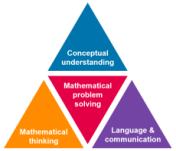
Year 4 Key Representations

Find out more…

Watch the **Unit tutorial** before planning each unit and read the **Unit Narrative.**

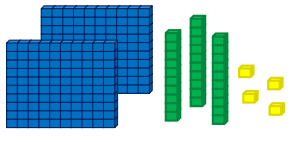
Read the **planning guides** for suggestions of representations.

Make use of **PD videos** on unit pages and Progression in Calculations page.

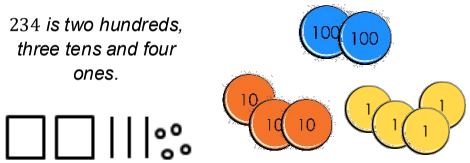


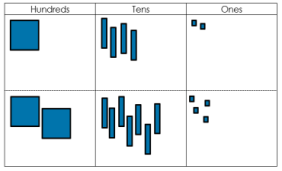
Representations of number

Pupils are familiar with a range of concrete and pictorial representations of number with and without a place value chart. These are used to represent a number or calculation and should not be used as a counting tool. Pupils also make use of these when comparing numbers.



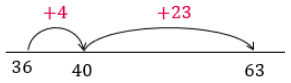
234 is two hundreds, three tens and four ones.





Number lines

Number lines can be used to represent and compare, demonstrating the continuous nature of the number system. When calculating, number lines may act as a jotting of the steps of a mental calculation and may begin 'empty' i.e. not have numbered divisions. They are also used as a representation for rounding.



Equations

The phrase **'is equal to'** is used consistently to refer to the = symbol. Equations should be presented with symbols and missing numbers in different positions:

$$38 = 25 + 13$$
$$\square = 37 + 44$$
$$12 \div \square = 4$$

Number fact knowledge

Pupils know number bonds to 100 and apply to other multiples of 10. Pupils are increasingly fluent in a range of number facts including partitioning in different ways to discuss number.

136 is multiple of 4 because I can see 120 and 16 which are both multiples of 4.

They are also familiar with multiplication tables for 2, 3, 4, 5, 6, 8 and 10 and related division facts.

$$6 \times 8 = 48 \quad 48 \div 8 = 6$$

Make use of transitions and Maths Meetings to develop this.

Deriving facts and inverse relationships

Pupils use known facts such as number bonds and understanding of place value and magnitude to derive further facts.

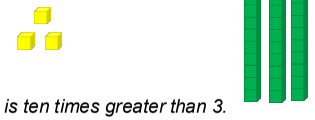
If I know $12 + 5 = 17$ *then* $222 + 5 = 227$
If I know $3 \times 4 = 12$ *then I know* $6 \times 4 = 24$

Inverse relationships have also been explored.

If I know $12 + 5 = 17$ *then* $17 - 12 = 5$
If I know $3 \times 4 = 12$ *then I know* $12 \div 4 = 3$

Multiplication and division by powers of 10

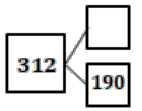
Pupils have experienced the concept of ten times greater and smaller through exchanging Dienes, linking this to the apparent move of digits in a place value chart.



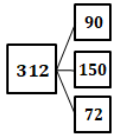
30 is ten times greater than 3.

Part-whole language and representations

A part-whole model is used to represent the relationship between numbers in all four operations. The model is made of a **whole** and two or more **parts**.

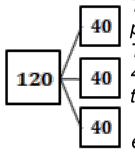


We know the whole is 312 and the value of one part is 190. We can use subtraction to find the missing part.



There are three parts.
$90 + 150 + 72 = 312$

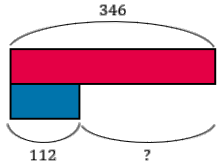
Using multiple **equal** parts represents multiplicative relationships.



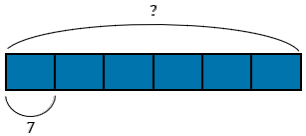
There are three equal parts with a value of 40. The whole is 120. 40 multiplied by 3 is equal to 120. 120 divided into three equal parts is equal to 40.

Bar models

Pictorial bar models and concrete Cuisenaire as bar models are used to represent **part-whole relationships** and **knowns and unknowns** within problems in all four operations. See PD videos for further exemplification.



I know the whole is 346*, and one of the parts is* 112*. I do not know the value of the missing part. I can subtract* 112 *from* 346*.*



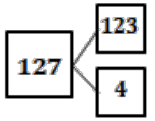
The value of each part is seven and there are six equal parts. The whole is unknown. Six groups of seven is equal to 42. The whole is 42.

Mental strategies

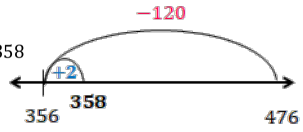
Pupils have experienced a range of mental strategies for all four operations, including:

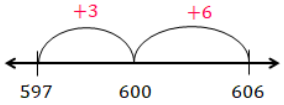
- Applying number bonds to 10 and 100 to calculate how many more/less to the next multiple of ten, extending to 100 and 1000, using the 'make 10' strategy.
- Identifying numbers close to a multiple of ten or 100 e.g. 28, 201 and using a round and adjust strategy, including for multiplication. *"If I know 20 x 4 is 80, then 19 x 4 is 76".*
- Identifying near doubles for addition. *43 and 45 can be seen as 'double 43 plus two.'*
- Subtracting numbers close together in value, through counting on to find the difference.

$336 + 127 = ?$ *I can partition 27 into 123 and 4. 336 plus 4 is equal to 340. 340 plus 123 is equal to 463.*



$476 - 118 = 358$



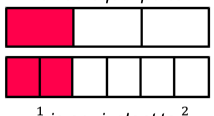


$606 - 597 = ?$ *I can count on from* 597 *to* 606*. The difference is* 9*.*

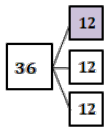
Representing fractions

A range of concrete and pictorial representations have been used for fractions including fractions of a whole, as part of a set of objects and as part of a quantity such as a length or volume. Pupils can apply these representations to comparing, finding simple equivalence and adding and subtracting with the same denominator, as well as fractions of sets or quantities.

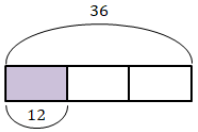
One third is one of three equal parts

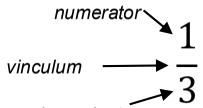


$\frac{1}{3}$ *is equivalent to* $\frac{2}{6}$



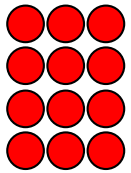
One third of 36 *is* 12*.*





Representing multiplicative relationships

Pupils have represented multiplicative relationships concretely and pictorially, primarily through arrays, Cuisenaire and bar models. A focus on equal parts, the number of equal parts and the value of each part supports understanding of commutativity and inverse relationships. The representations and language structures support written strategies.



There are four groups each with a value of 3.
There are three groups each with a value of 4.
I can see three, four times.
I can see four, three times.

12 divided into groups of 4 gives three groups
12 shared into four groups gives 3 in each group