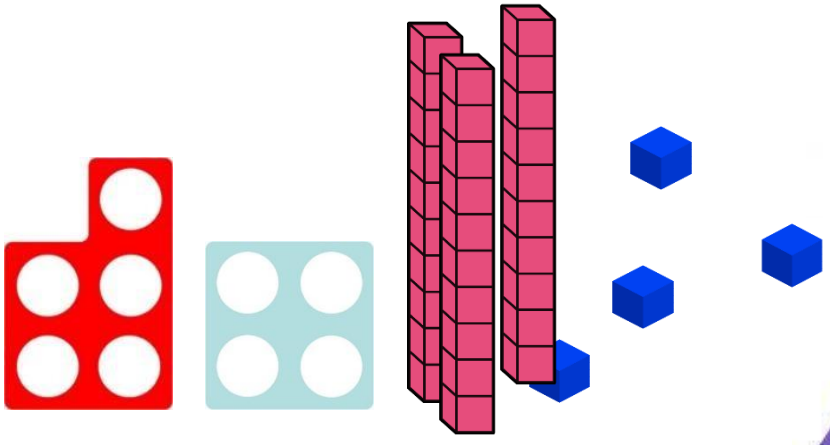
Wester Overton Primary School

Parents Guide to Subtraction



Your child is now learning about subtraction. In order for you to help at home it is important that you are familiar with the words and methods your child's teacher will be using in the classroom. One important change from previous school days is that the term **EXCHANGE** is now used instead of 'borrow' and 'pay back'.

Progression Through Calculations for Subtraction

Mental Calculations (on-going)

These are some of the mental calculation strategies we use at Wester Overton:

Mental recall of addition and subtraction facts

10 – 6 = 4 17 - 6 = 11
20 - 17 = 3 10 - 8 = 2

Find a small difference by counting up

82 – 79 = 3

Counting on or back in repeated steps of 1, 10, 100, 1000

86 - 52 = 34 (by counting back in tens and then in ones) 460 - 300 = 160 (by counting back in hundreds)

Subtract the nearest multiple of 10, 100 and 1000 and adjust

24 - 19 = 24 - 20 + 1 = 5
458 - 71 = 458 - 70 - 1 = 387

Use the relationship between addition and subtraction

36 + 19 = 55 19 + 36 = 55
55 – 19 = 36 55 – 36 = 19

These mental calculations are the foundations of your child's number knowledge, and will be continued to be used throughout their school career and in life.

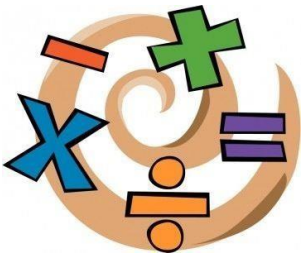
Introducing Subtraction- Using songs and number rhymes

Example 'Five little speckled frogs', 'Five little men in a flying saucer', '10 Green Bottles'.

This will introduce subtraction vocabulary, including 'take away', 'less than' and 'subtract'.

Children will be initially taught that, when subtracting, the answer is smaller than the starting number. They will count and point using objects, and subtract them by physically moving each item. Whenever possible we use real life experiences to develop the children's understanding of subtraction.

We then use pictorial examples to help children visualise the problem. The children will respond to questions like 'How many are left?'



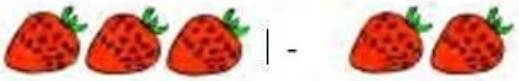
Example

I have 5 balloons.

2 burst.

How many do I have left?

Example



3 - 2 = 1

Example

4 – 1 = 3

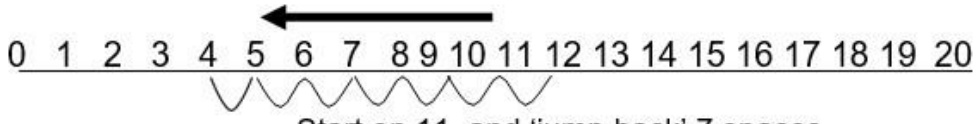
Children will develop their ability to subtract (by 'taking away'). This will involve them jumping backwards on a number line. This will prepare them to deal with larger quantities, and it will also become more time efficient.

Children are shown to mark their jumps on the number line to show that it is the opposite to add and therefore make links to the inverse.

Example

What is 11 take away 7?

11 – 7 = □



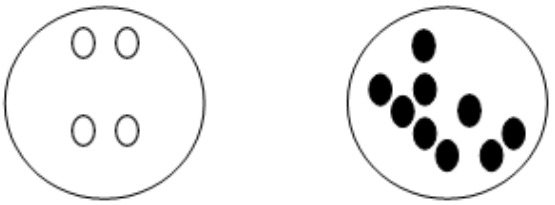
Start on 11, and 'jump back' 7 spaces.

11 – 7 = 4

After having experienced subtraction as 'taking away', children are then introduced to subtraction as 'finding the difference'.

Example

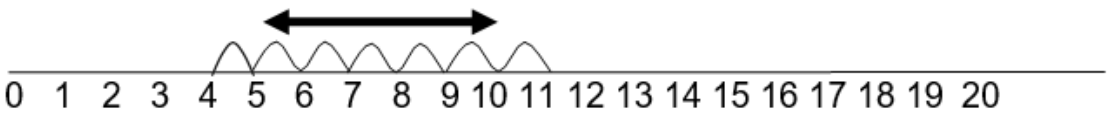
Which plate holds the most: black or white?
How many more? What is the difference?



Children can also solve subtraction problems by counting on or counting back using a number line. The method that the children will use will depend upon how they 'see' a problem.
If a child is 'stuck' on the problem they will be encouraged to count on from the smallest number (as this is normally the case when, for example, finding the difference between the heights of 2 people).

Example

What is the difference between 11 and 4?



Children will start on either number, or 'jump' until they reach the other (this is possible in either direction, but is normally thought of as 'jumping on').

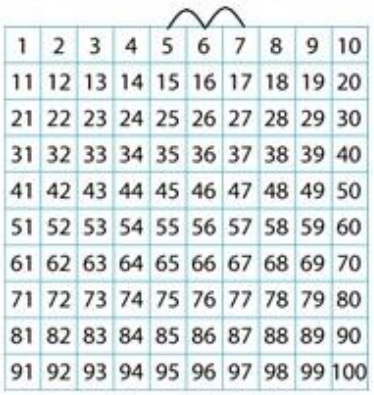
<u>Introducing the 100 Square</u>

Children use 100 squares as a tool to aid counting back in small steps (eg. in 1s or 2s). Once secure they begin to use the 100 square to count back in tens, learning that as they move down a row they subtract 10 each time.

Careful attention is given to possible misconceptions at this stage, especially jumping on their starting number, instead of always moving horizontally with each move.

Example

7 count back 2 = 5



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

7 – 2 = 5

They will then move to a more efficient method of subtracting 10 to a number (jumping vertically rather than horizontally).

Example

48 count back 10 = 38

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

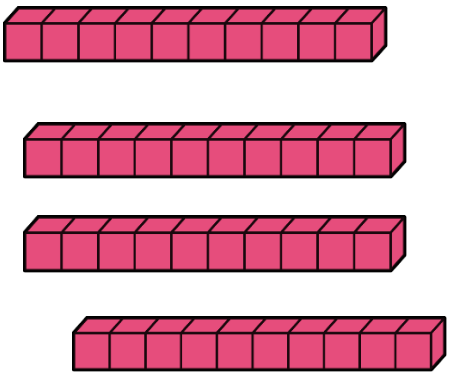
48 – 10 = 38

Introducing partitioning (2 digit numbers)

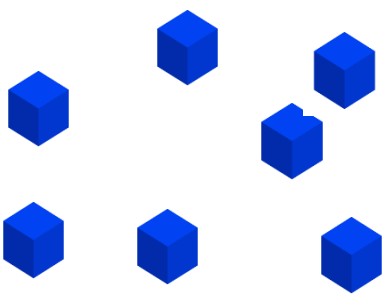
Children will learn that numbers 10 or over (and under 100) are made up of TENS and UNITS. Partitioning a number involves splitting it up into TENS/UNITS to show the value of each digit.
Children learn to subtract larger numbers using partitioning. This is done using concrete materials such as tens rods and units cubes.

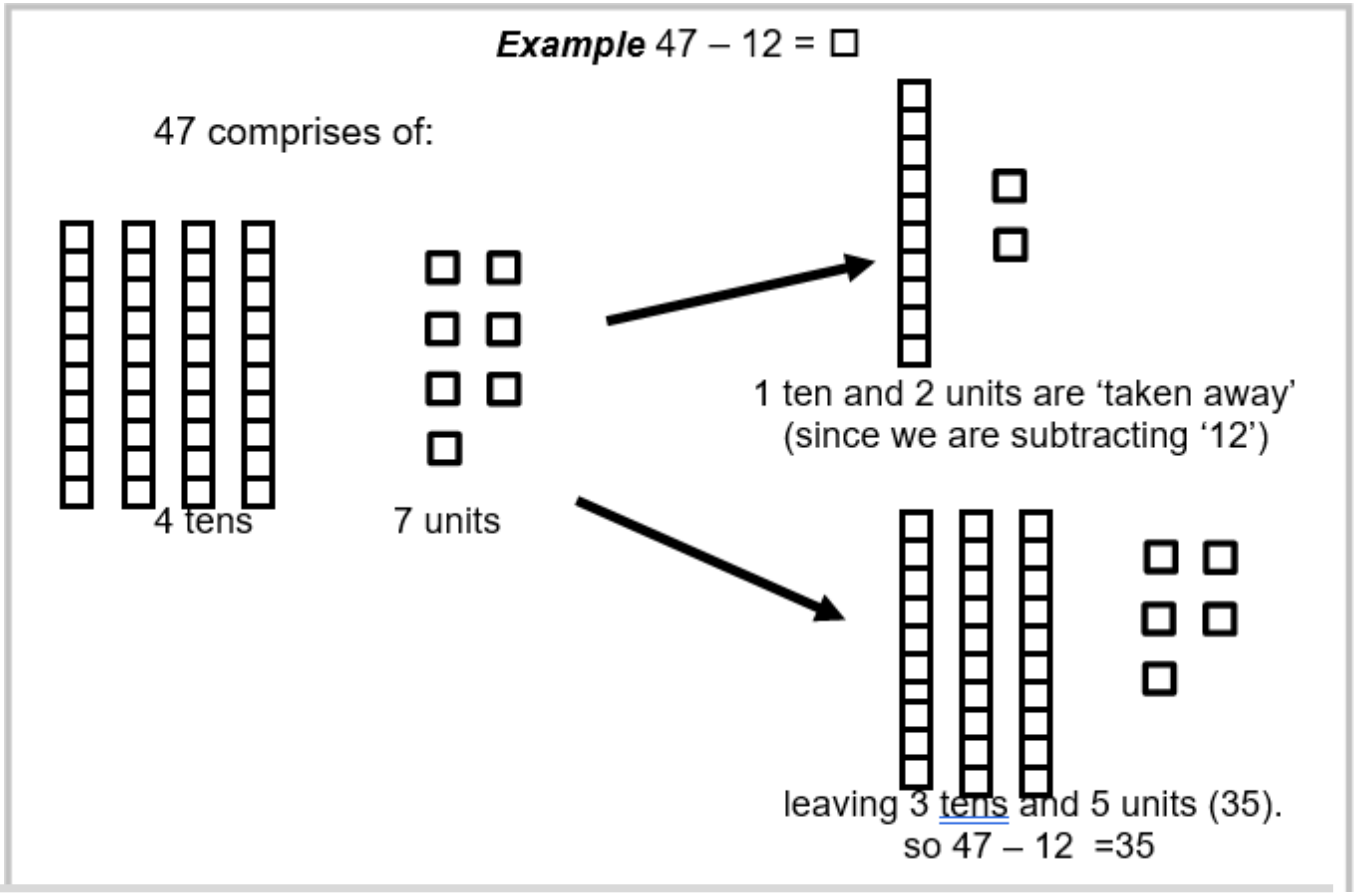
e.g. 47

Four tens



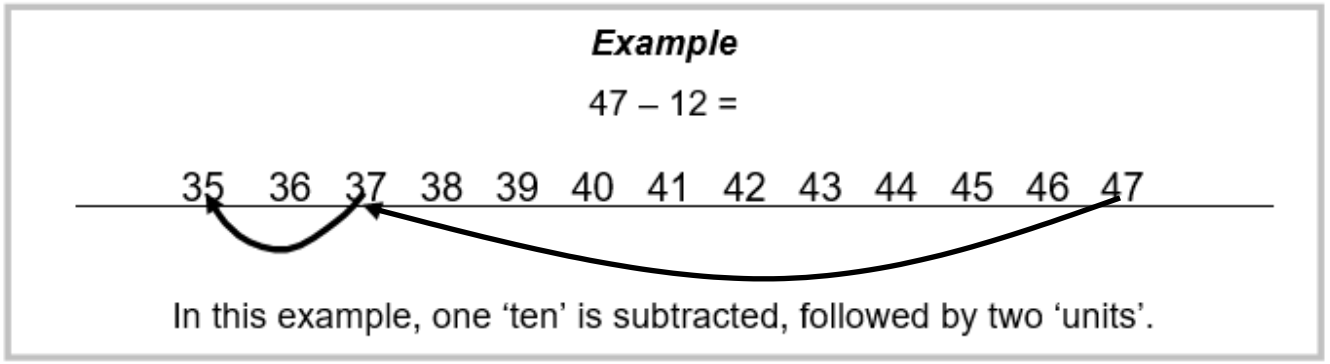
7 units





Subtraction using a number line

At this stage the children will learn how to subtract a two-digit number by subtracting the 'tens' and 'units' within this number using two number line jumps (rather than just jumping back in units).

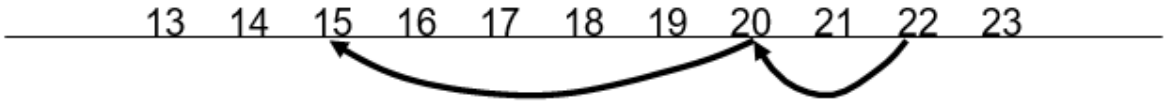


Noticing shortcuts on number lines

Children will develop their ability to use a number line, including shorter methods to help them when appropriate.

Example

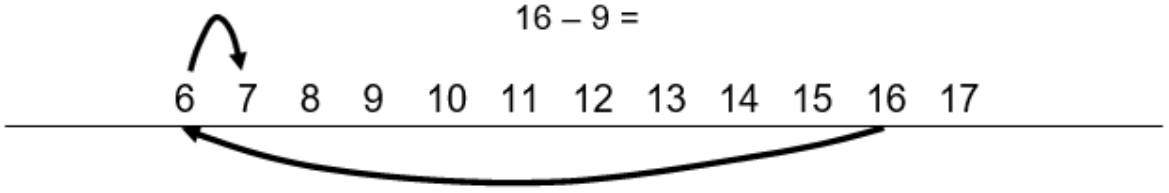
22 – 7 =



In this example, the children will recognise that they are able to jump to the next multiple of ten (subtracting 2), before subtracting the remainder (5).

Example

16 – 9 =



In this example, the children will recognise that '9' is nearly the same as subtracting 10. They will therefore subtract 10, before adjusting their answer to suit the question.

Towards a formal method without 'exchanging'

Children will begin to move towards informal written methods. They use partitioning with no exchanging taking place between the 'tens' and 'units' numbers.

Example

87 – 32 = ?

(Subtracting the tens) 80 – 30 = 50

(Subtracting the units) 7 – 2 = 5

50 + 5 = 55

Formal written methods (1)

The children will subtract a two-digit number from another using a formal written method, which does not involve exchanging. The children will start with the ones/unit digits. The placing of the operation on the right hand side will reinforce this.

38-13 =25

$$\begin{array}{r} 3\,8 \\ -13 \\ \hline 25 \end{array}$$

Formal written methods (2)

Once children have mastered the subtraction strategy involving two digit numbers without exchanging, they will begin to 'exchange'. Here they will draw upon their knowledge of partition into Tens and Units alongside their knowledge of partitioning in different ways.

Tens	Units	
T	**U**	Always start at the units
9	3	Now say **3 take away 7**
-5	7	3 is smaller than 7 therefore I cannot subtract

T	**U**	
8 ~~9~~	$^{1}3$	Now go to 9 tens and **EXCHANGE** one ten for 10 units. Do this by scoring out the 9 and writing an 8. Put the figure 1 (one ten) in front of the 3 units, making it **13** units.
-5	7	

T	**U**	
8 ~~9~~	$^{1}3$	Now say 13 units take away 7 leaves 6. Write the 6 in the units column. Then say 8 tens take away 5 leaves 3. Place the 3 in the Tens Column. The answer is **36.**
-5	7	

Exchanging involves a 'ten' being exchanged for ten 'units' in order for a problem to be calculated correctly. Concrete materials (tens and units) should be used to make the process of exchanging explicit. The term **'borrowing' must not be used**, as the units are never exchanged back to a ten.

Formal written methods (3)

This process is then repeated for three-digit numbers, with the children experiencing first the calculation without a need to 'exchange' and then involving 'exchanging'.

Example

243 – 122 = ?

243
- 122
121

so 243 – 122 = 121

Example

443 – 237 = ?

$$\begin{array}{r} {}^{3}\not{4}\,{}^{1}\not{4}3 \\ -\,2\,3\,7 \\ \hline 2\,0\,6 \end{array}$$

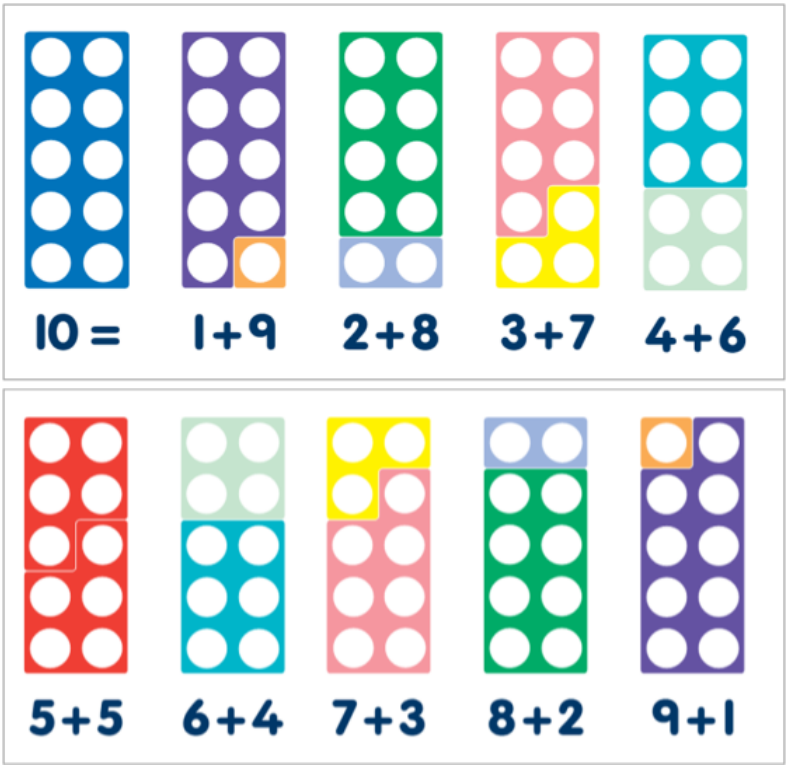
Example

400 – 199 = ?

$$\begin{array}{r} {}^{3}\not{4}\,{}^{1}0\,{}^{1}\not{0} \\ -\,1\,9\,9 \\ \hline 2\,0\,1 \end{array}$$

It is important to choose the most efficient method to subtract, e.g. 300 – 12 would be quicker to solve mentally; subtracting 10 and then 2.

Exchanging involves a higher digit being exchanged, for example a 'ten' being exchanged for ten 'units', or a 'hundred' being exchanged for ten 'tens'. This then enables a problem to be calculated correctly.

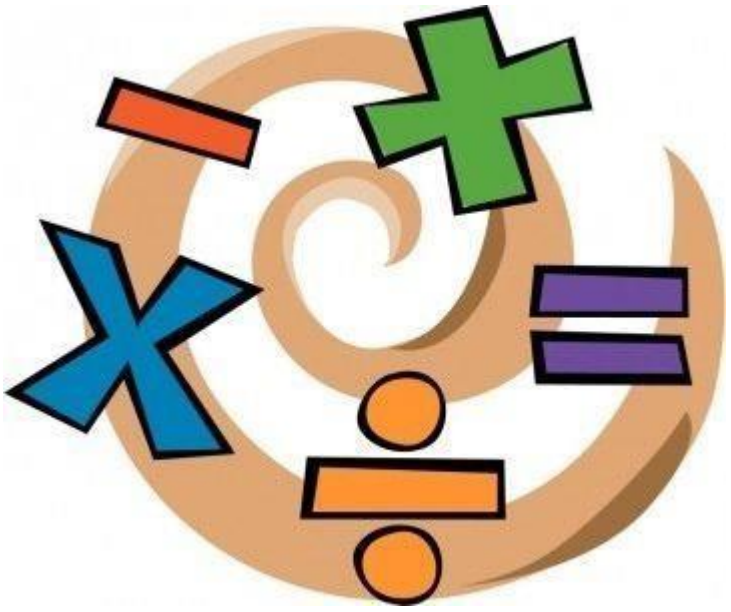


Decimal numbers

The children will also be given opportunities to subtract numbers with a different number of decimal places (eg. 34.85 –14.7). Putting a 0 in any 'spare' spaces will help them to put the digits in the correct place.

Example	***Example***
34.8 – 26.4 = ?	34.84 – 26.4 = ?
$\begin{array}{r} {}^{2}\not{3}^{1}4.8 \\ -26.4 \\ \hline 08.4 \end{array}$	$\begin{array}{r} 34.84 \\ -26.40 \\ \hline 08.44 \end{array}$
so 34.8 – 26.4 = 8.4	so 34.84 – 26.4 = 8.44

When your child has mastered basic subtraction, they will move onto examples using hundreds and thousands, and then will apply this same skill to decimals, money, weight, length, etc. The process will be exactly the same.



This parent guide has been produced to help inform and involve you in the working of the school and in your child's learning.

Only when families and school work together in partnership can we ensure the best for your child. Information from the school is only one part of this, and our willingness to answer your questions and listen to suggestions provides the other crucial part of this partnership.

Should you wish further information, please contact me at the school.

June Moir
Head Teacher