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| Subject: Mathematics Year 7 Curriculum Map 2024-2025 |
| Terms | **Topics covered** and **core knowledge and skills** | Links to careers | Links to the Knowledge organiser and other additional resources |
| Half term 1 |  **NP1 – Place Value and the Number Line**

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| writing integers and decimals in expanded form and in words |
| ordering positive integers and decimals, placing on a number line |
| ordering positive and negative numbers, placing on a number line, symmetry of the number line about 0 |
| multiplying/dividing by positive and negative powers of 10 |
| rounding 'to the nearest', d.p. and s.f. |
| common metric converions |
| finding the midpoint of two numbers |
| the median of discrete data |
| working in different bases (e.g. binary) |

**NP2: Addition and Subtraction**

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| strategies for addition and subtraction of positive integers and decimals, including counting up/down in different intervals (incl. decimals) |
| complement of a decimal (able to find 1-p, given p) |
| inverting addition and subtraction, additive inverse, additive identity; |
| using the commutative and associative laws to help calculation |
| extending additive number sense to unknowns, working with equality |
| zero pairs |
| finding the perimeter of a polygon |
| basic angle facts (straight line, round a point, vertically opposite, in a triangle) |
| mean & range of a dataset |
| applications & problems, including money problems and using different bases, continuing linear sequences |

 | Decimals:<https://www.youtube.com/watch?v=X0Gl72XKiyI>Place Value:<https://www.youtube.com/watch?v=q_3x2svPzkM>Positive and Negative Numbers:<https://www.youtube.com/watch?v=pbP2bdpT27w>Perimeter:<https://www.youtube.com/watch?v=YEw90aDVh-U>Angles:<https://www.youtube.com/watch?v=S-Xx22DaOvE>Averages:<https://www.youtube.com/watch?v=SALCargi1_0> | <https://classroom.thenational.academy/subjects-by-key-stage/key-stage-3/subjects/maths><https://www.bbc.co.uk/bitesize/subjects/zqhs34j><https://vle.mathswatch.co.uk/vle/><https://family.eedi.com/login> |
| Half term 2 | **Continue NP2: Addition and Subtraction****NP3: Multiplication and Division**

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| multiplication tables to 12x12 |
| mental and written strategies for multiplication of positive integers and decimals, formal and informal techniques, commutativity, associativity and distributivity |
| multiples and LCM (by systematic listing) |
| division of positive integers and decimals, writing division as a fraction, formal and informal techniques, incl. distributivity; divisibility rules |
| inverse operations, multiplicative inverse creating the multiplicative identity, non-commutativity and non-associativity of division |
| extending multiplicative and additive number sense to unknowns |
| factors and HCF (by systematic listing), coprime numbers |
| multiplicative reasoning: getting from one number to another by multiplying |
| rectilinear area |
| volume of cubes and cuboids |
| applications and problems, including money problems; simple proportion problems; different bases; method selection (which operation) for worded problems |

 | Multiples:<https://www.youtube.com/watch?v=xyOCgnixiaE>Fractions:<https://www.youtube.com/watch?v=3pccvFEWO0k>Operations:<https://www.youtube.com/watch?v=xm0ZgEImZZA>Area:<https://www.youtube.com/watch?v=D8RJUooe9CI> |  |
| Half term 3 | **NP4: Powers, Roots and Primes**

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| Squares to 15^2 and cubes to 10^3 by heart |
| Calculating powers, evaluating numerical expressions with powers, understanding index form |
| Roots as inverses of powers |
| addition and subtraction rules with positive indices |
| Prime numbers, product of primes, using the primes as building blocks (Fundamental Theorem of Arithmetic), applying the prime factorisation to find the factors of (large) numbers; intro to HCF with primes |

**NP5: Order of Operations**

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| Commutativity and fluency in calculation |
| Order of operations with the four operations |
| Order of operations including exponents |
| Breaking the order of operations with brackets |
| writing numerical expressions using the order of operations; practice with integers and decimals |

 | Powers & Roots:<https://www.youtube.com/watch?v=I95Nw1Pwl7c>Operations:<https://www.youtube.com/watch?v=xm0ZgEImZZA> |  |
| Half term 4 | **NP6: Directed Numbers**

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| negative numbers in context (temperature, finance) and on a number line (vertical and horizontal) |
| ordering positive and negative numbers, using symbols, placing on a number line |
| addition of directed numbers |
| subtraction of directed numbers (as addition of additive inverse); symmetry of subtraction (a-b=n, b-a=-n) |
| multiplication and division with negative numbers |
| powers of negative numbers |
| order of operations with negatives |
| applications (contextual) and problems |

**A1: Introduction to Algebraic Thinking**

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| Generalising number to algebra, concept of an 'unknown variable' |
| Simplifying simple additive linear expressions with no more than three variables |
| Solving simple 'unknown value' problems, using a range of symbols, including blank boxes and letters |
| Substituting numbers for variables presented as a range of symbols, including blank boxes and letters |

 | Positive and Negative Numbers:<https://www.youtube.com/watch?v=pbP2bdpT27w>Algebra:<https://www.youtube.com/watch?v=c4xwvFtsrMU> |  |
| Half term 5 | **NP7: Fractions**

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| concept of a fraction, multiple visual representations - shading shapes, bar models, placing on a number line |
| proper and improper fractions, |
| equivalent fractions, simplifying fractions, comparing the size of fractions through common denominator or common numerator |
| complement of a fraction (able to find 1-p, given p) |
| adding and subtracting fractions, including proper, improper and mixed |
| fraction of an amount by a bar model, expressing one number as a fraction of another, find original amount if you know a fraction of it |
| multiplying and dividing fractions, fraction of an amount (incl. fractions of fractions) with link to multiplying; increasing and decreasing by a fraction by multiplying |
| multiplication of a number by its reciprocal gives 1 (revisit of NP3.5 more formally) |
| order of operations with fractions |
| problems: worded fraction problems; |
| Binary fractions |

**NP8: Percentages, Fractions and Decimals**

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| equivalence of FDP, techniques to convert, ordering FDP |
| recurring and terminating decimals |
| multiple representations of % - shading shapes, bars |
| % of an amount; percentages greater than 100% |
| percentage of an amount with decimal multipliers |
| expressing one number as a % of another |
| percentage increase and decrease (finding the % and adding/subtracting), fraction increase and decrease |
| the effect of multiplying by numbers between 0 and 1 compared with numbers greater than 1 |
| applications and problems, including interpreting pie charts and simple interest |

 | Fractions:<https://www.youtube.com/watch?v=3pccvFEWO0k>Percentages:<https://www.youtube.com/watch?v=7EB0H1bhGTo>Decimals:<https://www.youtube.com/watch?v=X0Gl72XKiyI> |  |
| Half term 6 | **NP9: Estimation & Use of the Calculator**

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| Using the calculator effectively |
| timetables - with and without the time button on the calculator. Solving problems with time accurately and by estimating. Converting units of time with/without calculator |
| approximating the position of numbers on a number line, approximate metric/imperial conversions (with a calculator) |
| approximating powers and roots |
| error intervals for rounded numbers, including representing on a number line |
| estimating the answer to calculations |
| related calculations |
| truncation and error intervals |

**A2: Manipulating and Simplifying Expressions 1**

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| Algebraic notation - ab for a\*b, 3y for y+y+y and 3\*y, a^4 for a\*a\*a\*a, a^2b for a\*a\*b, a/b for division, coefficients as fractions not decimals, where brackets can be implied |
| collecting like terms |
| simplifying indices and coefficients when multiplying and dividing, multiplication rule for indices (power of a power) |
| writing algebraic expressions |

 | Estimation:<https://www.youtube.com/watch?v=meOjLJF9F7U>Time:<https://www.youtube.com/watch?v=54YzxploVy4>Algebra:<https://www.youtube.com/watch?v=c4xwvFtsrMU> |  |