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| **Year 6 - Building and assessing the conceptual understanding and learning – Calculation** |
| **End of Year Expectations:**Pupils should be taught to: * 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
* 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
* 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
* solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

**See NCETM “Teaching for Mastery” Year 6 book – calculation, measures, statistics, fractions) .**<https://www.ncetm.org.uk/public/files/23305653/Mastery_Assessment_Y6_Low_Res.pdf> | **Non-statutory guidance:**Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see Appendix 1). They undertake mental calculations with increasingly large numbers and more complex calculations. Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency. Pupils round answers to a specified degree of accuracy, e.g. to the nearest 10, 20, 50 etc, but not to a specified number of significant figures. Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9. Common factors can be related to finding equivalent fractions.   |
| **Autumn** | **Spring** | **Summer** |
| **In a range of contexts, including all measures (including time and money)*** Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
* 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 method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
* 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
* **Use rounding and mental calculation skills to make approximations for written calculations)**
* **Perform mental calculations, including with mixed operations and large numbers**
* Identify common factors, common multiples and prime numbers and use these when solving problems
* Solve problems involving more than one operation, developing an understanding of the order of operations to carry out calculations involving the four operations
* Solve problems involving addition, subtraction, multiplication and division (including calculating the “mean” – link to statistics)

**From fractions / decimals domain:** * multiply one-digit numbers with up to two decimal places by whole numbers
* use written division methods in cases where the answer has up to two decimal places
* solve problems which require answers to be rounded to specified degrees of accuracy

**AUTUMN TERM – second half:*** Solve problems involving using, reading, writing and converting between standard units, converting measurements of length, mass, volume and **time** from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
* recognise that shapes with the same areas can have different perimeters and vice versa
* recognise when it is possible to use formulae for area and volume of shapes
* calculate the area of parallelograms and triangles
* calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].
 | **In a range of contexts, including all measures (including time and money)*** Solve problems involving addition, subtraction, multiplication and division
* use their knowledge of the order of operations to carry out calculations involving the four operations
* **Use rounding and mental calculation skills to make approximations for written calculations**
* **Perform mental calculations, including with mixed operations and large numbers**
* Have confident formal written strategies for all four operations (in line with schools calculation guidance and appendix 1 of the National Curriculum mathematics document)
 | RevisionContinue to have rich opportunities to use and apply core calculation skills in transition units. |

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| Key questions:* Can I confidently solve multi-step problems involving addition and subtraction?
* Can I confidently use formal written methods for all four operations, in line with school calculation guidance and appendix 1 of national curriculum document?
* Can I use mental calculation skills, for example rounding to approximate and / or check?
* Can I solve some calculations involving large numbers and decimals mentally, explaining my solution?
* Can I multiply and divide accurately with decimal numbers to two decimal places, including using written methods?
* Can I use my knowledge of factors, multiples and prime numbers when solving problems?
* Can I solve problems involving more than one operation and show that I know the order in which order they should be done?
* Can I use my calculation skills to solve problems involving calculating with and converting measures?
* Can I use my calculation skills to work out area and perimeter (recognising that shapes with the same area can have different perimeters and visa versa).
* Can I calculate the area of triangles and parallelograms?
* Can I calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].
 | Key questions:* Can I use and apply a range of mental calculation skills to solving problems in all four operations?
* Can I confidently use a formal written method for all four operations?
* Can I solve a range of multi-step problems using all four operations?
 | Key questions: |