Calculation Policy: Y4

Mathematical **Manipulatives** | Key **Representations**

Progression in **Procedures**

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Key vocabulary

Place value: ones, tens, hundreds, thousands, column, tenth, hundredth, decimal, numeral

Addition: sum, addend, add

Subtraction: difference, subtrahend, subtract, partition

Multiplication: product, multiplicand, multiplier, multiply, multiple, repeated addition

Division: quotient, dividend, divisor, divide, repeated subtraction

Fractions: denominator, numerator, equal part, whole, equivalent, ascending, descending, unit fraction, non-unit fraction, tenth, hundredth

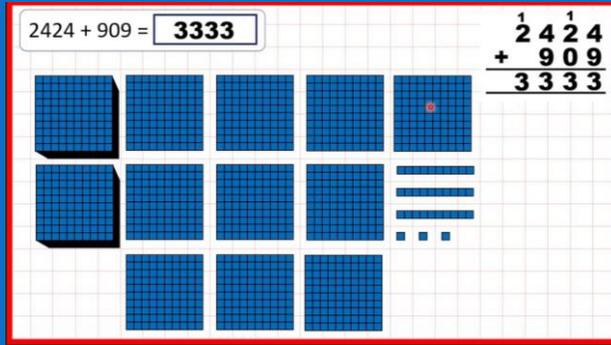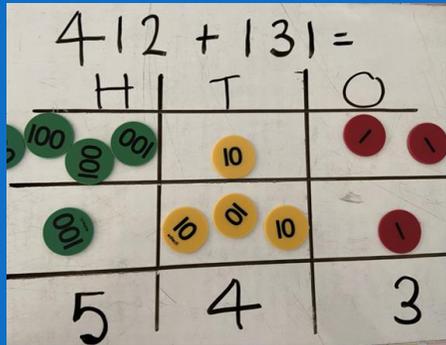Manipulatives: place value counters, Dienes

Representations: represent, representation, numberline, array, row/column, Part-Part-Whole diagram, bar model

YEAR 4: Addition

Manipulatives

The recommended manipulatives (physical resources) for adding numbers with up to 4-digits are **place value counters and Dienes.**
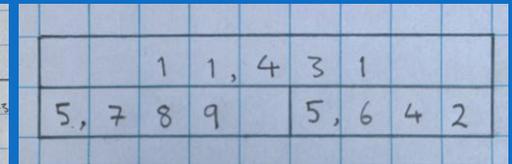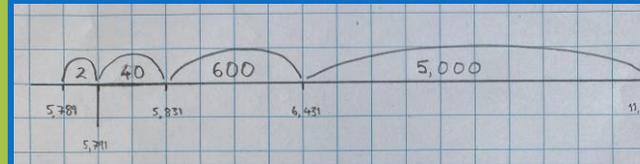

Representations

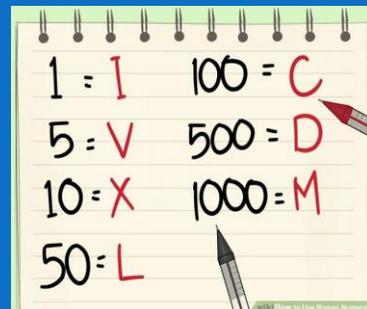The key representations used are **place value grids, blank number lines** and **bar models**.

Factual knowledge

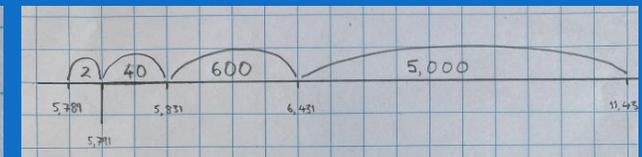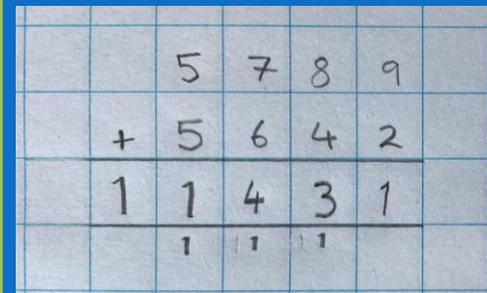The key factual knowledge includes recall of addition/subtraction facts to 100, doubling/halving facts to 50 and all Roman numerals I-C.
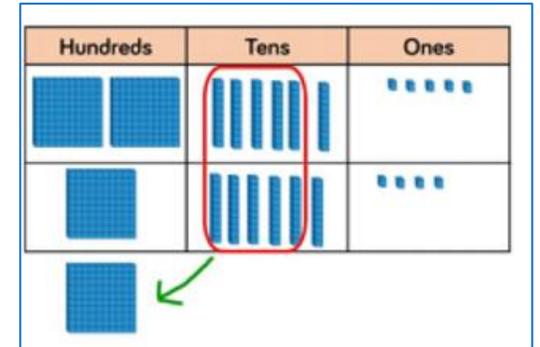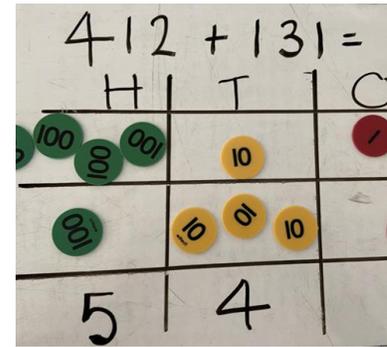

Procedural knowledge

The key method is **formal column addition. Use** numberlines alongside the formal algorithm to promote flexibility, estimation and decision making (number sense).

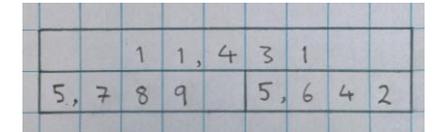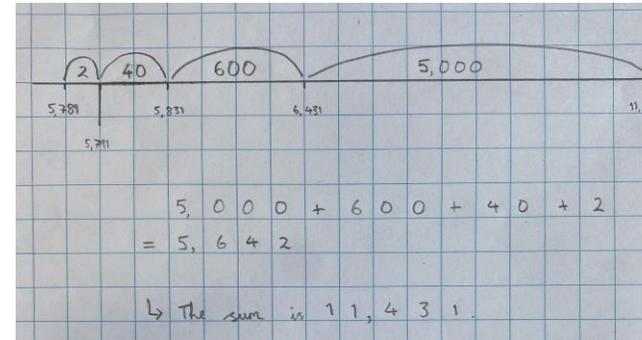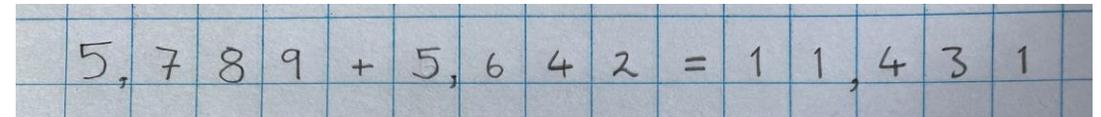**Key vocabulary: sum, addend, add**

Addition in Year 4

1. The recommended manipulatives (physical resources) for adding numbers with up to 4-digits are **place value counters** and **Dienes**.
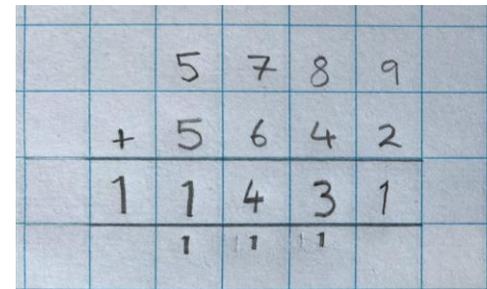
2. The key representations used are **place value grids**, **blank number lines** and **bar models**.

3. The key method (procedural knowledge) is **formal column addition** for numbers with up to 4 digits. It is suggested that the children write the calculation alongside representing the calculation on a numberline.
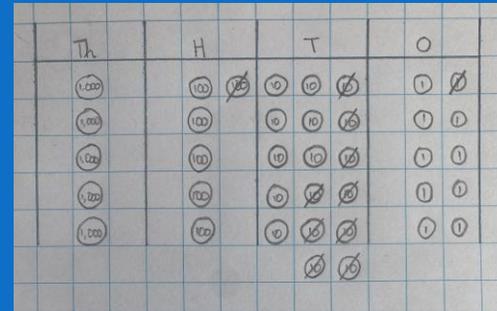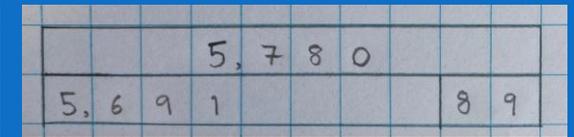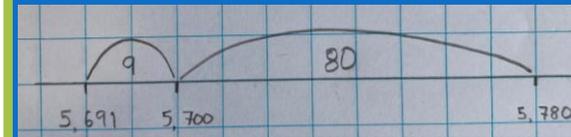
YEAR 4: Subtraction

Manipulatives

The recommended manipulatives (physical resources) for subtracting numbers with up to 4-digits are **place value counters and Dienes.**

Representations

The key representations used are **blank number lines, place value grids, bar models and part-part-whole diagrams**.
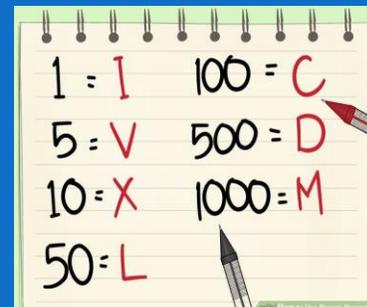

Factual knowledge

The key factual knowledge includes recall of addition/subtraction facts to 100, doubling/halving facts to 50 and all Roman numerals I-C.
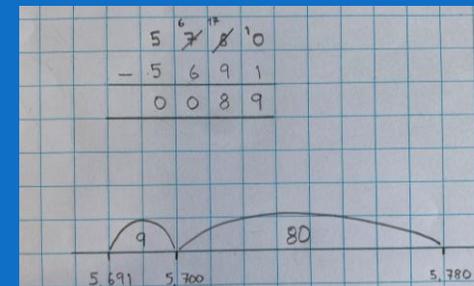

Procedural knowledge

The key methods is **formal column subtraction. Use** numberlines alongside the formal algorithm to promote flexibility, estimation and decision making (number sense).


Key vocabulary: difference, minuend, subtrahend, subtract
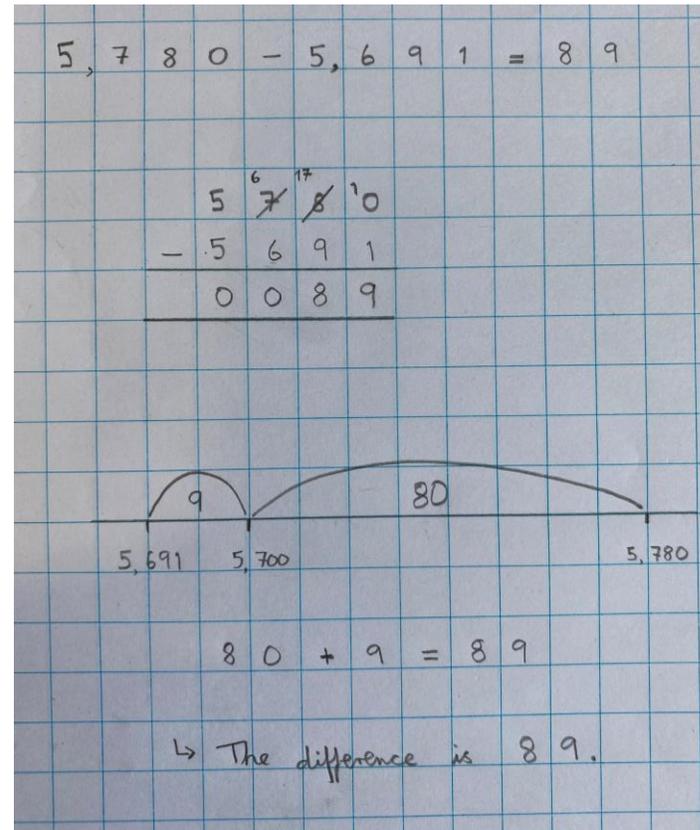
Subtraction in Year 4

1. The recommended manipulatives (physical resources) for subtracting numbers with up to 4-digits are **place value counters** and **Dienes**.

2. The key representations used are **blank number lines, place value grids, bar models** and **part-part-whole** diagrams (to develop flexible 'non-standard partitioning').

3. The key method (procedural knowledge) is **formal column subtraction** for numbers with up to 4 digits. It is suggested that the children write the calculation alongside representing the calculation on a numberline to promote mental flexibility and active decision making (the numbers involved need to be carefully chosen to promote this).
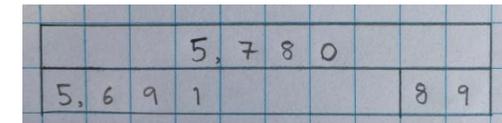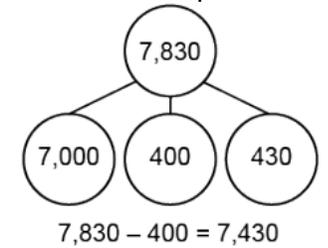
Non-standard partitioning:
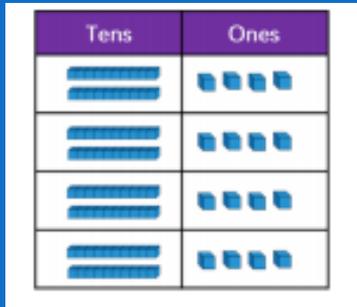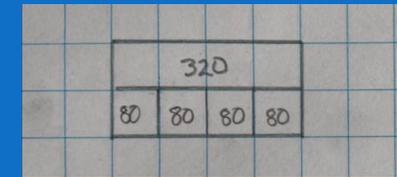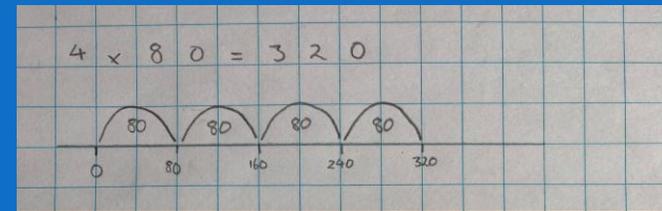
7,830 – 400 = 7,430
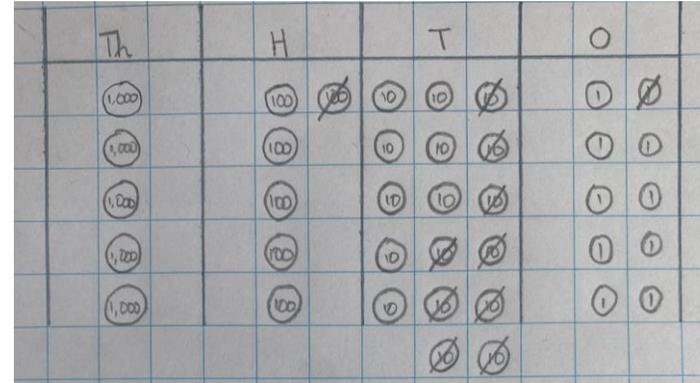
YEAR 4: Multiplication

Manipulatives

The recommended manipulatives (physical resources) for multiplying numbers with up are **place value counters and Dienes.**

Representations

The key representations used are **blank number lines** and **bar models.**
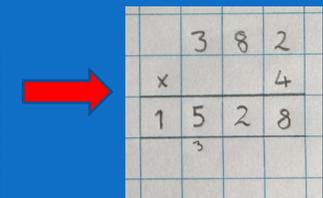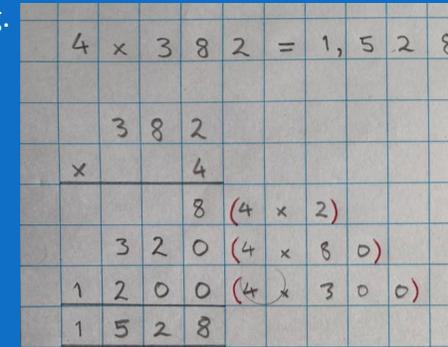

Factual knowledge

The key factual knowledge includes recall of **all** multiplication tables and count in multiples of 25 and 1,000.

Procedural knowledge

The key method is the **expanded method** and **formal column multiplication.** It is suggested that the children write the calculation alongside the numberline to secure conceptual understanding.

Key vocabulary: product, multiplicand, multiplier, multiply, multiple, repeated addition

Multiplication in Year 4

1. The recommended manipulatives (physical resources) for multiplying 2/3-digit numbers by 1-digit numbers are **place value counters** and **Dienes**.

2. The key representations used are: **blank number lines** (to show the link with repeated addition) and **bar models**.

3. The key methods (procedural knowledge) are the **expanded** written method and **formal column** method for multiplying 2/3-digit numbers by 1-digit numbers. It is suggested that the children write the calculation alongside the numberline to secure conceptual understanding.
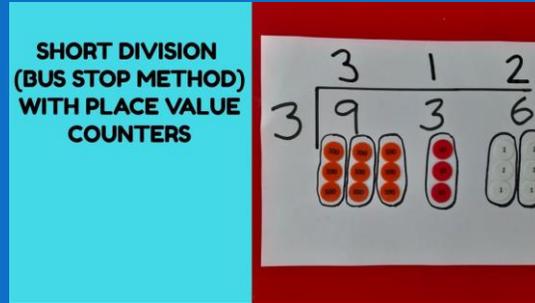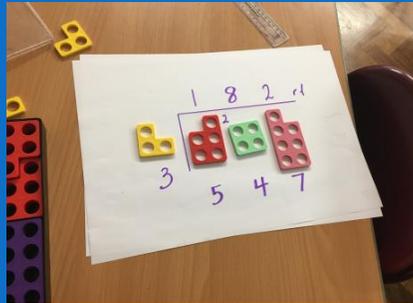
1

2

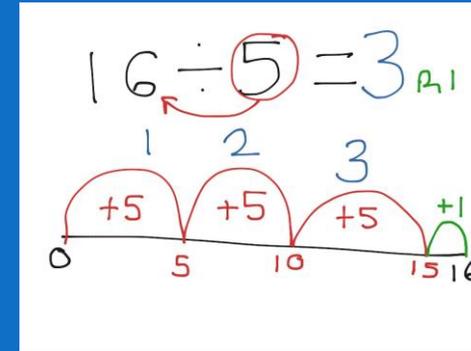

3

YEAR 4: Division

Manipulatives

The recommended manipulatives (physical resources) for Division **Numicon and** are **place value counters.**

Representations

The key representations used are **blank number lines and place value grids.**
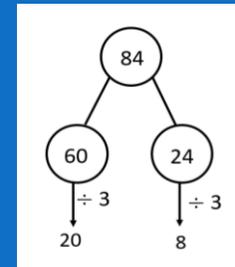

Factual knowledge

The key factual knowledge includes recall of **all** multiplication tables and count in multiples of 25 and 1,000.

Procedural knowledge

The key method is short division.


Key vocabulary: quotient, divisor, dividend, divide, repeated subtraction

Division in Year 4

1. The recommended manipulatives (physical resources) for dividing 2- digit numbers by 1- digit numbers are **place value counters** and **Dienes**.

He shares the tens first and exchanges the remaining ten for ones.

Then he shares the ones.

$42 \div 3 = 14$

2. The key representations used are: **blank number lines** (to show the link with repeated subtraction), **bar models**, **part-part-whole diagrams** and **place value grids**.

$31 \div 4 = 7 \, r \, 3$

$66 \div 3$

$60 \div 3$ $6 \div 3$

3. The key method (procedural knowledge) for dividing a 3-digit number by and 1-digit number is **short division**. It is suggested that the children begin by exploring this method using manipulatives (place value counters, Dienes or Numicon).
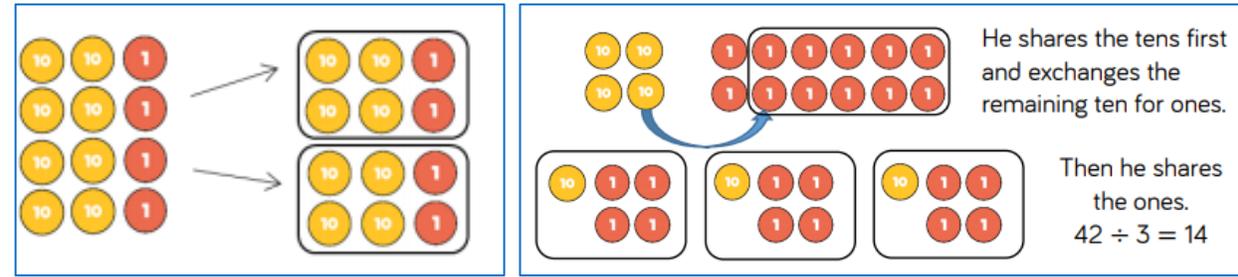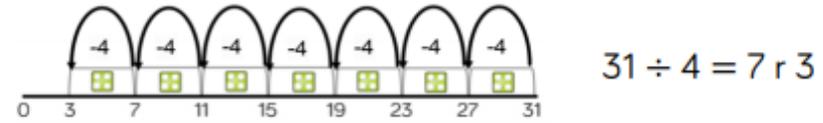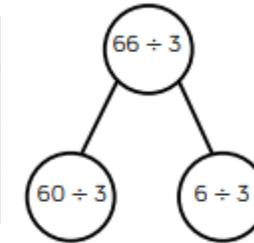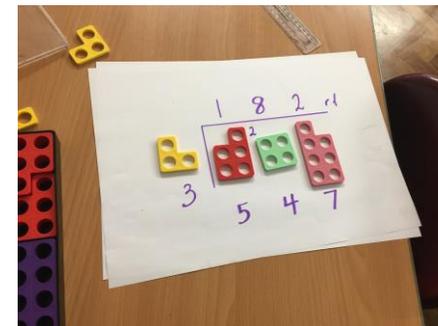
Manipulatives

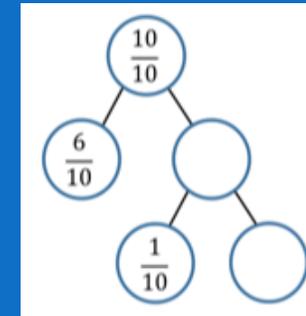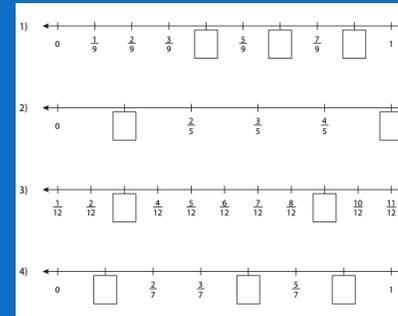The recommended manipulatives (physical resources) for Fractions are **fraction walls, two-colour counters and Cuisenaire rods.**
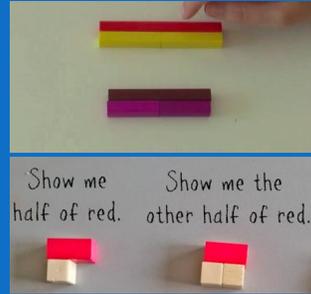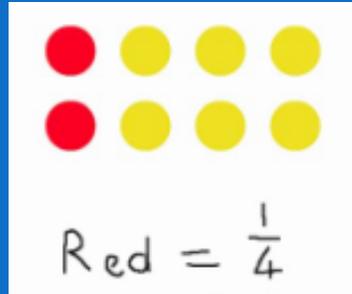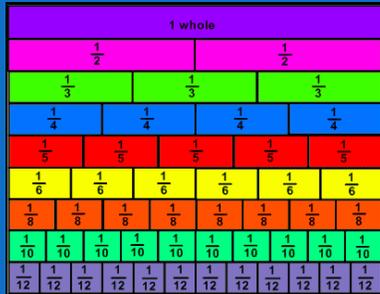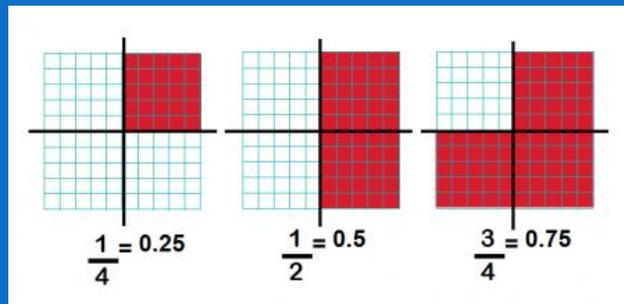

Representations

The key representations are **number lines, PPW diagrams and bar models.**
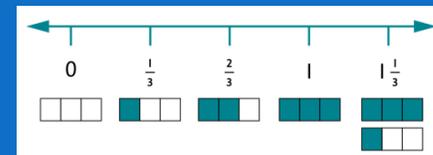

Factual knowledge

The key factual knowledge includes the recall and recognition of decimal equivalents of ¼, ½, ¾ and decimal equivalents of any number of tenths/hundredths.
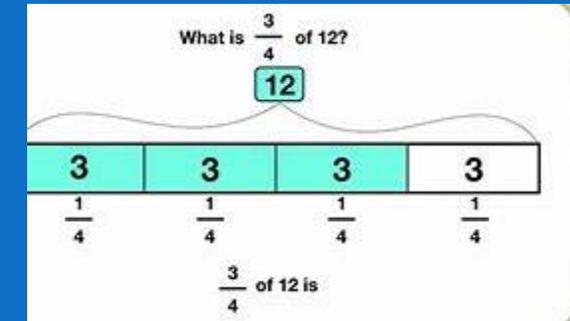

Procedural knowledge

The key procedures are counting up/down in fractions on a numberline, adding/subtracting fractions and finding non-unit fractions of amount.

Key vocabulary: denominator, numerator, equal part, whole, equivalent, ascending, descending, unit fraction, non-unit fraction, tenth
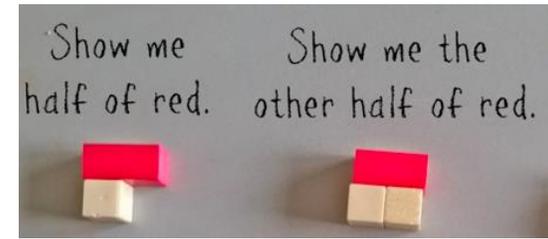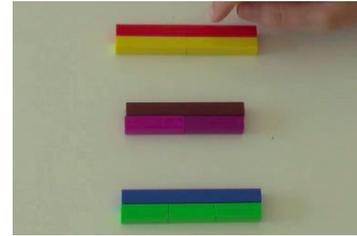
Fractions in Year 4

1. The recommended manipulatives (physical resources) for fractions are **two-colour counters and Cuisenaire rods.**
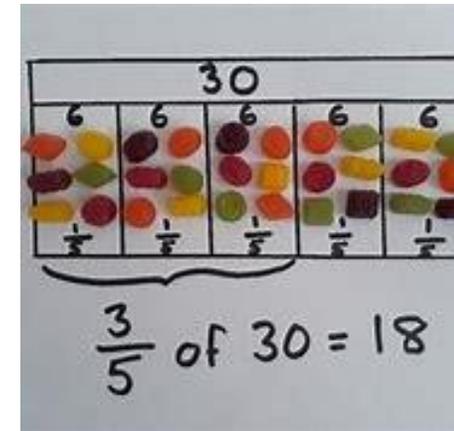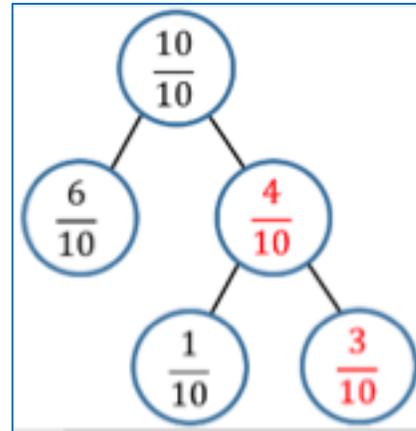
2. The key representations are **blank number lines**, **part-part-whole diagrams** and **bar models**.

3. The key procedural knowledge includes: **counting in fractions on a numberline**, **ordering** fractions with the same denominator, **adding/subtracting** fractions with the same denominator
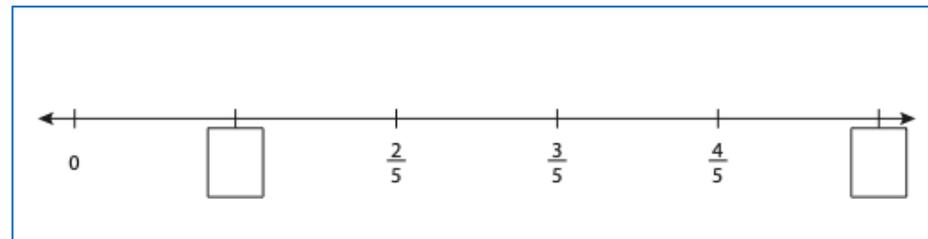

Show me half of red.   Show me the other half of red.

$\frac{3}{5}$ of 30 = 18

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