## Calculation Meeting

$$
\begin{gathered}
Y \text { Year } 2 \\
+-x \div
\end{gathered}
$$

How do we solve problems?

## Addition

## Multiplication

- add
- more
- plus
- make
- sum
- total
- altogether

Subtraction

- subtract
- minus
- leave
- less
- take away
- difference between
- lots of
- times
- multiply
- groups of
- product
- multiplied by
- multiple of
- repeated addition
- array


## Division

- divide
- divided by
- divided into
- share
- share equally
- equal groups of



## Year 2 maths curriculum

The national curriculum is broken down into the following sections:

- Number and place value
- Addition and subtraction
- Multiplication and division
- Fractions
- Measurement
- Properties of shapes
- Position and direction
- Statistics

```
Solve problems with addition and subtraction:
Using concrete objects and pictorial representations, including those involving numbers, quantities and measures
applying their increasing knowledge of mental and written methods
Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
- a two-digit number and 1s
a two-digit number and 10s
2 two-digit numbers
adding 3 one-digit numbers
Show that addition of 2 numbers can be done in any order (commutative) and subtraction of one number from another cannot
Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
```


## These are the National

 Curriculum statements for addition and subtraction, and multiplication and division.Recall and use multiplication and division facts for the 2,5 and 10 multiplication tables, including recognising odd and even numbers

Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication $(\times)$, division $(\div)$ and equals $(=)$ signs

Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot

Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

The road to problem solving
Each year we want to build on the children's ability to solve mathematical problems and reason mathematically. In order to do this, these 4 areas are hugely important.

## Number sense

## Place value

Methods
Understanding

Place Value
Understanding that each number represents an amount. Especially important when using double and triple digit numbers.

- Understanding how many ones, tens or hundreds are in a number.
- Good place value knowledge will allow children to break down equations and problems into manageable chunks.
- Important skill to understand column method


Barriers to learning What might be getting in the way?

- Understanding what a number is representing
- Counting on/back from a given number
- Knowing I more and I less
- Knowing IO more IO less
- Understanding place value - $100 \mathrm{~s}, \mathrm{IO}$ and Is


$$
\begin{gathered}
T 0 \\
43 \\
10 \\
40 \\
4 \times 10 \\
4 \times 1 \\
10+10+10+10
\end{gathered} 1+1+18
$$

## Some things to practise



- Simple number facts
- Asking how do you know?
- Subitising - knowing without counting


## Concrete, pictorial and abstract



Objects/things to handle
-Cubes
-Pencils
-IOs and Is


A visual representation
-Drawings
-Bar models
-Arrays

Numbers and symbols
-Equations
-Operations e.g. + -

## Multiplication and Division

- Creating equal groups
- Identifying equal and non-equal groups

$$
\text { Boop has } 20 \text { counters and has been asked to make equal groups of } 5 \text {. Which }
$$ representation is correct?

A.B.c.D.

Check
A.

c.

B.

D.


## Multiplication

- 'Groups of' or 'lots of' the same number.
- Can be represented as an array, repeated addition or by drawing groups
- Understanding it is commutative (the numbers can be moved or swapped around)
- Counting in multiples $-3 \times 5=15$

There are 3 equal groups, with 4 in each group.


You can use an array to multiply.
00 To find $6 \times 4$, make an array of 6 rows of 4 .


Division

- Breaking an amount into equal groups
- Sharing objects
- Circles and dots
- We share the greater amount between the smaller


Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg. $15 \div 3=5,15 \div 5=3,5 \times 3=15,3 \times 5=15$

## Division with remainders

Use of lollipop sticks to form wholes- squares are made because we are dividing by 4 .


There are 3 whole squares, with 1 left over.
What equations could you
write from this investigation?

## Addition

Methods we teach:

- Manipulatives such as bead strings, numicon, cubes,
- Number lines
- Lines and dots
- Partitioning - Breaking down

- Counting on

Bar models


## Addition using objects and manipulatives

- Cubes, tens and ones, numicon, bead strings, rekenreks.
- All of these give clear visual representations of the amounts and allow children to physically move objects to see it changing.

I - Make the greater amount
2 - Add the other amount
3 - Count to find the total - Either count all or count on from the greater amount

## Addition - Number lines

- Start from the greater number
- Do the correct number of jumps
- The answer is the number you land on
- Extend to jumps of IOs then Is

$$
11+7=
$$



Addition using pictorial representations

- Pictures of objects
- Lines and dots
- Whole part and bar models show how two amounts create a total


Addition - Using place value and partitioning

- Break the number down into IO s and Is.
- Make the equation easier.

$$
\begin{aligned}
& 45+23= \\
& 40+20=60 \\
& 5+3=8 \\
& 60+8=68 \\
& \\
& 45+3=48 \\
& 48+20=68
\end{aligned}
$$

Other methods
-Finding a 10


- Near IOs

$$
19+6=
$$

Subtraction

- Very similar to addition but backwards
- Children must understand that subtraction will decrease the value of our amount.
- Key language -subtract, minus, take away, less than, fewer


## Subtraction with a number line

- Start from greatest number
- Work out how many jumps backwards you will be doing
- Do your jumps
- The answer is the number you land on.

$$
10-6=4
$$


$15-13=2$

Subtraction using lines and dots

- Draw the total or first number
- Cross out how many are being taken away

$$
48-35=13
$$



## Subtraction using place value and partitioning

- Use place value to make the equation easier.
- Take away the ones first then $10 s$ - Or the other way around depending on which they find best.

28-14=
$28-4=24$
$24-10=14$

## Subtraction with converting

Subtraction equations like the one below are the toughest to grasp. The ones are greater in the second number so children cannot draw lines and dots then cross out without a 10 into 101 s converting.
The two methods we teach are,

1. Subtract the ones or 10s first, then the other
2. Convert a ten into 10 ones then cross out as usual

$34-27=$
34-7=27
27-20=7


Using the lines and dots method with this equation wont work because of the ones. We teach the children to interpret the equation first then decide if they need to convert/exchange a IO into IO Is .

In the Summer term if the children are ready we will being to teach simple column method to prepare for Year 3.

## Home Learning

- KIRF home learning
- Mathletics
- Purple Mash
- Maths challenges - On the website
https://toytheater.com/category/teacher-tools/virtual-manipulatives/
https://www.didax.com/math/virtual-manipulatives.html

