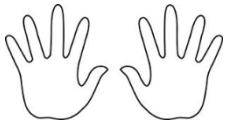
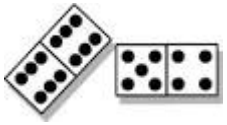
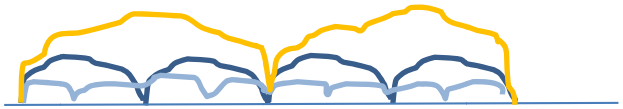
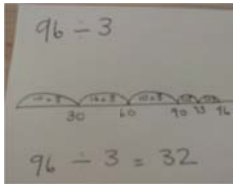
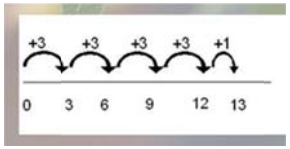
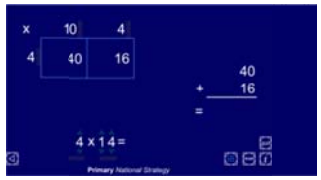
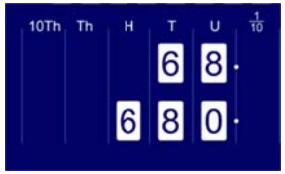
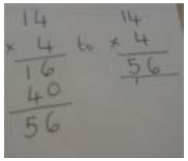
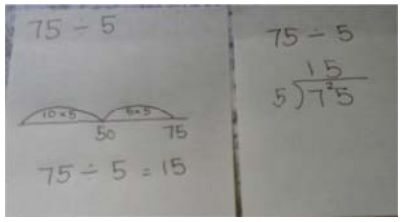
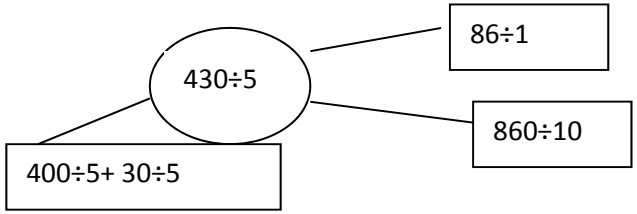
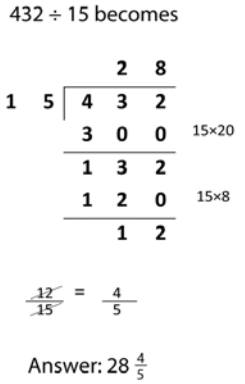
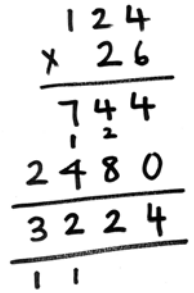
Step 1	Representations	Recordings
Multiplication and Division • solve problems, including doubling halving and sharing • solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher Pose real life problems or Maths from story	 Language of sharing   How many friends could I share this with?     	'Which Numicon tile is like this one?'- 'How many pegs would you need for both tiles?'  Can you find all the double dominoes? Can you make some double dominoes?   Informal jottings to present answers. Discussion to consolidate learning of language of grouping and sharing. Link with step counting and the formation of arrays. Explain using symbols 2+2+2 or 2 three times Can we use the story to make arrays? What arrays can we see? Can we match the real life arrays with Numicon tiles?

Step 2	Representations	Recordings
Multiplication and Division • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs • show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	Can you halve any number? What do you notice?  Explore odd and even numbers with Numicon Use Numicon tiles to display mathematical statements  Compare and describe   Counting into multiplication and division using a counting stick	On a number line – show equal jumps  Use ITP's to show links between objects and number lines and symbolic representations. Use Numicon tiles to explain mathematical statements written 3x2= and explore how 2x3= gives the same answer but looks different. What would they look like when recorded on a number line. What is division? Why is it not commutative? 6÷2 gives a different answer to 6÷3, what do you notice? How would you work out ?÷3=4 Support learning mental strategies for multiplication facts using a counting stick, target boards, dice, matching cards, Number Fun songs for 2,4,5,10&3

Step 3	Representations	Recordings- Examples
Multiplication and Division • recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	 Use a counting stick to support learning facts. Display multiplication table Use number wall First to 21 activities   2x8 is the same as 4x4 and 8x2 20x8 the same as 40x4 and 80x2   	**Record as** **3x1** Match to visual pictures and **3x2** vocabulary to support learning. **3x3** Match with division facts how **3x4** many 3's in …? Encourage children to ' just know' in problem solving Make links with 2,4,8 tables- explore number lines to 'see' the connections and Numicon tile towers Scaling problems- compare and talk 2 straws ten times bigger is 20 straws 2x10 is 2x1- 10 times bigger or (2x1) x10- illustrate in bundles of straws. Grouping on a number line & with remainders- use counting up eg 13÷3 96÷3 Illustrate on a number line then… ***n objects connected to m objects would be 'Granny's Tea Cup problem' nrich*** 

Step 4	Representations	Recordings
Multiplication and division • recall multiplication and division facts for multiplication tables up to 12 x 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1: dividing by 1: multiplying together 3 numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	Secure x facts-use grids, dials, counting sticks, chants     Grid method for 2 digit x1 digit then 14x4 formally - but children need to be very secure at x,÷10  Mental methods – x4 double and double again 75÷5 can be shown on a number line and developed into short division – remainders within  75 ÷ 5 = 15 -50 (5 x 10) 25 -25 (5 x 5) 0 Children need to be secure at this level to move onto dividing 3 digit numbers by 1 digit number	Commutativity-Make full use of the distributive law or the associative law to solve multiplication problems E.g I can't remember my 7 times table 6x7 can become… 3x7 +3x7 or 3x2x7- associative need to know factors 6x2+6x5- distributive as shown with an array Reinforcing associative/distributive law for more efficient methods at times eg 164÷4 is half and half again or 160÷4 and 4÷4 ***Mental Methods Matters Most*** Use Multiplication Grid ITP to demonstrate two digit by one digit number Use Moving digits ITP to show the effect of x,÷ 10,100 14x4 using a grid method can be moved to a short method *Ensure children have a good grasp of known facts, place value and estimation skills* 123X5- short multiplication Division needs to be taught alongside as the inverse of multiplication, scaling up and division, scaling down.

Step 5	Representations	Recordings
Multiplication and Division • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. • solve problems involving multiplication and division where larger numbers are used by decomposing them into their factors • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	Continue to consolidate multiplication facts to 12x12 Use of counting sticks would be good to see relationships Multiplication squares and ITP,s Number dial   Spider diagrams to 'see' relationships  Multiply 2 digit by 2 digit 72x38 Continue with grid method ensuring children can use facts to estimate the size of the answer i.e. 70x40=2800 Moving onto long multiplication when ready and make links with grid method 7 2 X 3 8 2160 720 x30 576 72x8 2736 *Careful addition- and check based on estimate*	Reinforce the use of factors and commutativity to find easier multiples- 24 x6 Can become 12x12 or 24x2x3 244÷16= 244÷(4x4) Understand how to use x, ÷ by 10, 100 430÷5= 860÷10 With remainders- 432÷5 8 6 r2 5 ⟌ 4 3 2 3 432 ÷ 5 = 86 R2 - 250 (5 x 50) 182 - 150 (5 x 30) 32 -30 (5 x 6) R 2 72x38 X | 70 2 30 | 2100 60 8 | 560 16 2100+ 560+ 60+ 16+ 2736

Step 6	Representations	Recordings
Multiply and Divide • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • perform mental calculations, including with mixed operations and large numbers. identify common factors, common multiples and prime numbers • use their knowledge of the order of operations to carry out calculations involving the four operations	Consolidation of formal written methods Consolidate use of factors i.e. x 32 is x 2^5 134 x 32= 134x2^5 or 134x2x2x2x2x2 Developing the explanation of displaying remainders as fractions	 

Key vocabulary: Multiplication – groups of, lots of, times, array, altogether, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times, _times as big as, once, twice, three times…, partition, grid method, multiple, product, tens, units, vale
Key vocabulary: Division – share, share equally, one each, two each…, group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor