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| Subject: Mathematics Year 10H 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 | **Unit 1: A10 Advanced Linear Graphs and Equations**   |  | | --- | | Find the gradient of a line using change in y/change in x | | Use the form y=mx+c to draw lines (without plotting points) and factorising to find the root. Sketching linear graphs. | | Identify equations of parallel and perpendicular lines. | | Advanced y=mx+c questions - is (x,y) on the given line?, finding equations given two points or a point and gradient. Solve problems related to this. | | Solve equations in two variables graphically: know that the points on a line represent the solution set to an equation in two variables, and that the intersection of two lines represents the solution to a pair of simultaneous equations in two variables | | Find the solution to a pair of simultaneous equations by elimination and by substitution, and check the solution | | Write and solve simultaneous equations from contexts | | Find regional solutions to linear inequalities in two variables on a Cartesian grid, including regions formed from multiple inequalities and identifying integer solutions in a region. |   **Unit 2: GM4 Congruence and Similarity**   |  | | --- | | Congruence - introduction | | Tessellating congruent shapes to fill the plane | | Isometries: translation (as a vector), reflection and rotation, including rotational and reflective symmetry, combinations of transformations, including successive translations. Knowing that reflection, rotation and translation produce congruent shapes | | Similarity of length, proving shapes are similar, finding scale factors and writing equivalent sides as equivalent ratios | | Enlargement (including negative and fractional enlargements). Knowing that enlargements produce similar shapes | | Conditions for congruent triangles - simple examples, getting familiar with terms | | Algebra:  <https://www.youtube.com/watch?v=c4xwvFtsrMU>  Graphs  <https://www.youtube.com/watch?v=JcEHR6O5E6Q>  Inequalities:  <https://www.youtube.com/watch?v=5sOw5og5sgc>  Simultaneous Equations:  <https://www.youtube.com/watch?v=z5p8MQSGh0w>  2D Shapes:  <https://www.youtube.com/watch?v=Ybe3gKeT7Jo>  Geometry:  <https://www.youtube.com/watch?v=b4Shg4r8gng>  Ratio:  <https://www.youtube.com/watch?v=BU9mKIvfxYU>  Transformations:  <https://www.youtube.com/watch?v=ejuJ20JroTo> | This link would take you to the KO on our website  <https://teachers.thenational.academy/subjects/maths/key-stages/key-stage-4>  <https://www.bbc.co.uk/bitesize/subjects/z38pycw>  <https://vle.mathswatch.co.uk/vle/>  <https://corbettmaths.com/contents/> |
| Half term 2 | **Unit 3: GM5 Right-Angled Triangles**   |  | | --- | | Pythagoras' Theorem in 2D to find missing sides | | Proving a triangle is right-angled with Pythagoras | | Identifying Pythagorean triples | | Pythagoras to find the distance between two points | | Trigonometric ratios for finding missing sides in right-angled triangles | | Trigonometric ratios for finding missing angles in right-angled triangles | | Exact values of sinq, cosq and tanq for q = 0, 30, 45, 60, 90 by heart | | Problems involving Pythagoras and trigonometry (including bearings), method selection practice |   **Unit 4: NP13 Advanced Proportion and Rates of Change**   |  | | --- | | Reverse percentages (original value problems) and finding the original value given a percentage of it | | Simple interest | | Direct (linear) proportion - first numerically, then graphically, then algebraically | | Inverse proportion (excluding squares, cubes, roots) - first numerically, then graphically, then algebraically | | Compound units - density, pressure, speed, value for money (what unit have I found?), including conversions between compound units | | Ratio problems - combining ratios, finding parts, differences and wholes; mixing ratios with fractions (part/part and part/whole) | | Angles:  <https://www.youtube.com/watch?v=S-Xx22DaOvE>  Problem Solving:  <https://www.youtube.com/watch?v=430Cs09V2n4>  Pythagoras:  <https://www.youtube.com/watch?v=KY8rRWvmt5c>  Trigonometry:  <https://www.youtube.com/watch?v=v62GGaDpk9Q>  Finance  <https://www.youtube.com/watch?v=Yjc_VxMMCy8>  Measurement  <https://www.youtube.com/watch?v=8uSmX2zNul0>  Percentages  <https://www.youtube.com/watch?v=7EB0H1bhGTo>  Proportion  <https://www.youtube.com/watch?v=Mz4nMRtTDCw>  Ratio  <https://www.youtube.com/watch?v=BU9mKIvfxYU> |  |
| Half term 3 | **Unit 5: GM6 Circles**   |  | | --- | | Circle parts and properties | | Circumference of a circle (and semi/quarter circles), in terms of pi and rounded | | Area of a circle (recap) and semi/quarter circles, in terms of pi and rounded | | Problems with circumference and area of a circle | | Length of an arc and area of a sector | | Identifying and using the circle theorems |   **Unit 6: GM7 Advanced Drawing, Measuring and Constructing**   |  | | --- | | Interior and exterior angles in polygons | | Problems with angles, including in parallel lines, bearings and polygons, and explaining reasoning | | Converting between 2D and 3D units of measurement | | Naming and recognising polyhedra. Labelling conventions (for faces esp). Euler's Formula (F + V - 2 = E) | | Drawing 3D shapes: normal and isometric. | | 2D representations of 3D shapes: constructing and interpreting nets, plans and elevations | | Planes of symmetry | | Loci - fixed distance from a point, fixed distance from a line, equidistant from a two points, equidistant from two lines |   **Unit 7: SP4 Continuous Data**   |  | | --- | | Measures of central tendency of grouped data - mean, mode and median | | Graphical representations of continuous and grouped data - cumulative frequency and boxplots (unequal and equal class widths) | | Measures of spread - interquartile range, including why it is better than the range | | Compare data sets through graphs, central tendency and spread | | Circles:  <https://www.youtube.com/watch?v=-PGrkZkYSF0>  Area:  <https://www.youtube.com/watch?v=D8RJUooe9CI>  Angles:  <https://www.youtube.com/watch?v=S-Xx22DaOvE>  Measurement:  <https://www.youtube.com/watch?v=8uSmX2zNul0>  2D Shapes:  <https://www.youtube.com/watch?v=Ybe3gKeT7Jo>  3D Shapes:  <https://www.youtube.com/watch?v=0sOpcrywXz0>  Symmetry:  <https://www.youtube.com/watch?v=WMV_bw17JzI>  Averages:  <https://www.youtube.com/watch?v=SALCargi1_0>  Data:  <https://www.youtube.com/watch?v=SBPtIAv5CRM>  Graphs:  <https://www.youtube.com/watch?v=JcEHR6O5E6Q> |  |
| Half term 4 | **Unit 8: SP5 Set Theory and Logic**   |  | | --- | | Thinking logically | | Representing sets with set notation | | Representing sets with Venn diagrams | | Intersections and unions of sets (in notation and on Venns), subsets | | Solving probability problems using sets | | Applying the 'AND' and 'OR' rules for independent and mutually exclusive events. Linking to intersections and unions | | Represent the solutions to linear inequalities using set notation |   **Unit 9: NP14 Number Theory**   |  | | --- | | the Fundamental Theorem of Arithmetic | | finding HCF/LCM using prime factors | | HCF/LCM problems | | advanced prime factors - square/cube numbers, using numbers given in factorised form | | recurring and terminating decimals - prime factor rule for identifying terminating decimals, converting a recurring decimal to a fraction | | writing error intervals (recap rounding and truncation); calculations with upper and lower bounds, combining upper and lower bounds, percentage error of these calculations | | Probability:  <https://www.youtube.com/watch?v=cJ1QPiGnGEM>  Inequalities:  <https://www.youtube.com/watch?v=5sOw5og5sgc>  Multiples:  <https://www.youtube.com/watch?v=xyOCgnixiaE>  Decimals:  <https://www.youtube.com/watch?v=X0Gl72XKiyI>  Estimation:  <https://www.youtube.com/watch?v=meOjLJF9F7U> |  |
| Half term 5 | **Unit 10: A11 – Advanced Manipulating and Simplifying Expressions**   |  | | --- | | Addition and subtraction of indices, power of a power, power of 0 | | expand two and three binomials, including adding expressions which need first expanding | | factorising a quadratic where a = 1 | | factorising the difference of two squares | | **factorising a quadratic where a > 1** | | **simplifying algebraic fractions, including numerical factors, single letter factors and bracket factors** | | rearranging more complex formulae (including non-linear, subject in denominator, **and subject appearing twice**) | | **simplifying an expression by factorising out a bracket** |   **Unit 11: A12 – Quadratic Graphs and Equations**   |  | | --- | | Plotting a quadratic and reading values from a graph; solving quadratics graphically and simple ax^2=b by rearrangement | | Solving quadratic equations = 0 by factorising, identifying the solutions on a graph | | **Solving quadratic equations = 0 using the quadratic formula, identifying the solutions on a graph** | | **Completing the square to find roots. Simple examples where b is even and a = 1.** | | Producing a sketch graph of a quadratic by finding roots, y-intercept and turning points (by symmetry only) | | **Solving quadratics presented not equal to 0, selecting the best method for solving** | | Algebra:  <https://www.youtube.com/watch?v=c4xwvFtsrMU>  Powers and Roots:  <https://www.youtube.com/watch?v=I95Nw1Pwl7c>  Quadratic Equations:  <https://www.youtube.com/watch?v=QAmbU12zs8c>  Quadratic Equations:  <https://www.youtube.com/watch?v=QAmbU12zs8c>  Graphs:  <https://www.youtube.com/watch?v=JcEHR6O5E6Q> |  |
| Half term 6 | **Unit 12: GM8 – Surface Area and Volume**   |  | | --- | | Surface area of prisms and cylinders | | Surface area of spheres, pyramids, cones, composite solids, frustums and other polyhedra | | Volume of prisms and cylinders | | Volume of spheres, pyramids, cones, composite solids, frustums and other polyhedra | | **Similarity of volume and area - generalising LAV similarity with scale factors and ratios** |   **Unit 13: A13 – Advanced Sequences**   |  | | --- | | working with visual representations of arithmetic, **quadratic and geometric** sequences | | Fibonacci sequences - numerical and algebraic | | **Quadratic sequences, including finding the nth term** | | **Recurrence relations** | | 2D Shapes:  <https://www.youtube.com/watch?v=Ybe3gKeT7Jo>  3D Shapes:  <https://www.youtube.com/watch?v=0sOpcrywXz0>  Area:  <https://www.youtube.com/watch?v=D8RJUooe9CI>  Patterns:  <https://www.youtube.com/watch?v=GIspObxnA7w>  Sequences:  <https://www.youtube.com/watch?v=7Vf6BJwdy_0> |  |