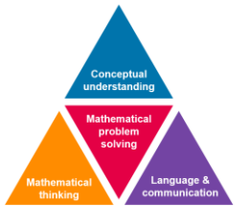
Year 5 Key Representations

Find out more…

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

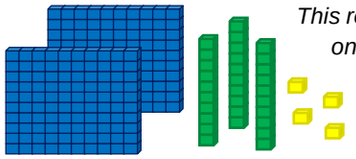
Read the **planning guides** for suggestions of representations.

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

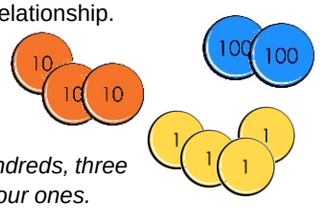


Representations of number

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 have also experienced representing decimal numbers using manipulatives including repurposing Dienes equipment, understanding the base 10 relationship.



This represents 2.34. It is 2 ones, 3 tenths and 4 hundredths.

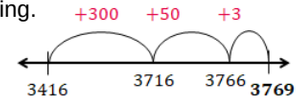


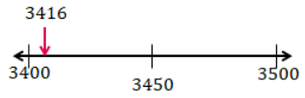
234 *is two hundreds, three tens and four ones.*

Tens	Ones	tenths	hundredths	thousandths
	2	3	4	

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.





Number fact knowledge

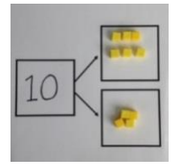
Pupils have an increasing range of number facts. Pupils should know all multiplication tables and related division facts.

Pupils make increasing use of number facts when considering larger integers.

I know 132 is a multiple of 4 because I can partition it into 120 and 12. These are both multiples of 4.

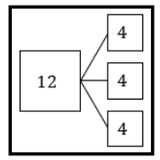
Part-whole language and representations

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**.



The whole is ten. One part is six and one part is four. Six plus four is equal to ten.

Using multiple equal parts represents multiplication, division and fractions of quantities.



There are three equal parts with a value of four. The whole is 12*.*
Three multiplied by four is equal to 12*.*
12 *divided into three equal parts is equal to four.*
One third of 12 *is four.*

Close links are made between this and bar model representations.

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:

$38 = 25 + 13$

$\square = 37 + 44$

$12 \div \square = 4$

Deriving facts

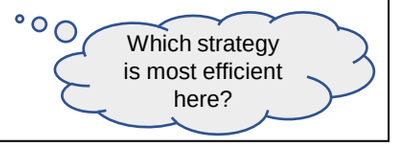
Using known number bonds pupils derive more complex facts including deriving decimal bonds and facts.

I know $1 + 3 = 4$ *so* $0.1 + 0.3 = 0.4$
I know $13 + 12 = 25$ *so* $1300 + 1200 = 2500$

Using strategies

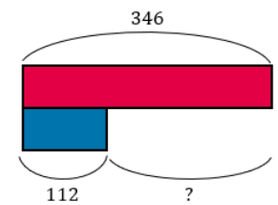
Pupils are familiar with columnar addition and subtraction, short multiplication and short division written strategies and have developed conceptual understanding through concrete and pictorial representations. These strategies can be applied to larger integers and decimals. See PD videos for further exemplification.

Pupils should make use of a range of strategies, considering efficiency.

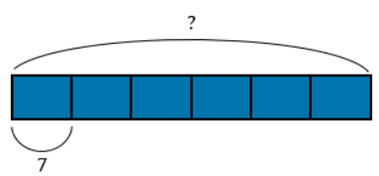


Bar models

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.

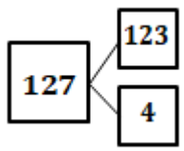
Identifying numbers close to a multiple of ten or 100 e.g. 28, 201 and using a round and adjust strategy, including for multiplication. *"If I know 20 x 4 is 80, then 19 x 4 is 76".*

Identifying near doubles for addition. *43 and 45 can be seen as 'double 43 plus two.*

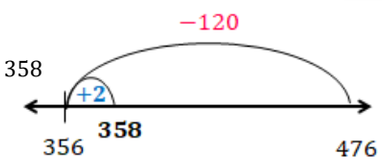
Subtracting numbers close together in value, through counting on to find the difference.

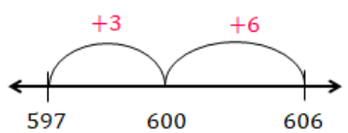
Once secure, these can be applied to larger integers and decimal values.

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



$476 - 118 = 358$



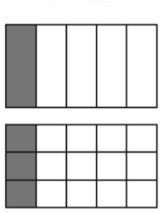


$606 - 597 = ?$ *I can count on from* 597 *to* 606*. The difference is* 9.

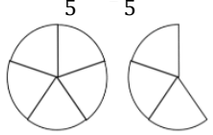
Representing fractions

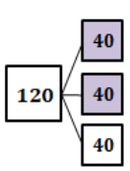
Pupils will have represented unit, non-unit and improper fractions in a variety of ways including area, part of a set and on a number line. Through representations they understand equivalence. They have identified non-unit fractions of quantities.

$\frac{1}{4} = \frac{3}{12}$

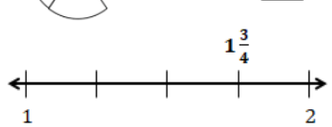


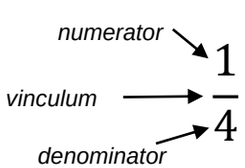
$\frac{8}{5} = 1\frac{3}{5}$





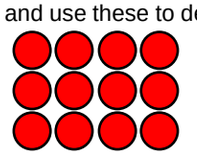
Two thirds of 120 *is* 40



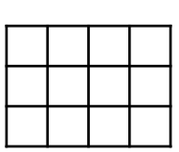


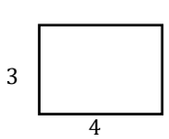
Representing multiplicative relationships

Pupils have used an increasing range of models to represent multiplicative relationships and use these to describe inverse relationships and commutativity.



There are three rows with a value of four. There are four columns with a value of 3.
$3 \times 4 = 12$ $4 \times 3 = 12$
$12 \div 4 = 3$ $12 \div 3 = 4$





Three groups of four are equal to 12.
Four groups of three are equal to 12.