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| **Title of unit:** | Integers, Powers and Roots |
| **Overview of unit:** | Factors, multiples and primesSquares, cubes and rootsHCF and LCMIndicesStandard formSurdsAlgebraic proofs of number |
| **Cross-curricular/ extra-curricular links:** | Science – use of standard form |
| **Literacy/ numeracy links:** | Worded problems/exam questionsKeywords displayed on all PPts – integer, odd, even, factor, multiple, prime, HCF, LCM, square, cube, power, root, index (indices), standard form, place value, surd, rational, irrationalWritten plenaries |

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| **Grade:** | **Learning objective:** | **Resources:** |
| **1** | Calculate factors and multiples.Understand and identify prime numbers to 100.Express numbers as products of their prime factors.Recognise square and cube numbers and calculate their roots. | [Factors, multiples and primes](https://www.piximaths.co.uk/factors-multiples-and-primes)[HCF and LCM](https://www.piximaths.co.uk/products-of-prime-factors-hcf-and-l) [Squares, cubes and roots](https://www.piximaths.co.uk/squares-cubes-and-roots) |
| **2** | Calculate HCF and LCM of pairs of numbers. | [HCF and LCM](https://www.piximaths.co.uk/products-of-prime-factors-hcf-and-l) |
| **3** | Use index notation for positive integer indices.Know and use the index laws for multiplication and division of positive integer indices.Find the reciprocal of a number. | [Laws of indices](https://www.piximaths.co.uk/laws-of-indices) |
| **4** | Know that (ab)c = abcUse index notation for negative integer indices.Convert between ordinary and standard index form. | [Laws of indices](https://www.piximaths.co.uk/laws-of-indices)[Standard form](https://www.piximaths.co.uk/standard-index-form) |
| **5** | Know that n1/2 = √n and n1/3 = ³√n for any positive number n.Use index notation and index laws for simple fractional powers such as 163/4.Calculate with standard index form. | [Laws of indices](https://www.piximaths.co.uk/laws-of-indices)[Standard form](https://www.piximaths.co.uk/standard-index-form) |
| **6** | Simplify surds to the form a√b | [Simplifying surds](https://www.piximaths.co.uk/surds) |
| **7** | Simplify surds, such as 4(3 + √3) and (2 - √3)(4 + √3) in the form a + b√3Rationalise the denominator of a surd such as 2/√5. | [Simplifying surds](https://www.piximaths.co.uk/surds)[Rationalising the denominator](https://www.piximaths.co.uk/surds) |
| **8** | Rationalise a denominator in the form a√b, a + √b and a + b√c.Construct an algebraic proof of number properties. | [Rationalising the denominator](https://www.piximaths.co.uk/surds)[Algebraic proofs](https://www.piximaths.co.uk/algebraic-proofs) |
| **9** |  |  |