R E C E P T I O N

Addition +

They will begin to relate addition to **combining two groups of objects**, first by **counting all** and then by **counting on** from the largest number.

They will find one more than a given number.

In practical activities and through discussion, they will begin to use the vocabulary involved in addition.

You have four bananas and I have three bananas.

How many bananas altogether?

Subtraction -

In practical activities and through discussion, they will begin to use the vocabulary associated with subtraction.

They will find one less than a given number.

They will begin to relate subtraction to 'taking away' **using objects** to count 'how many are left' after some have been taken away.

I have six apples. I take two apples away.

How many are left?

Multiplication

In practical activities and through discussion, they will begin to solve problems involving doubling.

Three pencils for you and three pencils for me.

How many pencils altogether?

Division

In practical activities and through discussion they will begin to solve problems involving halving and sharing.

Share the toy cars between two people.

Half of the toy cars for you and half of the toy cars for me.

YEAR ONE

Addition +

Given a number, they must be able to identify one more.

They must read, write and interpret mathematical statements involving addition (+) and the equals (=) sign.

They must be able to add one-digit and two-digit numbers within 20, including zero.

They must be able to solve missing number problems e.g. 10 + _ = 16

Children should continue to practise counting on from any number e.g. 'Put five in your head and count on four.'

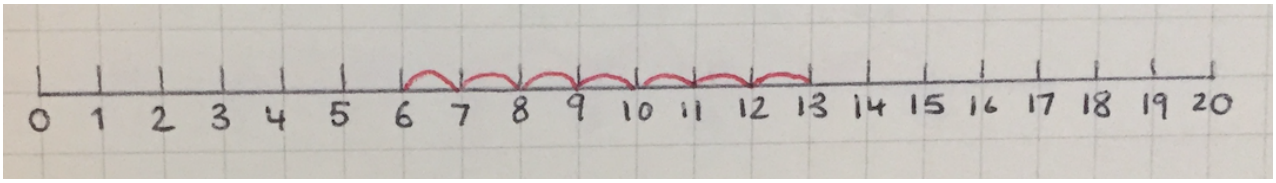
Initially use a **number track** to count on for addition, counting on from the largest number:

5 + 4 = 9

'Put your finger on number five. Count on (count forwards) four.'

After confidence has been built with this, progress to a **marked number line:**

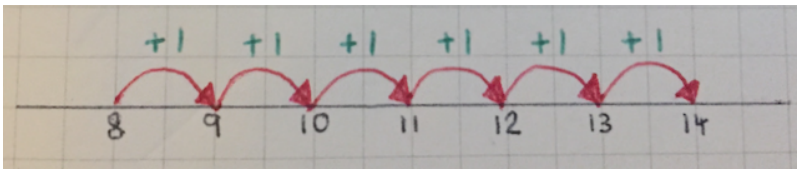
6 + 7 = 13



Put your finger on number six and count on six.

8 + 6 = 14

'Put your finger on number eight and count/ jump on six.'



Continue to practise counting on from the largest number for addition with totals within 20.

When children are ready, introduce calculations with totals beyond 20
e.g. 18 + 6 = 24

Ensure children are confident with using a number track and then a marked number line before moving on to an empty number line (see Y2 guidance).

Subtraction -

Given a number they must be able to identify one less.

They must read, write and interpret mathematical statements involving addition (-) and the equals (=) sign.

They must be able to take away one- digit and two-digit numbers within 20, including zero.

They must be able to solve missing number problems e.g. 10 - _ = 4

Children should continue to practise counting back from any number
e.g. 'Put six in your head and count back four.'

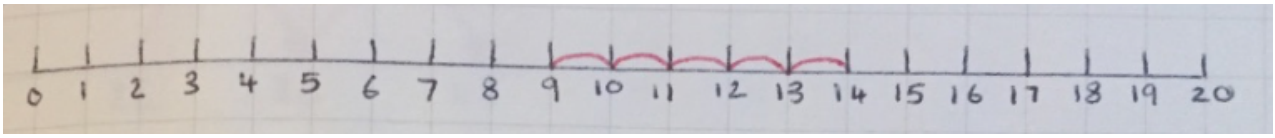
Initially use a **number track** to count back for subtraction, counting back from the largest number:

9 - 4 = 5

'Put your finger on number nine. Count back (count backwards) four.'

Then progress to a **marked number line:**

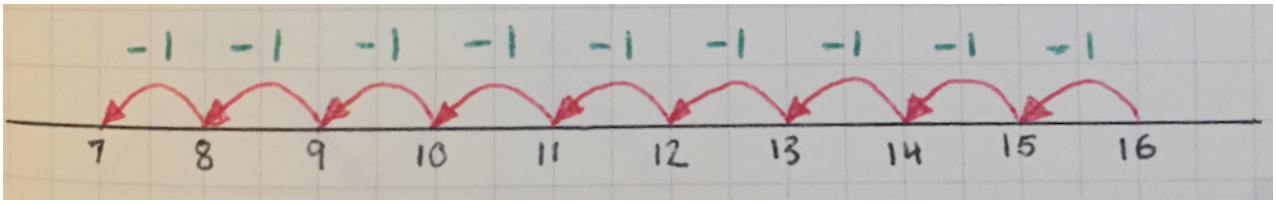
14 - 5 = 9



Put your finger on number twelve and count back six.

16 - 9 = 7

'Put your finger on number sixteen and count/ jump back nine.'

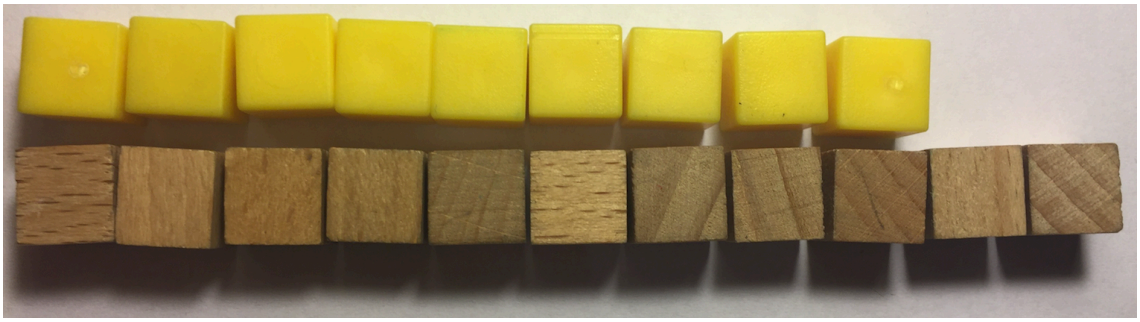


Continue on to find a small difference:

Introduce complementary addition to find differences (only use for small differences). The use of models is extremely important here to understand the idea of 'difference'.

Count up from the smallest number to the largest to find the difference using resources, e.g. cubes, beads, number tracks/lines:

11 - 9 = 2



Continue to practise counting back in subtractions starting with numbers up to 20.

When children are ready, introduce calculations with starting numbers beyond 20
e.g. 23 + 6 = 17

Ensure children are confident with using a marked number line before moving on to an empty number line (see Y2 guidance).

Multiplication

Solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays

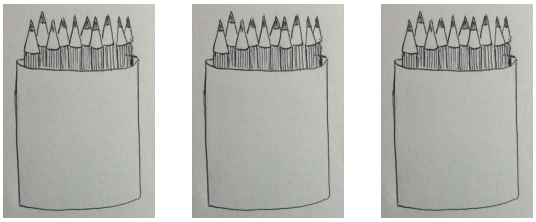
Count in multiples of twos, fives and tens (to the 10th multiple)

Children will count repeated groups of the same size in practical contexts. They will use the vocabulary associated with multiplication in practical contexts.

Use this to solve **practical problems** that involve combining groups of 2, 5 or 10 e.g. socks, fingers and cubes.

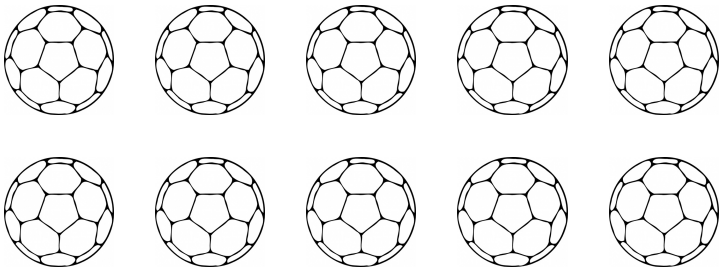
'Five pairs of socks.

How many socks altogether? 2, 4, 6, 8, 10'



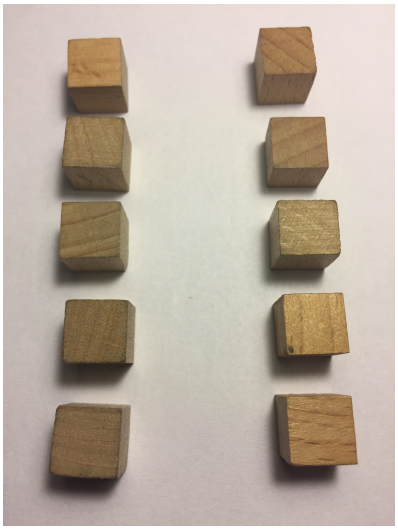
‘Three pots of ten crayons. How many crayons altogether? 10, 20, 30’

Use **arrays** to support early multiplication



‘Five groups of two footballs. How many footballs altogether? 2, 4, 6, 8, 10’

‘Two groups of five footballs. How many footballs altogether? 5, 10’



‘2 groups of 5’

‘How many altogether?’

‘5 + 5 = 10’

Double five is ten

Continue to solve problems **in practical contexts** and develop the language of early multiplication (but **not** the multiplication sign until Y2), with appropriate resources, throughout Y1.

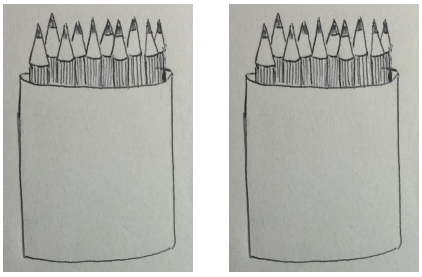
Division

Solve one-step problems involving division by calculating the answer using concrete objects, pictorial representations and arrays

Count in multiples of twos, fives and tens (to the 10th multiple)

Children will start with practical **sharing** using a variety of resources.
They will share objects into **equal groups** in a variety of situations.
They will begin to use the vocabulary associated with division in practical contexts.

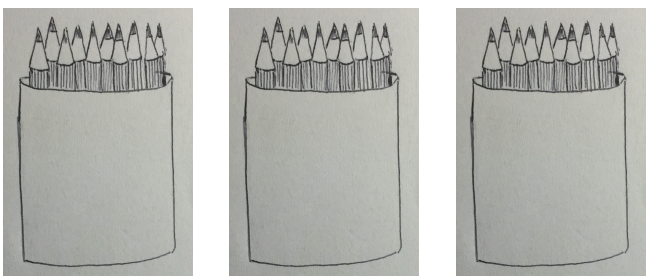
'Share these eight apples equally between two children. How many apples will each child have?'



'Share 20 crayons between 2 pots.'

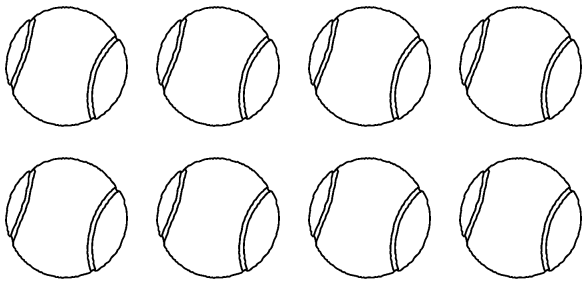
'How many crayons are in each pot?'

Children will move from **sharing** to **grouping** in a practical way

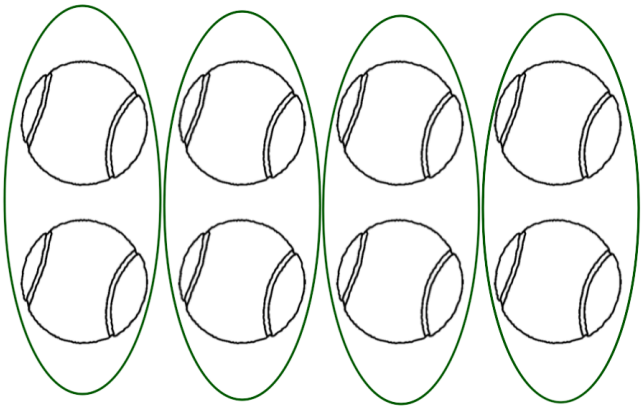


'Put 30 crayons into groups of 10. How many pots do we need?'

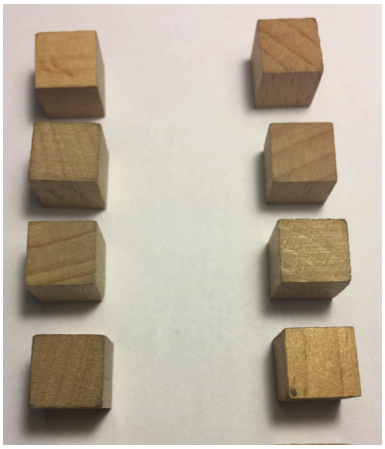
Use **arrays** to support early division



'How many tennis balls altogether? How many groups of two?'



'Four groups of two'



'How many groups of 4?'

'8 shared equally between 2 people'

'Half of 8 is four'

Continue to solve problems in **practical contexts** throughout Y1, and develop the language of early division (but **not** the division sign until Y2), with appropriate resources.

YEAR TWO

Addition

Add numbers using concrete objects, pictorial representations, and mentally, including:

- **A two digit number and ones**
- **A two digit number and tens**
- **Two two-digit numbers**
- **Three one-digit numbers (using a mental method)**

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.
Consolidate counting on using a **marked number line.**

After this go through the following objectives:

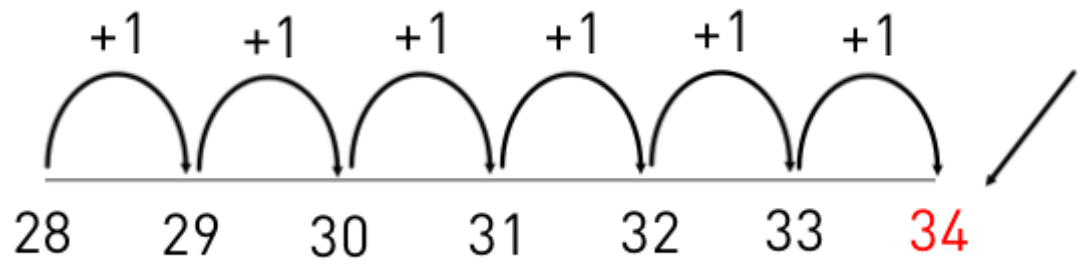
Count on in ones using an **empty number line,** within 100:

28 + 6

To solve an addition such as this, start by marking the larger number on the left hand side of the empty number line.

Next, add 6 ones, starting like this.

After you've added six ones it should look like this:



The number at the end of your number line is the answer:

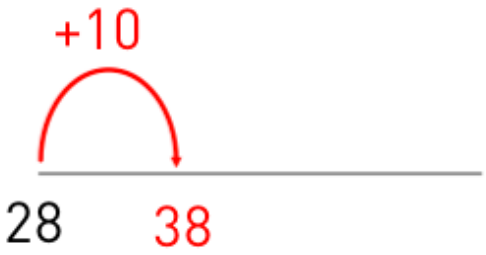
28 + 6 = 34

Add tens within 100:

28 + 30

To solve an addition such as this, start by marking 28 on the left hand side of the empty number line.

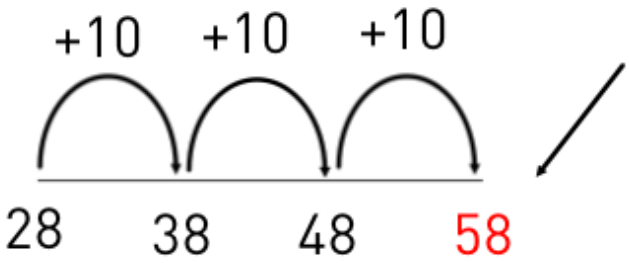
Next, add 3 tens, starting like this.



This is when you should look at a **100 square** to show jumps of tens.

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

After you've 3 tens it should look like this:



The number at the end of your number line is the answer:

28 + 30 = 58

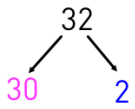
Add 2 two-digit numbers, within 100

46 + 32

As before put the largest number (46) first on the left:

46

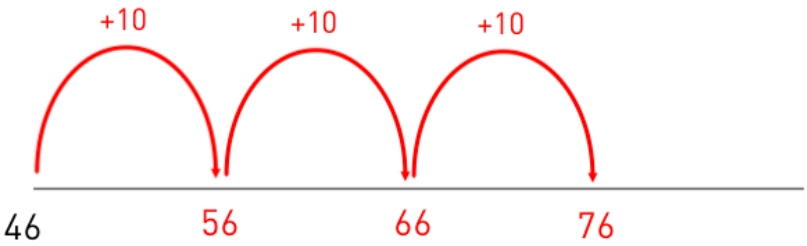
Then partition the smaller number (32) into tens and units:



32 = 30 + 2

To do this addition, we'll count on the tens and then the units: 46 + 30 + 2.

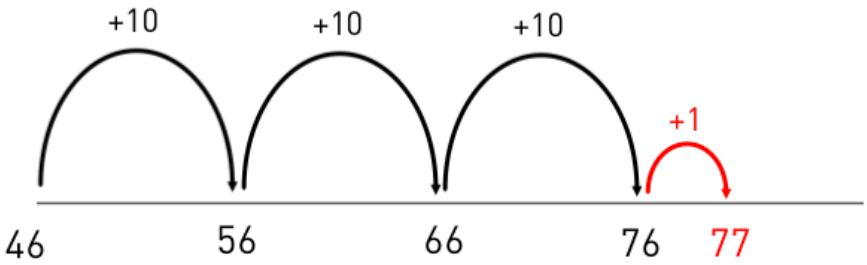
Add the 3 tens first:



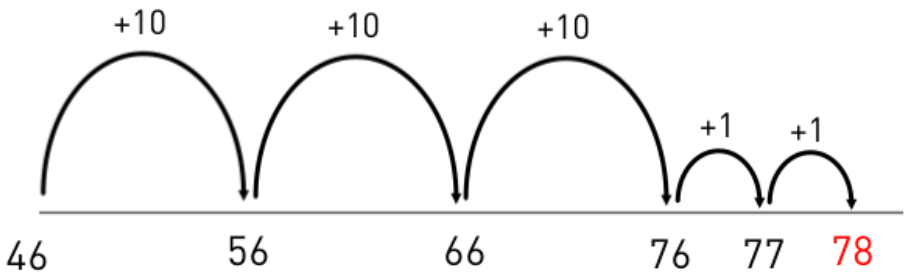
This is when you should look at a **100 square** to see the jumps of tens and ones.

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

Then begin to add the 2 ones like this:



After you've 3 tens and 2 ones, it should look like this:



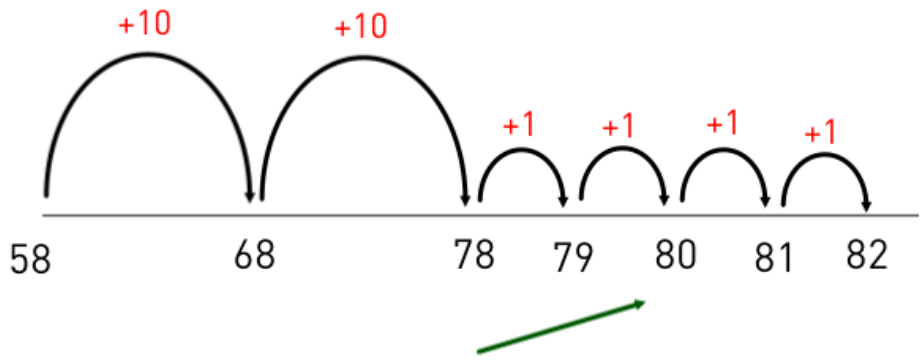
The number at the end of your number line is the answer:

46 + 32 = 78

Add 2 two-digit numbers within 100 where the units cross a tens barrier.

58 + 24

To solve this, follow the steps on the previous page and you should record it as follows:

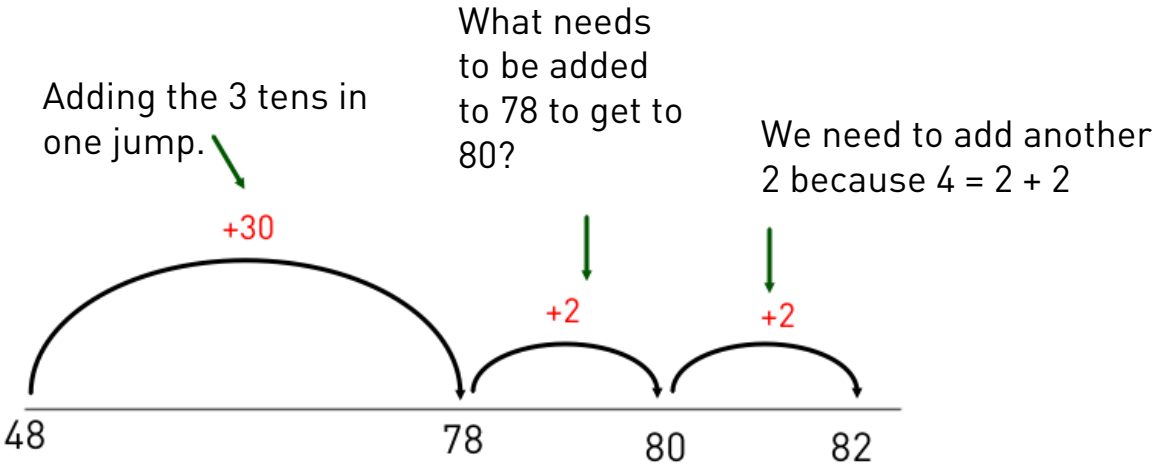


This is where we have crossed a tens barrier: we've gone from counting in the 70s to the 80s. This is a tricky skill to begin with.

Add 2 two-digit numbers within 100 where the units cross a tens barrier, using efficient jumps.

When children are confident with the step before, encourage more efficient jumps. This require good knowledge of your number bonds and plenty of practice counting in tens:

48 + 34



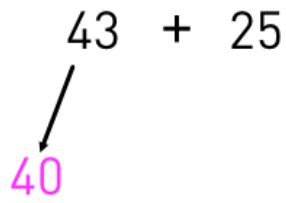
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Remember: for both of these additions, you should have a **100 square** to see the jumps of tens and units.

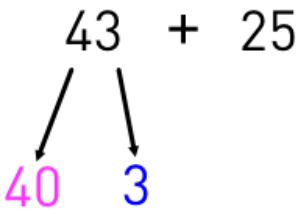
The **partitioning method** is an alternative method for adding 2 two-digit numbers:

43 + 25

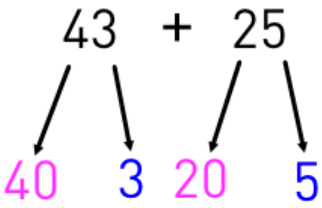
To partition a two-digit number you must split it into tens and units.
Partition the larger number first starting with its tens as follows:



Then move onto its units:



Do the same for the smaller number:



Once you have partitioned the numbers into tens and ones, add the tens together and then add the ones together.

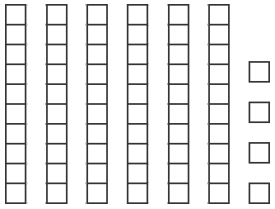
40 + 20 = 60

3 + 5 = 8

Recombine the answers to both of these to give the total.

60 + 8 = 68

Make sure that you can demonstrate what is happening using Dienes (this will improve and support understanding).



Adding 2 two-digit numbers using the **partitioning method** where the units cross a tens barrier:

When children are confident with the step before, move on to calculations that bridge tens:

48 + 36 = 40 + 8 + 30 + 6

40 + 30 = 70

8 + 6 = 14

70 + 14 = 84

48 + 36 = 84

This is an alternative way of recording the partitioning method.
Continue to use base ten apparatus to support understanding.
When children are confident, further develop addition of 2 two-digit numbers with totals greater than 100, using a **200 grid** to support (see Y3 guidance).

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Subtraction

Subtract numbers using concrete objects, pictorial representations, and mentally, including:

- **A two digit number and ones**
- **A two digit number and tens**
- **Two two-digit numbers**

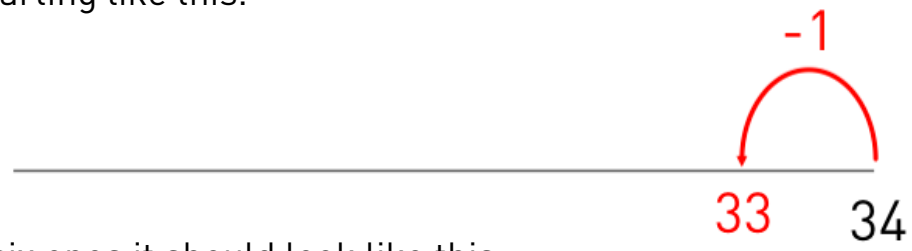
NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.
Consolidate counting back using a **marked number line.**

Count back using an **empty number line** within 100, in ones.

34 - 6 = 28

To solve an subtraction like this, start by marking the larger number on the right hand side of the empty number line.

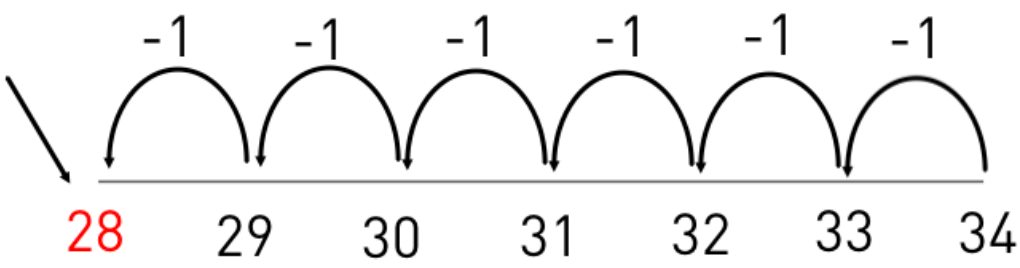
Next, subtract 6 ones, starting like this.



After you've subtracted six ones it should look like this:

The number at this end of your number line is the answer:

34 - 6 = 28

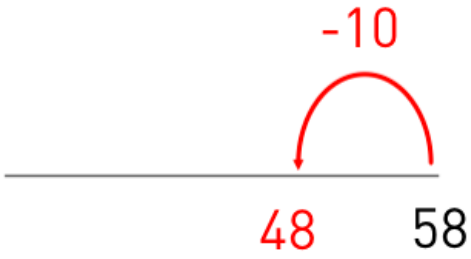


Subtract tens within 100:

58 - 30 = 28

To solve a subtraction like this, start by marking 58 on the right hand side of the empty number line.

Next, subtract 3 tens, starting like this.



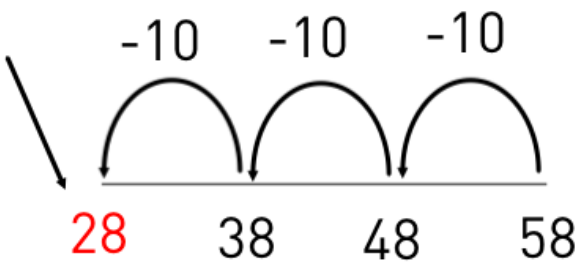
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

This is when you should look at a **100 square** to see the jumps of tens.

After you've subtracted 3 tens, it should look like this:

This number at the end of your number line is the answer:

58 - 30 = 28



Count back on an **empty number line** to subtract 2 two-digit numbers, within 100:

76 – 43 = 33

As before put the largest number (76) at the end on the right:

76

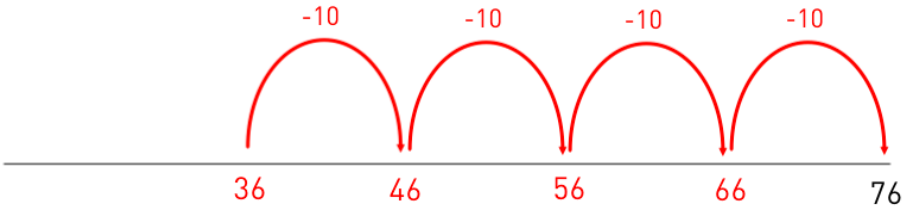
Then partition the smaller number (43) into tens and units:

To do this subtraction, we'll count back the tens and then the units: 76 - 40 - 3.

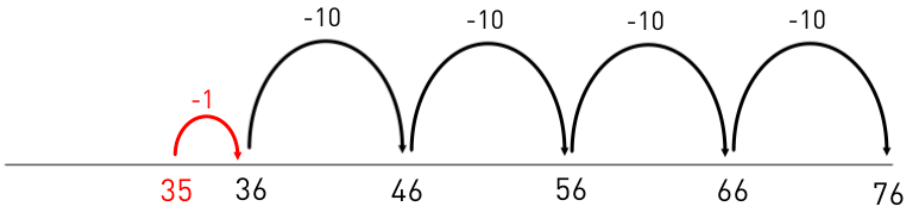
This is when you should look at a **100 square** to see the jumps of tens and ones.

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

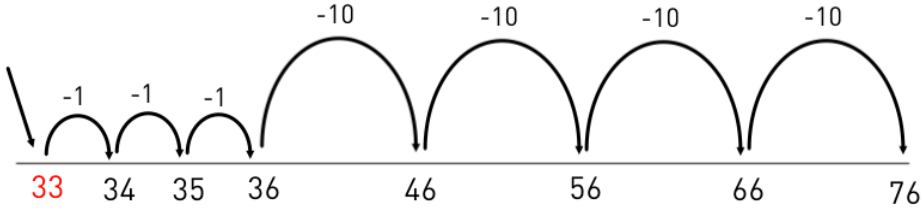
Subtract the 4 tens first: .



Then subtract the 3 units, starting like this:



After you've subtracted 4 tens and 3 units, it should look like this:

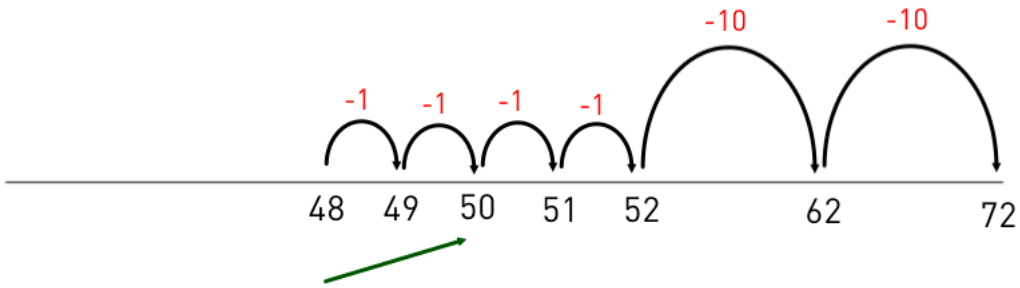


This number at the end of the line is your answer: 76 - 43 = 33

Subtract 2 two-digit numbers within 100 where the units cross a tens barrier.

72 – 24 = 48

To solve this, follow the steps on the previous page and you should record it as follows:



This is where we have crossed a tens barrier: we've gone from counting back in the 50s to the 40s. This is a tricky skill to begin with.

Subtract 2 two-digit numbers within 100 where the units cross a tens barrier, using efficient jumps.

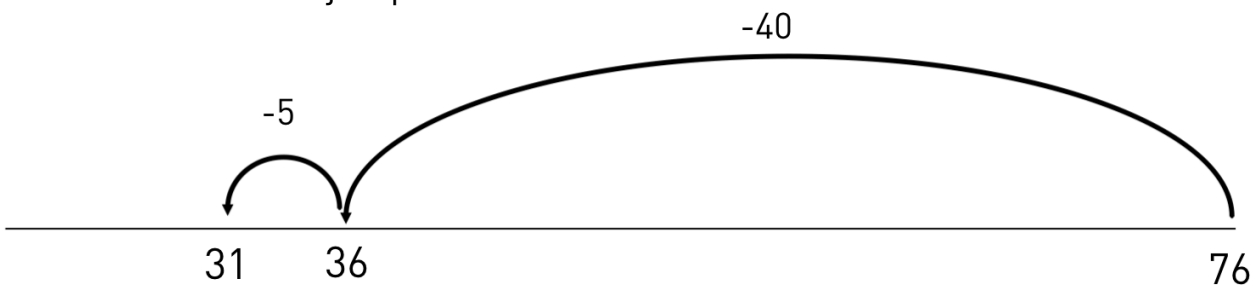
If children are confident, use more efficient jumps:

76 – 45 = 31

This require good knowledge of your number bonds and plenty of practice counting backwards in tens:

Subtracting the 5 units in one jump.

Subtracting the 4 tens in one jump.



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

Remember: for both of these subtractions, you should have a **100 square** to see the jumps of tens and units.

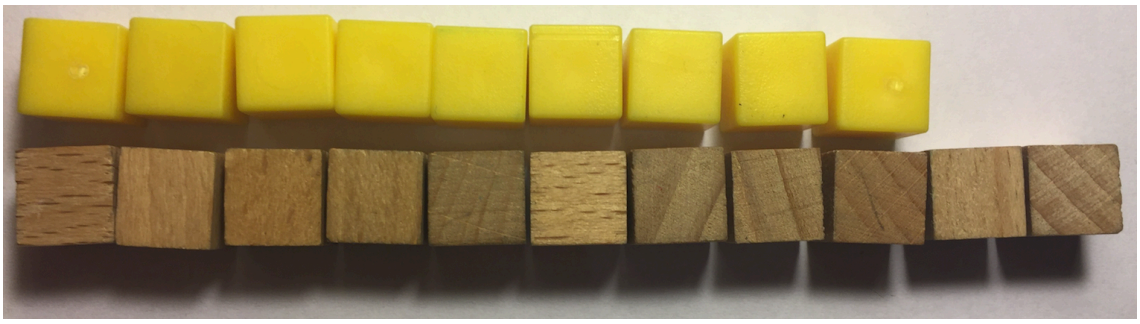
Counting on to find a small difference

Sometimes we actually add to find out the answer to a subtraction. This is called complementary addition and we use it to find differences (we only use this for **small** differences).

The use of models is extremely important here to understand the idea of "difference". Before looking at how we should show finding the difference in our books, remind yourself of how we find the difference in Year 1.

Count up from the smallest number to the largest to find the difference using resources, e.g. cubes, beads, number tracks/lines:

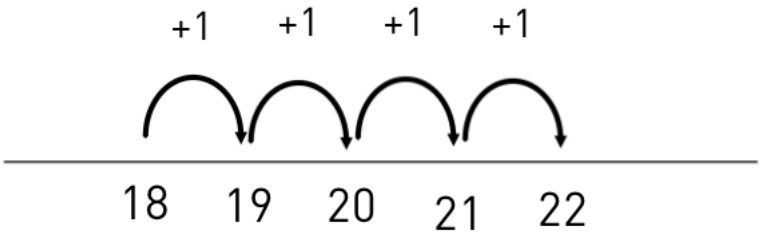
11 - 9 = 2



We continue this idea but express it using a number line like this:

22 - 18

We start with 18 and see what we have to add to get to 22. This is the differece

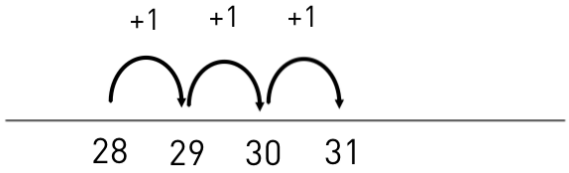


The difference between 18 and 22 is 4, so 22 - 18 = 4.

Counting on to find a small difference, **crossing the 10s barrier**

As before, **count up** from the smallest number to the largest to **find the difference**.

31- 28



The difference between 28 and 31 is 3. So 31 - 28 = 3

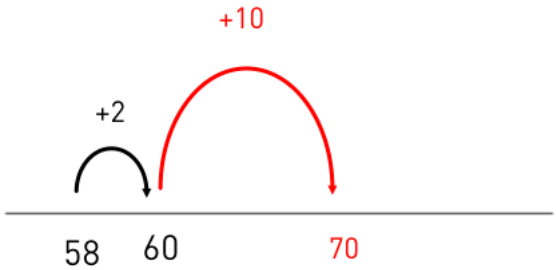
Counting on to find a difference, **using more efficient jumps.**

If children are confident, further develop this method to find the difference, using more efficient jumps:

74 – 58
Draw a number line and write the smaller number on the left handside.

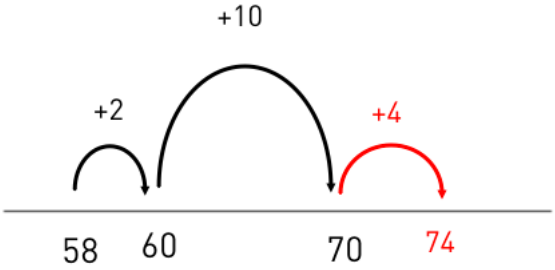
We need to add to 58 until we reach 74. To be efficient with this, we first add what is needed to reach the next 10:

We then add the number of 10s necessary to get as close to our target number as possible: .



In this example, we needed to add one ten, but in other examples, you might need to add more tens when finding the difference .

Finally, we add the remaining units to get to our target number:



We add the jumps together to find the difference: 2 + 10 + 4 = 16. The difference between 58 and 74 is 16.

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

NB If, at any time, children are making significant errors, return to the previous stage in calculation. And remember, you should use a hundred square to help.

Multiplication

Count in steps of 2, 3, 5 and 10 from 0
Recall and use multiplication facts for the 2, 5 and 10 multiplication tables (up to the 12th multiple)
Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs
Solve problems involving multiplication, using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in contexts
Show that multiplication of two numbers can be done in any order (commutative law)

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Children will use a range of vocabulary to describe multiplication and use practical resources, pictures, diagrams and the **x** sign to record.

Combining Groups (repeated addition) using physical resources:

'5 pots of 10 pencils'

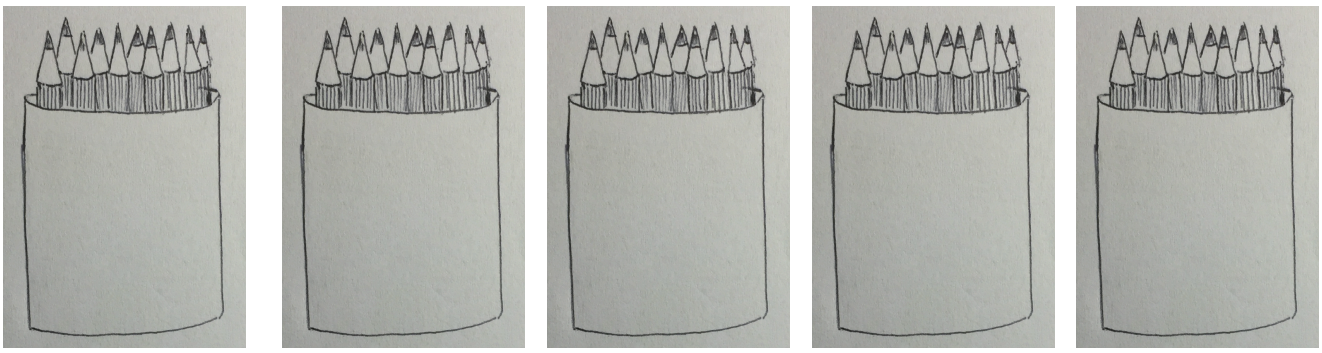
'How many pencils altogether?'

'10, 20, 30, 40, 50'

'10 + 10 + 10 + 10 + 10 = 50'

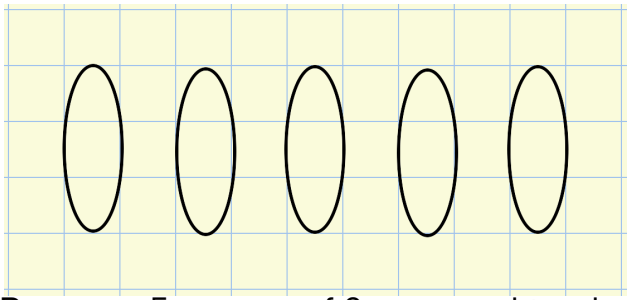
'5 groups of 10' '5 times ten'

'5 x 10 = 50'

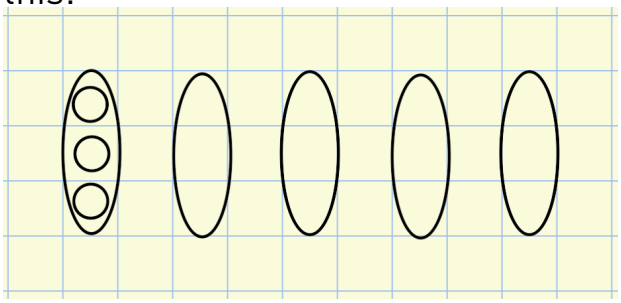


Combining Groups (repeated addition) by drawing diagrams:

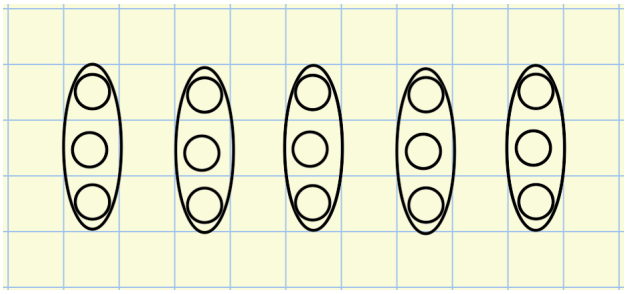
‘5 groups of 3
Begin by drawing 5 groups: you might draw 5 circles, ovals or any other shape you like:



Because 5 groups of 3, we need to place 3 in each of our groups, starting like this:



When we've put 3 in each, it should look like this:



We then count each of these 3s:

‘3, 6, 9, 12, 15’

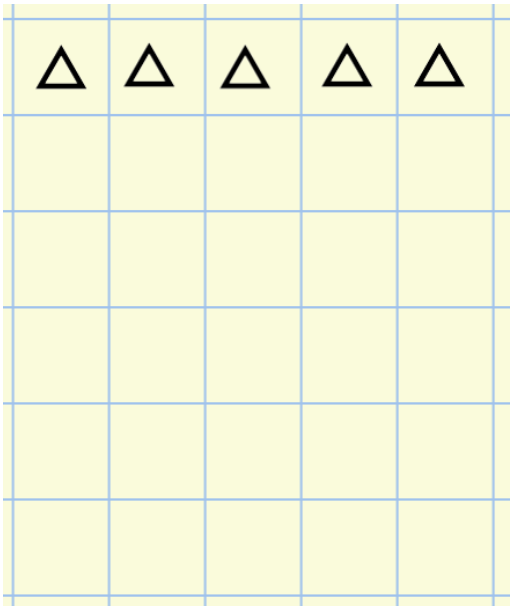
‘3 + 3 + 3 + 3 + 3 = 15’

‘5 x 3 = 15’

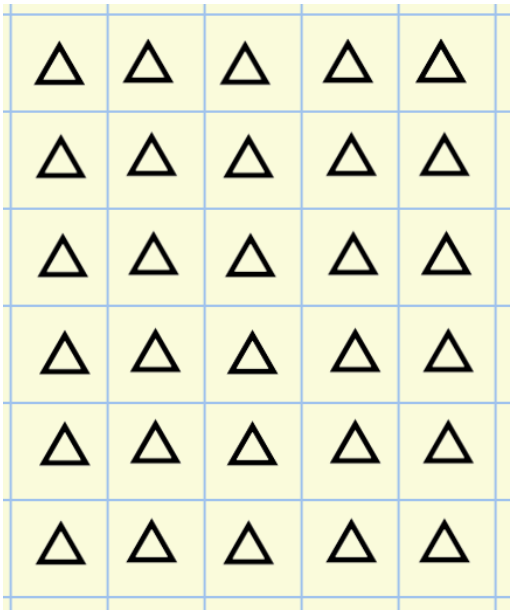
Using arrays to support multiplication:

5 x 6

We can draw arrays to demonstrate what 5 x 6 is. We can start by drawing a row of 5:



We need to draw 6 rows of 5:



Next, we ask: How many stars altogether?'

'5 + 5 + 5 + 5 + 5 + 5 = 30 '

'6 rows of 5'

'6 columns of 5'

'5 groups of 6'

'6 x 5 = 30'

'5 x 6 = 30'

We can see that the multiplication of two numbers can be done in any order: so 5 x 6 = 6 x 5

Using an empty number line to count on for multiplication:

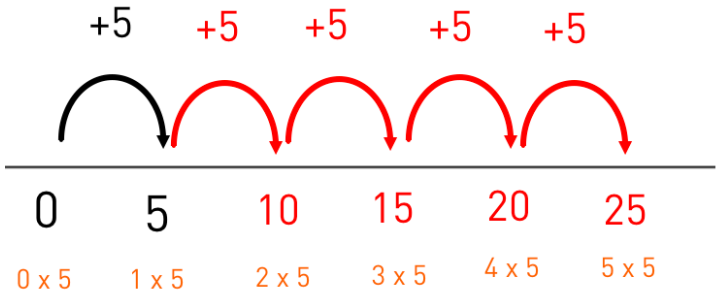
Use an **empty number line** to count on**:**

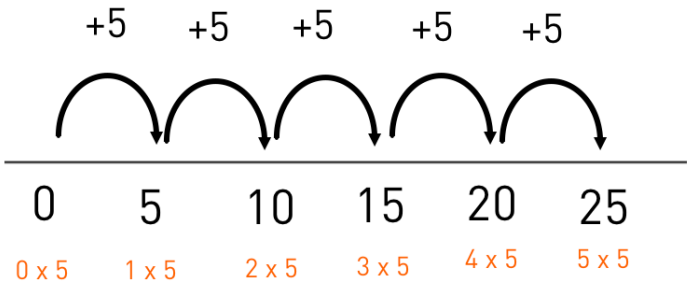
5 x 5

Begin by marking an empty number line with 0.

Add 5 to 0 and mark this on the number line like this:

Then continue this until you've added 5 lots of 5:





Make the link to repeated addition:
'5 + 5 + 5 + 5 + 5 = 25

Six jumps of five equals 30
5 x 5 = 25'

NB If, at any time, children are making significant errors, return to the previous stage in calculation.

Division
Count in steps of 2, 3, 5 and 10 from 0 (forward and backward)
Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables
Calculate mathematical statements for division within the multiplication tables they know and write them using the division (÷) and equals (=) signs
Solve problems involving division, using materials, arrays, repeated subtraction, mental methods, and multiplication and division facts, including problems in contexts

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.
Children will use a range of vocabulary to describe division and use practical resources, pictures, diagrams and the **÷ sign** to record, using multiples that they know.

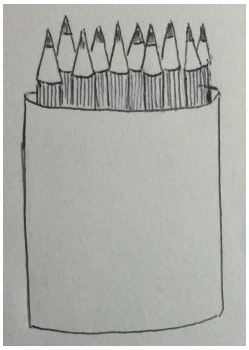
Sharing and grouping using pictures and physical resources to help:

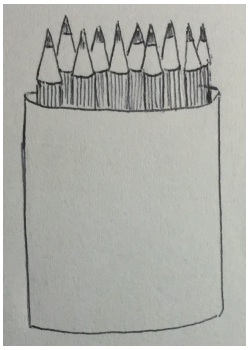
30 crayons shared equally between three pots. How many in each pot?
(**Sharing**)

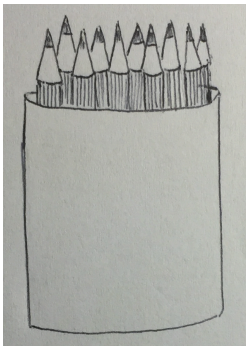
30 ÷ 3 = 10

We have 30 crayons and put ten tcrayons in each pot. How many pots do we need?
(**Grouping**)

30 ÷ 10 = 3



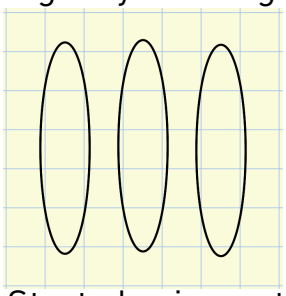




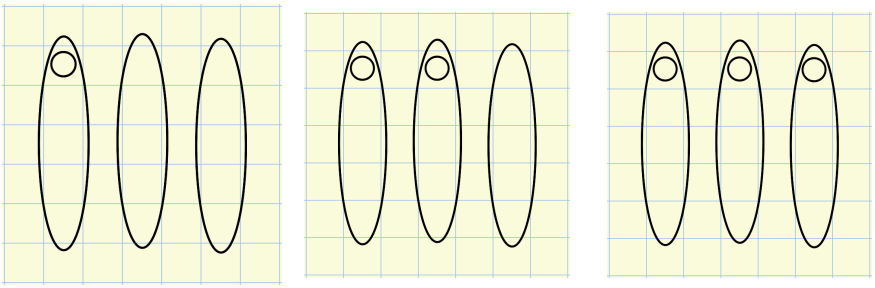
Sharing and grouping using drawing and diagrams to help:

15 toy cars shared equally between three boxes. How many in each box? (**Sharing**)

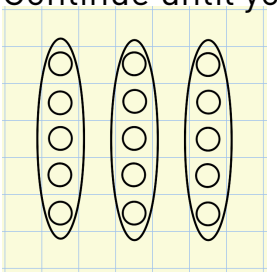
Begin by drawing three circles into which you can share out the 15 objects:



Start sharing out the 15 objects like this:



Continue until you've shared out all 15objects:



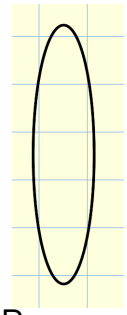
15 ÷ 3 = 5

15 divided by 3 = 5

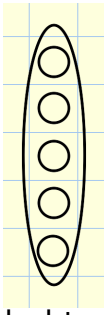
We have shared them out equaly and you can see that there are 5 in each.

We have 15 toy cars and put five toy cars in each box. How many boxes do we need?
(**Grouping**)

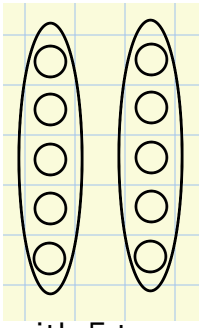
Begin by drawing a shape into which you can place five toy cars:



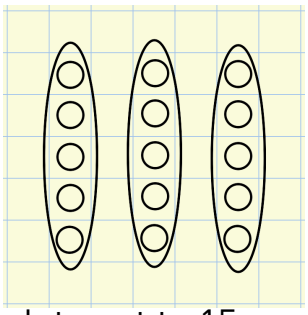
FIll that shape with 5 shapes to represent the toy cars:



Then draw another shape and fIll that shape with 5 shapes to represent the toy cars:



Finally draw another shape and fIll that shape with 5 shapes to represent the toy cars:



Because we've needed to draw 3 shapes with 5 toy cars in each to get to 15, we know that we need 3 boxes.

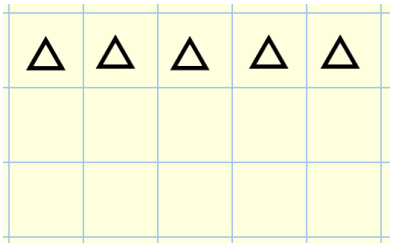
15 divided by 5 = 3

15 ÷ 5 = 3

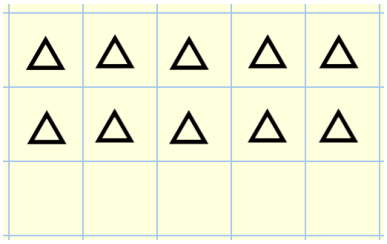
Using arrays to support division

15 ÷ 3

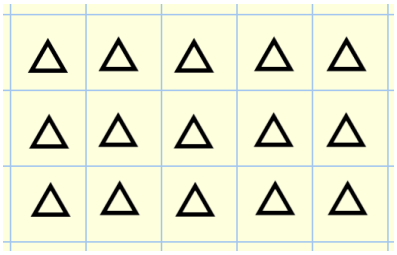
When solving these, you should know how to draw arrays to help. For 15 ÷ 5, you would begin by drawing out a row of 5 since this is the number your dividing 15 by:



You start by drawing a row of 5 triangles or circles (whatever you prefer). Then you start a new row of 5 like this.



Then you start a new row of 5 like this.



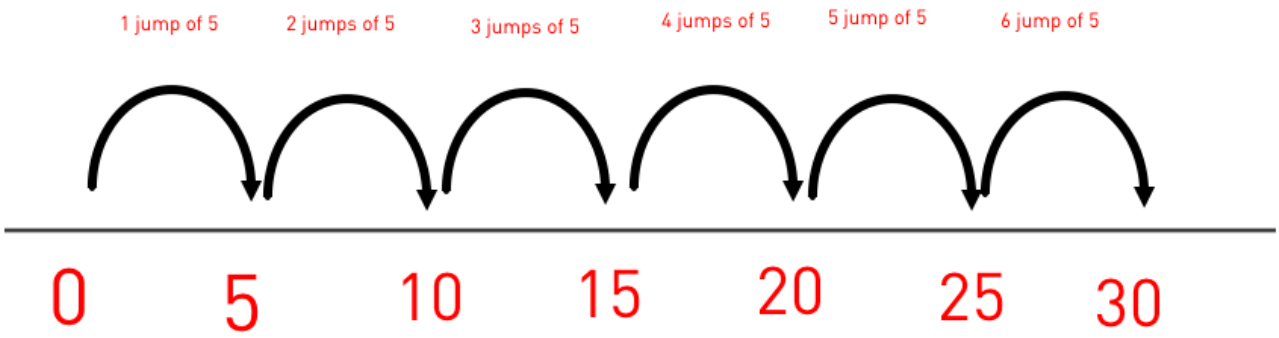
When you have reached the number you're dividing 5 by (15) you should stop.

Count how many rows you have: 1, 2, 3. 3 rows. This means that 15 ÷ 5 = 3

Use an **empty number** line to count forwards to divide, making the link with multiplication:

30 ÷ 5

'How many jumps of five make thirty?'



By drawing out the jumps of five, we can see that there are 6 of them.

So 30 ÷ 5 = 6

Using an empty number line to count back for division using repeated subtraction:

Use an **empty number line** to count back**:**

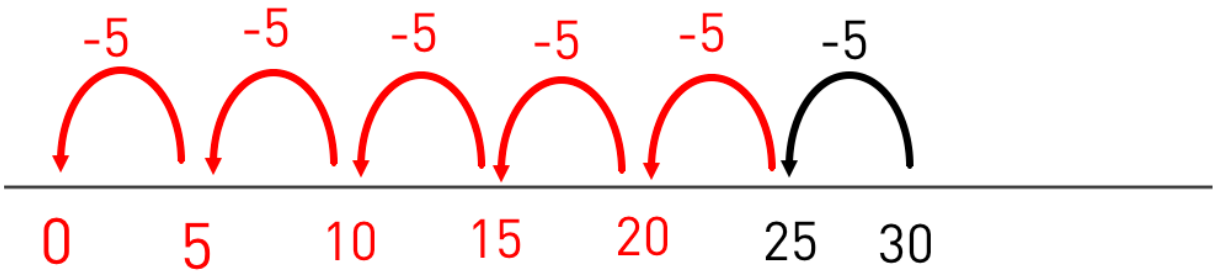
30 ÷ 5

'How many groups of five?'

Begin by marking an empty number line with 30, the number you're dividing.

Subtract 5 from 30 on the number line like this:

Then continue subtracting 5s until you get to 0:



How many times did we subtract 5 from 30 until we got to 0?

6

So 30 ÷ 5 = 30

NB If, at any time, children are making significant errors, return to the previous stage in calculation.