



# CASTLETOWN PRIMARY SCHOOL



## Numeracy - Year 5

Children will work towards achieving the following learning outcomes.

| NUMBER: NUMBER & PLACE VALUE   |  |   |  |   |
|--|--|---|--|---|
| Counting   | Comparing Numbers  | Reading   | Rounding   | Understanding Place Value   |
| 1. Interpret negative numbers in context (KPI)<br>2. Count forwards with positive and negative whole numbers, including through zero (KPI)<br>3. Count backwards with positive and negative whole numbers, including through zero (KPI)<br>4. Count forwards in steps of powers of 10 for any given number up to 1 000 000.<br>5. Count backwards in steps of powers of 10 for any given number up to 1 000 000. | 6. Compare and order numbers to at least 1 000 000 (KPI)<br>7. Compare and order numbers with up to three decimal places (KPI) | 9. Read numbers to at least 1 00 00 000 (KPI)<br>10. Read numbers with up to three decimal places (KPI)<br>11. Read Roman numerals to 1 000 (M)<br>12. Recognise years written in Roman numerals. | 15. Round any number up to 1 000 000 to the nearest 10.<br>16. Round any number up to 1 000 000 to the nearest 100.<br>17. Round any number up to 1 000 000 to the nearest 1 000.<br>18. Round any number up to 1 000 000 to the nearest 10 000.<br>19. Round any number up to 1 000 000 to the nearest 100 000<br>20. Round decimals with two places to the nearest whole number.<br>21. Round decimals with two decimal places to one decimal place. | 22. Identify the value of each digit in numbers given to two decimal place.<br>23. Determine the value of each digit in numbers to at least 1 000 000 (KPI) |
|  | <b>Identifying, representing &amp; estimating</b>  | <b>Writing</b>  |  | <b>Problem Solving</b>  |
|  |  | 8. Identify, represent and estimate numbers using different representations.  | 13. Write numbers to at least 1 000 000 (KPI)<br>14. Write numbers with up to three decimal places (KPI)   | 24. Solve number problems and practical problems involve all of the Y5 number criteria.   |

| Number Bonds & Rapid Recall Skills  | Mental calculation  | Written calculation  | Problem Solving   |
|---|---|--|---|
| 1. Derive and recall what must be added to any four-digit number to make the next multiple of 1000.<br>2. Derive and recall sums and differences of decimals to one decimal place.<br>3. Derive and recall doubles and halves of decimals to one decimal place.<br>4. Derive and recall what must be added to a one decimal place number to make the next whole number. | 5. Add numbers mentally with increasingly large numbers (KPI)<br>6. Subtract numbers mentally with increasingly large numbers (KPI)<br>7. Add any pair of decimals up to one decimal place.<br>8. Subtract any pair of decimals up to one decimal place.<br>9. Double decimals up to one decimal place.<br>10. Add near doubles of decimals to one decimal place. | 12. Add whole numbers with more than four digits, including using formal written methods (columnar addition) KPI<br>13. Subtract whole numbers with more than four digits, including using formal written methods (columnar subtraction) KPI | 14. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. |
|   | <b>Inverse operations, estimating and checking answers</b>  |  |   |
|   | 11. Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.   |  |   |

| <b>NUMBER: MULTIPLICATION &amp; DIVISION</b>  |   |   |  |
|---|---|---|--|
| <b>Rapid recall and mental calculation</b>  | <b>Written Calculation</b>  | <b>Properties of numbers, multiples, factors etc.</b>   | <b>Problem Solving</b>   |
| 1. Double three-digit multiples of 10 to 500 and find corresponding halves.<br>2. Multiply and divide two-digit numbers by 4 and 6.<br>3. Multiply two-digit numbers by 5 and 20.<br>4. Multiply by 25 and 50.<br>5. Double three-digit multiples of 10 to 500 and find the corresponding halves.<br>6. Multiply pairs of multiples of 10.<br>7. Multiply whole numbers by 1000.<br>8. Divide whole numbers by 1000.<br>9. Multiply numbers involving decimals by 10, 100 and 1000.<br>10. Divide numbers involving decimals by 10, 100 and 1000. | 12. Multiply numbers up to 4 digits by a one-digit number using a formal written method.<br>13. Multiply numbers up to 4 digits by a two-digit number using a formal written method of long multiplication.<br>14. Divide numbers 3 digits by a one-digit numbers using the formal written method short division and interpret remainders appropriately for the context.<br>15. 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. | 16. Identify multiples and factors (KPI)<br>17. Find all factor pairs of a number (KPI)<br>18. Find common factors of two numbers (KPI)<br>19. Know the vocabulary of prime numbers, prime factors and composite (non-prime) numbers using the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.<br>20. Establish whether a number up to 100 is a prime.<br>21. Recall prime numbers to 19.<br>22. Recognise square numbers.<br>23. Use square numbers and the notation for squared.<br>24. Recognise cube numbers.<br>25. Use cube numbers & the notation for cubed. | 26. Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes (KPI)<br>27. Solve problems involving addition, subtraction, multiplication and division and combination of these, including understanding the meaning of the equals sign.<br>28. Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates (KPI) |
| <b>Inverse operations, estimating &amp; checking</b>  |   |   |  |
| 11. Estimate and use inverse operations to check answers to multiplication and division calculations with Y5 criteria.  |   |   |  |

| <b>NUMBER: FRACTIONS</b>  |  |  |  |
|---|--|--|--|
| <b>Recognising Fractions</b>  | <b>Equivalence</b>   | <b>Addition and subtraction of decimals</b>  | <b>Problem Solving</b>   |
| 1. Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalence. | 3. Identify, name and write equivalent fractions of a given fraction.<br>4. Read decimal numbers as fractions (KPI)<br>5. Write decimal numbers as fractions (KPI)<br>6. Recognise and use thousands and relate them to tenths, hundredths and decimal equivalents.<br>7. Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'. | 10. Add fractions with the same denominator and multiples of the same number.<br>11. Subtract fractions with the same denominator and multiples of the same number.<br>12. Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements $>1$ as a mixed number. | 14. Solve problems involving numbers up to three decimal places.<br><br>15. Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{2}{5}$ , $\frac{4}{5}$ , and those with denominator of a multiple of 10 or 25. |
| <b>Comparing Fractions</b>  |  | <b>Multiplication and division of fractions</b>  |  |
| 2. Compare and order fractions whose denominations are all multiples of the same number (KPI)   | 8. Write percentages as a fraction with denominator 100 as a decimal fraction.<br>9. Write percentages as a decimal fraction.  | 13. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.   |  |

| MEASUREMENT  |   |                  |  |
|--|---|------------------|--|
| Comparing & Estimating   | Measuring & Calculating   | Telling the Time | Converting   |
| <ol style="list-style-type: none"> <li>1. Compare the area of squares and rectangles.</li> <li>2. Estimate the area of irregular shapes.</li> <li>3. Estimate volume</li> <li>4. Estimate capacity.</li> </ol> | <ol style="list-style-type: none"> <li>5. Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation.</li> <li>6. Measure and calculate the perimeter of composite rectilinear shapes in cm and m.</li> <li>7. Calculate the area of squares and rectangles including using standard units, square centimetres and square metres and estimate the area of irregular shapes.</li> </ol> |                  | <ol style="list-style-type: none"> <li>8. Convert between different units of metric measure for length km and m; cm and m; cm and mm.</li> <li>9. Convert between different units of metric measure for mass g and kg</li> <li>10. Convert between different units of metric measure for capacity l and ml</li> <li>11. Solve problems involving converting between units of time.</li> <li>12. Understand and use equivalences between metric units and common imperial units; inches, pounds and pints.</li> </ol> |

| GEOMETRY: PROPERTIES OF SHAPE   | GEOMETRY: POSITION & DIRECTION  | STATISTICS  |  |
|---|---|---|--|
| <p><b>Identifying their shapes and properties.</b></p> <ol style="list-style-type: none"> <li>1. Identify 3D shapes.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</li> </ol> | <p><b>Interpreting, constructing &amp; representing data.</b></p> <ol style="list-style-type: none"> <li>1. Read and complete information in tables, including timetables.</li> <li>2. Read and interpret information in tables, including timetables.</li> </ol> |  |
| <p><b>Comparing and Classifying</b></p> <ol style="list-style-type: none"> <li>2. Use the properties of rectangles to deduce related facts and find missing lengths and angles.</li> <li>3. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> </ol>  |   | <p><b>Problem Solving</b></p> <ol style="list-style-type: none"> <li>3. Solve comparison, sum and difference problems using information presented in line graph.</li> </ol>   |  |
| <p><b>Drawing and constructing</b></p> <ol style="list-style-type: none"> <li>4. Draw given angles.</li> <li>5. Measure angles in degrees.</li> </ol>   |   |   |  |
| <p><b>Angles</b></p> <ol style="list-style-type: none"> <li>6. Know angles are measured in degrees.</li> <li>7. Estimate and compare acute, obtuse and reflex angles.</li> <li>8. Identify: angles at a point and one whole turn (360); angles at a point on a straight line and <math>\frac{1}{2}</math> turn (180); other multiples of 90 degrees.</li> </ol> |   |   |  |
|   |   |   |  |
|   |   |   |  |

| trial and improvement |            | working systematically  | pattern spotting | visualising | working backwards   | conjecturing | generalising and proving   | reasoning: step 1: describing, step 2: explaining, step 3: convincing, step 4: justifying step 5: proving |
|-----------------------|------------|---|------------------|-------------|---|--------------|--|---|
| Stage                 | Year Group | Problem Solving   |                  |             | Communicating   |              | Reasoning  |   |
| Stage 3               | Y4 into Y5 | <ul style="list-style-type: none"> <li>• use classroom discussion as support to break into a problem and make connections to previous work <ul style="list-style-type: none"> <li>- put the problem into their own words</li> <li>- use mathematical content from previous year groups and their own year group to solve problems and investigate</li> </ul> </li> <li>• work systematically from the beginning</li> <li>• choose concrete and visual equipment appropriate to the task</li> <li>• pattern spot in results and use patterns to then find other possibilities</li> </ul> |                  |             | <ul style="list-style-type: none"> <li>• organise and represent work using pictorial and abstract representations <ul style="list-style-type: none"> <li>- working systematically</li> </ul> </li> <li>• independently check results <ul style="list-style-type: none"> <li>- look for repeats, errors and ways to improve</li> <li>- make reference to recording system used</li> </ul> </li> <li>• use and interpret diagrams (pictorial representations) and mathematical symbols (abstract)</li> <li>• discuss mathematical work and begin to explain thinking<br/><i>(REASONING STEP 1 &amp; STEP 2)</i> <ul style="list-style-type: none"> <li>- use appropriate mathematical vocabulary</li> <li>- talk about their findings by referring to their work</li> </ul> </li> <li>• reflect on others' explanations/methods/strategies and use this to improve their own</li> </ul> |              | <ul style="list-style-type: none"> <li>• provide a convinced argument for methods/solutions<br/><i>(REASONING STEP 3)</i> <ul style="list-style-type: none"> <li>- confident that their chain of reasoning is right and may use words such as: 'I reckon' or 'without doubt'</li> <li>- the underlying mathematical argument may or may not be accurate</li> <li>- the argument is likely to have more coherence and completeness than the explaining stage</li> </ul> </li> <li>• respond to 'What if?' questions</li> <li>• when they have solved a problem, pose a similar problem for a partner</li> <li>• with support understand a general statement by finding particular examples that match it <ul style="list-style-type: none"> <li>- with assistance of probing questions and prompts</li> </ul> </li> </ul> |   |