Stanhope Barrington
C. of E. Primary School

Addition

and

Subtraction

Key Stage 2

Years

3 and 4

In this booklet you will see a variety of working out different calculations.

The booklet is designed to explain how some of the different methods of calculating are being taught in school. The methods may look different to those you are familiar with but they may be how your child will be learning to calculate at school.

The methods of calculation in this booklet follow on from some of the mental methods of calculation your child may be familiar with.

All calculations should be written horizontally at first, until children decide which way to work them out e.g.

45 + 13 =   Not vertically 45

                                        +13

Children are becoming more familiar with the words calculation and calculate as they are being used a lot more in schools. The word 'sum' should only be used when adding numbers together.

It is important to use the correct words when talking about numbers in calculations. The numbers are said using the value of the number, for example;

   45

+ 13   add the tens first by saying forty add ten is
         fifty

A method of adding is to partition the numbers into parts, add the parts and then recombine the find the total.

45 + 13 =

Partition the numbers into tens and ones (units):

40 + 5 + 10 + 3

Add the tens together:

40 + 10 = 50

Add the ones together:

5 + 3 = 8

Recombine the numbers to give the total:

50 + 8 = 58

This knowledge of portioning can then be used in a vertical calculation where the largest part of the number is added first and the smallest part of the number is added last.

```
   45
+  13      add the tens first by saying add
   50      ten to forty

   45
+  13      add the ones (units) five add
    8      three

   45
+  13
   50
    8
   58      total the numbers
```

This method can be used for larger numbers e.g 143 + 531 =

The same method can be used to add the smallest part of the number first and the largest part of the number last. e.g.

$$
\begin{array}{r}
45 \\
+\ 13 \\
\hline
8
\end{array}
$$

add the ones (or units) first

$$
\begin{array}{r}
45 \\
+\ 13 \\
\hline
8 \\
\underline{50}
\end{array}
$$

add the tens by saying forty add ten is fifty

$$
\begin{array}{r}
45 \\
+\ 13 \\
\hline
8 \\
\underline{50} \\
\underline{58}
\end{array}
$$

total of numbers

This method can also be used with larger numbers.

This method can then lead to a more compact method:

625 add the ones (or units),

+ 48 five add eight is thirteen

_____3 one ten under the tens column

1   and 3 in the ones column.

625 add the tens, twenty add forty is

+ 48 sixty, plus ten underneath, seventy.

___7 3 Put the seventy in the tens column.

1

625 add the hundreds, six hundred.

+ 48 Put the six hundred in the

6 73 hundreds column.

1

This compact number can also be used with larger numbers.

| **Subtraction**

An empty number line can be used to subtract (take Away) two numbers.

$$22-7 =$$

_____

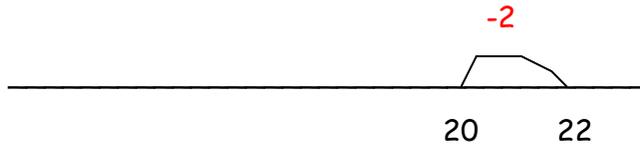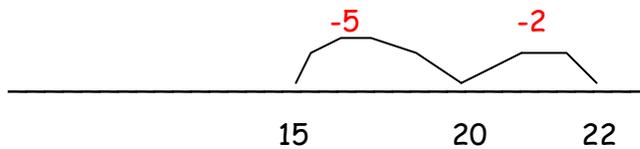22
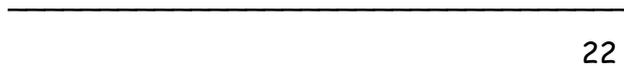
Start by marking 22 on the number line.

It's easier for children to work around the multiples of 10 and 100 when calculating.

Encourage your child to count back to the nearest multiple of 10, which in this example is 20.

-2

_____

20   22

How many have you subtracted (counted back)? 2.

How many more do you need to subtract (count back)? 5. Count back five.

-5   -2

_____

15   20   22

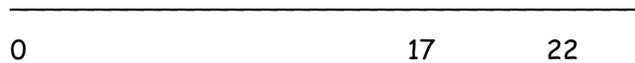How many have you subtracted (counted back)? 7

What's the answer? The answer is 15

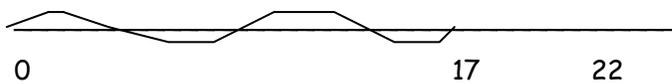$$22-7 = 15$$

The number line can also be used to subtract by counting up from the smaller number to the larger.

$$22 - 17 =$$

_____

0   17   22

Start by marking zero and the two numbers on the number line.

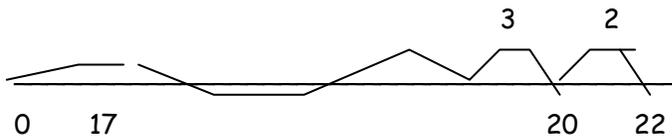We want to take 17 away, so we scribble away 17.

0   17   22

How many do we have left?

Count up from 17 to the next multiple of 10, which is 20.

Count up from 20 to 22.

                                    3   2

0   17   20   22

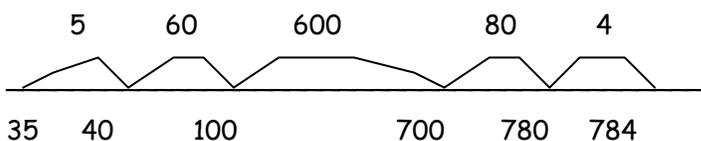Find the total of the jumps to give the answer: 3 + 2 = 5

The answer is 5. $22 - 17 = 5$

This method of counting up from the smaller to the larger number is often used when finding the difference between two numbers.

The same method can also be used with larger numbers.

A Year 4 example: 784—35 =

The children can simply mark the two numbers on the number line and count up to find the answer.

```
     5      60      600       80     4
   /\    /\     /    \    /\    /  \
__/  \__/  \__/      \__/  \__/    \__
35   40      100          700   780  784
```

Start with the largest number when adding to find the total e.g..

600 + 80 60 + 5 + 4 = 749

This method of counting up can also be recorded vertically:

            784

        -     35

              5 count up from 35 to 40

             60 count up from 40 to 100

            600   count up from 100 to 700

             80 count up from 700 to 780

              4 count up form 780 to 784

            749   Find the total as before by adding the
largest numbers first.

Another method used to subtract (take away) is a method called decomposition.

This method partitions each number and takes each part of one number away from each part of the other number.

e.g.   784 - 35 =

Each number is partitioned into hundreds, tens and ones (units) and set out in this way.

784 =	700	80	4
- 35	-	30	5

Starting with the ones, take 5 away from 4. There isn't enough, we need to exchange one ten for ten ones. The tens column becomes ten less and the ones column becomes ten more:

700	70	14
-	30	5

We can now take 5 away from 14:

700	70	14
-	30	5
		9

Move the tens column, can we take thirty from seventy?

Yes.

700	70	14
-	30	5
	40	9

Move to the hundreds column, can we take no hundreds from seven hundreds

700	70	14
-	30	5
700	40	9

The numbers are put back together (recombined) to give the answer.   784 - 35 = 749

It is important that your child understands that when subtracting the smallest number is taken away from the largest. (not as obvious to children as you would think) to take away the larger from the smaller gives a   negative number.

e.g. 6 - 9 = -3

Children also need to understand the link between addition and subtraction. This is called the inverse operation.

e.g. 6 + 3 = 9   9 - 6 = 3   9 - 3 = 6

Useful equipment to have:

- A ruler which can be used as a number line, or to draw a number line

- A hundred square to count forwards and back on.

- Bag of buttons, marbles, or similar to use for practically checking a calculation if your child gets stuck.

- Using squared paper you can make some paper hundreds, tens and ones. Your child can help make them, this will help reinforce one hundred is 100 ones or 10 tens. This is a great way to demonstrate how decomposition works. You can get your child to physically change a ten for 10 ones etc.

Your hundred, tens and ones can be used to play a fun game that helps to reinforce decomposition or compact addition with the ten or hundreds under the line.

For each game you need a dice and paper hundreds, tens and ones.

Compact addition game:

Throw the dice and pick up that number of ones, each person playing throws the dice in turn.

As the dice is thrown the next time if the number of ones is larger than 10 the person exchanges 10 ones for a ten strip.

Once a player has 10 tens they can exchange the tens for a hundred square.

The winner is the first person to get a hundred square.

Decomposition game:

Each person starts with 1 hundred square. Throw the dice and take away that number. You can't do this so you need to exchange the hundred square for 10 tens and then exchange 1 ten for 10 ones. The number can then be taken away.

At each throw the player either removes the number of ones or exchanges until they can take away the ones.

The winner is the player who has no ones, tens, or hundred left.

If this takes too long you can either go up to 50 for the addition game, or start with 50 for the decomposition game.

With each game ask your child to talk about what they are doing. This helps to embed the idea.

Parents are a child's first and best teacher and you can have a big impact on how your child succeeds at school. Your child will want to please you and will enjoy your support and interest.

This leaflet will give you a few ideas which you can then develop to help your child. Please remember a short session of ten minutes can be all it takes to make a huge difference, make it fun and let your child know you are pleased with them. Always try to find a positive comment to finish on, it will make your child want to repeat the experience.

If you would like more information about Numeracy in school you can talk to your child's teacher.

The government also have a number of publications which you might find useful.

To order material and find out more visit the Primary National Strategy website www.standards.dfes.gov.uk/primary or www.parentcentre.gov.uk.

The publications are available free from the Department for Education and Skills, telephone 0845 60 222 60

The BBC also has an excellent site with inter-active games.