Okehampton College Curriculum Overview:
Mathematics Higher and Foundation Tier

Edexcel GCSE – New SOL from Sept 2019 (Adapted for COVID, post remote learning)

Reviewed/Updated Oct 2020 by T Nethercott
Under review 2020-2021

Term	Year 10 Foundation	Year 10 Higher
1	**1. Ratio** • Understand and use ratios to describe situations • Write in simplest form • Divide in a given ratio, including 3 parts • Simplify or write in a given form (eg 1 : m or m : 1) • Write as a fraction • Solve ratio problems in context **2. Algebra: Equations and formulae** • Write expressions and set up simple equations • Solve linear equations with the unknown appearing on one or both sides • Solve linear equations with brackets, negative signs, fractions • Rearrange simple equations • Substitute into formulae **3. Number: Indices, Prime factors and Standard Form** • Know and find squares, cubes and roots • Understand index notation and use index laws to evaluate and simplify numerical expressions • Identify factors, multiples and primes • Find prime factor decomposition, LCM and HCF of two numbers • Understand and use standard form, including using a calculator	**1. Ratio** • Understand and use ratios to describe situations • Divide in a given ratio, including 3 parts • Simplify or write in a given form (eg 1 : m or m : 1) • Write as a fraction • Use in problem solving, including algebraic **2. Algebra: Equations and formulae** • Setting up and solving linear equations, integer, fraction, negative coefficients and solutions, brackets • Rearranging/changing the subject of simple and more complex equations • Substitution into formulae and solving resulting equations **3. Number: Indices, Prime factors and Surds** • use index laws to simplify and calculate the value of numerical expressions • evaluate calculations using indices including positive, fractional and negative indices • Identify factors, multiples and prime numbers; • Find the prime factor decomposition of positive integers, find the LCM and HCF of two numbers and solve problems using HCF and LCM, and prime numbers • Understand surd notation and simplify expressions involving surds
2	**4. Right angled triangles** • Understand, recall and use Pythagoras' Theorem in 2D • Justify whether a triangle is right angled or not • Leave answers in surd form • Use Pythagoras' Theorem in problem solving **5. Perimeter and area (moved from unit 3)** • Use and convert units of measure, including time • Find perimeter of rectangles, triangles, parallelograms and trapezia, and compound shapes • Use formulae for areas of rectangle, triangle, trapezium and parallelogram. • Calculate areas of compound shapes • Find surface area of prisms • Convert between metric area measures	**4. Right angled triangles** • Pythagoras' Theorem – recall (from Y9) and use to find missing sides of a right-angled triangle, justify whether a triangle is right-angled • Calculate length of a line segment, given a pair of points; find lengths in 3D shapes including the diagonal of a cuboid; give answers in surd form • Trigonometry – revisit (Year 9 Unit 13: NOT covered in 2020) the trigonometric ratios sine, cosine and tangent and apply them to find angles and lengths in right-angled triangles • Angles of elevation and depression • Exact values of sinθ, cosθ and tanθ **5. Perimeter, area and volume (moved from unit 3)** • Recall and use formulae for a variety of plane shapes including trapezium and parallelogram • Area and circumference of circles and composite shapes • Arc lengths and areas of sectors of circles

		• Volumes and surface areas of prisms, pyramids, cylinders, cones and composite shapes • Degrees of accuracy, upper and lower bounds of measurements and calculations • Error intervals
3	6. Inequalities and simultaneous equations • Represent inequalities on a number line • Solve linear inequalities • Solve linear simultaneous equations 7. Transformations and vectors • Rotation • Translation • Reflection • Enlargement • Combined transformations • Vectors	6. Inequalities and simultaneous equations • Represent inequalities on a number line • Solve linear inequalities • Solve linear simultaneous equations o By elimination o By substitution 7. Transformations and vectors • Rotation • Reflection • Translation • Enlargement • Combined transformations • Vectors and geometric proof
4	8. Algebra: Quadratic equations • Expand and factorise single brackets • Expand two brackets • Form quadratic expressions • Solving quadratic equations by factorising 9. Fractions and percentages (Covered during remote learning) • Fractions – Equivalence and four operations • Fractions, decimals and percentages - equivalence • Percentages o Numbers as percentages o Finding percentages of quantities o Increase/decrease	8. Algebra: Quadratic equations • Review expanding one or more brackets • Factorising into one or two brackets • Solve quadratic equations o By factorising o By completing the square o By using the quadratic formula 9. Fractions and percentages (Covered during remote learning) • Fractions (recap from Y9) • Percentages (recap from Y9) • Repeated percentage change (compound interest)
5	10. Collecting, representing and analysing data (Covered during remote learning) • Produce and interpret charts and graphs • Construct and interpret Pie charts • Statistics and sampling • The averages 11. Straight line graphs (Covered during remote learning) • Recap use of coordinates and y=mx+c • Further work with linear graphs including applications and coordinate geometry • Solve simultaneous equations using graphs 12. Quadratic graphs (Not covered during remote learning)	10. Collecting, representing and analysing data • Averages and range (review) • Representing and interpreting data • Collecting data • Cumulative frequency, box plots and histograms 11. Linear graphs and coordinate geometry (Covered during remote learning) • Recap basics of linear graphs • Applications of linear graphs including simultaneous equations • Further work with linear graphs including coordinate geometry 12. Non-linear graphs (Not covered during remote learning)

	• Generate points and plot graphs of simple quadratic functions, then more general quadratic functions; • Find and recognise the key features of quadratic graphs • Use quadratic graphs to find approximate solutions and interpret graphs from real-life problems 13. <u>Using and rearranging formulae (Covered during remote learning)</u> • Substitution • Change the subject of a formula (to include squares and roots)	• Quadratic • Cubic • Reciprocal 13. <u>Functions</u> • where appropriate, interpret simple expressions as functions with inputs and outputs; • interpret the reverse process as the 'inverse function'; • interpret the succession of two functions as a 'composite function' (the use of formal function notation is expected)
6	14. <u>Constructions, Loci and Bearings (Not covered during remote learning)</u> • Geometric drawing, plans and elevations • Constructions and congruence • Loci • Maps, scale drawings and bearings 15. <u>Trigonometry with right angled triangles (Part covered during remote learning)</u> • Use Sine, Cosine and Tangent ratios to find missing sides and angles in 2D figures • Angles of elevation and depression • Exact values for trigonometric ratios 16. <u>Circles, cylinders, cones and spheres (Covered during remote learning)</u> • Circumference/perimeter and area o Circles and composite shapes o Sectors of circles • Surface area and volume o Cylinders o Cones o Spheres	14. <u>Constructions, loci and bearings (Not covered during remote learning)</u> • Elevations of solid shapes • Maps and scale drawings • Standard compass constructions • Loci • Bearings 15. <u>Advanced Trigonometry (Covered during remote learning)</u> • Sine rule • Cosine rule • Area of a triangle • Graphs of trigonometric functions 16. <u>Circle Geometry (Part covered during remote learning)</u> • Circle theorems • The equation of a circle (x) • Circle graphs (x) • Circle geometry (x)
Term	Year 11 Foundation	Year 11 Higher
1	17. <u>Algebra review</u> • Review algebraic techniques from Y10: • Solve linear equations with the unknown appearing on one or both sides, brackets, negative signs, fractions • Inequalities • Simultaneous equations • *Quadratic equations (possibly covered during remote learning)* 18. <u>Construction, loci and bearings (Not covered remotely: Y10 Unit 14)</u> • Geometric drawing, plans and elevations • Constructions and congruence • Loci • Maps, scale drawings and bearings 19. <u>Ratio (review) and proportion</u> • Understand and use ratios, share in a ratio, solve ratio problems	17. <u>Algebra review</u> • Review algebraic techniques from Y10 (it may also be appropriate to present more challenging questions than students may have been exposed to when these topics were initially covered, eg 'show that …', 'prove …') • Algebraic fractions • Quadratic graphs (from Y10 Unit 12) • Quadratic graphs • Further simultaneous equations – one linear and one quadratic 18. <u>Construction, loci and bearings (Not covered remotely: Y10 Unit 14)</u> • Elevations of solid shapes • Maps and scale drawings • Standard compass constructions • Loci • Bearings

	• Simplify, write in form 1:m or m:1 • Express relationship as ratio or a fraction • Solve problems using direct and inverse proportion • Best buys, scaling recipes, currency conversions • Interpret the graph form of direct proportion	19. Circle Geometry (Not fully covered remotely: Y10 Unit 16) • The equation of a circle • Circle graphs • Circle geometry
2	20. Probability • Theoretical • Experimental • Venn diagrams and set notation • Tree diagrams 21. Similarity and congruence • Congruent triangles • Similar shapes and triangles • Effect of enlargement on perimeter • Problem solving with similar shapes 22. Trigonometry with right angled triangles (Not fully covered remotely: Y10 Unit 15) • Use Sine, Cosine and Tangent ratios to find missing sides and angles in 2D figures • Angles of elevation and depression • Exact values for trigonometric ratios 23. Real life graphs • Draw and interpret graphs representing real-life situations o Distance-time o Velocity-time o Conversion • Interpret linear and non-linear graphs	20. Probability • Experimental and theoretical measures, relative frequency • Expected outcomes • Venn diagrams, probability trees • Conditional probability 21. Similarity and congruence • Similarity and congruence in 2D o Congruent triangle conditions: SSS, SAS, ASA, RHS o Similar triangles • Lengths, areas and volumes in similar shapes 22. Trigonometry review (Advanced trig covered remotely and F2F: Y10 Unit 15) • Review use of Pythagoras' Theorem and sine, cosine and tangent ratios in right angled triangles • Use relevant formulae for calculations in non-right angled triangles: o Sine Rule o Cosine Rule o Area of a triangle • Graphs of trigonometric functions 23. Graphs: 23a • Non-linear graphs • Exponential and reciprocal graphs • Iteration • Representing linear inequalities graphically and solving quadratic inequalities 23b • Gradient and area under graphs • Transformations of graphs
3	24. Proportion and multiplicative reasoning • Compound measures • Percentages in more complex problems • Ratio and proportion problems including: o Growth and decay o Best buy o Direct and inverse proportion 25. Data review (covered remotely: Y10 Unit 10) • Produce and interpret charts and graphs • Construct and interpret Pie charts	24. Direct and Inverse proportion • Use algebraic methods to solve problems involving o Direct and inverse proportion o Squares, cubes, roots or other powers o Graphs and tables of values 25. Data review (part covered remotely: Y10 Unit 10) • Averages and range (review) • Representing and interpreting data • Collecting data • Cumulative frequency, box plots and histograms

	• Statistics and sampling • The averages 26. Sequences • Linear/arithmetic • Special • Quadratic • Geometric 27. Revise and review	26. Sequences • Linear/arithmetic • Special • Quadratic • Geometric 27. Revise and review