# Brough Primary School: 

## Information evening based around the addition and subtraction

 calculation policyWarm up activities to start
Roll the die and add the number rolled to the rolling total.


Roll the die 10 times - what was your total?
What would be the highest and lowest score you could get? Why?

$$
2+2=4
$$

$$
4+5=9
$$

$$
9+3=12
$$

$$
12+3=15
$$

$$
15+5=20
$$

## Aims of the evening:

- Look at how the addition and subtraction policy looks in the classroom.
- Discuss how mathematics is taught through a CPA approach (Concrete - Pictorial- Abstract)
- Look at the the concrete resources/manipulatives that we use at school to support mathematical teaching and learning.
- How to support your children at home with their maths learning


## Help!



## Maths with Michael: Has

 Maths changed?

Before we look at our addition and subtraction calculations policy in more detail, let's put in the context of our Maths lessons.

What does addition and subtraction look like in our school?

## CPA Approach: Concrete Pictorial Abstract

Concrete: 'doing' the maths-introducing real objects that can be manipulated to bring the problem to life. Eg: money, counters.

Pictorial: seeing the maths'-making connections between the concrete and the pictorial representations and the pictorial and the abstract. Eg: part whole models, bar models, ten frames.

Abstract: the ultimate goal is for children to understand abstract mathematical concepts, signs and notation. When a child demonstrates with concrete models and pictorial representations that they have grasped a concept, we can be confident that they are ready to explore the abstract.

Manipulatives used in class to support learning


Bead strings


Ten frames



Part whole model

cubes

## Numicon



## Base 10



Place value counters

## Addition/subtraction - an overview of skills in different year

 groups.

## Maths with Michael subtraction



I Draw counters to complete the part-whole models.


Here is a bar model.
Sam
$\square$

What does the bar model show?
What can you work out?

## Year 1 National Curriculum expectations

- read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs represent
- use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction,
- using concrete objects and pictorial representations, and missing number problems such as $7=-9$.



## Year 2 National Curriculum expectations

- 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 ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers
- show that addition of two 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.


## Year 2 - what does this look like

a) Use the number line to help you work out the subtractions.

What calculations are represented?
a)

b)

(1) What addition is represented?

a)

> c)



## Year 3- National Curriculum Expectations

- add and subtract numbers mentally, including: a three-digit number and ones. a three-digit number and tens.
 a three-digit number and hundreds. add and subtract numbers with up to three digits.
- using formal written methods of columnar addition and subtraction.
- estimate the answer to a calculation and use inverse operations to check answers.
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.


## Year 3 - what does this

## look like

(2) Complete the additions.

(3) Work out the addition. Use the place value chart to help you.
$369+70$

a)

b)



|  |  | H | T | O |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  | 4 | 2 | 9 |  |
|  | - | 1 | 7 | 2 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

## Year 4 - National Curriculum Expectations

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.
- estimate and use inverse operations to check answers to a calculation.
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.


## Year 4 - what does this look like


a) 5,435-2,036
b) $5,436-2,036$
c) 5,437-2,036

| 4,563 |  |
| :---: | :---: |
| 2,160 | 2,403 |


|  |  | Th | H | T | $\mathbf{O}$ |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 7 | 3 | 2 | 5 |  |
|  | - | 2 | 4 | 0 | 6 |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

c)

|  |  | Th | H | T | O |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 7 | 1 | 0 | 2 |  |
|  | - |  | 3 | 9 | 8 |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.


## Year 5 - what does this look like

| Th | Th | H | T | O |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 1 |
|  |  |  | 100 | 1 |


a)

c)


Complete the models.
a)

b)


- perform mental calculations, including with mixed operations and large numbers.
- use their knowledge of the order of operations to carry out calculations involving the four operations solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.


## Year 6 - what does this look like


b)

| $?$ |  |  |  |
| :--- | :--- | :--- | :---: |
| 2,354 | 750 | 1,500 |  |

c) $23,500+\square+120,578=1,201,079$
d)

$\square$
a)

b)

c)


| Player | Score |
| :---: | :---: |
| Annie | 350,250 |
| Jack | 175,900 |
| Mo | 99,750 |
| Dora | $?$ |

## A small step approach

We've divided each block of knowledge into a series of small learning steps. Together, these small steps cover all the curriculum content that your child needs to know.

Your child will remember more by learning maths in small, related chunks.

## Addition and subtraction block in Year 4

Add and subtract $1 \mathrm{~s}, 10 \mathrm{~s}, 100$ s and 1,000 s

- Add two 3-digit numbers - not crossing 10 or 100

Add two 4-digit numbers - no exchange

- Add two 3-digit numbers - crossing 10 or 100Add two 4-digit numbers - one exchange
- Add two 4-digit numbers - more than one exchangeSubtract a 3-digit number from a 3-digit number - no exchange
- Subtract two 4-digit numbers - no exchange
- Subtract a 3-digit number from a 3-digit number - exchange
- Subtract two 4-digit numbers - one exchange
- Subtract two 4-digit numbers - more than one exchange
- Efficient subtraction

Estimate answers

- Checking strategies


## Fluency, reasoning and problem solving skills

## What is fluency?

Fluency starts with the ability to apply procedures accurately and efficiently. This means that children quickly become confident in the methods they will later need to use to solve more complex problems.

## What is reasoning?

Reasoning enables children to make use of all their other mathematical skills; it could be described as the glue that helps mathematics make sense.
Reasoning is children understanding mathematics well enough that they can apply it to new situations and explain it.

## What is problem solving?

Problem solving is applying the mathematics children have learnt to solve problems. If children are fluent in the mathematical procedures required for each topic, problem solving becomes much easier.
When approaching problems, children must first work out what the problem is asking them to do, before then applying their procedural knowledge to find a solution.

## Using and applying these addition and subtraction skills



## Explain the mistakes

What is 245 rounded to the nearest 10 ?
Mistake 1:50
Mistake 2: 240
Mistake 3: 200


Use each digit card once to complete the calculation.


Try different combinations of digits to get an answer that is as close to 500 as possible.

## How can you help at home?

Useful website: https://whiterosemaths.com/parent-resources
Free workbooks on for each of the blocks in each year group.

Get the free_workbooks


Autumn Block 3
Statistics


Autumn Block 4 Multiplication and division


Autumn Block 5 Perimeter and areaDraw counters to complete the part-whole model
Complete the part-whole model.
Complete the part-whole models.

(2) Alex has 262 stickers She buys 12 more


How many stickers does she have now?

(3) Find the missing number.
$\square$
Example from Y3
(1)

Mo represents a number using counters


Alex represents a number using base 10


What is the total of their numbers?

Example from Y5

- Board games that involve dice or spinners-helps with counting and the idea of chance.
- A pack of playing cards- Card games can be adapted in many ways to learn about number bonds, chance, adding and subtracting.
- Dried beans, Macaroni or Smarties- for counting and estimating
- Fridge magnets with numbers on- can be used for a little practice of written methods.
- Indoor/outdoor Unusual dice- not all dice have faces 1-6, hexagonal dice, coloured dice, dice from board games all make talking about chance a little more interesting.
- A dartboard with velcro darts- Helps with doubling, trebling, adding and subtracting


## Free online maths games

BBC bitesize
Maths is fun
Top marks maths
Primary games
Number time

## Maths information evening

Thank you for coming to the information evening tonight.
We would be very grateful if you could take the time to answer these two short questions to evaluate the evening and help us prepare for future sessions.

Thank you
What did you feel useful about tonight's information evening?

What further support for Maths could we provide in the future?

