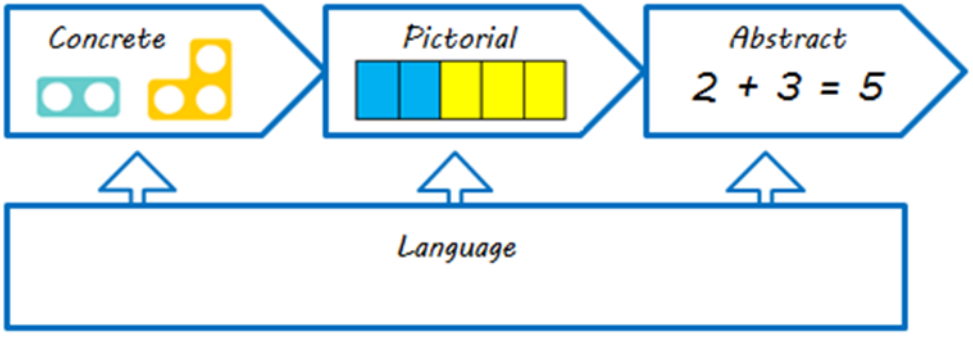
RATIONALE

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

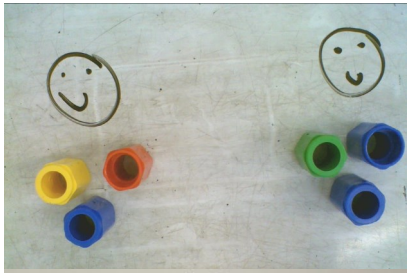
CALCULATION GUIDE

DIVISION

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

REVIEWED SEPTEMBER 2016

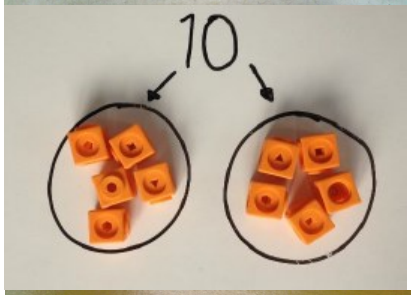
YEAR 1



PRACTICAL DIVISION

SHARING

EG. TWO FRIENDS SHARE SIX SWEETS, HOW MANY DOES EACH GET?



USE REAL OBJECTS TO DEMONSTRATE ARRAYS AND LINK TO COUNTING IN GROUPS

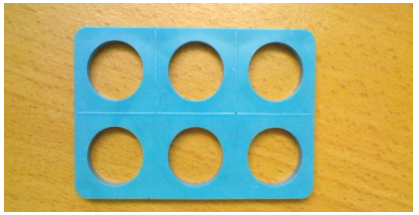
GROUPING COUNTERS

ALL THESE METHODS CAN BE USED TO SHOW THAT:

$$6 \div 2 = 3$$

$$6 \div 3 = 2$$

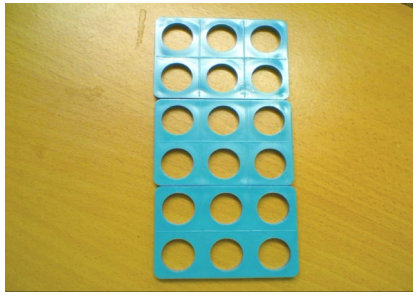
YEAR 2



ARRAYS

LINK PRIOR UNDERSTANDING OF ARRAYS TO NUMICON SHAPES.

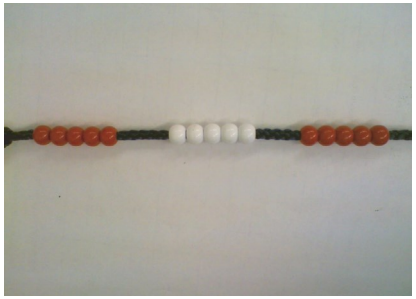
$6 \div 3 = 2$



PRIOR UNDERSTANDING LINKS TO GREATER VALUES.

$18 \div 6 = 3$

BOTH AS AN ARRAY AND MULTIPLES OF NUMICON SHAPES



REPEATED SUBTRACTION

USING COUNTING BEADS.

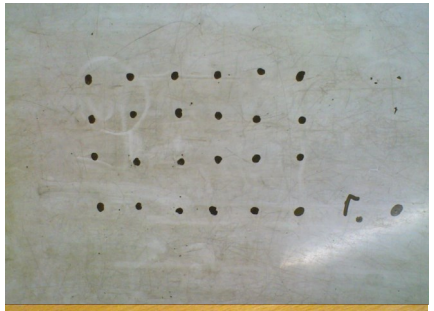
$15 \div 3 = 5$

MULTIPLICATION TABLES

RELATE TABLES KNOWLEDGE BY COUNTING BACK. HOW MANY TWOS IN TWENTY?

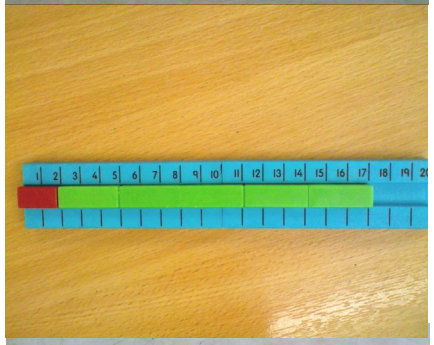
LOWER KEY STAGE 2

NUMBER LINES AND ARRAYS 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.



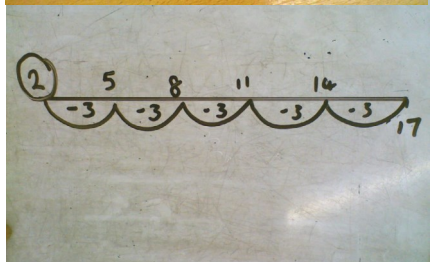
TWO DIGITS BY ONE DIGIT AS AN ARRAY

$24 \div 4 = 6$ R. 1



CUISINAIRE CAN SUPPORT THE NEXT STEP.

$17 \div 3 = 5$ R. 2



COUNTING BACK ON A BLANK NUMBER LINE.

KEY VOCABULARY

DIVIDE

SHARE

DIVIDE EQUALLY

DIVISION

DIVIDEND

DIVISOR

QUOTIENT

DIVISIBLE BY

INTEGER

REMAINDERS

FRACTIONS

DECIMALS

IS EQUAL TO

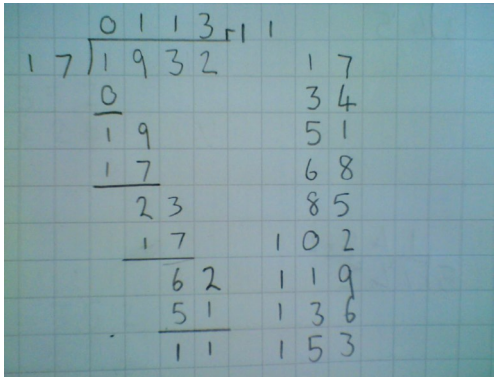
INVERSE

GROUPS OF

AVOID: EQUALS, TIMES BY, TIMESING

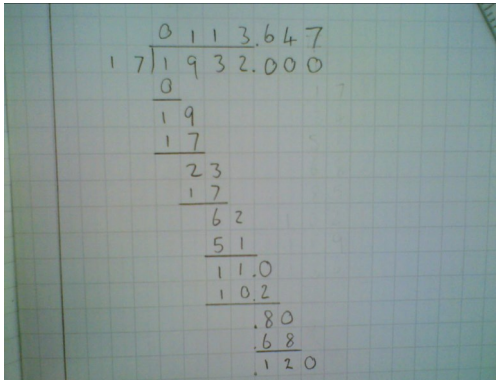
UPPER KEY STAGE

When children have mastered short division, they should move onto long division methods.



Formal long division.

Copy out the multiples of the divisor first, to help prevent mistakes.



Once again, remainders can be expressed as fractions or decimals.

Multiplication tables

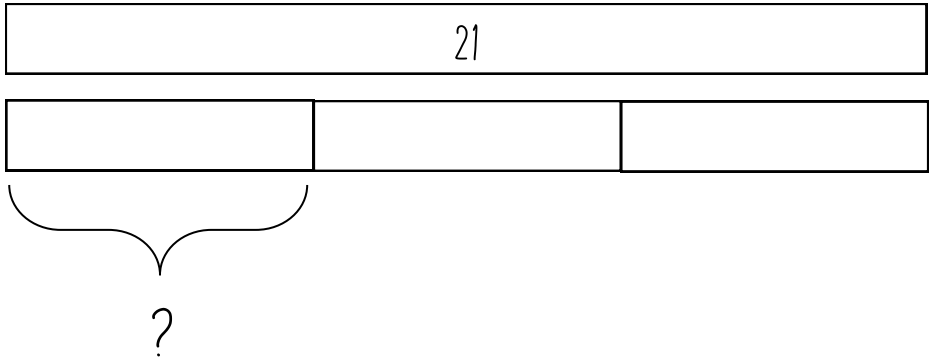
Work on all tables must continue regularly throughout, to support understanding of these methods.

LOWER KEY STAGE 2

Bar modelling

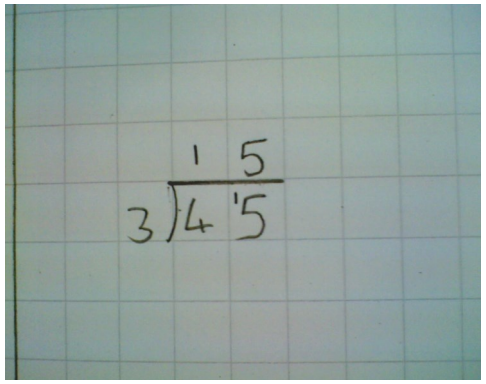
Children are introduced to division calculations being represented by bar models. This should be introduced using a mixture of concrete manipulatives, cuisenaire rods, and pictorial representations.

$21 \div 3 = ?$

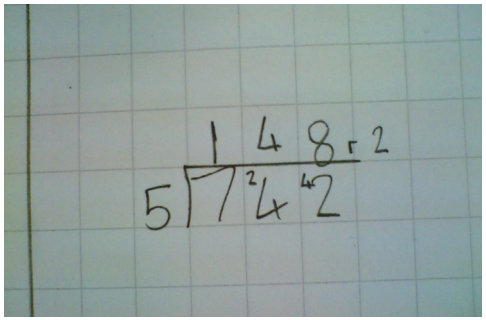


LOWER KEY STAGE 2

NUMBER LINES AND ARRAYS SHOULD BE USED UNTIL CHILDREN ARE CONFIDENT WITH THE CONCEPT. ONLY THEN SHOULD THEY BE INTRODUCED TO SHORT DIVISION.



TWO DIGITS BY ONE DIGIT



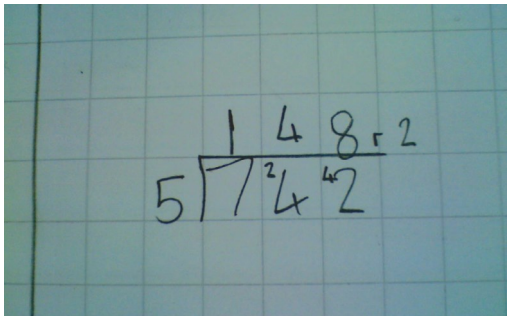
THREE DIGITS BY ONE DIGIT WITH REMAINDERS.

MULTIPLICATION TABLES

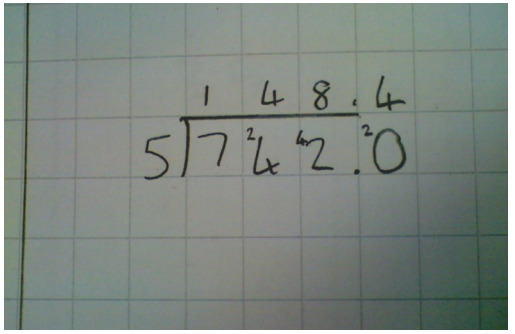
TABLES FACTS NEED CONSTANT PRACTICE TO ENABLE SUCCESS IN THESE METHODS.

UPPER KEY STAGE

SHORT DIVISION WILL BE CONSOLIDATED ALONGSIDE THE USE OF VISUAL APPARATUS TO SUPPORT UNDERSTANDING.



EXPRESSING REMAINDERS AS FRACTIONS.



EXPRESSING REMAINDERS AS DECIMALS.

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.