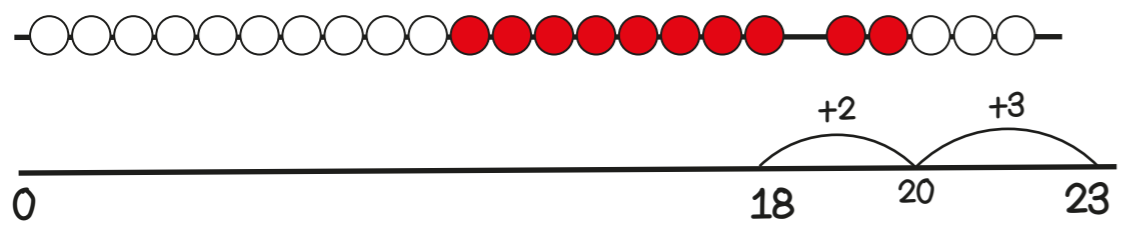
25 + 43
Partition and recombine

25 + 43
20 + 5 + 40 + 3
60 + 8 = 68

10s   1s

37 + 19
Round then adjust

10s   1s

Add 20 then subtract 1

+20
-1
0   37   56   57

+10   +10   +5   +2
0   35   45   55   60 62
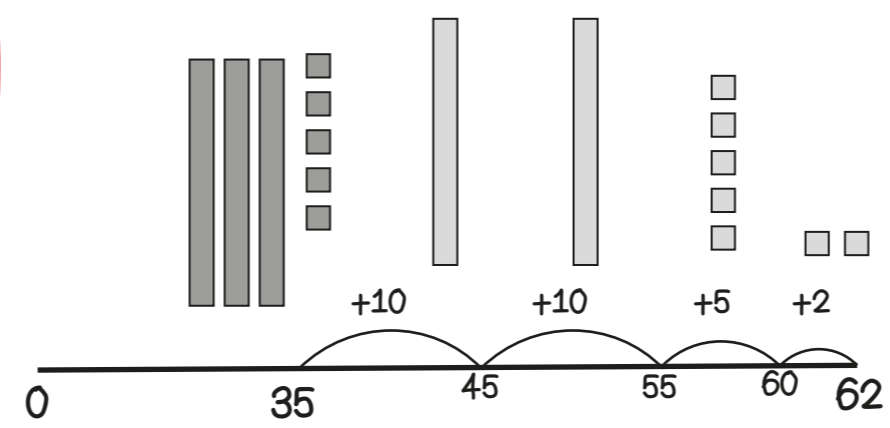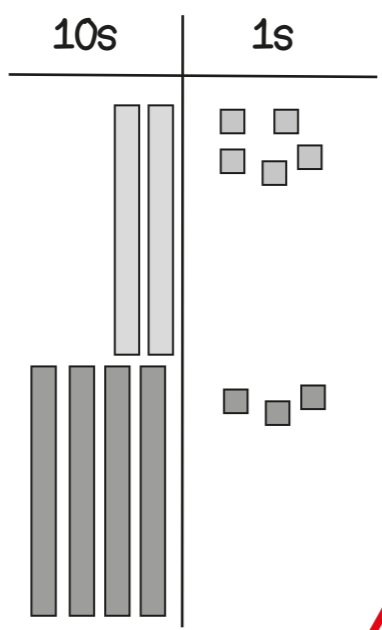
35 + 27
Count on in tens then ones

CanDoMaths

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How shall I subtract?
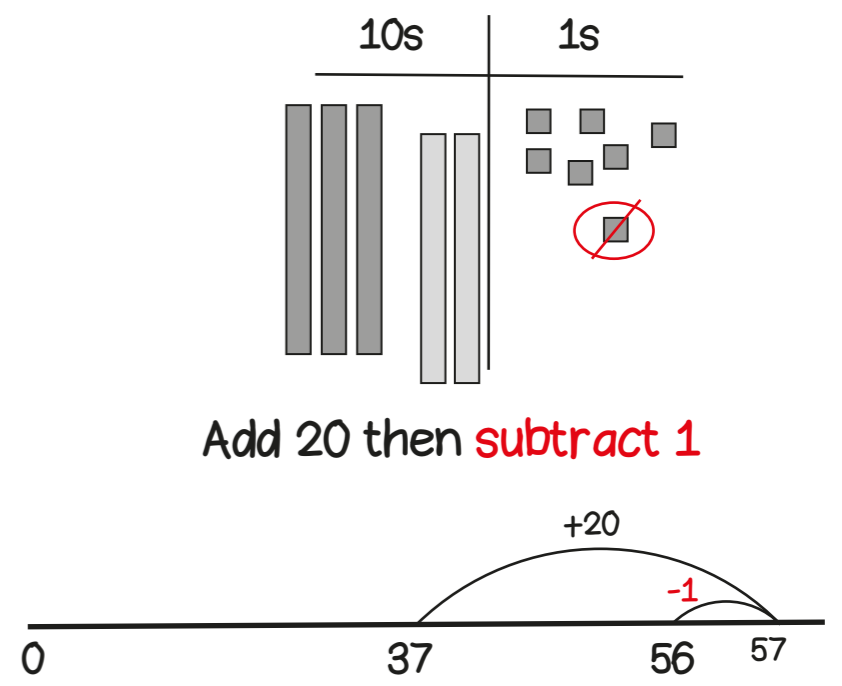
9 – 4, 13 – 5, 18 – 9
Number facts
Single digit numbers
Halves
Teens and single digits

I just knew it!

30 – 7
Use known facts
100 – 70
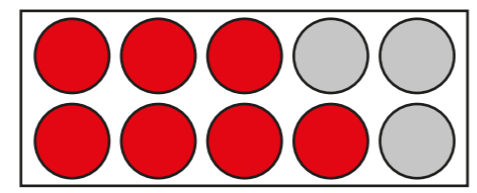
If I know 10 – 7 = 3
then I know
30 – 7 is 2 tens and 3
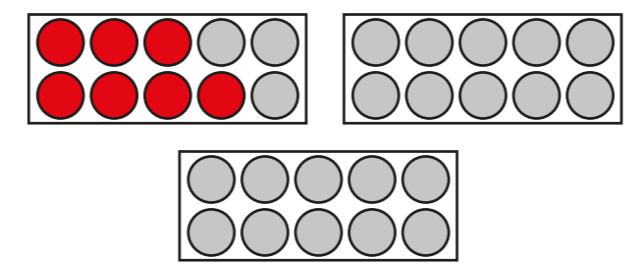
46 – 20
Count back: multiples of ten
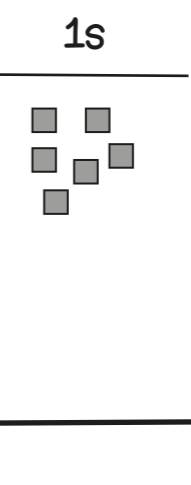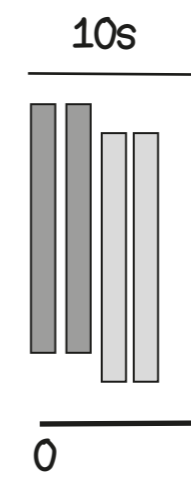
If I know 4 – 2 = 2
then I know
4 tens – 2 tens = 2 tens
so 40 – 20 = 20

10s   1s

-10   -10
0   26   36   46

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

-2   -3
0   18   20   23

47 – 19
Round then adjust

10s   1s

Take away 20 then add 1

-20
+1
0   27 28   47

42 – 37
Find the difference between
two numbers
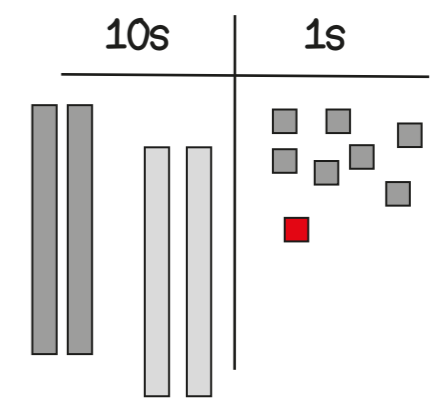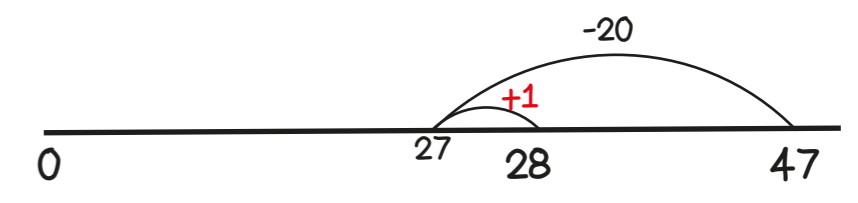
42 is 5 more than 37,
37 is 5 less than 42 so
the difference between
37 and 42 is 5

42
37   5

+3   +2
0   37   40   42
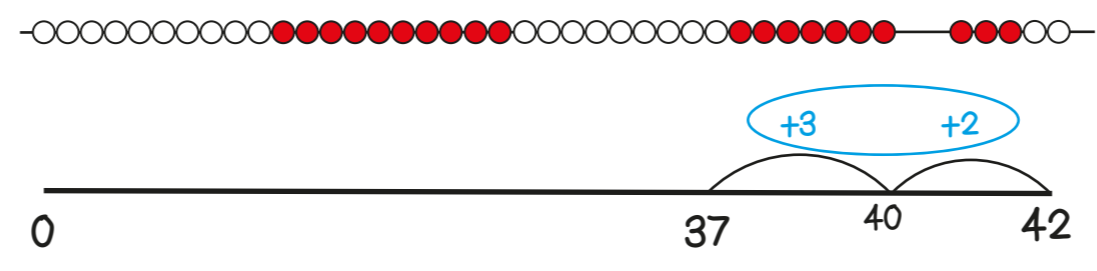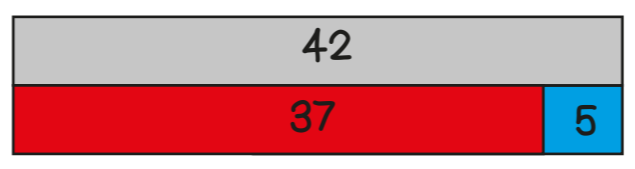
55 – 24
Count back in tens then ones

-4   -10   -10
0   31   35   45   55
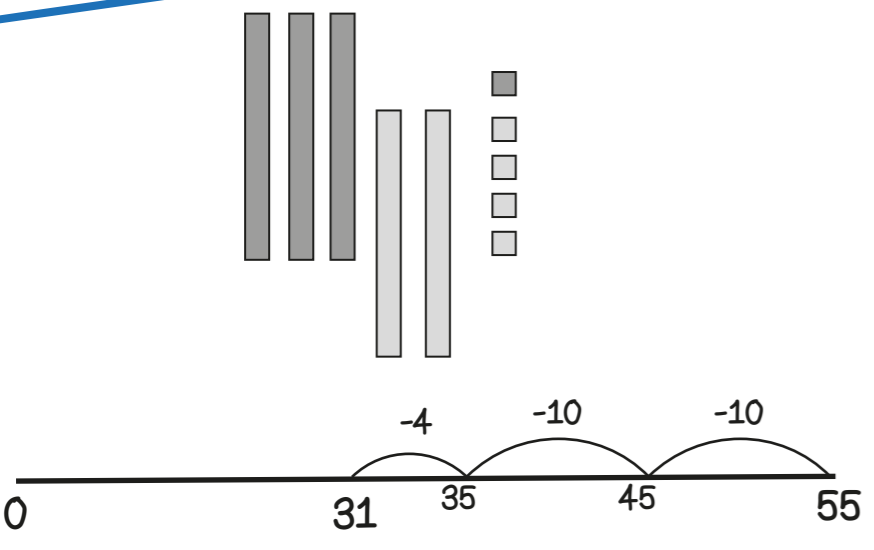
Equal groups

There are 3 groups with 4 cats in each group

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

One to many correspondence

If each person has 4 cats, there are 4 times as many cats as people
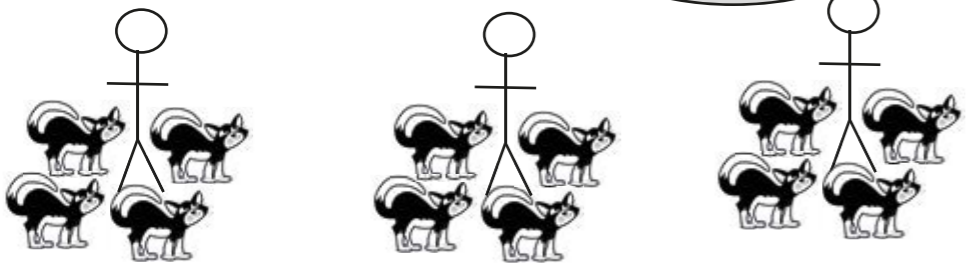
Four cats, multiplied by 3
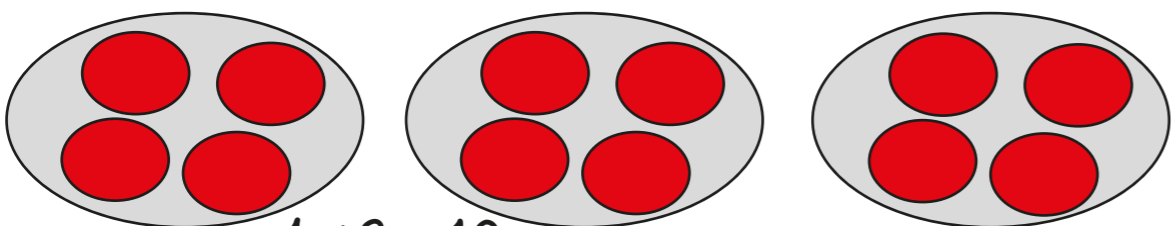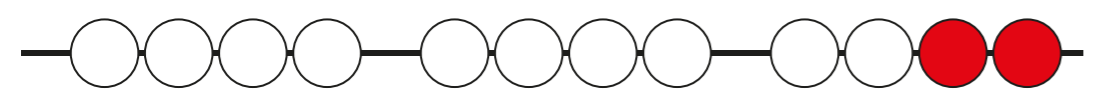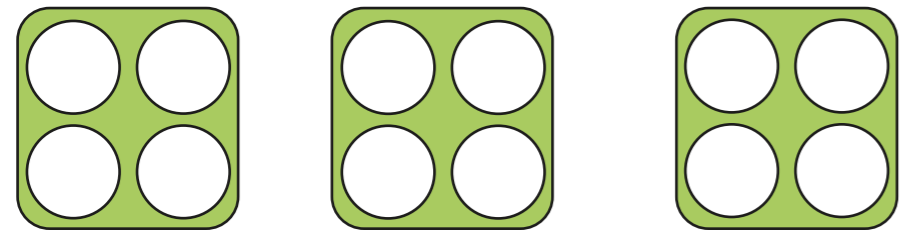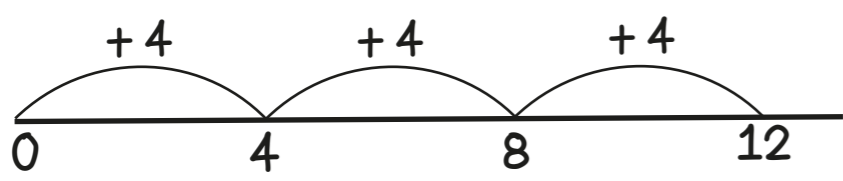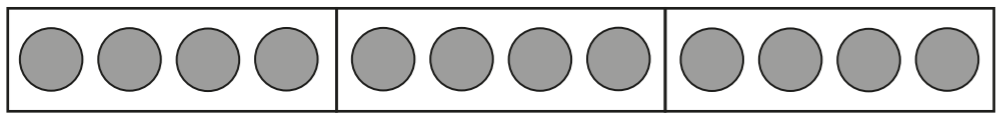
Recall of 2x, 5x and 10x tables

$4 \times 3 = 12$

People	Cats
1	4
2	8
3	12

How shall I multiply?

Arrays

$4 \times 3 = 12$

$3 \times 4 = 4 \times 3$

Repeated addition
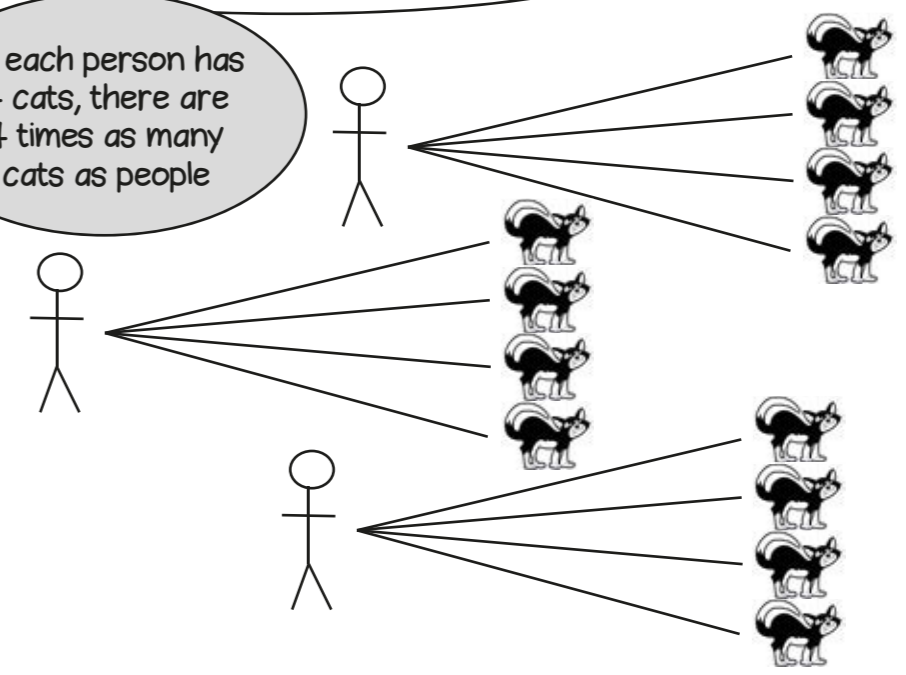
Count in ones

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 x 3 is 6, then 4 x 3 is double 6.
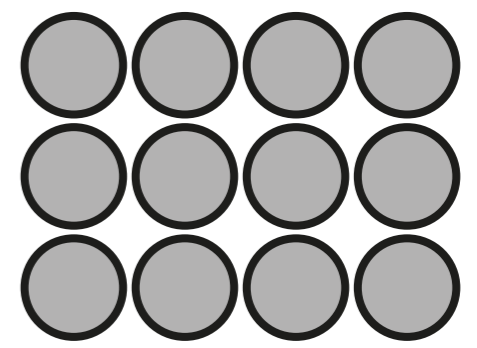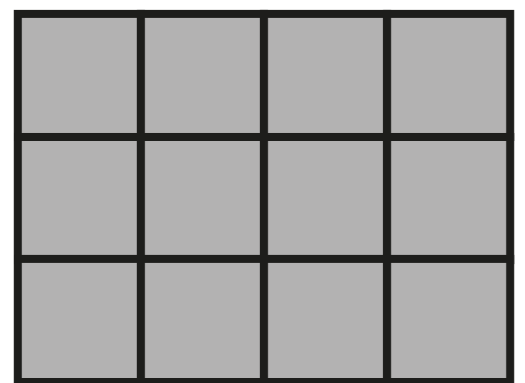
4	4	4

+ 4   + 4   + 4

0   4   8   12

$4 + 4 + 4 = 12$

Sharing

12 shared into 3 equal groups

$12 \div 3 = 4$

Grouping

How many groups of 3 are there in 12?

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

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

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

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

Bar model

12		
4	4	4

+3 +3 +3 +3

0   3   6   9   12
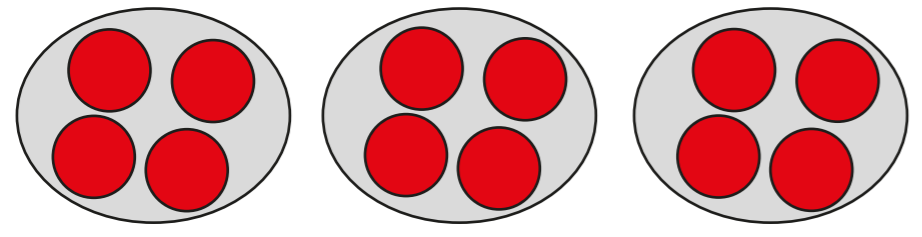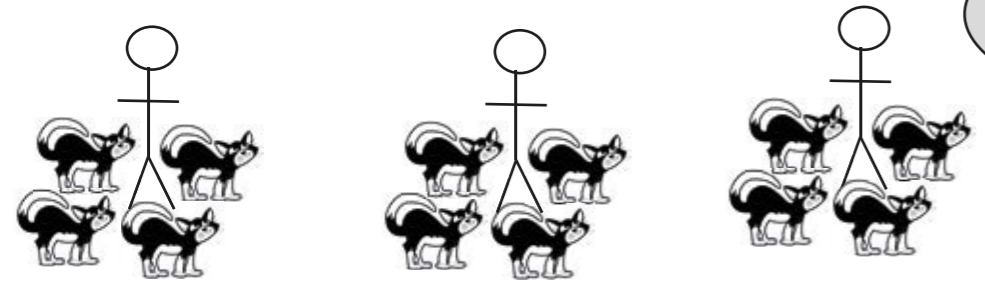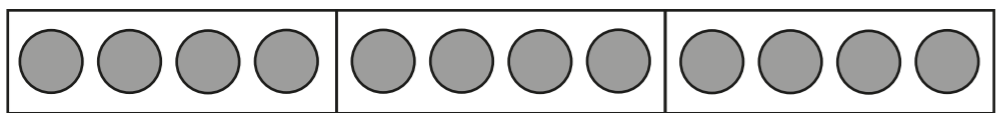
Link to fractions.
One third of 12 is 4
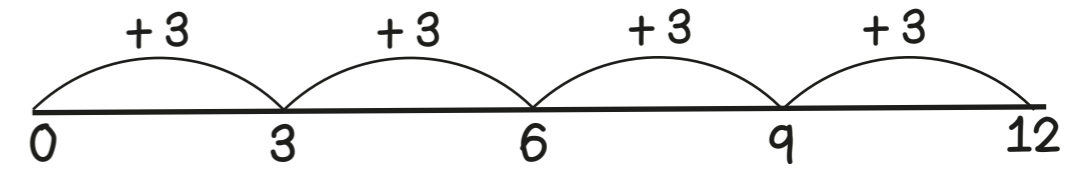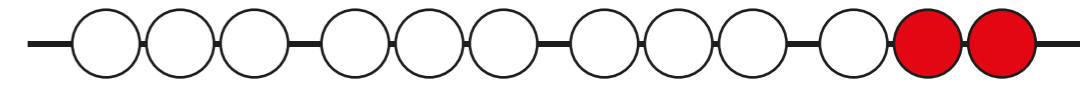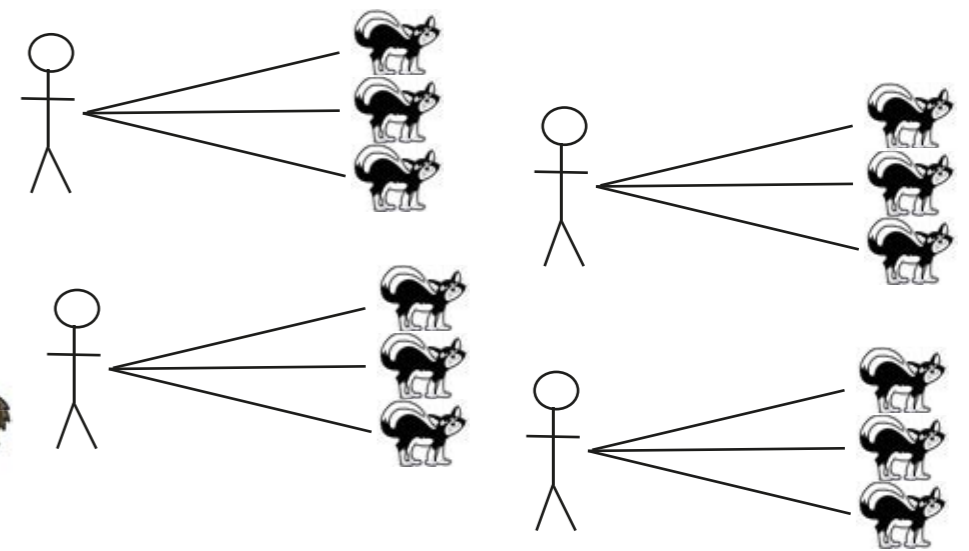
If I know 3 x 4 = 12 then I know 12 ÷ 3 = 4

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

| 100s | 10s | 1s |

+100   +100

0   325   525

150 + 80
Bridging boundaries

+50   +30

150   200   230
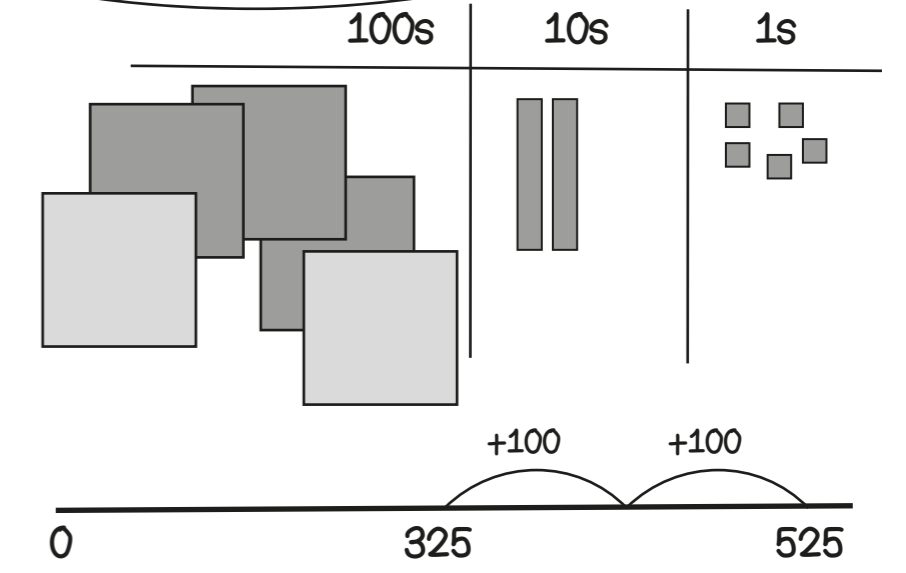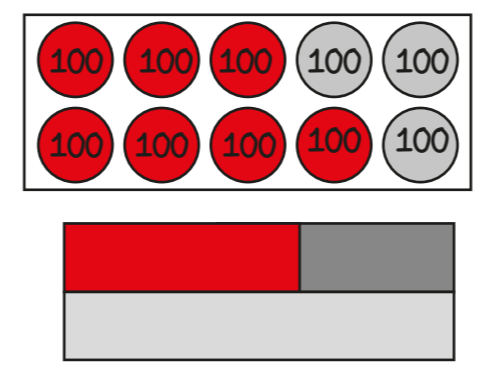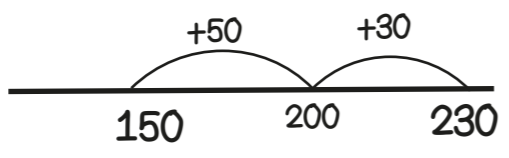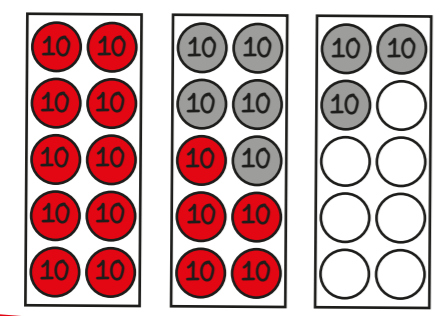
262 + 152
Formal written method
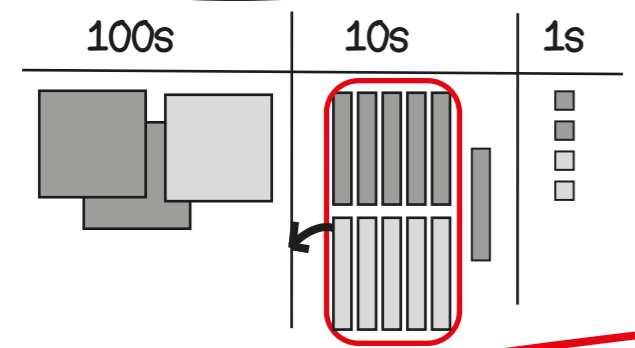
6 tens add 5 tens
= 11 tens or 110

| 100s | 10s | 1s |

```
   2 6 2
 + 1 5 2
 -------
   4 1 4
     1
```
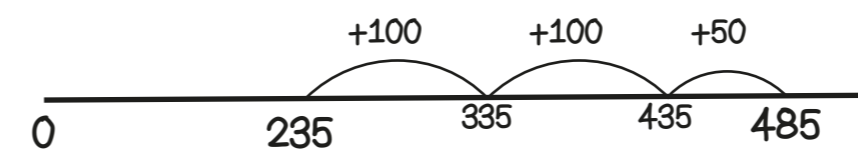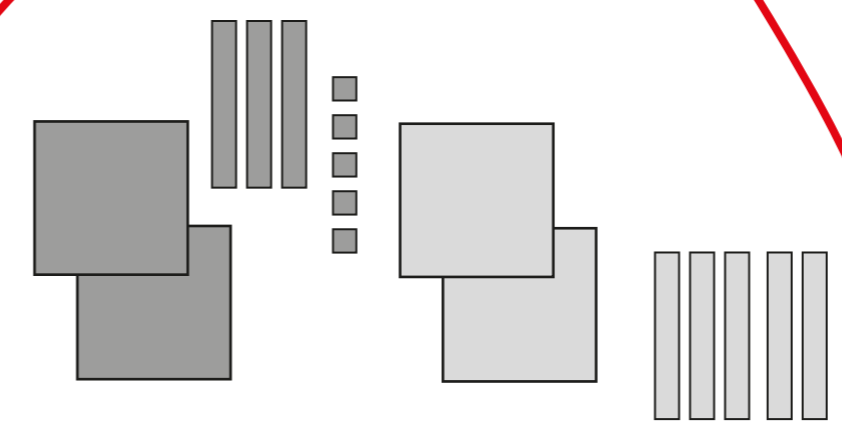
237 + 199
Round then adjust

| 100s | 10s | 1s |
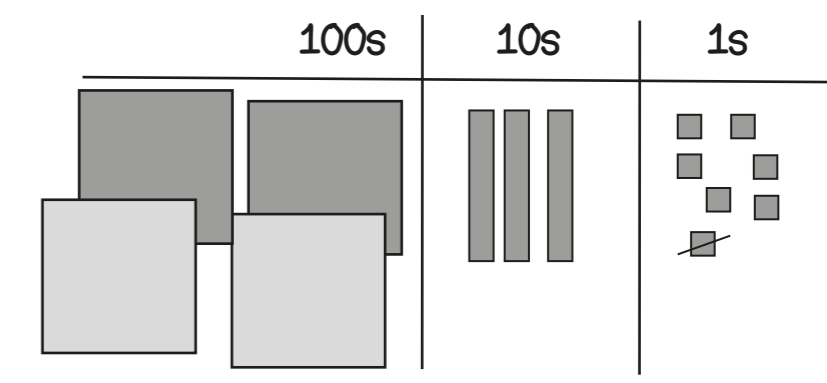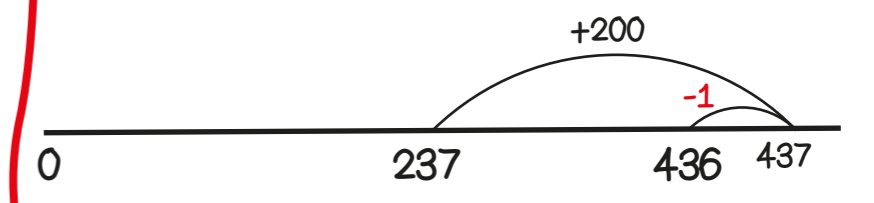
250 + 360
Partition and recombine

| 100s | 10s | 1s |

+100   +100   +50

0   235   335   435   485

235 + 250
Count on in hundreds then tens
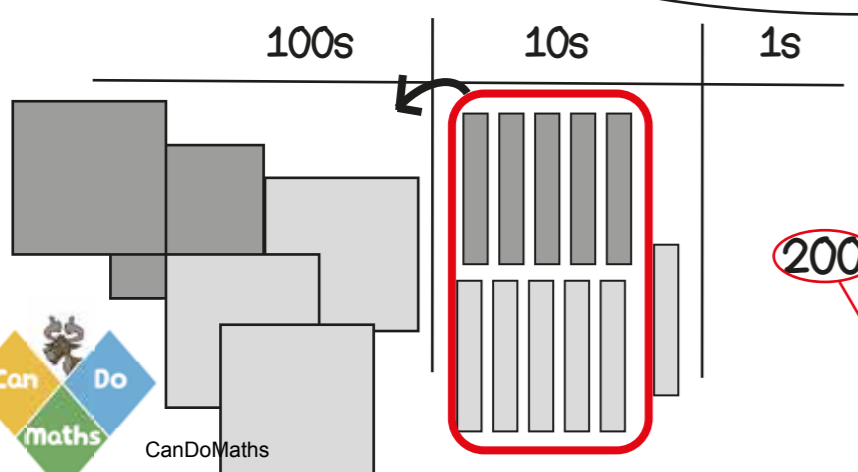
200 + 50 + 300 + 60

500 + 110 = 610

Add 200 then subtract 1

+200

-1

0   237   436   437

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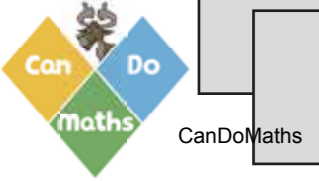
15 - 8, 18 - 5
Number facts
Single digit numbers
Teens and single digits

I just knew it!

240 - 7
Use known facts
1000 - 700

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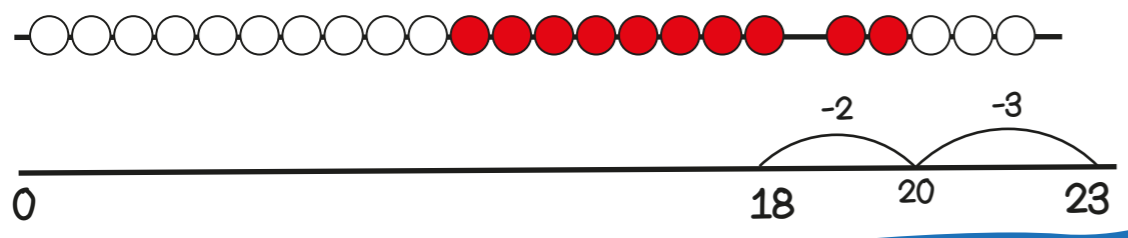= 3 hundreds

100 100 100 100 100
100 100 100 100 100

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

100s | 10s | 1s

-100 -100 -100
225   525
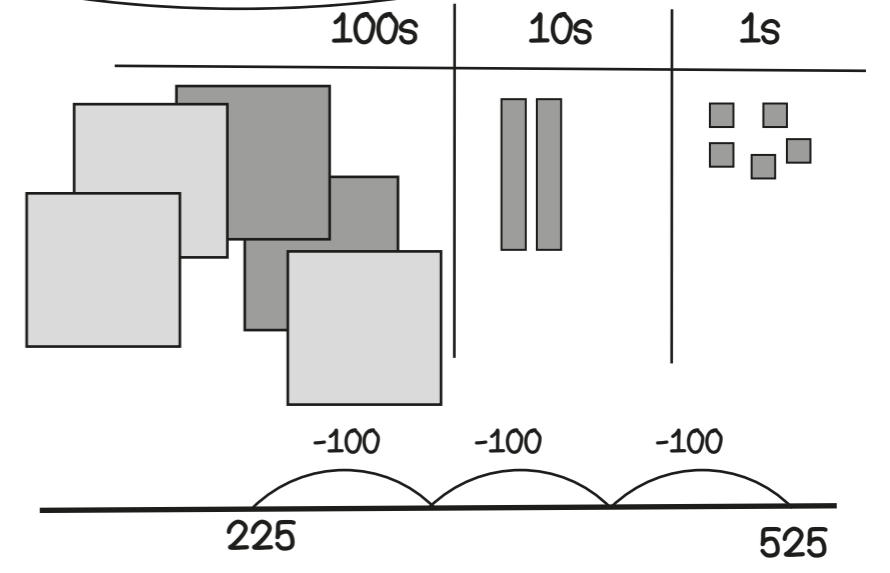
230 - 80
Bridging boundaries
by counting back in efficient steps

0 - 7 = 3

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

How shall I subtract?

230 - 30 - 50 = 150

-50   -30
0   150   200   230
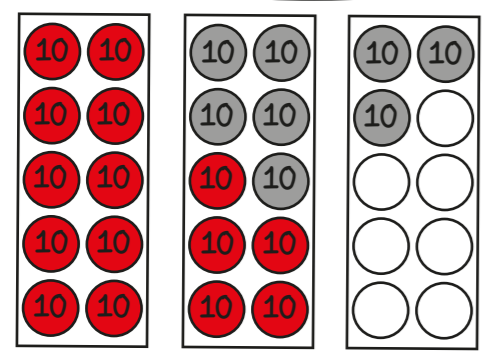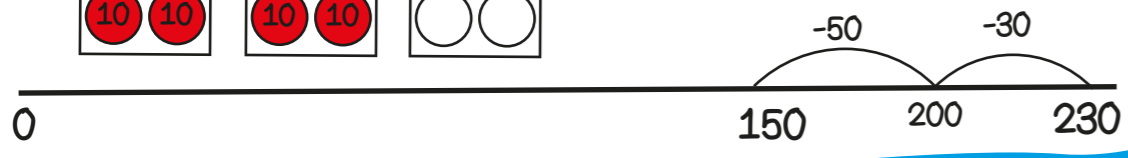
435 - 199
Round then adjust

100s | 10s | 1s
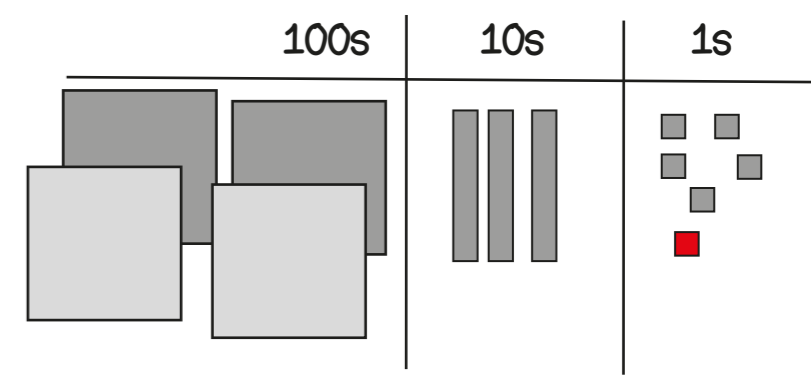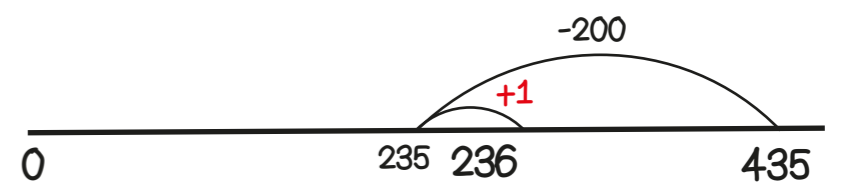
234 - 152
Formal written method

$$\begin{array}{r} {}^1 2\,{}^1 3\,4 \\ -\ 1\ 5\ 2 \\ \hline 8\ 2 \end{array}$$

234 = 100 + 130 + 4

100s   10s   1s

+4   +5
326   330   335
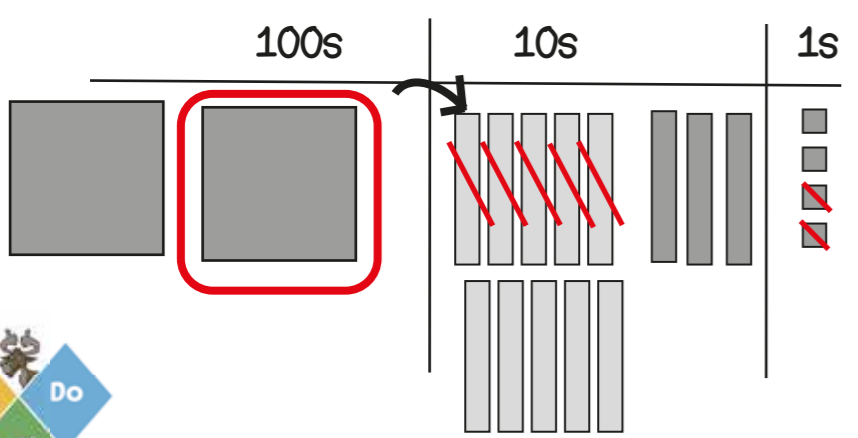
335 - 326
Find the difference
between two numbers

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

335
326   9

Take away 200 then add 1

-200
+1
0   235 236   435

3

How shall I multiply?

Multiply by 10

100s	10s	1s

2 ⤵ x10
20 ⤵ x10
200

6 x 4
Use known facts and place value

40 is ten times greater than 4

6 x 4 = 24
60 x 4 = 240
6 x 40 = 240

6 x 10 x 4
= 24 x 10

8 x 3
Repeated addition

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

8	8	8

+8   +8   +8
0   8   16   24
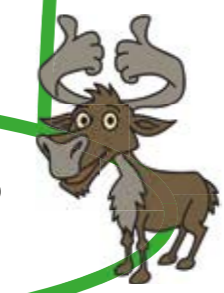
Arrays
If I know 3 x 8 then I know 8 x 3

5 x 18
Double and halve

5 x 18
= 5 x 2 x 18 ÷ 2
= 10 x 9
= 90

18
10   5
9
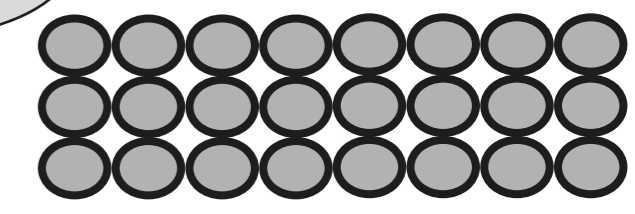
17 x 4
Partition and recombine

10 x 4 + 7 x 4
40 + 28 = 68
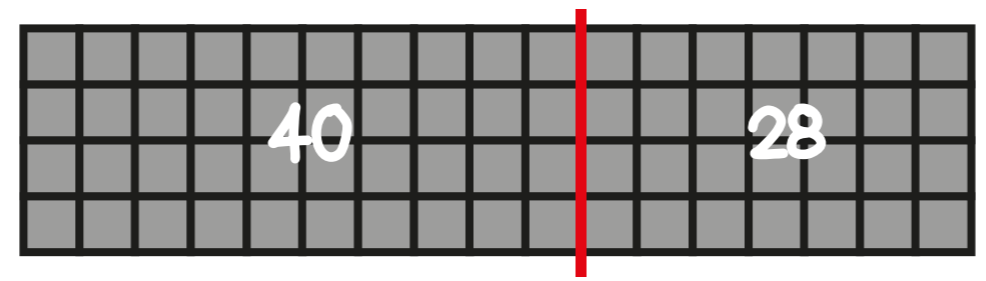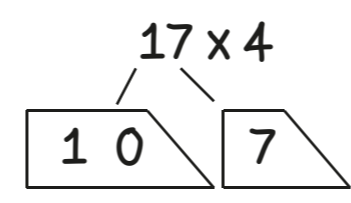
17 x 4
1 0   7

40   28

Scaling
The red tower is 3 times taller than the grey tower

24cm
8cm
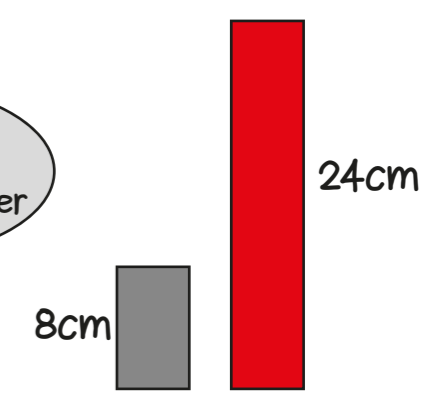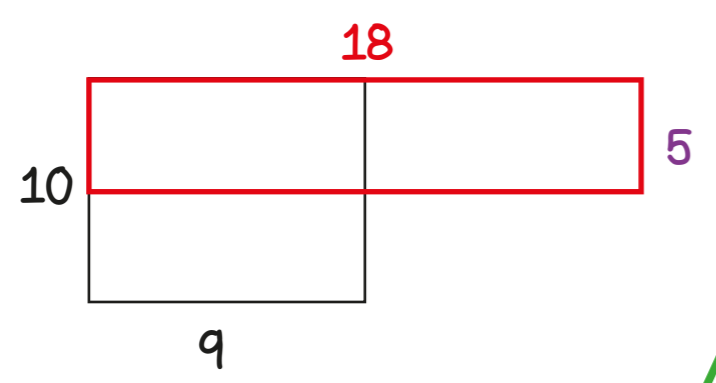
17 x 4
Formal written method

	10	7
4	40	28

17
x 4
68
2

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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

240 is ten times greater than 24

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

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

$240 \div 40 = 6$
How many steps of 40 make 240?

+40 +40 +40 +40 +40 +40
0 40 80 120 160 200 240
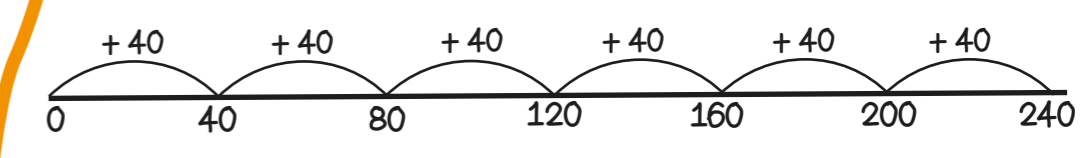
$200 \div 10$
Divide by 10

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

100s	10s	1s

200
$\div 10$
20
$\div 10$
2
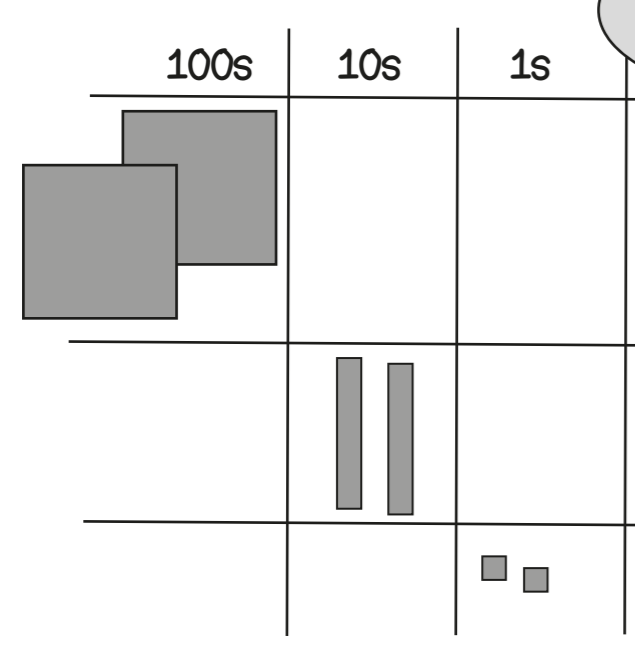
A tenth of ▮ is ▪
A tenth of 1 is 1 tenth
so $1 \div 10 = \frac{1}{10}$

How shall I divide?

$45 \div 3$
Sharing equally

10s	1s		10s	1s
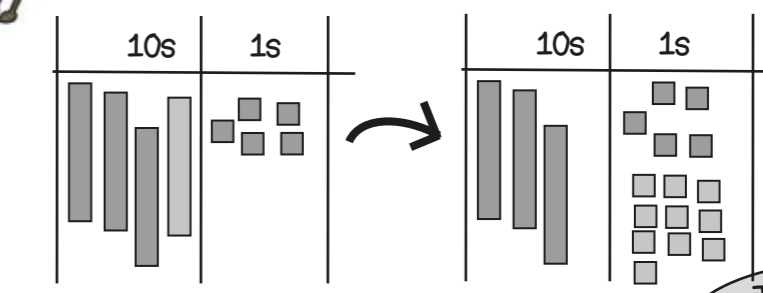
Ten for you, ten for you, ten for you...

45
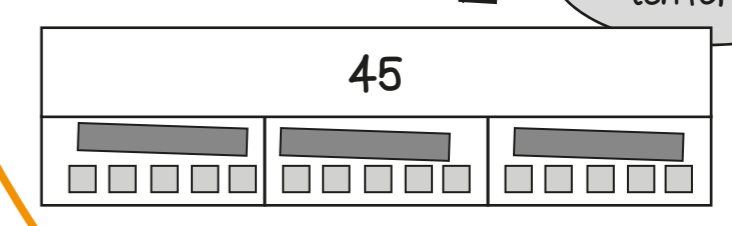
$52 \div 4$
Partition and recombine

ten lots and the rest

$52 \div 4$
40   12
$\div 4$ $\div 4$
10   +   3   =   13
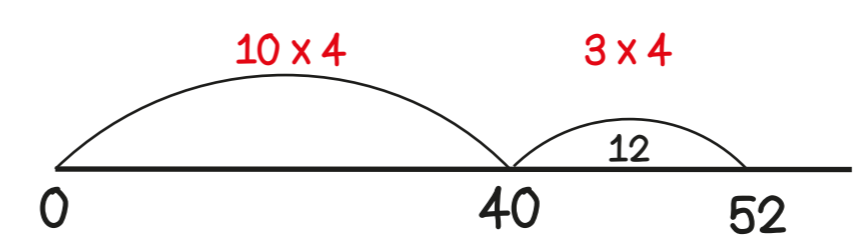
Link to fractions

$42 \div 6$
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

10 x 4   3 x 4
12
0   40   52
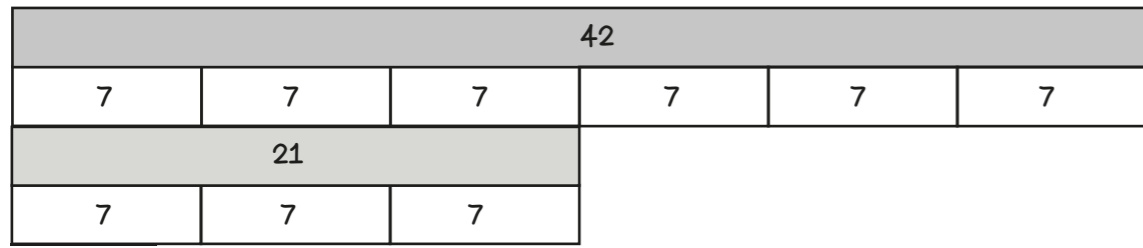
© Liz Hopkins

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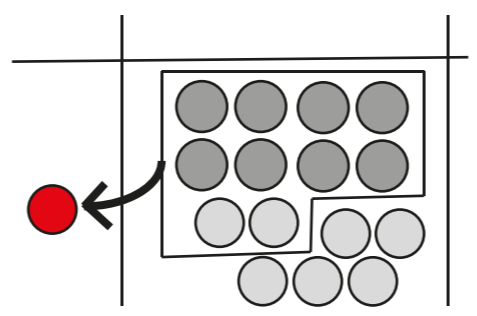
2,403 + 3,020
Use place value to add

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.

1000s	100s	10s	1s
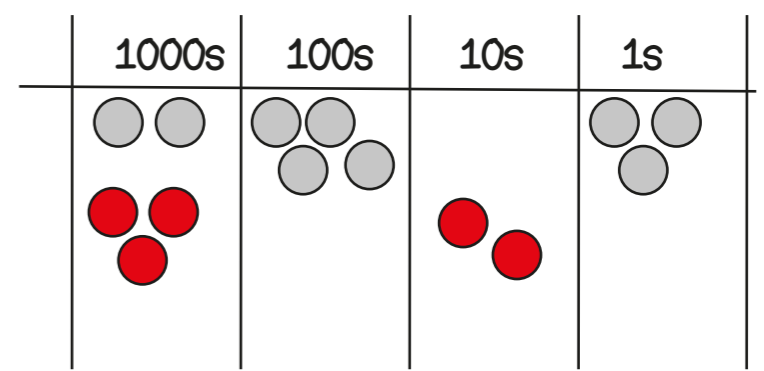
1.6 + 0.7
Bridge through boundaries
by counting in efficient steps

+0.4   +0.3
0   1.6   2.0   2.3

How shall I add?

3,356 + 1,998
Round then adjust

1000s	100s	10s	1s

Add 2,000 then take away 2

+2,000
−2
3,356   5,354   5,356

5354	
3356	2000

5,250 + 2,360
Partition and recombine

5000 + 200 + 50 + 2000 + 300 + 60
7000 + 500 + 110 = 7610

1000s	100s	10s	1s

5,748 + 3,374
Formal written method

Exchange ten of these for one of those!

Regroup and rename

5,748
+ 3,374
9,122
1 1 1

1000s	100s	10s	1s

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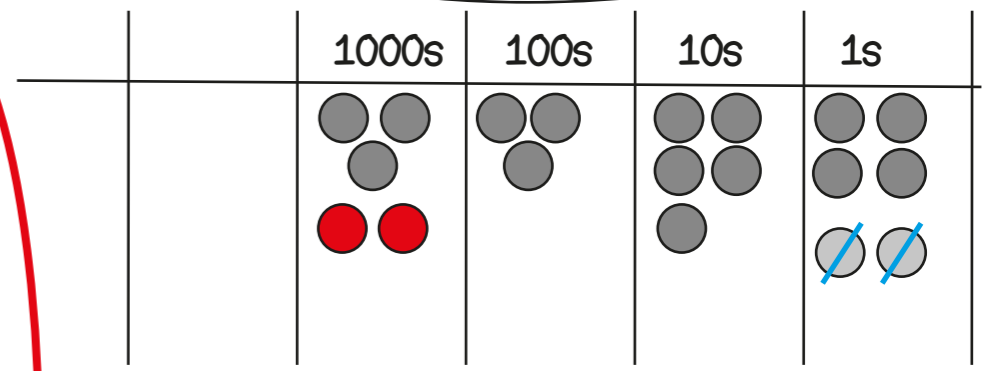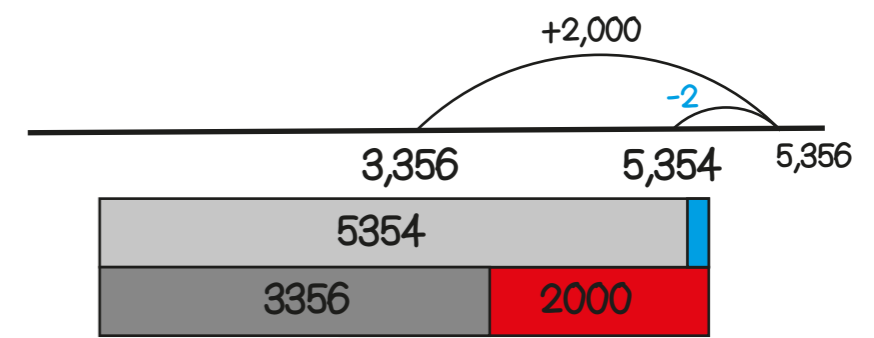
13 - 5, 1.8 - 0.8
Number facts
Single digit numbers
Halves
Wholes and tenths

I just knew it!

15 - 8 = 7
Use known facts

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

150 - 80 = 70
1500 - 800 = 700
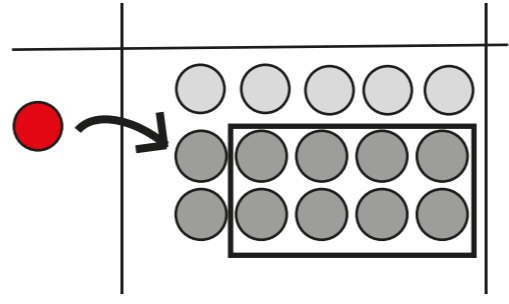
6,342 - 3,020
Use place value to subtract

By using place value counters it is easy to see how to take away
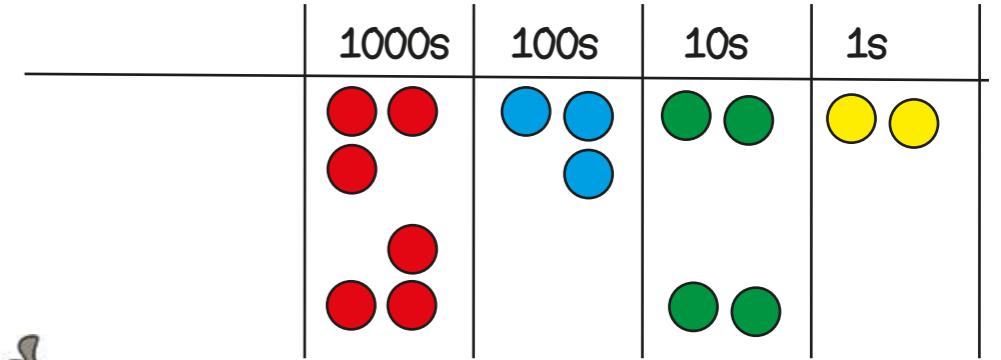
1000s	100s	10s	1s

1.5 - 0.7
Bridge through boundaries
by counting in efficient steps

- 0.2   - 0.5

0.8   1.0   1.5

How shall I subtract?

4.56 - 1.99
Round then adjust

1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s
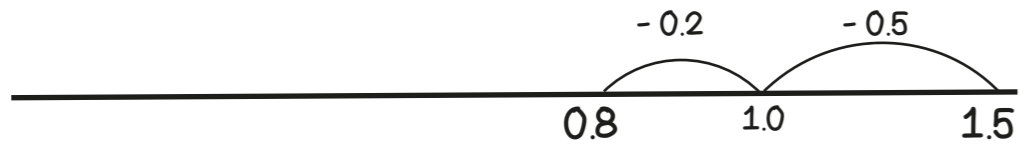
5,352 - 2,136
Formal written method

Exchange ten of these for one of those!

Regroup and rename

$$\begin{array}{r} 4\ ^1 4\ ^1 \\ 5,3\cancel{5}\cancel{2} \\ -\ 2,436 \\ \hline 2,916 \end{array}$$

1000s	100s	10s	1s

4007 - 3998
Find the difference between two numbers

+2   +7

3,998   4,000   4,007

4,007

3,998   9
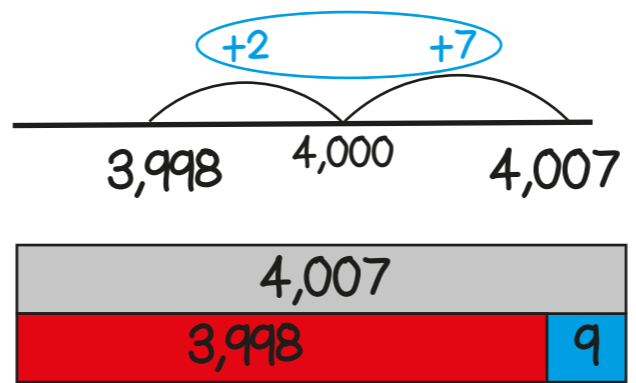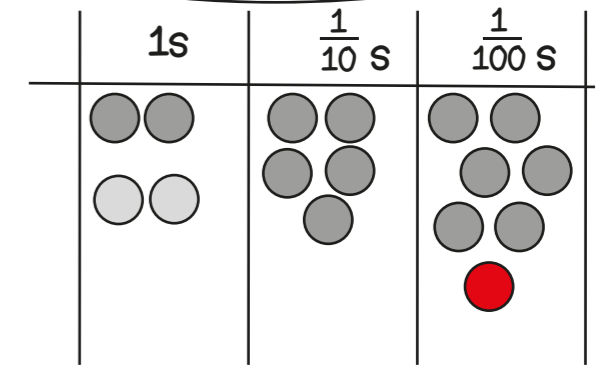
Take away 2 then add one hundredth
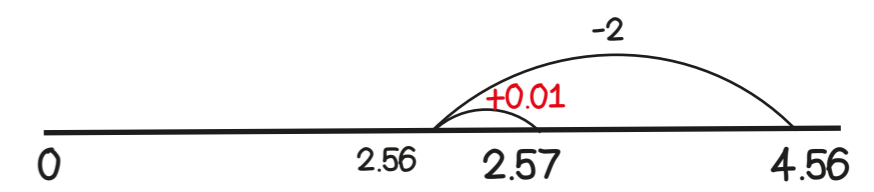
-2

+0.01

0   2.56   2.57   4.56

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

$6 \times 4 = 24$
$60 \times 4 = 240$
$60 \times 40 = 2400$

$6 \times 10 \times 4 \times 10$
$= 24 \times 100$

0.6 is ten times smaller than 6

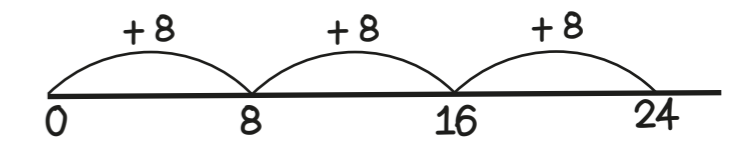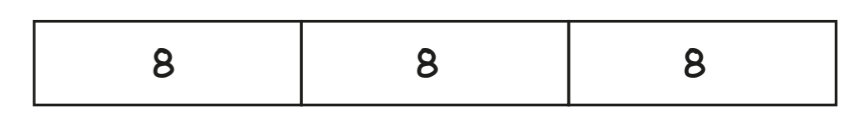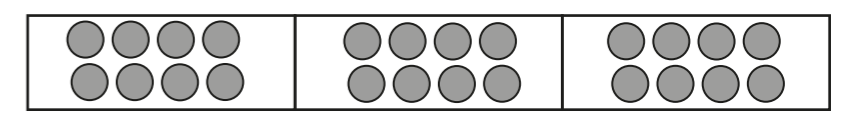**6 x 4** Use known facts and place value

$0.6 \times 4 = 2.4$
4 jumps of 0.6
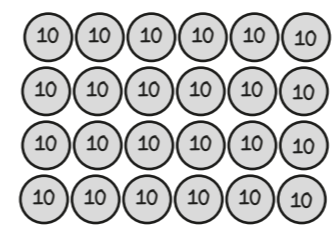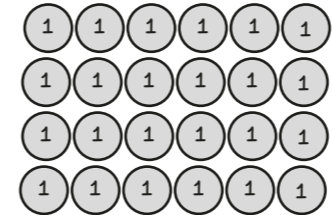
$+0.6 \quad +0.6 \quad +0.6 \quad +0.6$
0 \quad 0.6 \quad 1.2 \quad 1.8 \quad 2.4

$0.6 \times 4 = 24$ tenths
$0.6 \times 4 = 2.4$

0.6 \qquad 1
4

2.34 x 100 Multiply by 10, 100

1000s	100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s

2.34
x10
23.4
x10 \quad x100
234
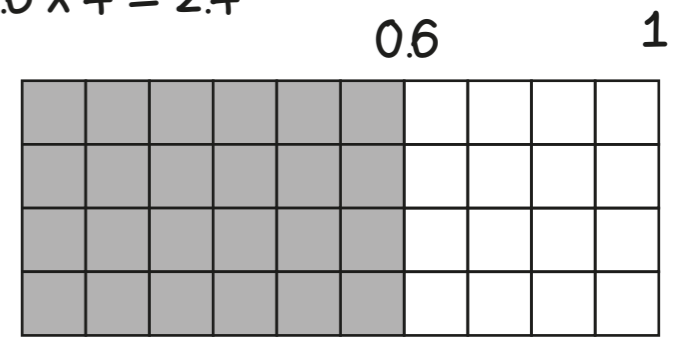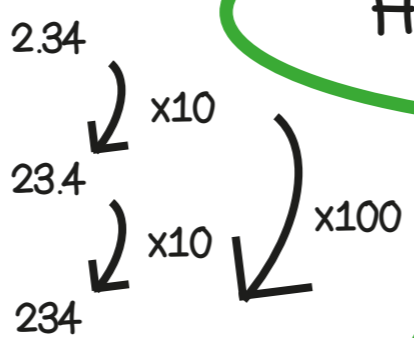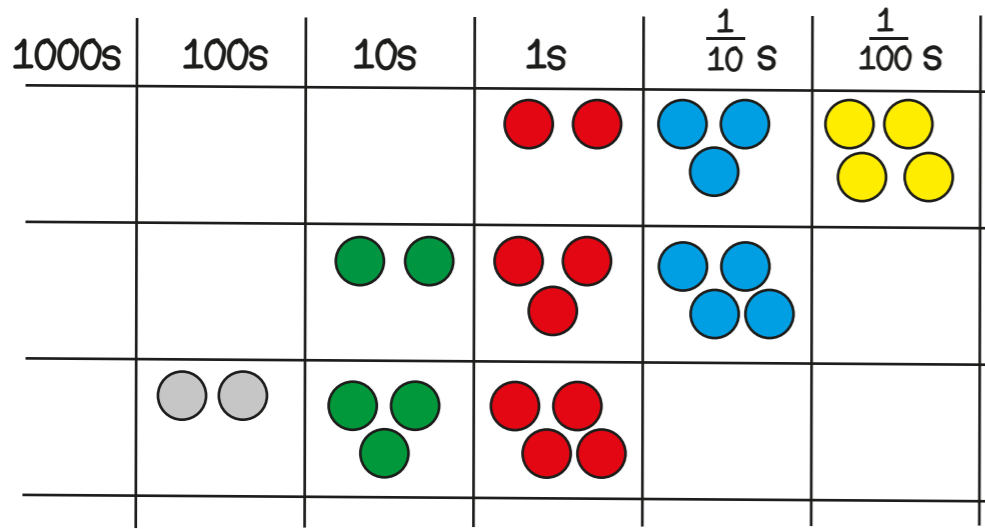
How shall I multiply?

7 x 36 Use the distributive law

7×36
$= 7 \times 30 + 7 \times 6$
$= 210 + 42$
$= 252$

36
30 \quad 6
7 | 210 | 42

36 x 7 Formal written method

	30	6
7	210	42

$\begin{array}{r} 36 \\ \times \ 7 \\ \hline 252 \\ \tiny 4 \end{array}$
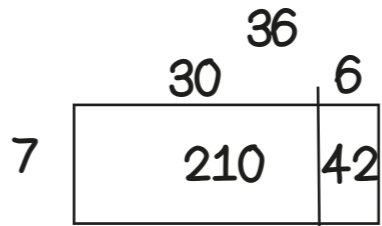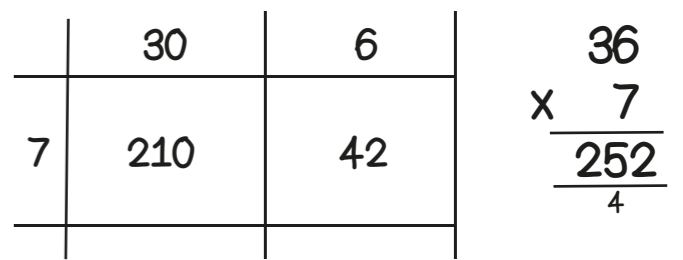
45 x 6 Use factors and commutativity

2, 5, 6

$2 \times (5 \times 6) = (2 \times 5) \times 6$
$2 \times 30 = 10 \times 6$

Write as factors then re-order

45×6
$= 5 \times 9 \times 6$
$= 5 \times 6 \times 9$
$= 30 \times 9$
$= 270$

236 x 7
200 x7 \quad 30 x7 \quad 6 x7
1400 + 210 + 42 = 1652

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

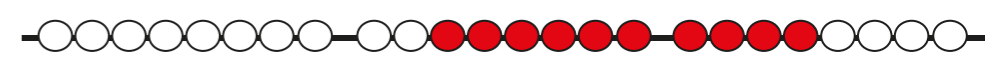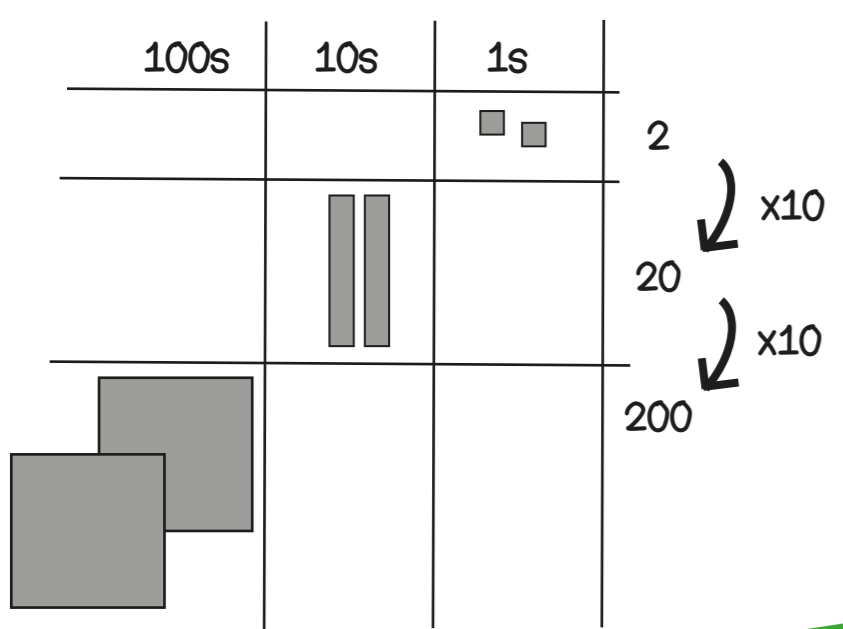**24 ÷ 4**
Use known facts and place value

240 is ten times greater than 24

$24 ÷ 4 = 6$
$240 ÷ 40 = 6$
$2400 ÷ 400 = 6$

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

$$\frac{24}{4} = 6$$

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?

60 is ten times greater than 6

2400 ÷ 60
Use known facts and place value

$2400 ÷ 60 = 40$
How many steps of 60 make 2400?

10 x 60   10 x 60   10 x 60   10 x 60

0   600   1200   1800   2400

24 ÷ 100
Divide by 10, 100

100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s

24
$÷10$
2.4
$÷10$ $÷100$
0.24
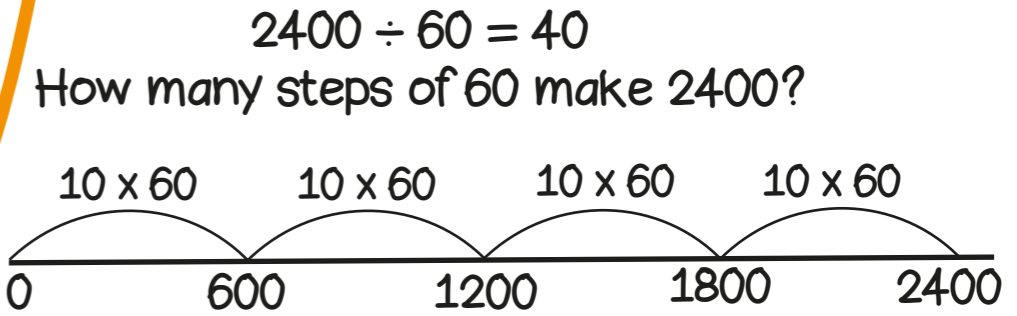
How shall I divide?

732 ÷ 6
Formal written method

100s	10s	1s

$$6\overline{)7^13\ 2}\ \ 1$$

$$6\overline{)7^13^12}\ \ 1\ 2\ 2$$

100s	10s	1s
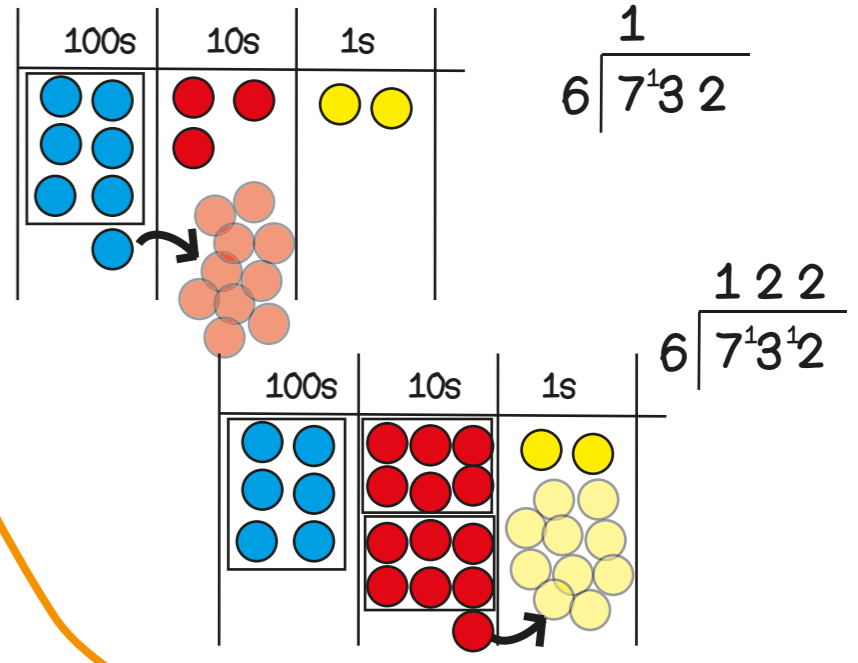
516 ÷ 12
Using factors

$516 ÷ 3 ÷ 4$

516		
172	172	172
43 43 43 43		

496 ÷ 8
Partition and recombine

496 ÷ 8
480   16
÷ 8   ÷ 8
60   +   2   =   62

60 x 8   2 x 8

0   480   496

How shall I add?
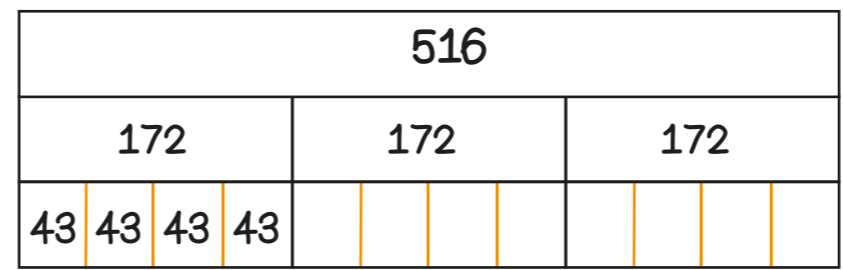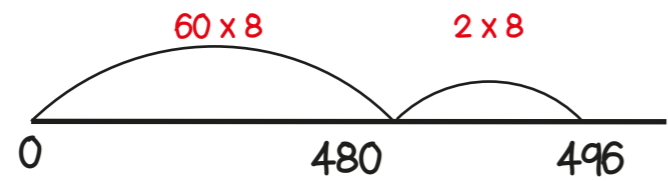
0.8 + 0.7, 45 + 45
Number facts
Single digit decimals
Doubles
Bonds of 1 and 100

I just knew it!

Rapid fluency of 2 digit add 2 digit numbers

0.016 + 0.007
Bridge through boundaries
by counting in efficient steps

+0.004   +0.003
0.016 0.020 0.023

7 + 8
Use known facts

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

7,000 + 8,000 = 15,000
70,000 + 80,000 = 150,000
700,000 + 800,000 = 1,500,000

12,403 + 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.

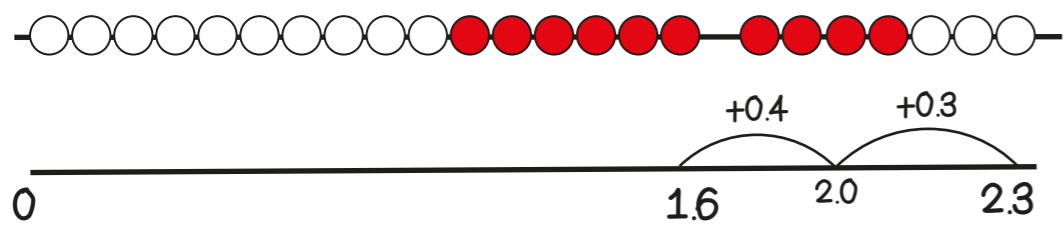| 10,000s	1000s	100s	10s	1s

32,356 + 19,998
Round then adjust

10,000s	1000s	100s	10s	1s

Add 20,000 then subtract 2

+20,000
0   32,356   52,354   52,356
-2

52,354
32,356   20,000

25,748 + 46,374
Formal written method

Exchange ten of these for one of those!

Regroup and rename

25,748
+ 46,374
72,122
1 1 1 1

10,000s	1000s	100s	10s	1s

35,040 + 22,070
Partition and recombine

30,000 + 5,000 + 40 + 20,000 + 2,000 + 70
50,000 + 7,000 + 110 = 57,110

10,000s	1000s	100s	10s	1s

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How shall I subtract?

9 – 4, 13 – 5, 18 – 9
Number facts
Single digit decimals
Halves
Subtract from 1 and 100

I just knew it!

Rapid fluency of
2 digit subtract
2 digit numbers

15 – 8 = 7
Use known facts

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

15,000 – 8,000 = 7,000
150,000 – 80,000 = 70,000
1,500,000 – 800,000 = 700,000
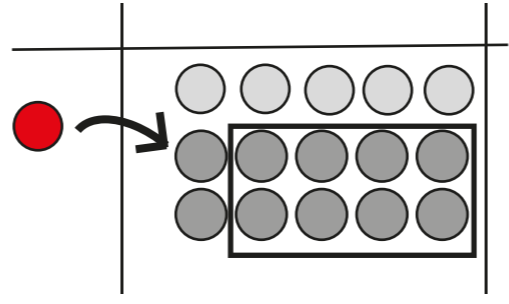
40,012 – 3,005
Use place value to subtract

5 less than 12 is 7
Now it is easy to
take away 3000

If I know 40 – 3 = 37
then I know that
40 thousand take away
3 thousand is 37 thousand

40,000 = 4 tens of thousands or 40 thousands
12 = 1 ten and 2 ones or 12 ones

40,012 = 40 thousands and 12 ones
take away 3 thousands and 5 ones
equals 37 thousands and 7 ones.

0.54 – 0.17
Bridge through boundaries
by counting in efficient steps

– 0.03   – 0.04   – 0.1

0.16   0.40   0.44   0.54
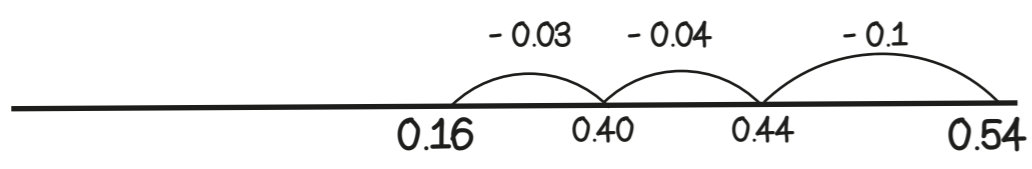
45,748 – 26,374
Formal written method

Exchange ten of
these for one of
those!

Regroup and rename

$$\begin{array}{r} \overset{3\ \ 1\ \ 6\ \ 1}{45{,}748} \\ -\ 26{,}374 \\ \hline 19{,}374 \end{array}$$

10,000s	1000s	100s	10s	1s

20,045 – 19,989
Find the difference between
two numbers

+11   +45

19,989   20,000   20,045
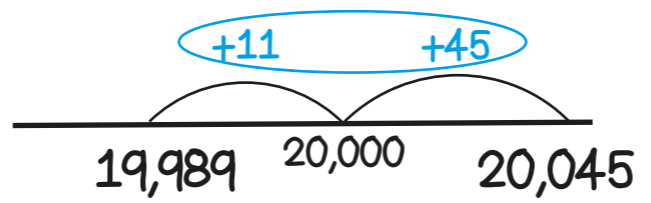
20,045	
19,989	56

43,453 – 19,998
Round then adjust

10,000s	1000s	100s	10s	1s

Take away **20,000** then **add 2**

–20,000

+2

0   23,453 23,455   43,453

5

How shall I multiply?

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

$6 \times 4 = 24$
$60 \times 4 = 240$
$60 \times 40 = 2400$

$6 \times 10 \times 4 \times 10$
$= 24 \times 100$

0.6 is ten times smaller than 6

6 x 4 Use known facts and place value

$0.6 \times 4 = 2.4$
4 jumps of 0.6

$+ 0.6 \quad + 0.6 \quad + 0.6 \quad + 0.6$

0   0.6   1.2   1.8   2.4

$0.6 \times 0.4 = 24$ hundredths
$0.6 \times 0.4 = 0.24$

0.6   1

0.4

1

2.34 x 1000 Multiply by 10, 100, 1000

1000s	100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s

2.34
23.4   x10
234   x10   x100
2340   x10

423 x 4 Partition and recombine

423×4

4 0 0	2 0	3
x4	x4	x4

$1600 + 80 + 12 = 1692$

15 x 42 Using factors and distributive law

15×48
Factor pair
$= 15 \times 6 \times 8$
$= 90 \times 8$
$= 720$

6
8   15

15×14
$= 15 \times 6 + 15 \times 8$
$= 90 + 120$
$= 210$

14
6   8
15

427 x 38 Formal written method

	400	20	7
30	12,000	600	210
8	3,200	160	56

427
$\times \; 38$
3416
12810
16226

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

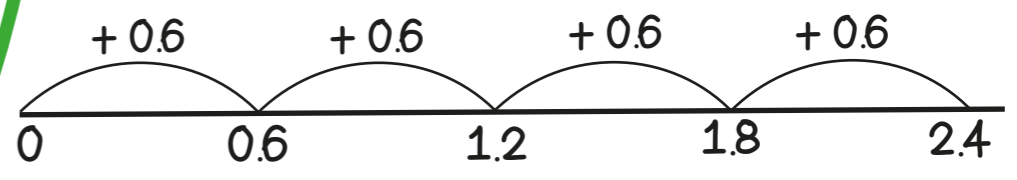Include calcuations where remainders occur

24 ÷ 4
Use known facts and place value

24,000 is a thousand times greater than 24

0.6 is ten times smaller than 6

2.4 ÷ 0.6
Use known facts and place value

$24 \div 4 = 6$
$240 \div 40 = 6$
$2400 \div 400 = 6$
$24{,}000 \div 4000 = 6$

$24{,}000 \div 400 = \dfrac{24 \times 1000}{4 \times 100}$

$\dfrac{240}{4} = 60$

24 biscuits shared between 4 people means they will get 6 biscuits each.
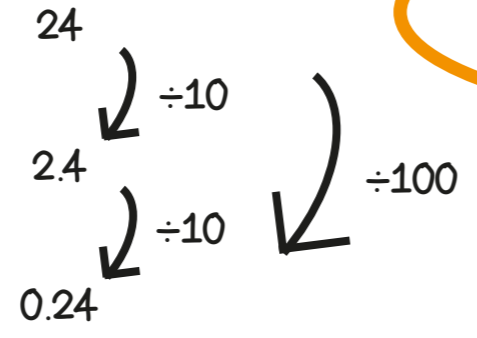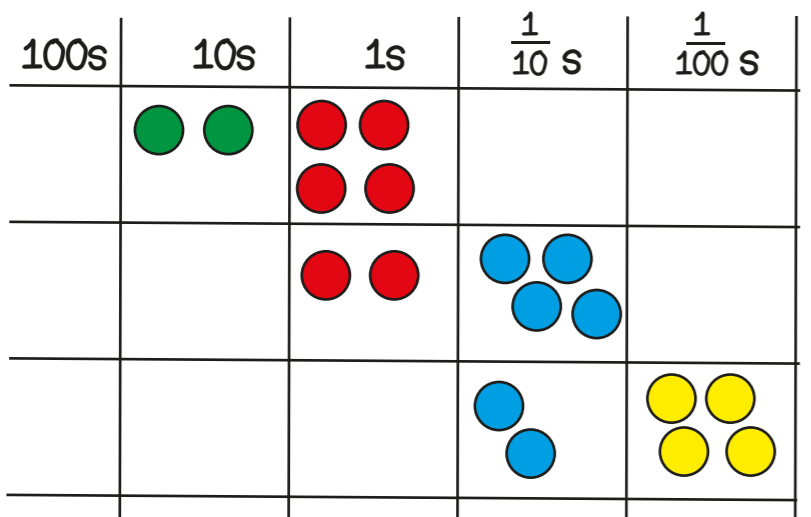If there are 1000 times as many people and 1000 times as many biscuits, how many biscuits each now?

$2.4 \div 0.6 = 4$
How many steps of 0.6 make 2.4?

+ 0.6   + 0.6   + 0.6   + 0.6

0   0.6   1.2   1.8   2.4

24 ÷ 1000
Divide by 10, 100, 1000

100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s	$\frac{1}{1000}$ s

24
2.4   ÷10
0.24 ÷10   ÷1000
0.024 ÷10

How shall I divide?

5724 ÷ 4
Formal written method

1000s	100s	10s	1s

$\begin{array}{r} 1\ 4 \\ 4\overline{)5\,{}^{1}7\ 2\ 4} \end{array}$

1512 ÷ 24
Using factors

$1512 \div 6 \div 4$

1000s	100s	10s	1s

$\begin{array}{r} 1\ 4\ 3\ 1 \\ 4\overline{)5\,{}^{1}7\,{}^{1}2\ 4} \end{array}$

496 ÷ 8
Partition and recombine

$496 \div 8$

480   16

÷ 8   ÷ 8

60 + 2 = 62

60 x 8   2 x 8

0   480   496

1512					
252	252	252	252	252	252

63 63 63 63

How shall I add?

44 + 56, 27 + 27
Number facts
Single digit decimals
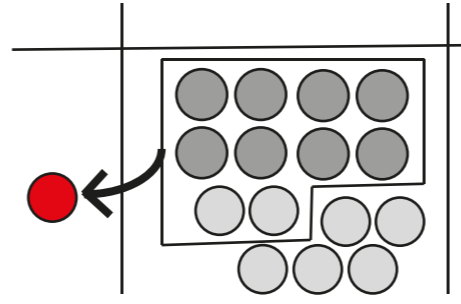Doubles
Bonds of 1 and 100

I just knew it!

Rapid fluency of 2 digit add 2 digit numbers

17 + 17
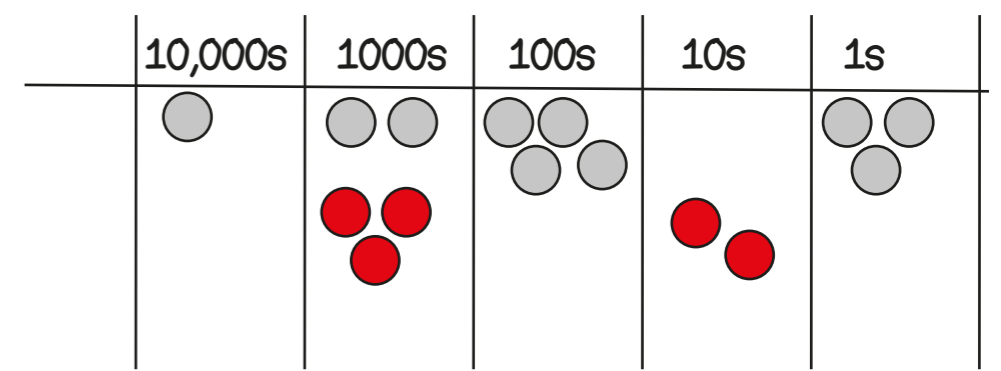Use known facts

If I know 17 + 17 = 34 then I know 1.7 + 1.7 = 3.4

17,000 + 17,000 = 34,000
170,000 + 170,000 = 340,000
1,700,000 + 1,700,000 = 3,400,000

1,102,403 + 50,020
Use place value to add

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

0.028 + 0.015
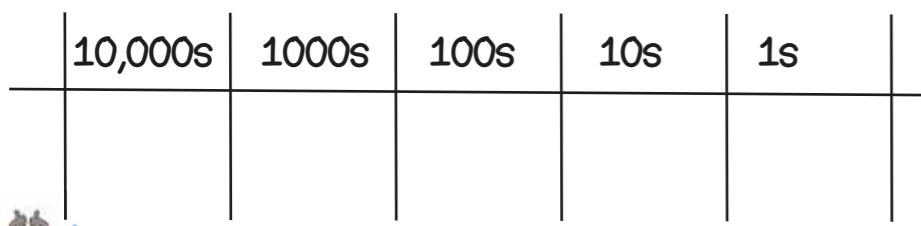Bridge through boundaries by counting in efficient steps

+0.01   +0.002   +0.003

0   0.028   0.038 0.040 0.043

432,356 + 99,000
Round then adjust

307,040 + 206,070
Partition and recombine

300,000 + 7,000 + 40 + 200,000 + 6,000 + 70

500,000 + 13,000 + 110 = 513,110

325,748 + 246,374
Formal written method

Exchange ten of these for one of those!

Regroup and rename

$$325,748$$
$$+\ 246,374$$
$$\overline{572,122}$$
$$\ \ 1\ \ 1\ \ 1\ \ 1$$

Add 100,000 then take away 1,000

+100,000
−1,000
0   432,356   531,356 532,356

531,356
432,356   100,000

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0.9 - 0.4, 100 - 65
Number facts
Single digit decimals
Halves
Bonds of 1 and 100

I just knew it!

Rapid fluency of 2 digit subtract 2 digit numbers

36 - 18 = 18
Use known facts

If I know 36 - 18 = 18 then I know 3.6 - 1.8 = 1.8

36,000 - 18,000 = 18,000
360,000 - 180,000 = 180,000
3,600,000 - 1,800,000 = 1,800,000
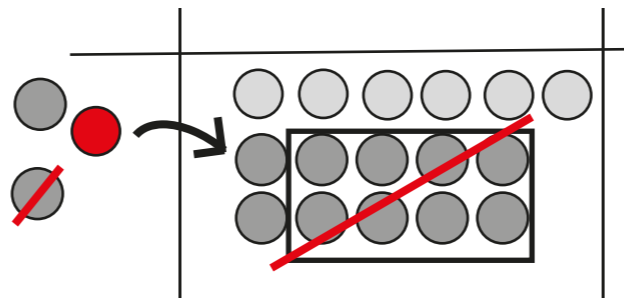
400,032 - 30,005
Use place value to subtract

5 less than 32 is 27

400,000 = 4 hundreds of thousands
or 400 thousands
400 - 30 = 370 so 400,000 - 3,000 = 370,000

400,032 = 400 thousands and 32 ones
take away 30 thousands and 5 ones
= 370,027

0.054 - 0.017
Bridge through boundaries
by counting in efficient steps

- 0.03   - 0.004   - 0.01

0.037   0.040   0.044   0.054

How shall I subtract?

243,453 - 99,900
Round then adjust

100,000s	10,000s	1000s	100s	10s	1s

Take away 100,000 then add 100

-100,000
+100
0   143,453   143,553   243,453

445,748 - 126,374
Formal written method

Exchange ten of these for one of those!

Regroup and rename

$$445,748$$
$$+ \ 126,374$$
$$\overline{319,374}$$

100,000s	10,000s	1000s	100s	10s	1s

200,450 - 199,989
Find the difference between two numbers

+11   +450

199,989   200,000   200,450

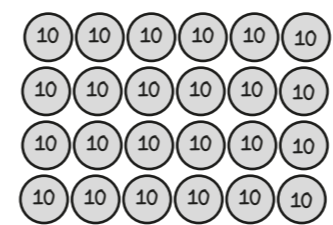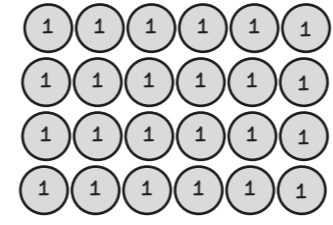| 200,450	
199,989	461

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

6 x 4
Use known facts and place value
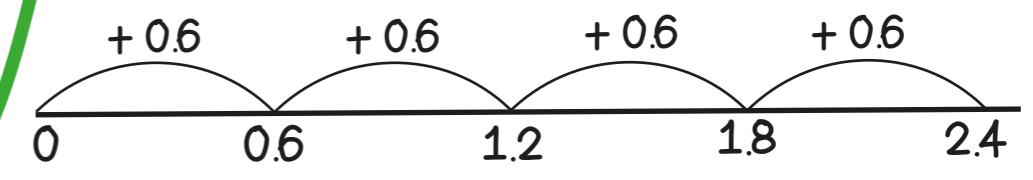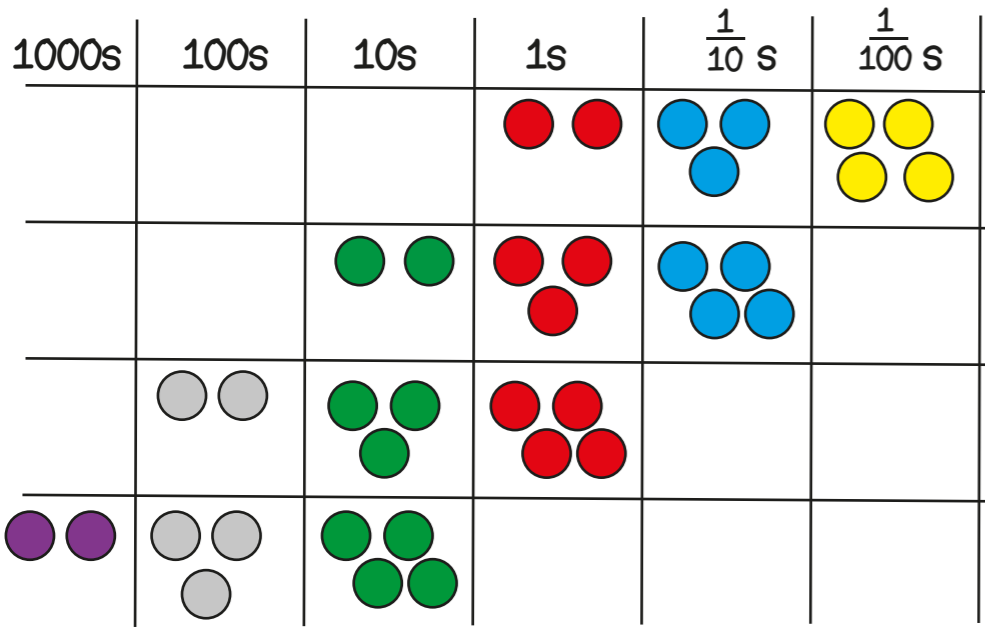
40 is ten times greater than 4

$60 \times 40 = 2400$
$600 \times 400 = 240{,}000$
$6000 \times 4000 = 24{,}000{,}000$

$6 \times 10 \times 4 \times 10$
$= 24 \times 100$

0.6 is ten times smaller than 6

6 x 4
Use known facts and place value

$0.06 \times 4 = 0.24$
4 jumps of 0.06

$+ 0.06 \quad + 0.06 \quad + 0.06 \quad + 0.06$

0   0.06   0.12   0.18   0.24

2.34 x 1000
Multiply by 10, 100, 1000

1000s	100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s

2.34
x10
23.4
x10
x100
234
x10
2340

How shall I multiply?

$0.6 \times 0.4 = 24$ hundredths
$0.6 \times 0.4 = 0.24$

0.6   1

0.4

1
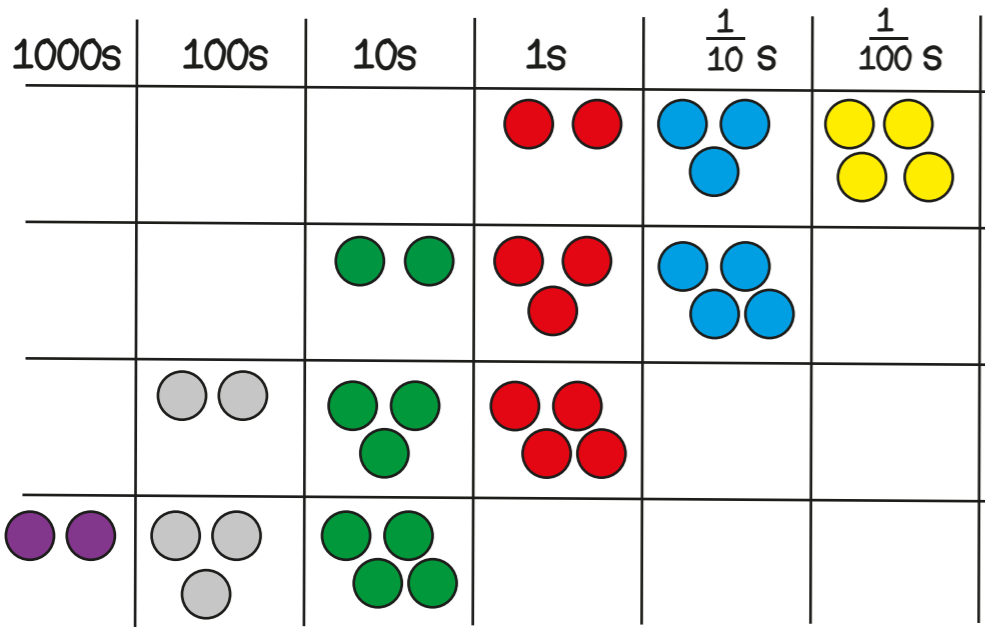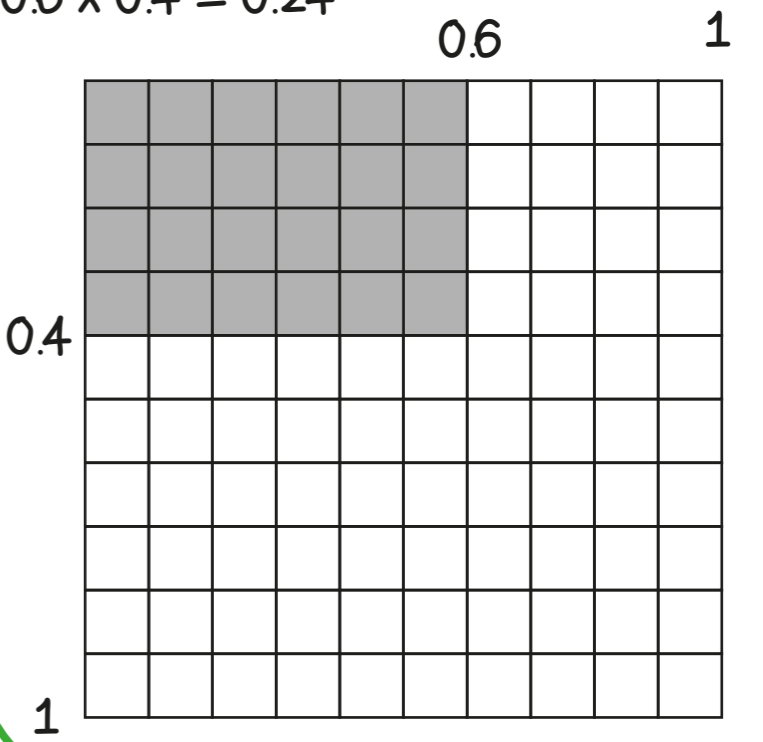
4203 x 4
Partition and recombine

4203 x 4

4 0 0 0	2 0 0	3
x4	x4	x4

$16{,}000 \quad + \quad 800 \quad + \quad 12 \quad = \quad 16{,}812$

15 x 42
Using factors and distributive law

15×48
Factor pair
$= 15 \times 6 \times 8$
$= 90 \times 8$
$= 720$

6
8
15

15×14
$= 15 \times 6 + 15 \times 8$
$= 90 + 120$
$= 210$

14
6   8

15

2427 x 38
Formal written method

$\begin{array}{r} 2427 \\ \times \ 38 \\ \hline 19416 \\ 72810 \\ \hline 92226 \\ \hline \end{array}$

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

Include calcuations where remainders occur

24 ÷ 4 Use known facts and place value

240 is ten times greater than 24

0.6 is ten times smaller than 6

2.4 ÷ 0.6 Use known facts and place value

$240 \div 40 = 6$
$2400 \div 400 = 6$
$24,000 \div 4000 = 6$
$240,000 \div 40,000 = 6$
$2,400,000 \div 400,000 = 6$

$240,000 \div 400 = \dfrac{24 \times 10,000}{4 \times 100}$

$\dfrac{2400}{4} = 600$

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?
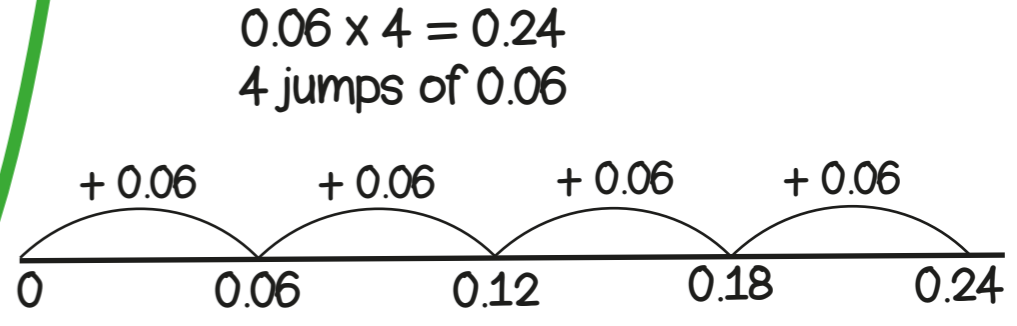
$2.4 \div 0.6 = 4$
How many steps of 0.6 make 2.4?

+ 0.6   + 0.6   + 0.6   + 0.6

0   0.6   1.2   1.8   2.4

24 ÷ 1000 Divide by 10, 100, 1000

100s	10s	1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s	$\frac{1}{1000}$ s

24
2.4   ÷10
0.24   ÷10   ÷1000
0.024   ÷10

How shall I divide?

7182 ÷ 21 Formal written method

1000s	100s	10s	1s

$\begin{array}{r} 1\ 4\ 3\ 1 \\ 4\ \overline{| 5\,{}^17\,{}^12\ 4} \end{array}$

1512 ÷ 24 Using factors

4960 ÷ 8 Partition and recombine

$4960 \div 8$

4800   160

÷ 8   ÷ 8

600   +   20   =   620

600 x 8   20 x 8

0   4800   4960

$1512 \div 6 \div 4$

1512					
252	252	252	252	252	252
63 63 63 63					

$\begin{array}{r} 3\ 4\ 2 \\ 21\ \overline{| 7\ 1\ 8\ 2} \\ 6\ 3 \\ \hline 8\ 8 \\ 8\ 4 \\ \hline 4\ 2 \\ 4\ 2 \\ \hline 0 \end{array}$

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