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LISTERDALE

Progression in Calculations

Division

Progression in Division

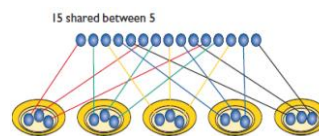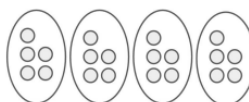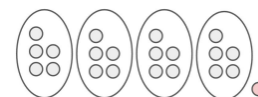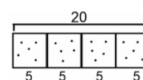|	
EYFS Sharing into equal groups. Even and odd numbers – sharing equally into 2 groups. Children to notice that sometimes there are items left over when they share. Encourage children to create their own suggestions for how to resolve this.	 Practical activities involving sharing, distributing cards when playing a game, putting objects onto plates, into cups, hoops etc.
Year 1 Recall and use doubles of all numbers to 10 and corresponding halves. Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Once children are confident at sharing objects practically (concrete) they can be encouraged to make simple jottings (pictorial). Initially this could be using physical objects but requiring children to draw the correct number of circles to share between. Checking by counting that all groups are the same. **Sharing** – 6 sweets are shared between 2 people. How many do they have each? 15 shared between 5 12 pupils get into teams of 4 to play a game. How many teams are there? **Equal grouping**
Year 2 Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. Understand division as sharing and grouping and that a division calculation can have a remainder. Derive and use halves of simple two-digit even numbers (numbers in which the tens are even) Calculate mathematical statements for division within the multiplication tables and write them using the, division (÷) and equals (=) signs. Show that multiplication of two numbers can be done in any order (commutative) and division of one 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	**Division symbol** $15 \div 3 = \square$ **Sharing**: First using concrete objects. Then simplify pictorial representations ensuring all groups are the same. There are 20 sweets and 4 friends share them between themselves. How many do they get each? Children also need to be taught that if they are not all equal the extra ones must be left as a remainder. E.g. $21 \div 5 = 4$ r1 **Grouping**: First using concrete objects, then simplify pictorial representations. 12 children get into teams of 4 to play a game. How many teams are there? **Fact families:** 20 / 5 5 5 5 What number sentences can you create for this model? **Missing number problems (using multiplication facts)** $6 \div 2 = \blacktriangleright$ $\blacktriangleright = 6 \div 2$ $6 \div \blacktriangleright = 3$ $3 = 6 \div \blacktriangleright$

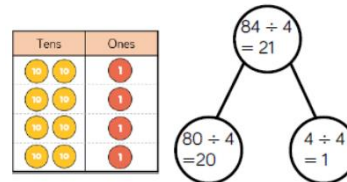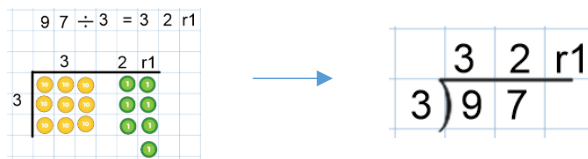|	
<u>**Year 3**</u> Choose an appropriate strategy to solve a calculation based upon the numbers involved. Understand that division is the inverse of multiplication and vice versa. Understand division as sharing and grouping and use each appropriately. Recall and use division facts for the 3, 4 and 8 multiplication tables. Derive and use doubles of all numbers to 100 and corresponding halves. Write and calculate mathematical statements for division using the multiplication tables that they know, including for **two-digit numbers divided by one-digit numbers,** progressing to formal written methods. Use estimation to check answers to calculations. Solve problems, including missing number problems, involving division (and interpreting remainders), including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	**Practise and consolidation** Count in groups. How many 5s in 15? $1 \times 5 = 5$ $2 \times 5 = 10$ $15 \div 5 = 3$ $3 \times 5 = 15$ $15 \div 3 = 5$ Ensure children are secure with grouping. Children also need to be taught that if groups are not all equal the extra ones must be left as a remainder. E.g. $21 \div 5 = 4$ r1 **Concrete apparatus:** $84 \div 4 = 21$ $80 \div 4 = 20$ $4 \div 4 = 1$ **Progressing to formal written method:** $$4\overline{)8\ 4}\quad 2\ 1$$
<u>**Year 4**</u> Choose an appropriate strategy to solve a calculation based upon the numbers involved. Recall multiplication and division facts for multiplication tables up to 12×12. Use partitioning to halve any number, including decimals to one decimal place. Use place value, known and derived facts to divide mentally, including dividing by 1. Divide numbers up to **3 digits by a one-digit number** using the formal written method of short division and interpret remainders appropriately for the context. Use estimation and inverse to check answers. Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, division (including interpreting remainders), integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	**Practise and consolidate** **using concrete apparatus:** **Short division (no remainders):** $9\ 6 \div 3 = 3\ 2$ $$3\overline{)9\ 6}\quad 3\ 2$$ **Division with remainders:** $9\ 7 \div 3 = 3\ 2$ r1 $$3\overline{)9\ 7}\quad 3\ 2\ \text{r1}$$ Repeat above process to divide a 3 digit number by a one-digit number**.**
<u>**Year 5**</u> Choose an appropriate strategy to solve a calculation based upon the numbers involved. Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Use partitioning to halve any number, including decimals to two decimal places. Divide numbers mentally drawing upon known facts.	**Short division** $98 \div 7$ becomes $432 \div 5$ becomes $$7\overline{)9\ ^2 8}\quad 1\ 4 \qquad 5\overline{)4\ 3\ ^3 2}\quad 8\ 6\ \text{r}2$$ $$8\overline{)1\ ^1 5\ ^7 5\ ^3 0}\quad 1\ 9\ 3\ \text{r}6$$ **Remainders** Pupils interpret remainders appropriately for the given context.
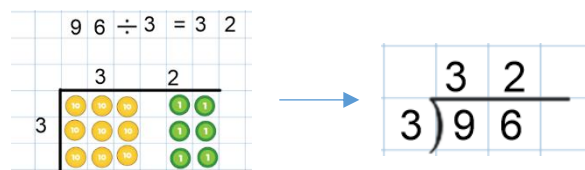
Solve problems involving division including using their knowledge of factors and multiples, squares and cubes. Divide numbers up to **4 digits by a one-digit number** using the formal written method of short division and interpret remainders appropriately for the context. Use estimation and inverse to check answers to calculations. 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. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	Biscuits are retailed in boxes of nine. How many complete boxes can be sold if we have 3291 biscuits? 280 people are to be seated in rows of 9 at the cinema. How many rows are needed?
Year 6 Choose an appropriate strategy to solve a calculation based upon the numbers involved. Identify common factors, common multiples and prime numbers. Use partitioning to halve any number. Perform mental calculations, including with mixed operations and large numbers. Divide numbers up to **4 digits by a two-digit number** using the formal written method of short division where appropriate, interpreting remainders according to the context. 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 Use written division methods in cases where the answer has up to two decimal places. Use estimation and inverse to check answers to calculations. Use their knowledge of the order of operations to carry out calculations involving the four operations. Solve problems involving addition, subtraction, multiplication and division.	**Short division:** Formal short division with remainders represented as fractions and decimals. **Long division:** Formal long division with remainders represented as fractions and decimals. 8712 ÷ 16 = 544 r8 **or** 544 ½ **or** 544.5