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| **H Unit 1: Number** | **Road Map** |
| In this unit you will learn about number. The aims are as follows:**LG1**: Knowledge**LG2**: Application**LG3**: Skills | Assessment Grades |  |  |
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| **Themes** | **Learning Goals/Outcomes/Content** |  |  |  |
| 1a Calculations, checking and rounding. | Add, subtract, multiply and divide decimals and whole numbers; |  |  |  |
| Multiply or divide by any number between 0 and 1; |  |  |  |
| Put digits in the correct place in a decimal calculation and use one calculation to find the answer to another; |  |  |  |
| Use the product rule for counting (i.e. if there are *m* ways of doing one task and for each of these, there are *n* ways of doing another task, then the total number of ways the two tasks can be done is *m* × *n* ways); |  |  |  |
| Round numbers to the nearest 10, 100, 1000; |  |  |  |
| Round to the nearest integer, to a given number of decimal places and to a given number of significant figures; |  |  |  |
| Estimate answers to one- or two-step calculations, including use of rounding numbers and formal estimation to 1 significant figure: mainly whole numbers and then decimals.  |  |  |  |
| 1b Indices, roots, reciprocals and hierarchy of operations.  | Use index notation for integer powers of 10, including negative powers; |  |  |  |
| Recognise powers of 2, 3, 4, 5; |  |  |  |
| Use the square, cube and power keys on a calculator and estimate powers and roots of any given positive number, by considering the values it must lie between, e.g. the square root of 42 must be between 6 and 7; |  |  |  |
| Find the value of calculations using indices including positive, fractional and negative indices; |  |  |  |
| Recall that *n*0 = 1 and *n*–1 =  for positive integers n as well as,  = √*n* and  = 3√*n* for any positive number *n*; |  |  |  |
| Understand that the inverse operation of raising a positive number to a power *n* is raising the result of this operation to the power ; |  |  |  |
| Use index laws to simplify and calculate the value of numerical expressions involving multiplication and division of integer powers, fractional and negative powers, and powers of a power; |  |  |  |
| Solve problems using index laws; |  |  |  |
| Use brackets and the hierarchy of operations up to and including with powers and roots inside the brackets, or raising brackets to powers or taking roots of brackets; |  |  |  |
| Use an extended range of calculator functions, including +, –, ×, ÷, *x*², √*x*, memory, *x y*, , brackets; |  |  |  |
| Use calculators for all calculations: positive and negative numbers, brackets, powers and roots, four operations. |  |  |  |
| 1c Factors, multiples and primes | Identify factors, multiples and prime numbers; |  |  |  |
| Find the prime factor decomposition of positive integers – write as a product using index notation; |  |  |  |
| Find common factors and common multiples of two numbers; |  |  |  |
| Find the LCM and HCF of two numbers, by listing, Venn diagrams and using prime factors – include finding LCM and HCF given the prime factorisation of two numbers; |  |  |  |
| Solve problems using HCF and LCM, and prime numbers; |  |  |  |
| Understand that the prime factor decomposition of a positive integer is unique, whichever factor pair you start with, and that every number can be written as a product of prime factors. |  |  |  |
| 1d Standard form and surds | Convert large and small numbers into standard form and vice versa; |  |  |  |
| Add and subtract numbers in standard form; |  |  |  |
| Multiply and divide numbers in standard form; |  |  |  |
| Interpret a calculator display using standard form and know how to enter numbers in standard form; |  |  |  |
| Understand surd notation, e.g. calculator gives answer to sq rt 8 as 4 rt 2; |  |  |  |
| Simplify surd expressions involving squares (e.g. √12 = √(4 × 3) = √4 × √3 = 2√3). |  |  |  |

**Links:**

LG1: You will need to carry out processes involving numbers presented in a variety of forms, with confidence and fluency in almost all future GCSE topics.

LG2: You will apply the number processes from this topic to lots of other areas of Maths.

LG3: You will use your problem solving skills and mastery of number to solve complex Mathematical problems such as problems linking Pythagoras with surds.