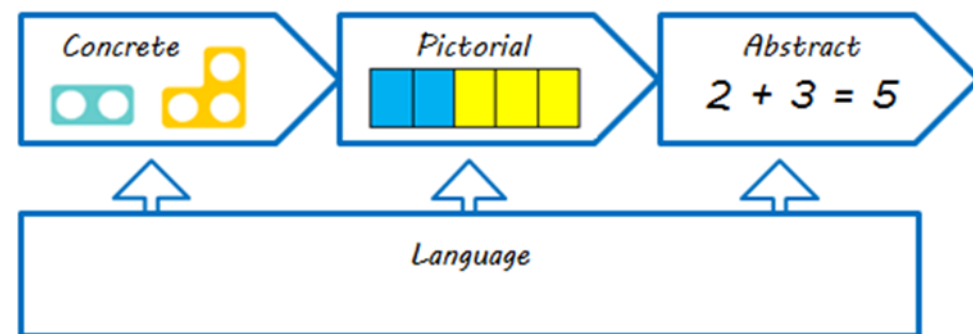# RATIONALE

Analysis of previous learning has indicated that a simplified calculation strategy may assist learners in understanding the logic behind mathematical calculations. By avoiding the teaching of numerous different strategies, we can prevent confusion which, under pressure, causes children to make inappropriate decisions about how to tackle a question.

It is expected that children will move on to more formal calculation methods when they are ready to do so. The use of concrete manipulatives, such as numicon and cuisenaire rods, will be maintained throughout school life, to reinforce the link with previous learning and maintain understanding.

Concrete → Pictorial → Abstract $2 + 3 = 5$

Language

MALIN BRIDGE PRIMARY SCHOOL

CALCULATION GUIDE

SUBTRACTION

A guide for parents and carers on the methods used in school.

Reviewed September 2016

YEAR 1

PRACTICAL SUBTRACTION

COUNTING OBJECTS MOVING ON TO PRACTICAL METHODS OF SUBTRACTION USING A RANGE OF PHYSICAL APPARATUS.
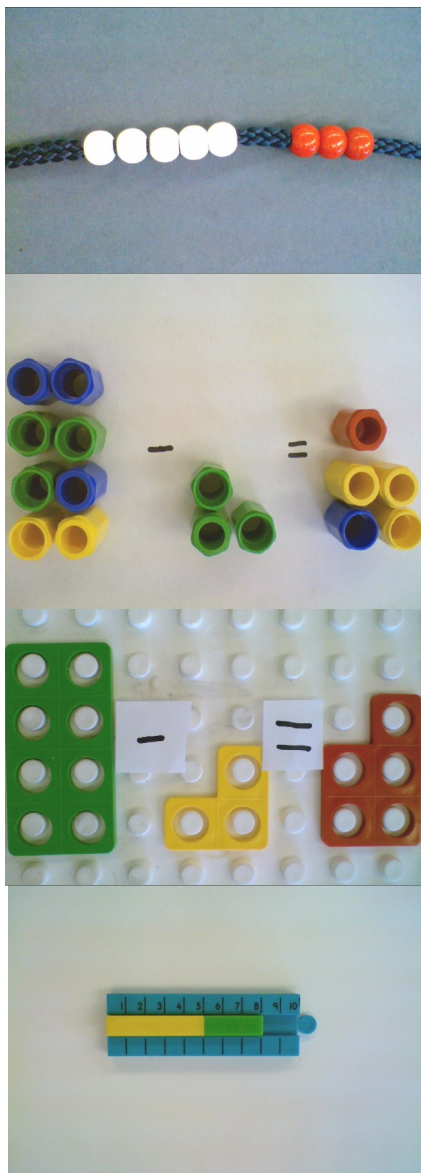
$$8 - 3 = 5$$

THIS NUMBER SENTENCE COULD BE SHOWN IN A RANGE OF WAYS EG.

$$5 = 8 - 3$$

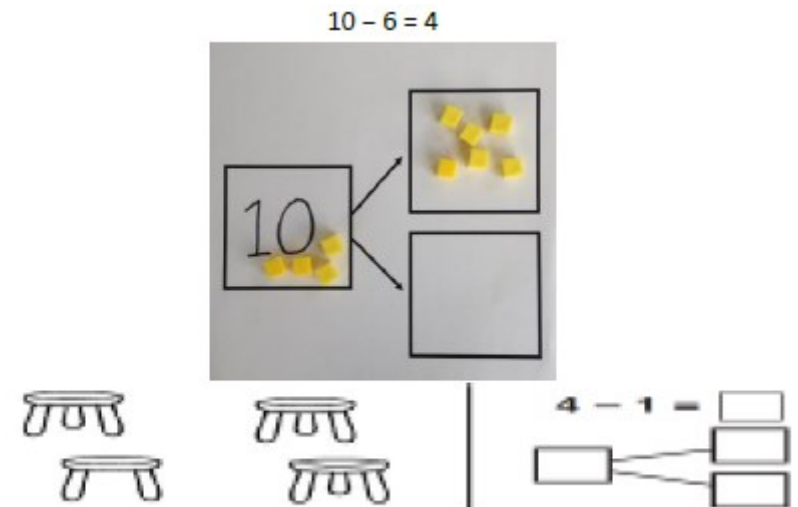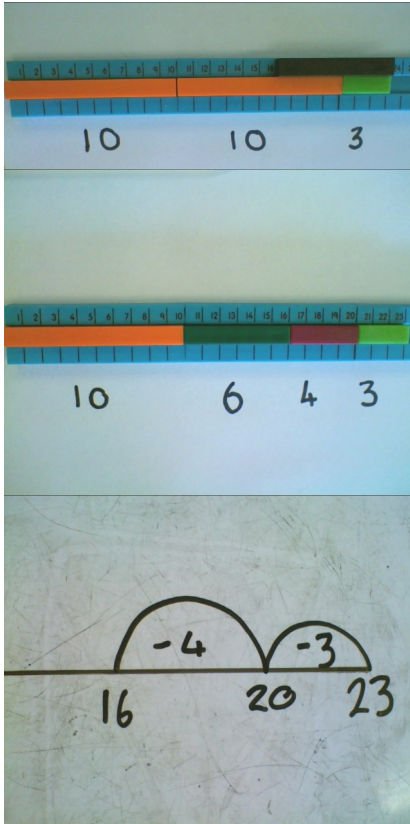$$8 - \square = 5$$

$$\square - 3 = 5$$

YEAR 1

Part - Part - Whole Method

Teach both addition and subtraction alongside each other, as pupils will use this model to identify the inverse link between them.

This model begins to develop the understanding of the COMMUTATIVITY of addition, as pupils become aware that the parts will make the whole IN ANY ORDER.

YEAR 2

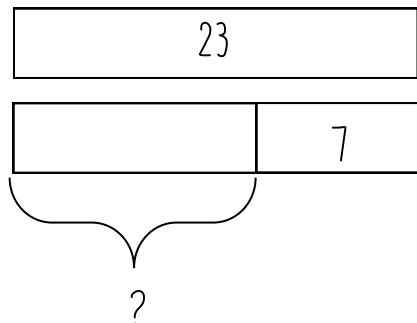## TWO DIGIT SUBTRACT ONE DIGIT NUMBER LINES

PRACTICAL METHODS BEGINNING TO BE REPRESENTED BY BLANK NUMBER LINES. UNDERSTANDING REINFORCED BY REPEATING PREVIOUS LEARNING.

$$23 - 7 = 16$$

BAR MODELLING

LINKS MADE BETWEEN PRACTICAL METHODS AND BAR REPRESENTATIONS.

$$23 - 7 = ?$$

KEY VOCABULARY

SUBTRACTION

TAKE AWAY

SUBTRACT

LESS THAN

INCREASE

DECREASE

INTEGER

NEGATIVE NUMBERS

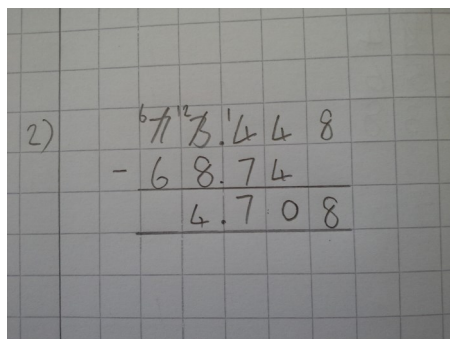CALCULATION

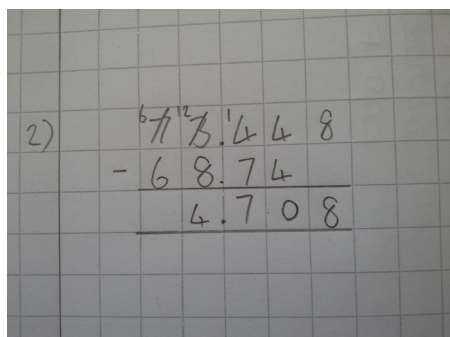COLUMN

ESTIMATE

IS EQUAL TO

EXCHANGE

CALCULATE

AVOID: EQUALS, UNITS, MINUS TO MEAN TAKE AWAY

UPPER KEY STAGE

THE COLUMN METHOD WILL CONTINUE TO BE USED ALONGSIDE VISUAL APPARATUS TO SUPPORT UNDERSTANDING.
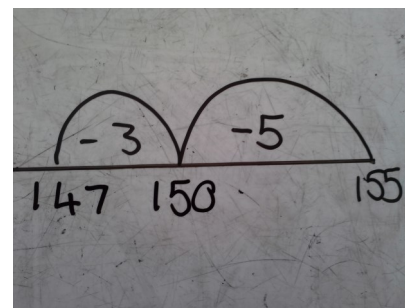

LARGER VALUES

DECIMALS WITH DIFFERING NUMBERS OF DECIMAL PLACES.

ONCE THESE TECHNIQUES HAVE BEEN MASTERED CHILDREN WILL APPLY THEIR UNDERSTANDING IN A RANGE OF PROBLEM SOLVING CONTEXTS, INCLUDING MASTERY QUESTIONS WITH PROMOTE HIGHER ORDER THINKING SKILLS.
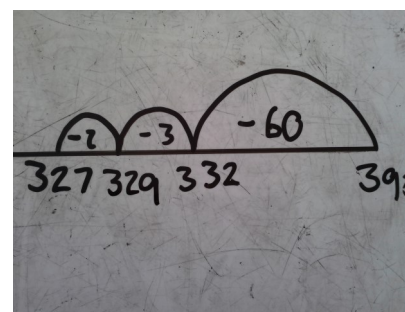
LOWER KEY STAGE 2

NUMBER LINES BUILD ON PREVIOUS LEARNING, HELPING WITH THE TRANSITION TO MORE FORMAL RECORDING. BAR MODELLING METHODS AND OTHER PICTORIAL REPRESENTATIONS SUPPORT DEEPER MATHEMATICAL UNDERSTANDING THROUGHOUT LKS2.

THREE DIGITS SUBTRACT ONE DIGIT.

$155 - 5 - 3 = 147$

$155 - 8 = 147$

THREE DIGITS SUBTRACT TWO DIGITS.

$392 - 60 - 3 - 2 = 327$

$392 - 65 = 327$

PARTITIONING

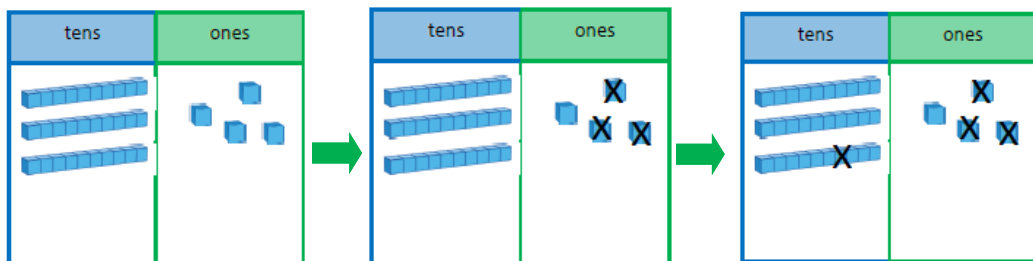REINFORCED BY SUBTRACTING MULTIPLES OF TEN EG.

$163 - 50 =$

$435 - 300 =$

COLUMN SUBTRACTION SHOULD BE INTRODUCED WHEN CHILDREN UNDERSTAND THE PREVIOUS CONCEPTS. IT HELPS TO ORGANISE LEARNING AND PREVENT UNNECESSARY MISTAKES. WHEN BEING INTRODUCED THIS SHOULD BE DONE ALONG SIDE CONCRETE MANIPULATIVES AND PICTORIAL REPRESENTATIONS.

COLUMN SUBTRACTION WITHOUT REGROUPING

$$\begin{array}{cc} 3 & 4 \\ 1 & 3 \\ \hline 2 & 1 \end{array}$$

THREE DIGITS SUBTRACT TO DIGITS → THREE DIGITS SUBTRACT THREE DIGITS → LARGER NUMBERS → MONEY

COLUMN SUBTRACTION WITH REGROUPING
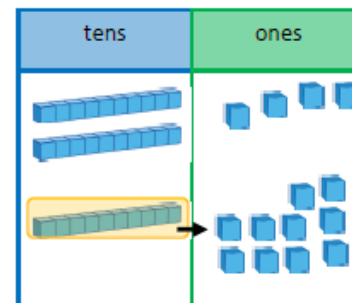
1. First subtract the ones

   But we cannot subtract 7 ones from 4 ones.

   So, we regroup the tens in 34.

   Regroup the tens in 34.

   34 = 3 tens and 4 ones

   34 = 2 tens and 14 ones

   First subtract the ones

   $$\begin{array}{ccc} & \text{tens} & \text{ones} \\ & {}_{2}\cancel{3} & {}^{1}4 \\ - & 1 & 7 \\ \hline & & 7 \end{array}$$

   14 ones - 7 ones = 7 ones

2. Then subtract the tens

   $$\begin{array}{ccc} & \text{tens} & \text{ones} \\ & {}_{2}\cancel{3} & {}^{1}4 \\ - & 1 & 7 \\ \hline & 1 & 7 \end{array}$$

   2 tens - 1 ten = 1 tens

   So, 34 - 17 = 17