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| Year 6ES | End of year expectations for mental calculation | End of year expectations for written methods and problem solving | Written strategies/ recordings/methods/images | Vocabulary& Links |
| * Perform mental calculations, including with mixed operations and large numbers *(increasingly large numbers & more complex calculations)*

*(Use all the multiplication tables to calculate mathematical statements in**order to maintain fluency)** Use estimation to check answers to calculations & determine, in the context of a problem, an appropriate degree of accuracy.
* Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.

*(Use mental strategies to solve problems e.g.**• x4 by doubling and doubling again**• x5 by x10 and halving**• x20 by x10 and doubling**• x9 by multiplying by 10 and adjusting**• x6 by multiplying by 3 and doubling)***Children should know the square numbers up to 12 × 12 & derive the corresponding squares****of multiples of 10** **e.g. 80 × 80 = 6400** | * Multiply multi-digit numbers up to 4 digits by a 2 - digit whole number using the formal written method of long multiplication

 *(short & long multiplication)** Multiply 1 - digit numbers with up to two decimal places by whole numbers

*(How many different x/÷ facts can you make using 72? 7.2? 0.72?**What is the best approximation for 4.4 x 18.6?)*FRACTIONS* Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. ¼ x ½ = 1/8

Three key applications of understanding:• Recognise that ¼ of 12, ¼ x 12  and12divided by 4 are equivalent• Use cancellation to simplify the product  of a fraction and an integer e.g. 1/3 x 15  = 3, 2/5 x 15 = 2 x 3= 6• Work out how many ½s in 15, how  many 2/5s in 15, how many 2/5s in 1  etc. | Look at long‐multiplication calculationscontaining errors, identify the errors anddetermine how they should be correctedWhat’s the same?What’s different?What’s the same?What’s different?What’s the same?What’s different?Pupils should use a variety of images to support their understanding of multiplication with fractions. This follows earlier work about fractions as operators (fractions of), as numbers, and as equal parts of objects, e.g. as parts of a rectangle. | • Identify common factors, common  multiples and prime numbers• Use their knowledge of the order  of operations to carry out  calculations involving the four  operations• Solve problems involving addition,  subtraction, multiplication and division• *Explore the order of operations using*  *brackets; for example, 2 + 1 x 3 = 5 and*  *(2 + 1) x 3 = 9.*• Fractions, decimals and percentages  including equivalences in different  contexts.• Solve problems involving the relative  sizes of two quantities where missing  values can be found by using integer multiplication and division facts• solve problems involving the calculation  of percentages [for example, of measures, and such as 15% of 360] and  the use of percentages for comparison• Solve problems involving similar shapes  where the scale factor is known or can  be found• Solve problems involving unequal  sharing and grouping using knowledge of  Fractions and multiples.• Algebra including formulae, linear  number sequences, combinations of  variables• Measurement including solving problems  with conversion of units, decimal  notation, area & volume• Statistics including pie charts, line charts  and calculating the mean |