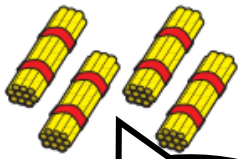
Maths Resources & Representations in Year 2

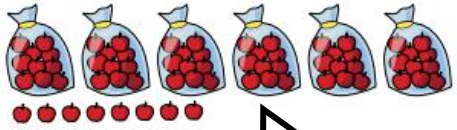
Groups of objects

4 tens = 40



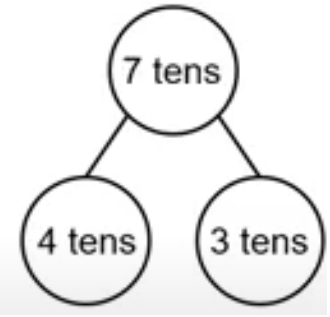
How many straws are there?

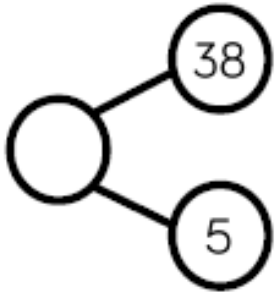
4 tens and 1 one is 41

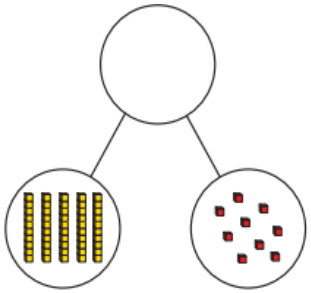


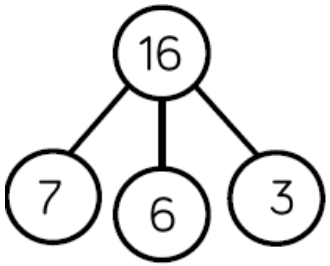
How can you count this?

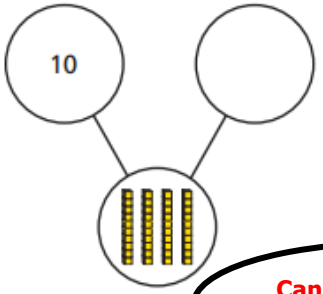
Part Whole Model

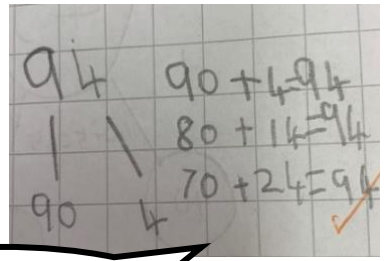












Can we represent it in different ways?

The Year 2 Maths Curriculum

In year 2, pupils learn to work mathematically and solve problems with two-digit numbers. They use concrete, pictorial and abstract maths to develop their understanding of place value.

Groups of objects:

These concrete and pictorial representations support pupil's understanding of tens and ones. They will explore how to solve problems by counting in multiples of 2s, 5s, and 10s.

Part Whole Model:

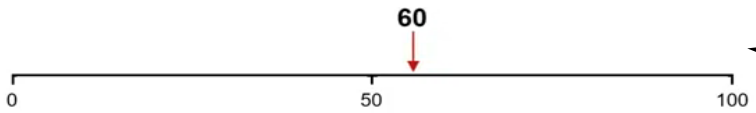
The part whole model can be represented using images, concrete resources or numbers. Pupils learn to compose quantities of two or more parts.

When the parts are complete and the whole is empty, children use aggregation to add the parts together to find the total. When the whole is complete and at least one of the parts are empty pupils use partitioning (a form of subtraction) to find the missing part. There are various ways that a part whole model can be represented.

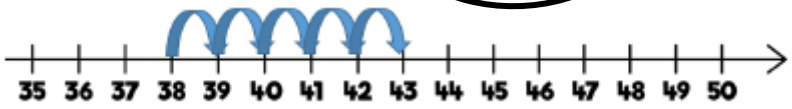
When pupils add three single digit numbers, they should be encouraged to look for number facts to help them solve the problem more efficiently, for example doubles or number bonds.

Maths Resources & Representations in Year 2

Number lines & Number tracks

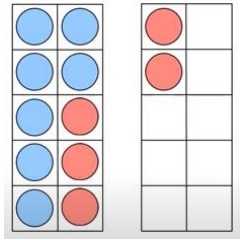


Where would 42 be?



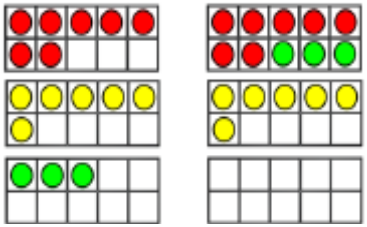
Can you count in steps of 3?

What number is represented?



7 + 5 = 12

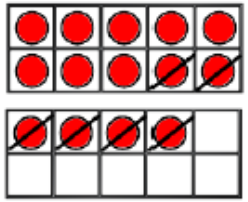
Ten Frame

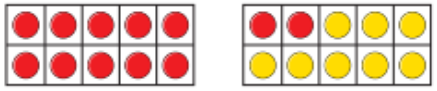


7 + 6 + 3 = 16

Can you recall and use addition and subtraction facts to 20 fluently?

14 - 6 = 8





12 + 8 = 20

Number lines and Number tracks

Number lines and number tracks develop pupil's counting, sequencing and estimating skills. They learn to label numbers on labelled and partially labelled numbered number lines.

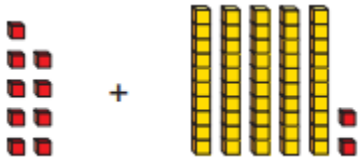
They are also useful to help pupils solve addition and subtraction problems, count forwards and backwards and count in steps of 2,3,5 and 10.

Ten Frame

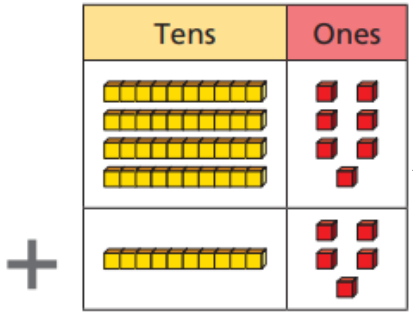
The ten frame supports pupil's understanding of the different structures of addition and subtraction**.** By combining ten frames together, they can explore addition and subtraction beyond 10. When multiple ten frames are used, pupils begin to explore place value in more depth (numbers beyond 20).

Maths Resources & Representations in Year 2

Base 10 Equipment

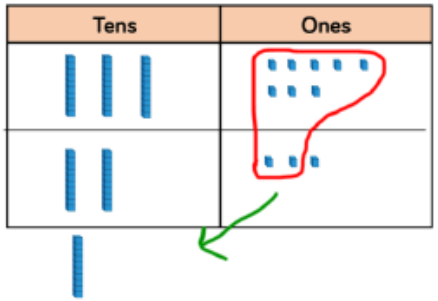


9 + 52 =



47 + 15 =

Base 10 equipment set out in this place value grid helps children to see the structure of each two-digit number before they begin the calculation.

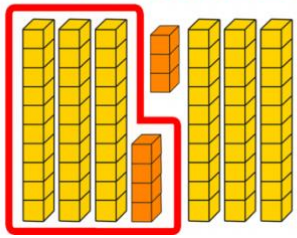


$$\begin{array}{r} 38 \\ +\ 23 \\ \hline 61 \\ \hline 1 \end{array}$$

Why did you make an exchange in this calculation?

With Base Ten, children begin with their amount and subtract the cubes. They might sometimes draw this as lines and dots.

67 - 33 = 34



Base 10 Equipment:

Base 10 equipment exposes the structures of numbers. In year 2 it can be used to help pupils determine place value, solve addition and subtraction problems, to partition and to exchange. Our pupils become familiar with these concrete resources and progress to representing them pictorially.

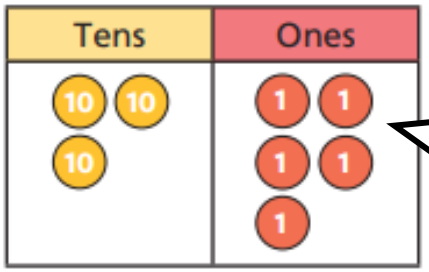
Pupils will learn to add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers and adding three one-digit numbers.

As pupils learn to add and subtract larger numbers crossing multiples of 10, they also learn to exchange.

Pictorial Representations: In year 2, our pupils become confident in using pictures to represent their maths. Through securing their understanding of place value using concrete resources they move onto solving number problems independently using pictures.

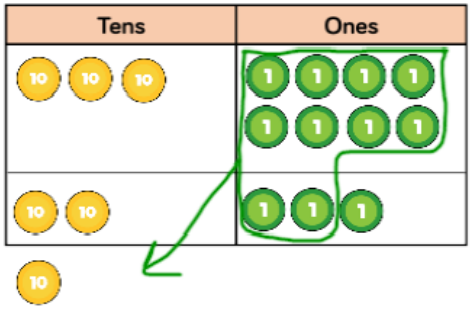
Maths Resources & Representations in Year 2

Place Value Counters & Place Value Grids

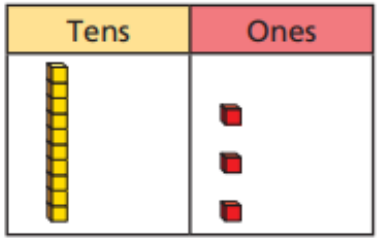


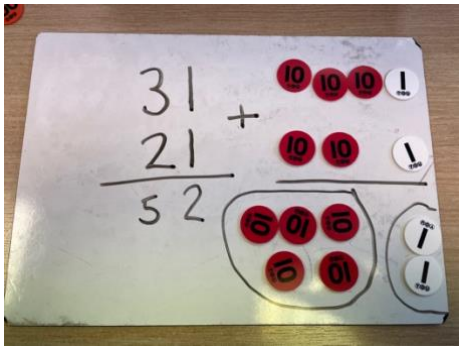
What number is being represented here?

38 + 23 =

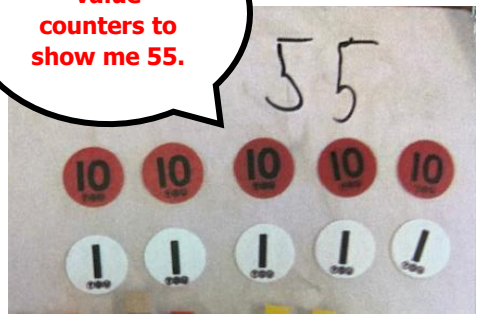


Can you complete the place value grid to show number 47?

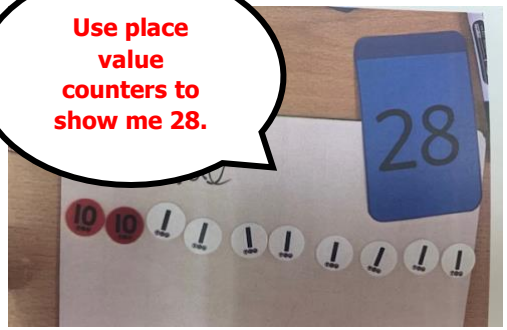




Use place value counters to show me 55.



Use place value counters to show me 28.



Place Value Counters: Place value counters and place value grids are useful tools for pupils to work mathematically through place value problems, such as addition and subtraction. As pupils learn to add and subtract larger numbers crossing multiples of 10, they also learn to exchange. This creates the foundation for children to carry out column addition and subtraction.

Children learn to see clear links between the concrete, pictorial and abstract processes.

Maths Resources & Representations in Year 2

Multiplication & Division

Here is an array.

Calculations

5 + 5 + 5 =15

3 x 5 = 15

5 x 3 = 15

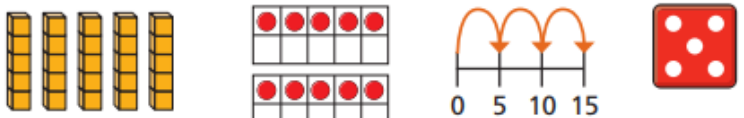
Can you write a multiplication to match this array?

How much would it costs to buy 4 trains?

Children may choose to represent this as dots.

How many cookies are there altogether?

Can you match the picture to the correct multiplication fact?



3 × 5 2 × 5 1 × 5 5 × 5

An Array

An array is an arrangement of objects in rows or columns. Arrays are used to help pupils understand multiplication and division facts. Pupils will learn to match an array with multiplication, division, and repeated addition statements.

Multiplication

In year 2, pupils will recall and use multiplication facts for the 2, 5 and 10 multiplication tables.

They will use these facts across of a range of contexts in Maths, including problem solving.

When pupils know these multiplication facts confidently, it frees up their working memory so that they can solve problems more efficiently.

Maths Resources & Representations in Year 2

Multiplication & Division

Can you share the sweets equally between the party bags?

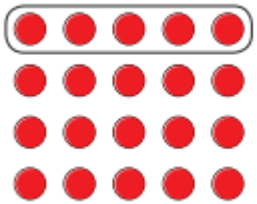
Can you solve this word problem? What do you notice about the division and multiplication facts?

There are 10 muffins.

There are ☐ muffins in each group.

There are ☐ groups.

10 ÷ 2 = ☐ ☐ × 2 = 10



☐ × 5 = 20

20 ÷ 5 = ☐

Can you complete the number sentences for each array?

Can you solve this word problem? What do you notice about the division and multiplication facts?

Tommy has 100 stickers for his sticker book.

He can fit 10 stickers on each page.

How many pages can Tommy fill?

Division

In year 2, pupils are introduced to the division symbol formally. They will recall and use division facts for the 2, 5 and 10 multiplication tables.

They will use these facts across of a range of contexts in Maths, including problem solving.

When pupils know these division facts confidently, it frees up their working memory so that they can solve problems more efficiently.

Acknowledgements:

Some representations have been taken from White Rose Maths, NCETM and Twinkl. These are a sample of questions that the children use in class.