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| **Unit 1: Number** | **Year 9 Road Map** |
| In this unit you will learn about number. The aims are as follows: **LG1**: Knowledge **LG2**: Application **LG3**: Skills |
| **Level** | **Learning Goals/Outcomes/Content** | **Video Clips** | **R**  | **A**  | **G**  |
| **1a) Integers, decimals, place value, calculations, checking and rounding** |
| 1 | S | Use and order positive and negative numbers (integers) | N2a |  |  |  |
| 2 | S | Order integers, decimals, use the symbols <, > and understand the ≠ symbol |  |  |  |  |
| 3 | S | Add and subtract positive and negative numbers (integers) | N19 |  |  |  |
| 4 | S | Recall all multiplication facts to 10 × 10, and use them to derive quickly the corresponding division facts |  |  |  |  |
| 5 | S | Multiply or divide any number by powers of 10 | N17a |  |  |  |
| 6 | SC | Multiply and divide positive and negative numbers (integers) | N19b |  |  |  |
| 7 | SC | Use brackets and the hierarchy of operations (not including powers) | N20 |  |  |  |
| 8 | SCE | Round numbers to the nearest integer a given power of 10 | N27a |  |  |  |
| 9 | SCE | Check answers by rounding and using inverse operations | N26 |  |  |  |
| 10 | S | Use decimal notation and place value | N1a-b |  |  |  |
| 11 | S | Identify the value of digits in a decimal or whole number | N1a-b |  |  |  |
| 12 | S | Compare and order decimal numbers using the symbols <, > |  |  |  |  |
| 13 | S | Understand the ≠ symbol (not equal) |  |  |  |  |
| 14 | S | Write decimal numbers of millions, e.g. 2 300 000 = 2.3 million; |  |  |  |  |
| 15 | SCE | Add, subtract, multiply and divide decimals and whole numbers; | N13bN14b |  |  |  |
| 16 | SCE | Multiply or divide by any number between 0 and 1; | N40aN40b |  |  |  |
| 17 | SCE | Put digits in the correct place in a decimal calculation and use one calculation to find the answer to another; |  |  |  |  |
| 18 | CE | 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); | 59 |  |  |  |
| 19 | SCE | Round to the nearest integer, to a given number of decimal places and to a given number of significant figures; | 90 |  |  |  |
| 20 | CE | 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. | 91 |  |  |  |
| **1b) Indices and roots** |
| 21 | S | Find squares and cubes: | 81 |  |  |  |
| 22 | S | Recall integer squares up to 10 x 10 and the corresponding square roots; |  |  |  |  |
| 23 | S | Understand the difference between positive and negative square roots; |  |  |  |  |
| 24 | S | Recall the cubes of 1, 2, 3, 4, 5 and 10; |  |  |  |  |
| 25 | SC | Use index notation for squares and cubes; | 82 |  |  |  |
| 26 | SCE | Recognise powers of 2, 3, 4, 5; |  |  |  |  |
| 27 | SCE | Evaluate expressions involving squares, cubes and roots: |  |  |  |  |
| 28 | SCE | Add, subtract, multiply and divide numbers in index form; |  |  |  |  |
| 29 | SCE | Cancel to simplify a calculation; |  |  |  |  |
| 30 | S | Use index notation for powers of 10, including negative powers; | 29 |  |  |  |
| 31 | SC | Use the laws of indices to multiply and divide numbers written in index notation; | 131 |  |  |  |
| 32 | SC | Use the square, cube and power keys on a calculator; |  |  |  |  |
| 33 | SC | Use brackets and the hierarchy of operations with powers inside the brackets, or raising brackets to powers;  | 75 |  |  |  |
| 34 | SC | Use calculators for all calculations: positive and negative numbers, brackets, powers and roots, four operations. |  |  |  |  |
| 35 | SC | List all three-digit numbers that can be made from three given integers; |  |  |  |  |
| 36 | CE | 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; | 91 |  |  |  |
| 37 | CE | Find the value of calculations using indices including positive, fractional and negative indices; | 154, 188 |  |  |  |
| 38 | CE | Recall that n0 = 1 and n–1 =  for positive integers n as well as,  = √n and  = 3√n for any positive number n; | 82 |  |  |  |
| 39 | E | Understand that the inverse operation of raising a positive number to a power n is raising the result of this operation to the power ; |  |  |  |  |
| 40 | CE | 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; |  |  |  |  |
| 41 | E | Solve problems using index laws; |  |  |  |  |
| 42 | E | 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; |  |  |  |  |
| 43 | CE | Use an extended range of calculator functions, including +, –, ×, ÷, x², √x, memory, x y, , brackets; |  |  |  |  |
| 44 | CE | Use calculators for all calculations: positive and negative numbers, brackets, powers and roots, four operations. |  |  |  |  |
| **1c Factors, multiples and primes, standard form and Surds** |
| 45 |  S | Recognise odd and even numbers; |  |  |  |  |
| 46 | SC | Identify factors, multiples and prime numbers; | N10N11N30 |  |  |  |
| 47 | SC | Recognise two-digit prime numbers; |  |  |  |  |
| 48 | SC | List all factors of a number and list multiples systematically; |  |  |  |  |
| 49 | SCE | Identify factors, multiples and prime numbers; | 28 |  |  |  |
| 50 | SCE | Find the prime factor decomposition of positive integers – write as a product using index notation; | 78 |  |  |  |
| 51 | SCE | Find common factors and common multiples of two numbers; |  |  |  |  |
| 52 | SCE | 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; | 7980 |  |  |  |
| 53 | CE | Solve problems using HCF and LCM, and prime numbers; |  |  |  |  |
| 54 | CE | 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. |  |  |  |  |
| 55 | SCE | Convert large and small numbers into standard form and vice versa; | N45 |  |  |  |
| 56 | CE | Add and subtract numbers in standard form; | 83 |  |  |  |
| 57 | CE | Multiply and divide numbers in standard form; | 83 |  |  |  |
| 58 | CE | Interpret a calculator display using standard form and know how to enter numbers in standard form; |  |  |  |  |
| 59 | CE | Understand surd notation, e.g. calculator gives answer to sq rt 8 as 4 rt 2; | 207a |  |  |  |
| 60 | E | Simplify surd expressions involving squares (e.g. √12 = √(4 × 3) = √4 × √3 = 2√3). |  |  |  |  |
| Student’s comments and questions |