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| **Title of unit:** | Integers, Powers and Roots |
| **Overview of unit:** | Factors, multiples and primes  Squares, cubes and roots  HCF and LCM  Indices  Standard form  Surds  Algebraic proofs of number |
| **Cross-curricular/ extra-curricular links:** | Science – use of standard form |
| **Literacy/ numeracy links:** | Worded problems/exam questions  Keywords displayed on all PPts – integer, odd, even, factor, multiple, prime, HCF, LCM, square, cube, power, root, index (indices), standard form, place value, surd, rational, irrational  Written 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 = abc  Use 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√3  Rationalise 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** |  |  |