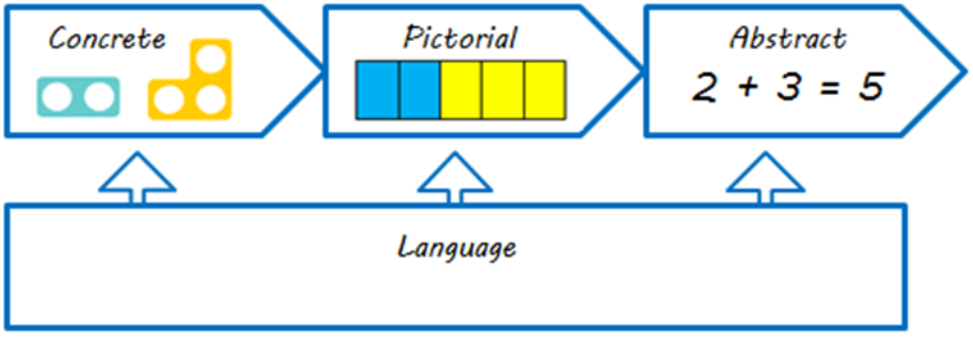
RATIONALE

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.



MALIN BRIDGE PRIMARY SCHOOL

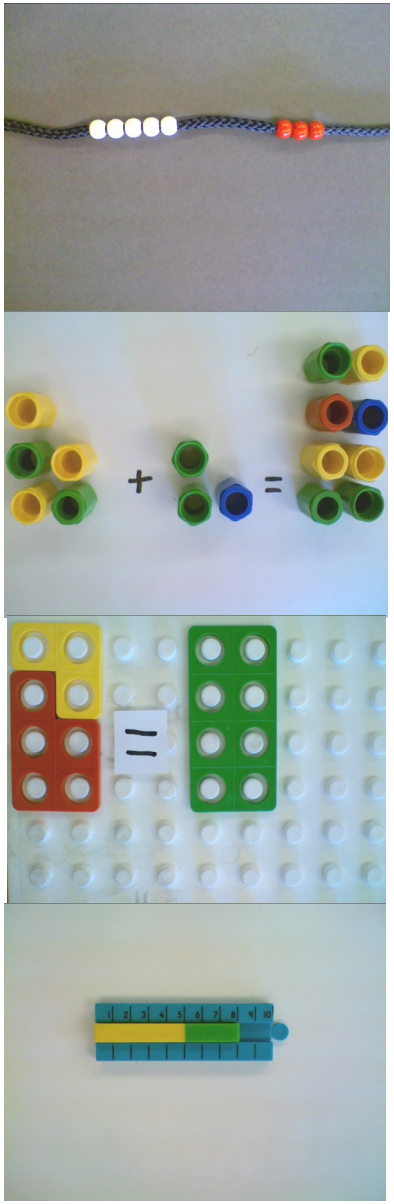
CALCULATION GUIDE

ADDITION

A GUIDE FOR PARENTS AND CARERS ON THE METHODS USED IN SCHOOL.

REVIEWED SEPTEMBER 2016

YEAR 1



PRACTICAL ADDITION

COUNTING OBJECTS MOVING ON TO PRACTICAL METHODS OF ADDITION, USING A RANGE OF PHYSICAL APPARATUS.

$$5 + 3 = 8$$

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

$$8 = 5 + 3$$

$$3 + \square = 8$$

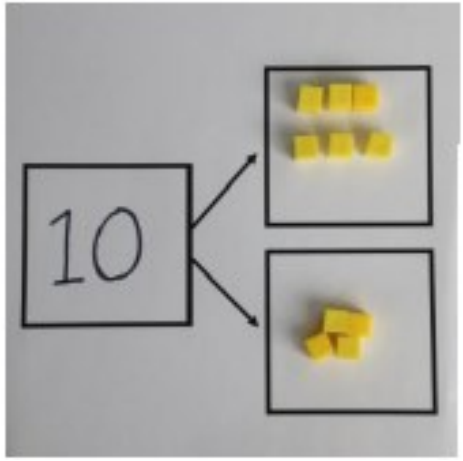
$$\square + 3 = 8$$

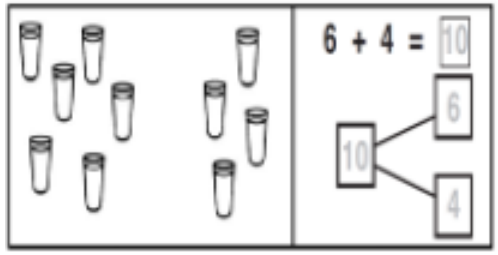
YEAR 1

PART – PART – WHOLE METHOD

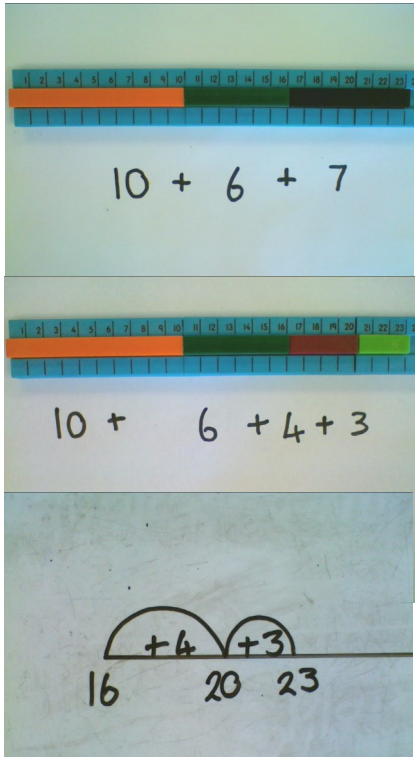
TEACH BOTH ADDITION AND SUBTRACTION ALONGSIDE EACH OTHER, AS PUPILS WILL USE THIS MODEL TO IDENTIFY THE INVERSE LINK BETWEEN THEM.

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.





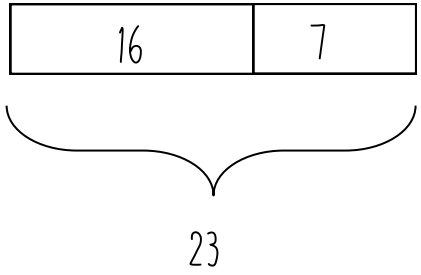
YEAR 2



TWO DIGIT PLUS ONES NUMBER LINES

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

16 + 7 = 23



BAR MODELLING

LINKS MADE BETWEEN PRACTICAL METHODS AND BAR REPRESENTATIONS.

16 + 7 = 23

KEY VOCABULARY

ADD

ADDITION

TOTAL

SUM

MORE/FEWER

INTEGER

ESTIMATION

ONES

TENS

HUNDREDS

THOUSANDS

IS EQUAL TO

INCREASE

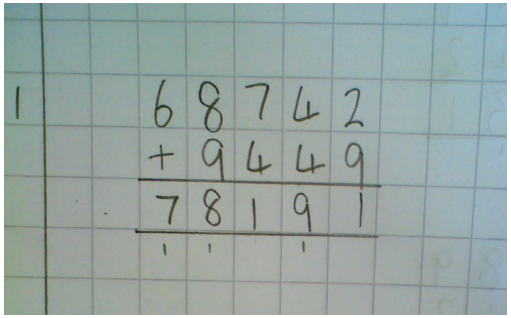
DECREASE

NEGATIVE NUMBERS

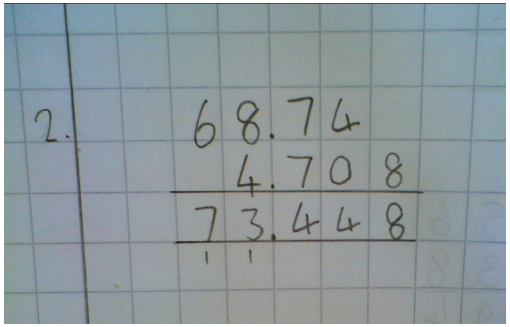
AVOID: EQUALS, UNITS, SUM IF USED FOR OTHER OPERATIONS, MINUS TO MEAN TAKE AWAY

UPPER KEY STAGE

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



LARGER VALUES

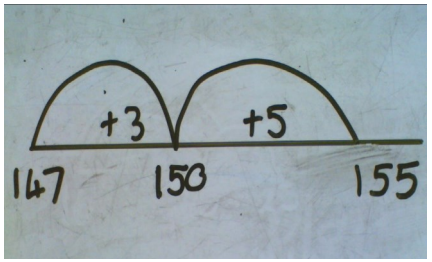


DECIMALS WITH DIFFERING NUMBERS OF DECIMAL PLACES.

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

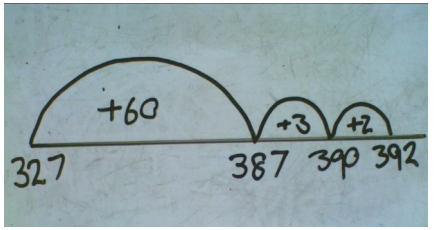
NUMBER LINES BUILD ON PREVIOUS LEARNING, HELPING WITH THE TRANSITION TO MORE FORMAL RECORDING. BAR MODELLING METHODS AND OTHER PICTORIAL REPRESENTATIONS SUPPORT DEEPER MATHEMATICAL UNDERSTANDING THROUGHOUT LKS2.



THREE DIGITS PLUS ONE DIGIT.

147 + 3 + 5 = 155

147 + 8 = 155



THREE DIGITS PLUS TWO DIGITS.

327 + 60 + 3 + 2 = 392

327 +65 = 392

PARTITIONING

REINFORCED BY ADDING MULTIPLES OF TEN EG.

163 + 50 =

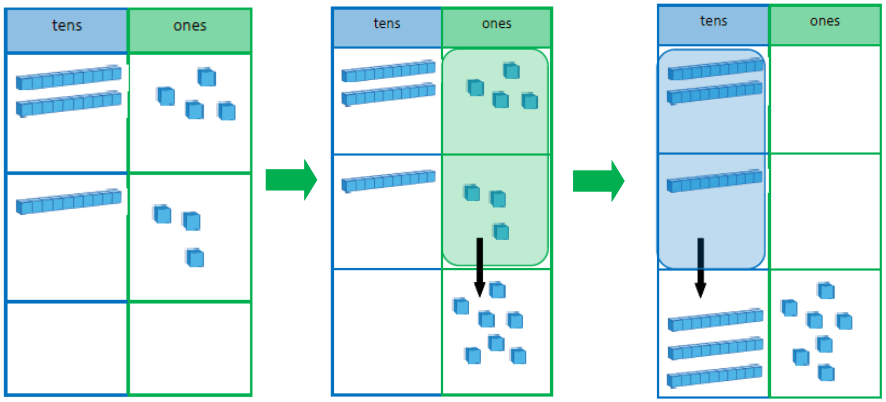
435 + 300 =

LOWER KEY STAGE 2

COLUMN ADDITION 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 ADDITION **WITHOUT** REGROUPING

$$\begin{array}{r} 24 \\ +\ 13 \\ \hline 37 \end{array}$$

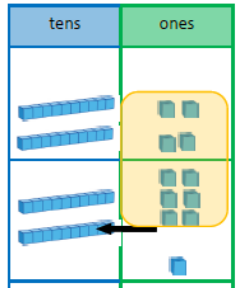


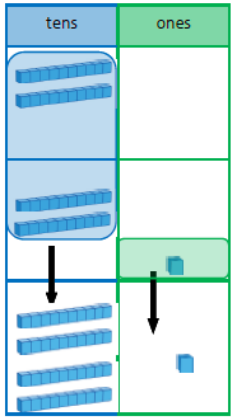
LOWER KEY STAGE 2

COLUMN ADDITION **WITH** REGROUPING

1. First add the ones

	tens	ones
	2	4
+	1	7
	1	





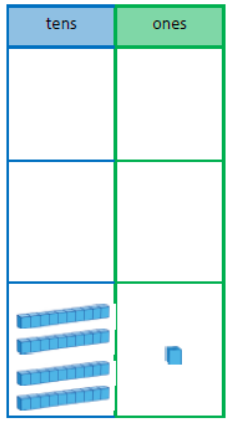
Regroup the ones.

11 ones = 1 ten and 1 one

2. Then add the tens.

	tens	ones
	2	4
+	1	7
	1	
	4	1

2 tens + 1 ten + 1 ten = 4 tens



So, 24 + 17 = 41

THREE DIGITS PLUS TWO DIGITS → THREE DIGITS PLUS THREE DIGITS → LARGER NUMBERS → MONEY