Burlington Infant & Nursery School
INSPIRATION, RESILIENCE, EXCELLENCE

Aims of this session:

- understand the principles of what makes a good mathematician. (including the principles of counting)

- understand how we use different methods and models.

Maths Curriculum

- Develop fluency

Number fluency - knowing and recalling facts.

Procedural fluency - knowing which method is needed when solving calculations and the ability to apply knowledge to solving problems and different contexts.

- Encourage mathematical reasoning: e.g.,the children are asked to describe, explain, justify and prove their ideas and solutions.

- Children develop their problem solving skills in a variety of contexts and learn to apply their knowledge with increasing accuracy.

The principles of counting

We can often want to rush towards symbols in mathematics and counting is no different.

Help children develop a firm grasp of counting before we formally introduce the symbols of number.

5 counting principles

1. One-to-One Correspondence Principle
Understanding that each object being counted must be given one count and only one count.

It is useful in the early stages for children to actually tag or to move each item as it is counted

5 counting principles

2. Stable Order Principle
Understanding that the counting sequence stays consistent. It is always 1, 2, 3, 4, 5, 6, 7, etc., not 1, 2, 4, 5, 8.

Can your child spot your mistake?

Nursery rhymes, practise counting a variety of different things in different ways.

5 counting principles

3. Cardinality Principle
Understanding that the last count of a group of objects represents how many are in the group.

A child who recounts when asked how many there are in a set that they have just counted, has not understood the cardinality principle.

Keep modelling: There are 1,2,3 marbles in the jar. There are 3 marbles.

5 counting principles

4. Abstraction Principle

Understanding that it doesn't matter what you count, how we count stays the same.

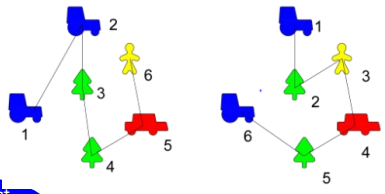
For example, any set of objects can be counted as a set, regardless of whether they are the same colour, shape, size, etc.

This can also include non-physical things such as sounds, imaginary objects, etc

5 counting principles

5. Order Irrelevance: Knowledge that the order that items are counted in is irrelevant as long as every object in the set is given one count and only one count.

(left-to-right, right-to-left, in a random fashion)

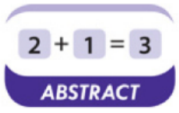


Re-count real objects that can be touched starting from different position.

The curriculum and research encourages the CPA approach to learning and teaching.

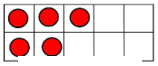
The hands on and doing stage.

Representing the problem in pictures, drawings and models.

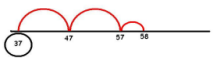


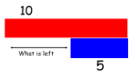
Representing a problem in symbols.

Models and Methods

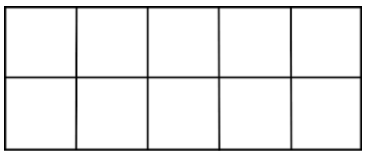
Tens frame 

Tens and Ones 

Empty Numberline 

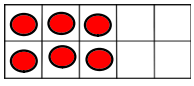
Bar Model 

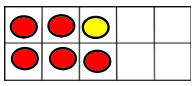
Tens frame



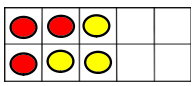
Draw 8. Compare it to your partner. Have you represented 8 in the same way?

Number bonds on a tens frame.

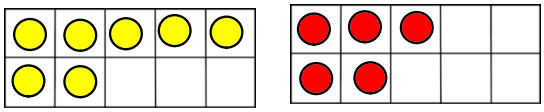
 6+0

 5+1

 4+2

 3+3

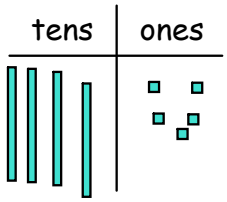
7 + 5 =



Tens and Ones

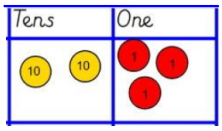
Partition: 45 = 40 + 5

Place value: (digit)

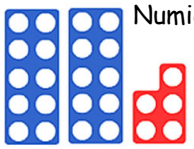


45 has 4 tens and 5 ones

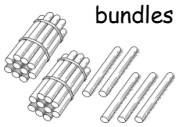
place value counters



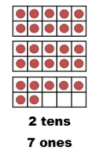
Numicon



bundles of straws

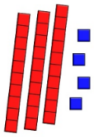


tens frames



money

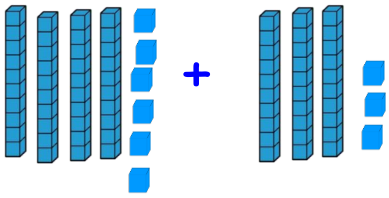
Dienes



Deines - Addition

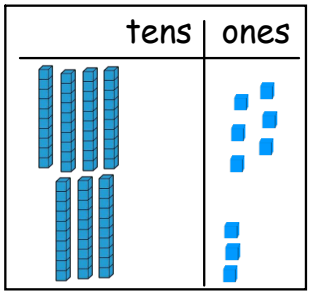
(Different resources can be used to represent tens and ones)

46 + 33 =



Deines - Addition

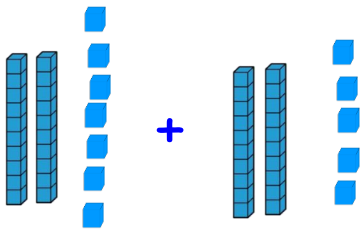
46 + 33 =



Deines - Addition/exchanging

(regrouping)

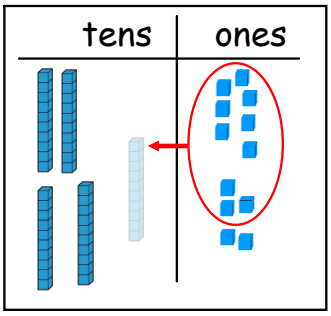
27 + 25 =



Deines - Addition/regrouping

27 + 25 =

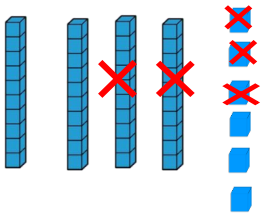
Children learn that when there are more than 10 ones they have to regroup 10 ones into a tens.



57 + 38 =

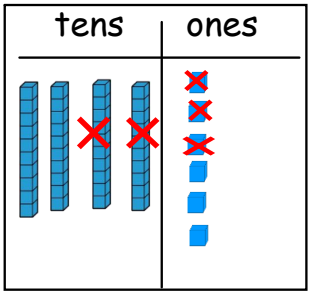
Deines - Subtraction

46 - 23 =



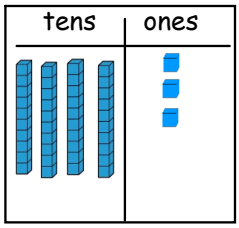
Deines - Subtraction

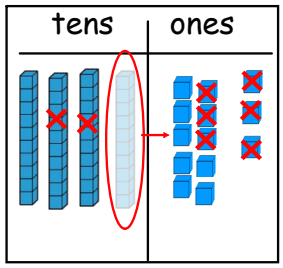
46 - 23 =



Deines - exchanging

43 - 26 =



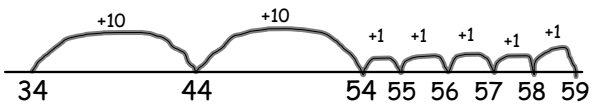


82 - 45 =

Empty number line

34 + 25 =

20 5

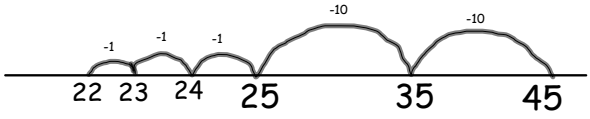


56 + 33 =

Empty number line

45 - 23 =

20 3



56 - 31 =

Bar Model

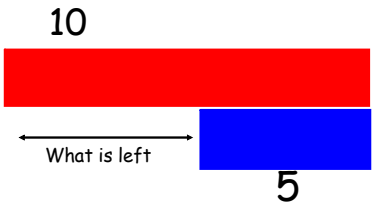
Bar models are pictorial representations of problems or concepts that can be used for any of the operations: addition, subtraction, multiplication and division.

Bar models hold the huge benefit of helping children decide which operations to use or visualise problems

Jamie has 10 stickers.
Sam gives him 5 more stickers.
How many stickers does Jamie have now?

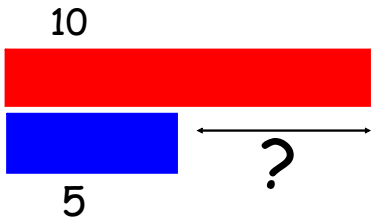
10 + 5 = ☐

Jamie has 10 stickers.
He gives Sam 5 stickers.
How many stickers does Jamie have left?



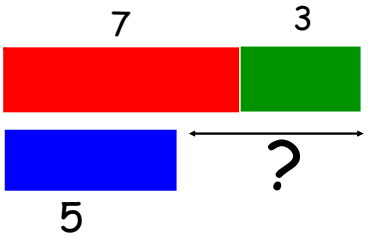
10 - 5 = ☐

Jamie has 10 stickers.
Sam has 5.
How many more stickers does Jamie have?



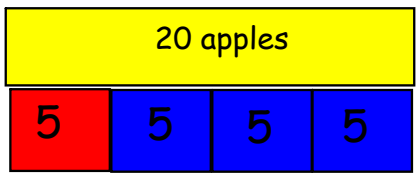
5 + ☐ = 10
10 - 5 = ☐

Jamie has 7 red stickers and 3 green stickers.
Sam has 5.
How many more stickers does Jamie have?

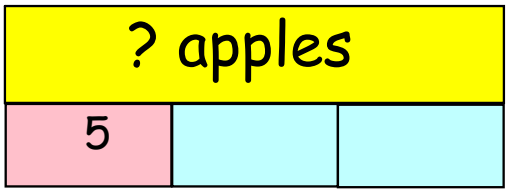


7 + 3 = ☐
10 - 5 = ☐

Jamie has 20 apples.
He gives 1 quarter to Sam.
How many apples does he give to Sam?
How many apples does Jamie have?



I buy a bag of apples.
If one third of the apples is 5 how many apples are there in the bag?



Please take a few minutes to complete the questionnaire.