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| be able to double, halve and share within 20 | *count in multiples of twos, fives and tens*  (copied from Number and Place Value) | *count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward*  (copied from Number and Place Value) | *count from 0 in multiples of 4, 8, 50 and 100*  (copied from Number and Place Value) | *count in multiples of 6, 7, 9, 25 and 1 000*  (copied from Number and Place Value) | *count forwards or backwards in steps of powers of 10 for any given number up to*  *1 000 000*  (copied from Number and Place Value) | |  |
|  |  | recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers | recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables | recall multiplication and division facts for multiplication tables up to 12 × 12 |  | |  |
|  |  | **Missing numbers**  10 = 5 x  What number could be written in the box?  **Making links**  I have 30p in my pocket in 5p coins. How many coins do I have? | **Missing numbers**  24 = x  Which pairs of numbers could be written in the boxes?  **Making links** Cards come in packs of 4. How many packs do I need to buy to get 32 cards? | **Missing numbers**  72 = x  Which pairs of numbers could be written in the boxes?  **Making links** Eggs are bought in boxes of 12. I need 140 eggs; how many boxes will I need to buy? | **Missing numbers**  6 x 0.9 = x 0.03  6 x 0.04 = 0.008 x  Which numbers could be written in the boxes?  **Making links** Apples weigh about 170 g each. How many apples would you expect to get in a 2 kg bag? | | **Missing numbers**  2.4 ÷ 0.3 = x 1.25  Which number could be written in the box?  **Making links** |
|  | **MENTAL CALCULATION** | | | | | | |
|  |  |  | 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 (appears also in Written Methods) | use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers | multiply and divide numbers mentally drawing upon known facts | perform mental calculations, including with mixed operations and large numbers | |
|  |  |  | **Use a fact**  20 x 3 = 60.  Use this fact to work out  21 x 3 = 22 x 3 =  23 x 3 = 24 x 3 = | **Use a fact**  63 ÷ 9 = 7  Use this fact to work out  126 ÷ 9 =  252 ÷ 7 = | **Use a fact**  3 x 75 = 225  Use this fact to work out  450 ÷ 6 =  225 ÷ 0.6 =  To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve  48 x 25 78 x 25  4.6 x 25 | **Use a fact**  12 x 1.1 = 13.2  Use this fact to work out  15.4 ÷ 1.1 =  27.5 ÷ 1.1 = | |
|  |  | show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot |  | recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) | multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | *associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)*  (copied from Fractions) | |
|  | **Making links**  If one teddy has two apples, how many apples will three teddies have?  Here are 10 lego people If 2 people fit into the train carriage, how many carriages do we need? | **Making links**  Write the multiplication number sentences to describe this array   |  |  |  | | --- | --- | --- | | X | X | X | | X | X | X |   What do you notice?  Write the division sentences. | **Making links**  4 × 6 = 24  How does this fact help you to solve these calculations?  40 x 6 =  20 x 6 =  24 x 6 = | **Making links**  How can you use factor pairs to solve this calculation?  13 x 12  (13 x 3 x 4, 13 x 3 x 2 x 2, 13 x 2 x 6) | **Making links**  7 x 8 = 56  How can you use this fact to solve these calculations?  0.7 x 0.8 =  5.6 ÷ 8 = | **Making links**  0.7 x 8 = 5.6  How can you use this fact to solve these calculations?  0.7 x 0.08 =  0.56 ÷ 8 = | |
|  | **WRITTEN CALCULATION** | | | | | | |
|  |  | calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs | 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 (appears also in Mental Methods) | multiply two-digit and three-digit numbers by a one-digit number using formal written layout | 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 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 one-digit number using the formal written method of short division and interpret remainders appropriately for the context | divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for 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* (copied from Fractions (including decimals)) | |
|  | Practical  If we put two pencils in each pencil pot how many pencils will we need? | **Prove It**  Which four number sentences link these numbers? 3, 5, 15?  Prove it. | **Prove It**  What goes in the missing box?   |  |  |  | | --- | --- | --- | | x | ? | ? | | 4 | 80 | 12 |   Prove it.  **How close can you get?**    ×  Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product? | **Prove It**  What goes in the missing box?  6 x 4 = 512  Prove it.  **How close can you get?**  X 7  Using the digits 3, 4 and 6 in the calculation above how close can you get to 4500? What is the largest product? What is the smallest product? | **Prove It**  What goes in the missing box?  12 2 ÷ 6 = 212  14 4 ÷ 7 = 212  22 3 ÷ 7 = 321 r 6  323 x 1 = 13243  Prove it. | **Prove It**  What goes in the missing box?  18 4 ÷ 12 = 157  38 5 ÷ 18 = 212.5  33 2 ÷ 8 = 421.5  38 x .7 = 178.6    Prove it.  **Can you find?**  Can you find the smallest number that can be added to or subtracted from 87.6 to make it exactly divisible by 8/7/18? | |
|  | **PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS** | | | | | | |
|  |  |  |  | recognise and use factor pairs and commutativity in mental calculations (repeated) | identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. | | identify common factors, common multiples and prime numbers  *use common factors to simplify fractions; use common multiples to express fractions in the same denomination*  (copied from Fractions) |
|  | 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 | |
|  |  |  |  |  | recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) | | *calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3), and extending to other units such as mm3 and km3*  (copied from Measures) |
|  | **Spot the mistake**  Use a puppet to count but make some deliberate mistakes.  e.g. 2 4 5 6  10 9 8 6  See if the pupils can spot the deliberate mistake and correct the puppet | **True or false?**  When you count up in tens starting at 5 there will always be 5 units. | **True or false?**  All the numbers in the two times table are even.  There are no numbers in the three times table that are also in the two times table. | **Always, sometimes, never?**  Is it always, sometimes or never true that an even number that is divisible by 3 is also divisible by 6.  Is it always, sometimes or never true that the sum of four even numbers is divisible by 4. | **Always, sometimes, never?**  Is it always, sometimes or never true that multiplying a number always makes it bigger  Is it always, sometimes or never true that prime numbers are odd.  Is it always, sometimes or never true that when you multiply a whole number by 9, the sum of its digits is also a multiple of 9  Is it always, sometimes or never true that a square number has an even number of factors. | | **Always, sometimes, never?**  Is it always, sometimes or never true that dividing a whole number by a half makes the answer twice as big.  Is it always, sometimes or never true that when you square an even number, the result is divisible by 4  Is it always, sometimes or never true that multiples of 7 are 1 more or 1 less than prime numbers. |
|  | **ORDER OF OPERATIONS** | | | | | | |
|  |  |  |  |  |  | | use their knowledge of the order of operations to carry out calculations involving the four operations |
|  |  |  |  |  |  | | **Which is correct?**  Which of these number sentences is correct?  3 + 6 x 2 =15  6 x 5 – 7 x 4 = 92  8 x 20 ÷ 4 x 3 = 37 |
|  | **INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS** | | | | | | |
|  |  |  | *estimate the answer to a calculation and use inverse operations to check answers* (copied from Addition and Subtraction) | *estimate and use inverse operations to check answers to a calculation*  (copied from Addition and Subtraction) |  | | use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy |
|  |  | **Use the inverse**  Use the inverse to check if the following calculations are correct:  12 ÷ 3 = 4  3 x 5 = 14 | **Use the inverse**  Use the inverse to check if the following calculations are correct  23 x 4 = 82  117 ÷ 9 = 14  **Size of an answer**  Will the answer to the following calculations be greater or less than 80  23 x 3=  32 x 3 =  42 x 3 =  36 x 2= | **Use the inverse**  Use the inverse to check if the following calculations are correct:  23 x 4 = 92  117 ÷ 9 = 14  **Size of an answer**  Will the answer to the following calculations be greater or less than 300  152 x 2=  78 x 3 =  87 x 3 =  4 x 74 = | **Use the inverse**  Use the inverse to check if the following calculations are correct:  4321 x 12 = 51852  507 ÷ 9 = 4563  **Size of an answer**  The product of a two digit and three digit number is approximately 6500. What could the numbers be? | | **Use the inverse**  Use the inverse to check if the following calculations are correct:  2346 x 46 = 332796  27.74 ÷ 19 = 1.46  **Size of an answer**  The product of a single digit number and a number with two decimal places is 21.34  What could the numbers be? |
|  | **PROBLEM SOLVING** | | | | | | |
|  | 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 | solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | 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 | solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes | | solve problems involving addition, subtraction, multiplication and division |
|  | 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 | | *solve problems involving similar shapes where the scale factor is known or can be found*  (copied from Ratio and Proportion) |