Our calculation policy - addition

Addition

Our calculation policy has been devised to meet and exceed the requirements of the National Curriculum for the teaching and learning of mathematics It is designed to support pupils in delivering a consistent progression of calculation methods throughout their time at school. Early learning in number and calculation in Reception follows the 'Development Matters' EYFS document, and this calculation policy is designed to build on from the content and methods established in the Early Years Foundation Stage.

Providing a context for calculation

A problem solving approach helps to build children's understanding of the purpose of calculation, and to help them recognise when to use certain operations and methods when faced with problems. It is important that any type of calculation is given a real life context. This must be a priority within calculation lessons.
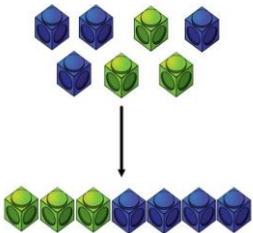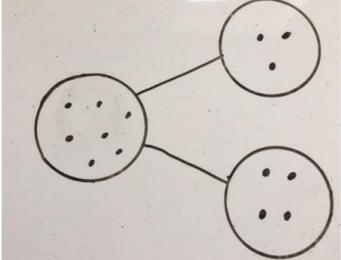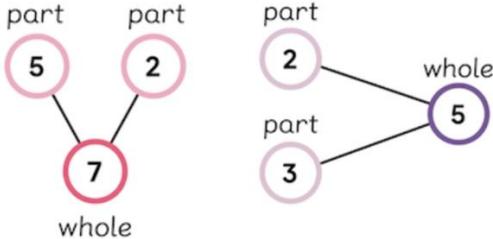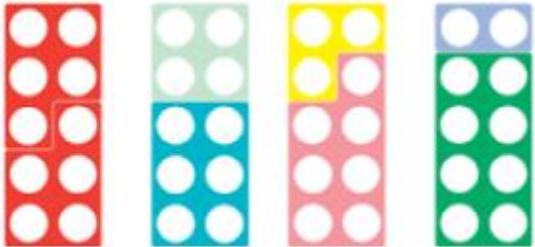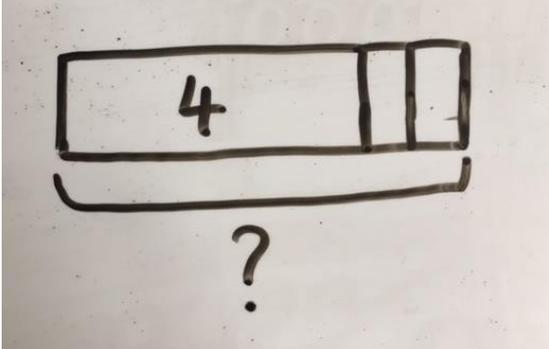
Choosing a calculation method

Children are encouraged to use the following processes in deciding what approach they will take to a calculation...

Can I do it in my head?

Can I use some jottings to help me?

Should I use a written method to work it out?

Addition

Early Years Add with numbers up to 20

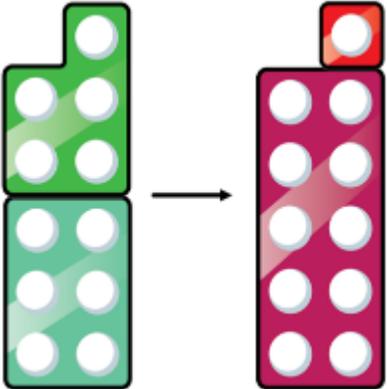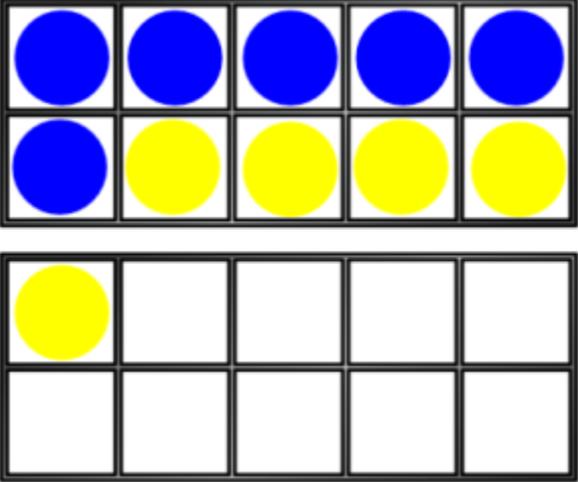| Concrete	Pictorial	Abstract
Combining two parts to make a whole (with a variety of resources).	Children represent numbers using dots or crosses. They could put each part on a part whole model too.	5 + 2 = 7 5 is a part, 2 is a part and the whole is 7.
Counting on using number lines, cubes or Numicon. 5+5 6+4 7+3 8+2	A bar model which encourages the children to count on, rather than count all. 4 ?	The abstract number line: What is 1 more than 6? What is the sum of 1 and 6? What is the total of 6 and 1? 1 less 1 more
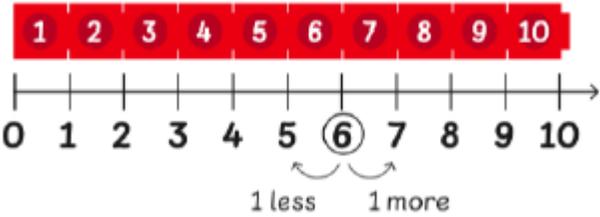
Addition

Key skills:
- Recognising numerals 1 to 20 ordering these and counting reliably by saying one number for each item.
- Counting actions or objects, which cannot be moved and objects from a larger group.
- Estimating how many objects and checking by counting.
- Combining two parts to make a whole: part whole model.
- Starting at the bigger number and counting on- using cubes.
- Saying the number that is one more than a given number using fingers, number lines and objects.
- Record, using marks and pictures that they can interpret and explain.
- Solve problems, including doubling, e.g. 'You have 2 grapes, how many do you have when I give you 2 more?'
- Regrouping to make 10 using a ten frame.

Vocabulary: add, more, too many, not enough, enough, total, altogether, double, twice, count on, number line

Addition

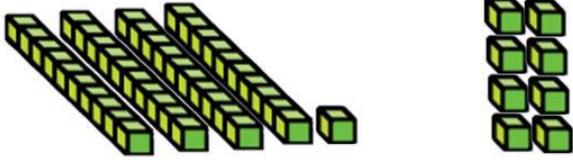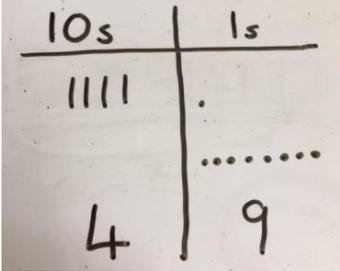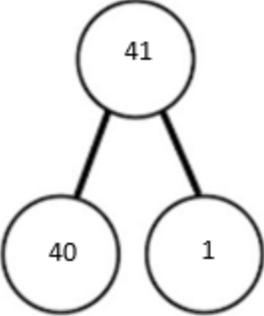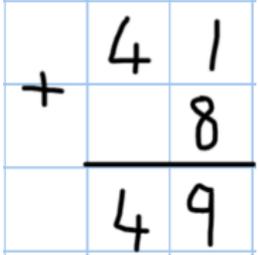| Concrete	Pictorial	Abstract
Regrouping to make 10; using ten frames and counters/cubes or using Numicon. 6 + 5	Children to draw the ten frame and counters/cubes.	Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$

Key skills for addition at Y1:

• Read and write words and numbers to 100

• Recall bonds to 10 and 20, and addition facts to 20

• Count to and across 100

• Count in multiples of 1 2, 5 and 10

• Interpret addition number sentences and solve missing box problems, using concrete objects and number line addition to solve them:

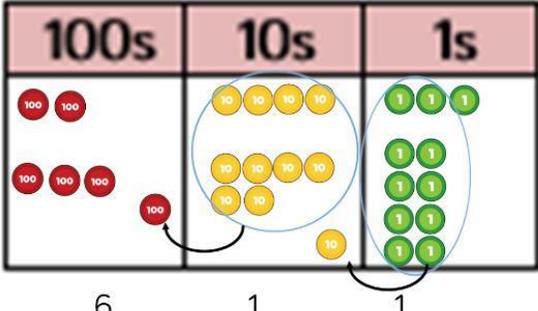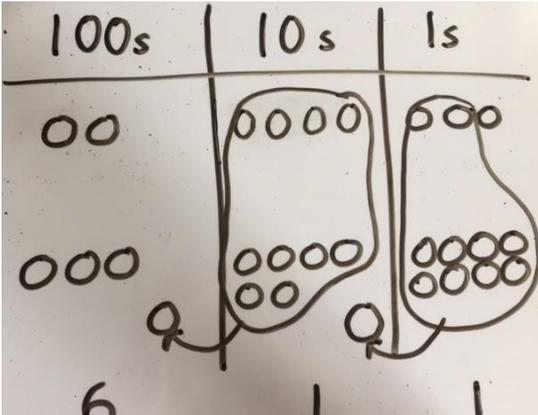Vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line

Addition

Year 2 Add with 2-digit numbers
Developing mental fluency with addition and place value using 2-digit numbers, then establishing more formal methods.

Concrete	Pictorial	Abstract
TO + O using base 10. Continue to develop understanding of partitioning and place value. 41 + 8	Children to represent the base 10 e.g. lines for tens and dot/crosses for ones.	41 + 8 $1 + 8 = 9$ $40 + 9 = 49$

Key skills for addition at Y2:

• Add a 2-digit number and ones (e.g. 27 + 6) and tens (e.g. 23 + 40)

• Add pairs of 2-digit numbers (e.g. 35 + 47) add three single-digit numbers (e.g. 5 + 9 + 7)

• Show that adding can be done in any order (the commutative law).

• Recall number bonds to 20 and bonds of tens to 100

• Count in steps of 2, 3, 5 and tens from any number.

• Compare and order numbers to 100 using < > and = signs.

• Read and write numbers to at least 100 in numerals and words.

• Solve problems with addition, using concrete objects, pictorial representations, involving numbers,

New Vocabulary: sum, tens, units, partition, addition, column, tens boundary

Addition

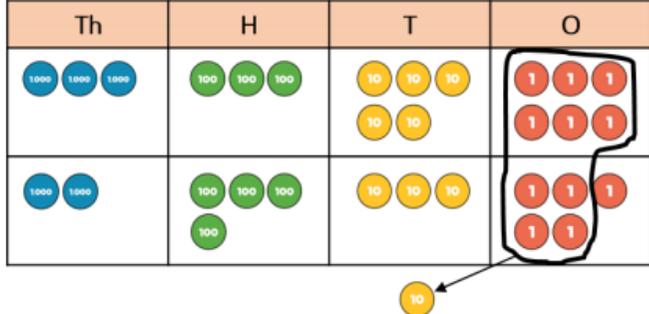| Concrete	Pictorial	Abstract
TO + TO using base 10. Continue to develop understanding of partitioning and place value. 36 + 25 	Children to represent the base 10 in a place value chart. 	Looking for ways to make 10. $36 + 25 =$ $30 + 20 = 50$ $5 + 5 = 10$ $50 + 10 + 1 = 61$ Formal method: $\begin{array}{r} 36 \\ +25 \\ \hline 61 \\ \hline {\scriptstyle 1} \end{array}$

Key skills for addition at Y3:

• Add 2-digit numbers mentally, incl. those exceeding 100.

• Add a three-digit number and ones mentally (175 + 8) and tens mentally (249 + 50)

• Add a three-digit number and hundreds mentally (381 + 400)

• Add three-digit numbers using a formal written method, including bridging 10

• Estimate answers to calculations, using inverse to check answers.

• Continue to practise a wide range of mental addition strategies, i.e. number bonds, adding the nearest multiple of 10, 100, 100 and adjusting, using near doubles, partitioning and recombining.

• Read and write numbers to 1000 in numerals and words.

New Vocabulary: hundreds boundary, increase, vertical, carry, expanded, compact

Addition

Year 4 Add numbers with up to 4 digits Column method- regrouping (up to 4 digits).

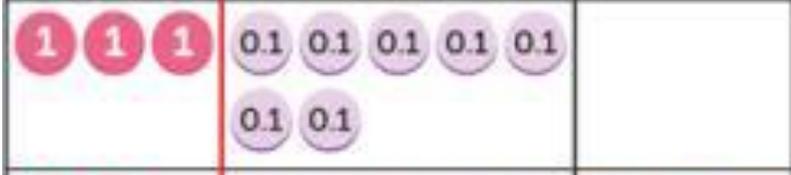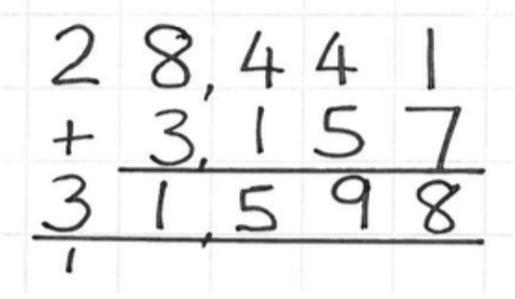| Concrete	Pictorial	Abstract
Use of place value counters to add THTO + HTO, HTO + HTO etc. When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred.	Children to represent the counters in a place value chart, circling when they make an exchange.	
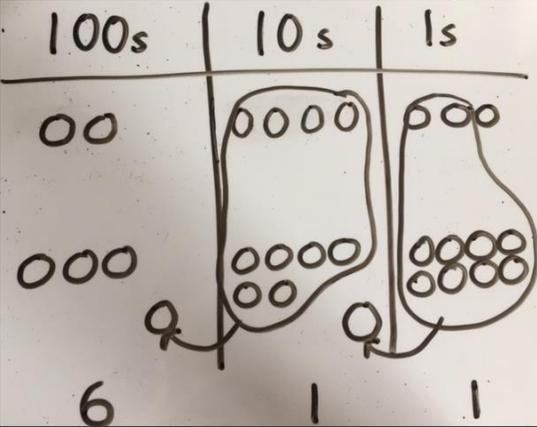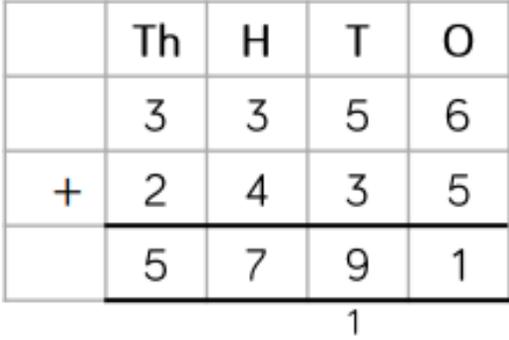
Key skills for addition at Y4:

- Round any number to the nearest 10, 100 or 1000.
- Estimate and use the inverse to check answers.
- Continue to practise number bonds, adding the nearest multiple of 10, 100, 1000 and adjust, use near doubles, partitioning and recombining.
- Solve 2-step problems in context, deciding which operations and methods to use and why.
- Add numbers with up to 4 digits using the formal written method of column addition, including bridging 10s and 100s.
- Solve 2-step problems in contexts, deciding which operations and methods to use and why.

New Vocabulary: thousands, hundreds, digits, inverse

Addition

Concrete/Pictorial	Abstract

Key skills for addition at Y5 & 6:

• Add numbers mentally with increasingly large numbers,
  ie. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and
  re-combining; using number bonds.

• Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

• Solve multi-step problems in contexts, deciding which operations and methods to use and why.

• Read, write, order and compare numbers to at least 1 million and determine the value of each digit.

• Round any number up to 10 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.

• Add numbers with more than 4 digits using formal written method of columnar addition.

New Vocabulary: decimal places, decimal point, tenths, hundredths, thousandths