Strategies for teaching Calculations at St Cyprians Greek Orthodox Primary Academy

The aims of this workshop are to:

- Provide an overview for all of the parents of how mathematics is taught within our school.
- Model and demonstrate the pencil and paper procedures for addition and subtraction **+, –.**
- Explain the KS1and KS2 mental calculation strategies including jottings.

Addition

Foundation stage

- The starting point for the children would be to build up a range of vocabulary thinking about the concept of adding one more.

- The learning is very visual for the children using a variety of different resources so they can see, touch and feel what is happening to these objects when added together.

- There are a variety of songs used to encourage the idea of addition and begin to use the appropriate vocabulary required at this level.

- At this stage the focus is combining 2 groups of objects.

- The children begin to use a number line to find numbers and to practice counting forwards.

Example:

There were 4 cars in the garage, 3 more arrive. How many cars altogether?

Addition

Early KS1

- The focus in early key stage 1 is mental calculation.
- The children will use a variety of practical apparatus to assist them with their addition.
- Very visual and practical learning continues to take place in KS1.

- Children will recognise to place the larger number first in order to count on, for example **5 + 8 =** becomes **8 + 5 =**

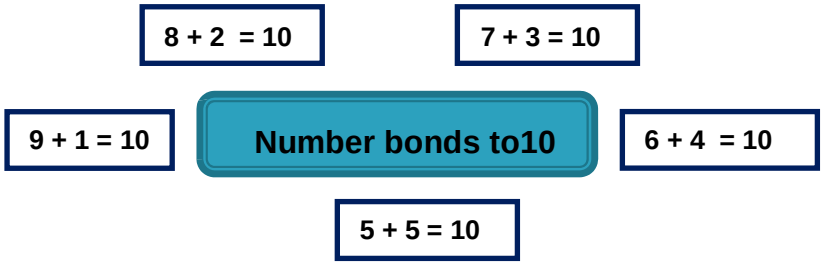
- Children will begin to use a number line to show the movement of counting on from one number.

- They will begin to bridge over the number 10 as shown above.

Addition

KS1

- The children will learn the number bonds to 10 so these can assist them when using these numbers in an addition number sentence



Example:
8 + 5 =
8 + 2 = 10
10 + 3 = 13

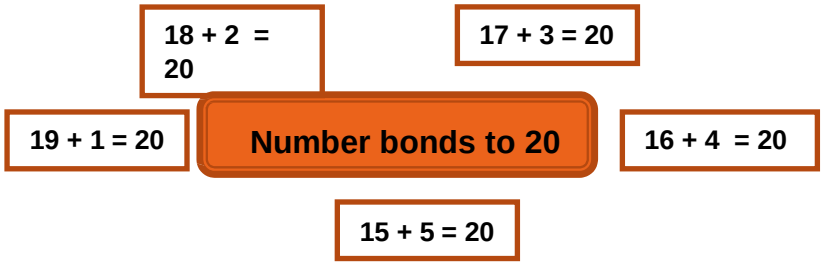
- The children will also begin to spot near doubles in their workings to assist with the mental mathematics.

9 + 8 =
8 + 8 + 1 = 17
16 + 1 = 17

Can you think of a near double ?

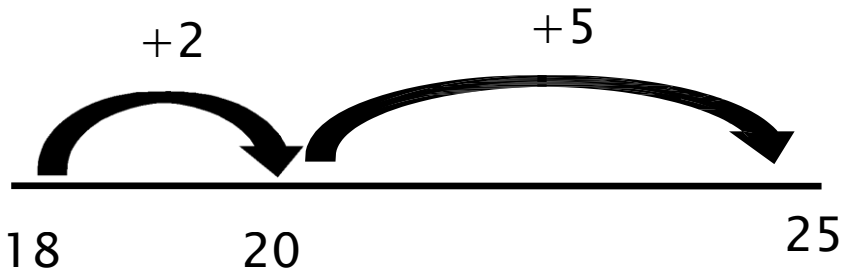
KS1

➢ Children will also be learning and using the number bonds to 20 that can also assist when calculating number sentences beyond 10.



The thought process is very important

Example 1: 18 + 7 =



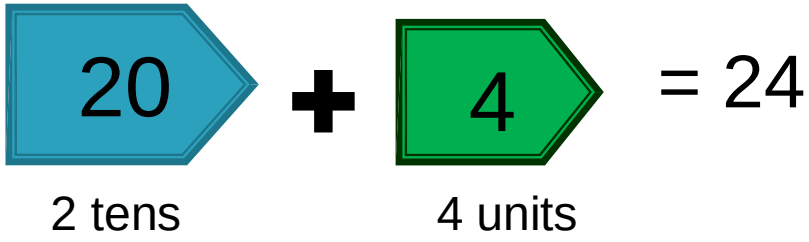
This can only be done if the children's number bonds to 10 are secure

Place value

KS1

- During KS1 the children will need to become aware of the place value of each digit they are working with in order to follow the procedures and strategies taught with all 4 of the operations in numeracy.

For example:
At KS1 we work with tens and units and extend to hundreds when necessary.

So, 24 would be 

- A variety of resources are used to assist the children recognising place value such as arrow cards as above and diennes apparatus. Clearly showing hundreds, tens and units

Addition

Later KS1

➢ In the later stages of KS1 partitioning numbers into tens and units is used when adding 2 digit numbers to a 2 digit number.

Example 1: 12 + 16 =

12 + 16 =
6 + 2 = 8 (*Units first*)
10 + 10 = 20 (*Then tens*)
20 + 8 = 28 (*Recombine*)

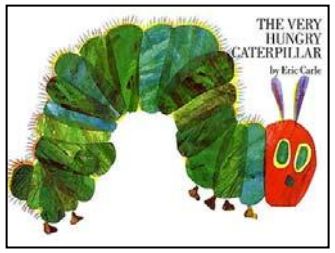
Example 2: 24 + 13

24 + 13 =
4 + 3 = 7 *(Units first)*
20 + 10 = 30 *(Tens next)*
30 + 7 = 37 *(Recombine answers)*

➢Finally the children will have a variety of opportunities to use and apply these methods in a series of real life situations and problem solving activities

I had 12 oranges in my basket and 16 pears. How many pieces of fruit do I have altogether?

Subtraction



Foundation stage

- At this stage the children will focus on finding one ‘less than’ numbers up to 10.

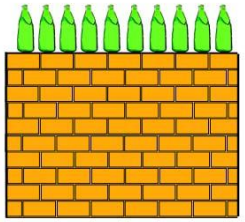
- They will begin to recognise subtraction as ‘taking away’.

- Practical methods using real objects and applying to real life situations will be carried out in the classroom.

- Opportunities during the daily routines of the day such as the register, snack time and circle time are used to demonstrate the idea of subtraction. For example We have 10 cups on the table and take 2 away. How many cups are left?

- There are a number of subtractions songs, rhymes and stories the children learn to understand the idea of subtraction.

5 little speckled frogs



Ten green bottles

5 currant buns

Subtraction

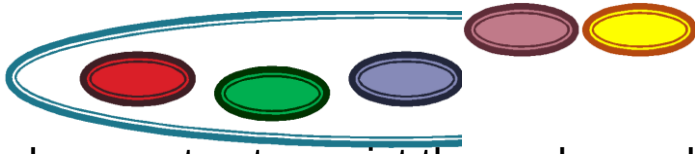
Early KS1

➢Children will continue to use songs and rhymes to assist them with the idea of subtraction.

➢They will identify and use the appropriate vocabulary of ‘Taking away’ and ‘less than’.

➢The idea of subtraction will be applied to real life situations for the children to use and apply the idea of taking away.

Example: There were 10 jelly beans in the bag. Tommy ate 5. How many jelly beans left ?



➢The children will use a variety of practical apparatus to assist them when subtracting. For example cubes and counters.

➢Number bonds to 10 will also be useful to the children in this stage as they can use this knowledge when looking at the subtraction facts to 10.

For example: **10 – 7 = 3**

10 – 6 = 4

Subtraction

KS1

➢At this stage the children will begin to **find the difference between** 2 numbers. This is different from the concept of taking away.

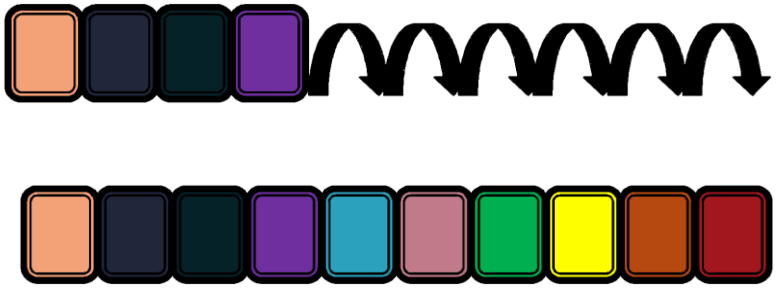
➢Children will need to see this modelled using unifix cubes.

For example: 10 – 4 =

Begin with 10 cubes

Next we make 2 blocks of cubes making sure our smallest number in the calculation is first and the number we want to find the difference with is next.

Start with 4 and 10 as these are the numbers we would like to find the difference between



We then count forwards to our largest number 10 to find the difference

The difference between 4 and 10 = 6

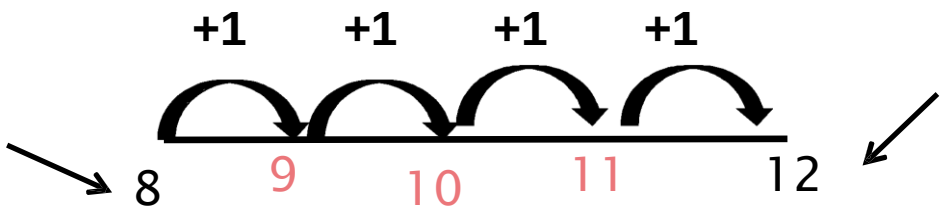
Subtraction

KS1

➢The children will then move on to use an empty number line to assist them with finding the difference between two numbers.

For example: 12 – 8 =

Starting with the smallest number at the start of the number line



Place the largest number at the end

To reach the final answer add the number of jumps forward together.

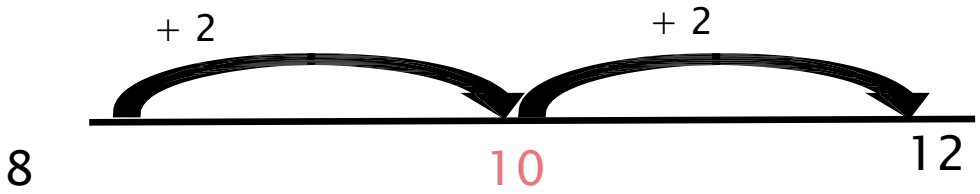
1+1+1+1 = 4

12- 8 = 4

➢When the children are secure with this method they can begin to make larger jumps

Use number bonds to count to the nearest 10

Count on until largest number is reached.



2+2 = 4

12 – 8 = 4

Subtraction

KS1

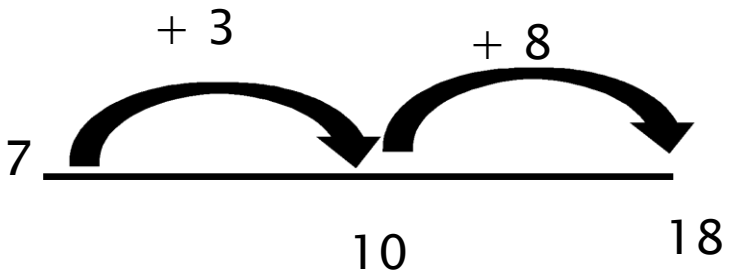
- The children will begin to use and apply these methods whilst tackling word problems such as:

18 cars were parked in the shopping centre car park. 7 cars left the car park. How many cars are left?

8+ 3 = 11

18 – 7 = 11

18 – 7 =



Subtraction

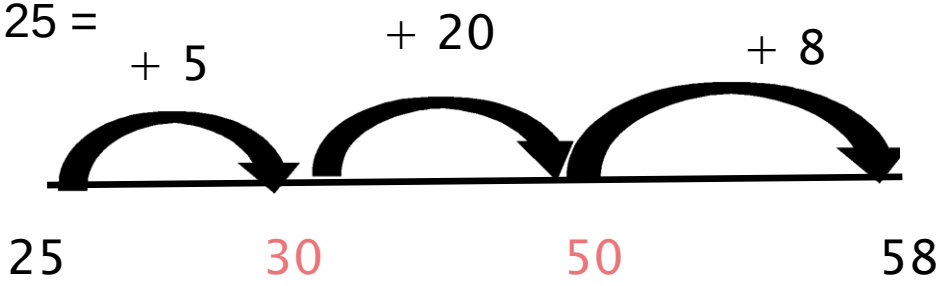
Later KS1

➢The children will be able to use hundred squares, cubes and counters to assist them with counting on particularly when working with the larger numbers.

➢They will begin subtracting 2 digit numbers from 2 digit numbers.

➢Larger jumps will be made on their number line, for example jumping in tens rather than units.

For example 58 – 25 =



20 + 8 = 28
28 + 5 = 33
58 – 25 = 33

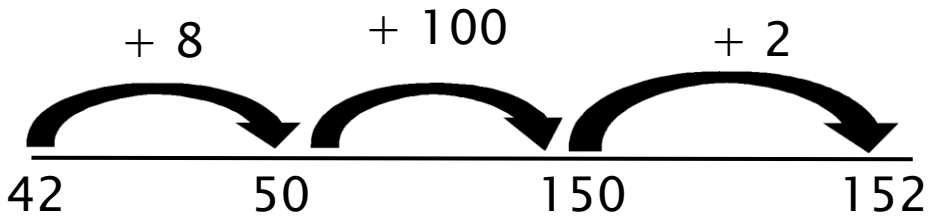
Later KS1 and Early KS2

- The children will continue to use their knowledge of number bonds to both 10 and 20 to assist when working with the larger numbers in a subtraction calculation.

- They will continue to use the empty number line to count on to establish the answer in a subtraction number sentence.

- They will begin to solve number sentences containing 2 and 3 digit numbers.

For example: 152 – 42 =



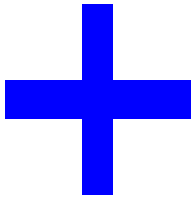
100 + 8 + 2 =
100 + 10 = 110
152 - 42 = 110

Now try these yourself using the methods we have taught you.

16 + 12 =
59 + 31 =
72 + 35 =

53 – 24 =
75 – 33 =
154 – 63 =

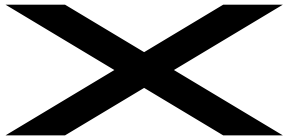
Mathematical vocabulary



Addition
Add
Plus
Sum
Total
Altogether
More than
Count on
Increase
double
near double how many more to make…?

Subtraction
Minus Less than
Difference
Count back
take (away), decrease
leave
how many are left/left over?
half, halve
how many more/fewer is… than…? how much more/less is…?

Divide
Division Equal
Groups of halve
share equally
remainder
factor



Multiply
Multiplication
Product
Times
Groups of
lots of repeated addition array
row, column
double

Is the same as

Inverse operation:

The inverse operation is the opposite operation. For example the inverse operation to + is - this can be used to check your answers have been calculated correctly.

Estimate:

To estimate is to have a good guess, to find the answer that is close enough

Above is a list of some of the vocabulary we shall use with the children whilst teaching the areas of mathematics mentioned in this policy.