THE CLERE SCHOOL LEARNING JOURNEY

POST 16 EDUCATION

REVISION

MOCK EXAMS

REVISION

REVISION

MOCK EXAMS

REVISION

YEAR 11

UNIT 21: SEQUENCES

UNIT 22: UNITS & PROPORTIONALITY

UNIT 20: PROBABILITY OF COMBINED EVENTS

UNIT 18: GRAPHS 2

UNIT 17: CALCULATIONS 2

UNIT 16: HANDLING DATA 2

UNIT 19: PYTHAGORAS, TRIGONOMETRY & VECTORS

UNIT 15: WORKING IN 3D

UNIT 14: GRAPHS 1

UNIT 13: FACTORS, POWERS & ROOTS

UNIT 12: RATIO & PROPORTION

YEAR 10

UNIT 10: EQUATIONS & INEQUALITIES

UNIT 11: CIRCLES & CONSTRUCTIONS

UNIT 9: MEASURES & ACCURACY

UNIT 8: PROBABILITY

UNIT 7: WORKING IN 2D

UNIT 6: FORMULAE & FUNCTIONS

UNIT 5: FRACTIONS, DECIMALS & PERCENTAGES

UNIT 4: HANDLING DATA 1

UNIT 3: ANGLES & POLYGONS

UNIT 2: EXPRESSIONS

UNIT 1: CALCULATIONS

YEAR 9

Your Journey in Maths at Key Stage 4 Starts Here…….

Use the links below to access the curriculum intent and skills for each unit of work. The units are named the same as those in the corresponding textbook to avoid confusion. Those on the Higher tier course will cover all skills including those in bold. Foundation will NOT cover the bold content.

YEAR 9 – Maths Department Curriculum Intent Year 9.docx
YEAR 10 – Maths Department Curriculum Intent Year 10.docx
YEAR 11 - Maths Department Curriculum Intent Year 11.docx

GREEN TILE = NUMBER	PINK TILE = GEOMETRY	BLUE TILE = ALGEBRA	ORANGE TILE = RATIO & PROPORTION	YELLOW TILE = PROBABILITY AND STATISTICS

AMBITIOUS FOR ALL

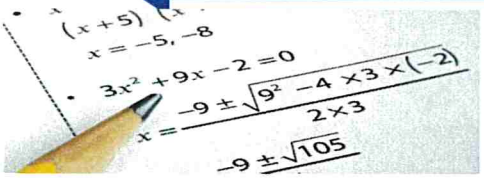
THE CLERE SCHOOL LEARNING JOURNEY

GCSE HIGHER OR FOUNDATION TIER

UNIT 9: CONSTRUCTIONS

UNIT 8: POLYGONS

UNIT 7: PERIMETER, AREA & VOLUME



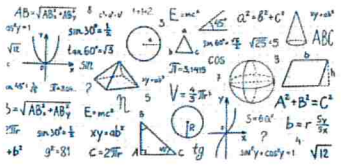
UNIT 6: STATISTICS

UNIT 5: PERCENTAGES & PROPORTIONALITY

UNIT 4: LINEAR GRAPHS

UNIT 3: SEQUENCES

UNIT 2: SOLVING LINEAR EQUATIONS



UNIT 1: ESTIMATION & ROUNDING

YEAR 8

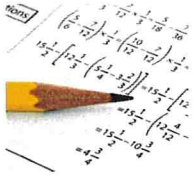
UNIT 9: TRANSFORMATIONS

UNIT 8: FRACTIONS & RATIO

UNIT 7: FRACTIONS

UNIT 6: PERIMETER & AREA

UNIT 5: COORDINATES



UNIT 4: EXPRESSIONS & EQUATIONS

UNIT 3: ARITHMETIC

UNIT 2: PROPERTIES OF NUMBER

UNIT 1: PLACE VALUE

Your Journey in Maths at Key Stage 3 Starts Here.....

YEAR 7

GREEN TILE = NUMBER	PINK TILE = GEOMETRY	BLUE TILE = ALGEBRA	ORANGE TILE = RATIO & PROPORTION	YELLOW TILE = PROBABILITY AND STATISTICS
The core number skills in the curriculum cover the understanding of place value for integers and decimals. The 4 operations and the order of operations with decimals and integers. The relationships between fractions, decimals and percentages. Calculating percentage change. Using laws of indices and standard form.	Shape, space and measure skills at Key Stage 3 cover perimeter, area and volume of 2D and 3D shapes. Application of angle facts in polygons and lines. Transformations of shapes using reflection, rotation, translation and enlargement. Construction of scale drawings and loci.	The core algebraic skills covered include understanding algebraic notation, simplifying algebraic expressions. Using formulae by substitution and rearranging formulae. Solving linear equations both algebraically and with graphs. Recognising and relating graphs to functions. Using algebra to describe a linear sequence.	Understand how to describe the proportions of a whole and as one quantity of another using fractions, decimal and percentages. Be able to make proportional changes in context e.g. recipes. Be able to form and simplify ratios, divide a quantity by a given ratio, and link ratios to their equivalent fractions.	Students learn to use theoretical probability to describe events and outcomes. Applying knowledge to experiments and contexts to make predictions. Using the handling data cycle to collate data, analyse it and represent it using different statistical diagrams, and draw conclusions from their results.

Maths Department Curriculum Intent – YEAR 7

Rationale

Year 7 are studying the Oxford Smart Mosaic Curriculum for Maths. The curriculum is designed to develop knowledge, skills and understanding across units of work that are well sequenced, connecting different aspects of mathematics and builds upon the learning from key stage 2.

The Oxford Smart Curriculum for Maths is designed to:
- ensure that new learning is built on firm foundations
- enable learners to make connections between new ideas and previous learning
- promote depth of learning via a Learning Episode model based on Craig Barton's pedagogy
- provide time and scaffolding for all learners to become fluent
- provide opportunities for all learners to develop skills in working mathematically
- enable responsive teaching and learning through integrated formative assessment
- provide support and challenge through personalised next steps
- ensure that learners consolidate learning through interweaving and retrieval.

Topic	Key Concepts within Unit
1. PLACE VALUE	Place value with integers and decimals Multiply and divide by powers of 10 Use inequalities to form coherent mathematical statements. Convert between units of measure and time
2. PROPERTIES OF NUMBER	Understand and apply knowledge of multiples. Calculate square and cube numbers. Calculate square and cube roots Use a calculator effectively to find any power of a number or any root of a number. Identify factors of a number, including common factors. Identify prime numbers and apply this to write any number as a product of its prime factors. Find the highest common factor and lowest common multiple of two or more numbers.
3. ARITHMETIC	Apply all 4 operations to positive and negative integers and decimals. Know and use the commutative, associative and distributive laws. Calculating using the priority of operations. Use a calculator fluently
4. EXPRESSIONS & EQUATIONS	Understand how to use a letter to represent a number. Identify terms, products and expressions. Understand and use algebraic notation to form an expression or formula. Substitute any value into an algebraic expression. Identify the different types of algebraic statements used such as functions, equations, inequalities, formula and expressions. Perform algebraic manipulation by collecting like terms, expanding brackets and factorising.
5. COORDINATES	Solving problems involving points and shapes on a coordinate grid. Construct and plot vertical and horizontal lines using their equations. Draw a graph of an algebraic relationship
6. PERIMETER & AREA	Know and use the properties of triangles and quadrilaterals. Work out the perimeter of any polygon. Work out the areas of triangles, quadrilaterals and compound shapes.
7. FRACTIONS	Apply fraction notation and convert integers and mixed numbers into fraction notation. Convert between fractions and decimals.

	Compare and order fractions using common denominators and decimals. Add and subtract fractions with same and different denominators. Multiply fractions including mixed numbers. Divide fractions by integers and fractions.
8. FRACTIONS & RATIO	Show a multiplicative relationship using fractions, ratio or a diagram. Using ratio notation and simplifying ratios. Find a fraction of an amount. Find the original amount given a fraction of an amount and the fraction. Write one number as a fraction of another. Share an amount by a given ratio. Find part of or the whole amount given part of or the whole ratio.
9. TRANSFORMATIONS	Be able to describe a translation, carry out the translation of a shape and understand the impact it has on the shape. Be able to describe a rotation, carry out the rotation of a shape and understand the impact it has on the shape. Be able to describe a reflection, carry out the reflection of a shape and understand the impact it has on the shape. Be able to describe a enlargement, carry out the enlargement of a shape and understand the impact it has on the shape. Convert between real life and scale measurements on scale drawings. Interpret and draw scale drawings.

Maths Department Curriculum Intent – YEAR 8

Rationale

Year 8 are studying the Oxford Smart Mosaic Curriculum for Maths. The curriculum is designed to develop knowledge, skills and understanding across units of work that are well sequenced, connecting different aspects of mathematics and builds upon the learning from key stage 2 and year 7.

The Oxford Smart Curriculum for Maths is designed to:

- ensure that new learning is built on firm foundations
- enable learners to make connections between new ideas and previous learning
- promote depth of learning via a Learning Episode model based on Craig Barton's pedagogy
- provide time and scaffolding for all learners to become fluent
- provide opportunities for all learners to develop skills in working mathematically
- enable responsive teaching and learning through integrated formative assessment
- provide support and challenge through personalised next steps
- ensure that learners consolidate learning through interweaving and retrieval.

Topic	Key Concepts within Unit
1. ESTIMATING & ROUNDING	Rounding any number to a given degree of decimal places Rounding any number to a given degree of significant figures Estimation of complex calculations, understanding the impact of rounding. Be able to write the interval using inequalities for the bounds of number that has been rounded.
2. SOLVING LINEAR EQUATIONS	Recognise linear equations and that multiple linear equations could share the same solution. Solve one step linear equations using inverse operations Solve two step linear equations using inverse operations Solve increasingly complex linear equations that include brackets and fractions
3. SEQUENCES	Describe and continue a sequence using a term-to-term rule, or a position to term rule. Describe and continue an arithmetic sequence using the nth term Use the nth term to define if a number if part of a sequence or not
4. LINEAR GRPAHS	Connect coordinates, equations and graphs by exploring rules that link coordinate sets and how we can use lines to demonstrate their relationship. Linear relationships – explore gradients and y-intercepts, using this to explain real-life concepts.
5. PERCENTAGES & PROPORTIONALITY	Representations of multiplicative relationships – converting between fractions, decimals and percentages, writing one quantity as a percentage of another. Percentages - calculating percentage change and calculating the original amount after a % change. Proportionality – linking with graphs of direct proportion e.g. currency conversion to understand the links between gradient and proportional change. Explore inverse proportion concepts.
6. STATISTICS	Statistical representations – explore how data is collated, how data can be record in tables using groups if necessary. Explore different statistical graphs and charts how to construct and interpret them. Angles and pie charts – construct and interpret pie charts as a proportional representation of data Measures of central tendency and spread – calculate the mean, mode, median and range of ungrouped and grouped data Interpreting statistical representations and measures – analyse and compare data sets. Exploring statistical problems
7. PERIMETER, AREA & VOLUME	Circumference of circles and perimeter of portions of circles Area of circles including semi and quarter circles Surface Area of 3D prisms including cylinders Volume of 3D prisms including cylinders

8. POLYGONS	Line and rotational symmetry of polygons Angle properties of parallel lines Interior and exterior angles of polygons Multi-step angle problems
9. CONSTRUCTIONS	Constructions using circles Constructions using rhombuses leading to perpendicular and angle bisectors

Maths Department Curriculum Intent – YEAR 9

Rationale

Year 9 are studying the AQA GCSE Maths 3-year curriculum. The curriculum is designed to develop knowledge, skills and understanding across units of work that are well sequenced, connecting different aspects of mathematics and builds upon the learning from key stage 2 and key stage 3. Depending on their academic ability in maths, students will follow either the foundation or higher tier content.

The GCSE maths curriculum is designed to:

- ensure that new learning is built on firm foundations
- enable learners to make connections between new ideas and previous learning
- promote depth of learning via a Learning Episode model based on research-based pedagogy
- provide time and scaffolding for all learners to become fluent
- provide opportunities for all learners to develop skills in working mathematically
- enable responsive teaching and learning through integrated formative assessment
- provide support and challenge through personalised next steps
- ensure that learners consolidate learning through interweaving and retrieval.

Topic	Key Concepts within Unit
1. CALCUALTING 1	Use place value when calculating with decimals. Order positive and negative integers and decimals using the symbols = ≠ < ≤ ≥ > Round to a number of decimal places or significant figures. Add and subtract integers and decimals. Multiply and divide with integers and decimals. Use BIDMAS in multi-stage calculations.
2. EXPRESSIONS	Use algebraic notation. Substitute numbers into formulae & expressions. Use and understand the words expressions, equations, formulae, term and factors. Collect like terms and simplify expressions involving sums, products, powers and surds. Use the laws if indices. Multiply a single term over a bracket. Take out common factors in an expression. **HIGHER TIER only:** **Simplify algebraic fractions and carry out arithmetic operations with algebraic fractions.**
3. ANGLES & POLYGONS	Describe and apply the properties of angles at a point, on a line and at intersecting and parallel lines, including the context of bearings. Derive and use the sum of angles in a triangle. Derive and apply the properties and definitions of special types of quadrilaterals. Solve geometrical problems on coordinate axes. Identify and use congruence and similarity. Deduce and use the angle sum in any polygon and derive properties of regular polygons. **HIGHER TIER only:** **Prove congruence**
4. HANDLING DATA 1	Construct and interpret frequency tables and two-way tables. Construct and interpret pictograms, bar charts and bar-line charts. Interpret and construct pie charts. Compare distributions using mean, median, mode and range. **HIGHER TIER only:** **Calculate the inter-quartile range of a data set.** **Use frequency tables to represent grouped data.** **Construct histograms with equal and unequal class widths.**
5. FRACTIONS, DECIMALS & PERCENTAGES	Convert between terminating decimals and their corresponding fractions. Compare decimals and fractions using the correct inequalities symbols. Find fractions and percentages of amounts.

	Add, subtract, multiply and divide with fractions and mixed numbers. Convert between fractions, decimals and percentages. **HIGHER TIER only:** **Convert recurring decimals to fractions**
6. FORMULAE & FUNCTIONS	Substitute numerical values into formulae and expressions. Rearrange formulae to change the subject. Identify inequalities, equations, formulae and identities. Expand double brackets. Factorise quadratic expressions of the form $x^2 + bx + c$ and the difference of 2 squares. **HIGHER TIER only:** **Find the inverse of a function and construct and use composite functions.** **Construct algebraic proofs of numeric situations.**
7. WORKING IN 2D	Accurately measure and draw line segments and angles. Use standard units of lengths and areas. Use bearings. Interpret maps and scale drawings. Know and apply formulae to calculate the area of triangles, parallelograms and trapezia. Identify, describe and construct reflections, rotations, translations and enlargements. **HIGHER TIER only:** **Calculate the area of composite shapes.** **Interpret, describe and construct enlargements with fractional and negative scale factors.** **Identify what changes and what is invariant under a combination of transformations.**
8. PROBABILITY	Use experimental data to estimate probabilities and expected frequencies. Calculate theoretical probabilities and expected frequencies using the idea of equally likely events. Compare theoretical probabilities with experimental probabilities. Recognise mutually exclusive events and exhaustive events and know the probabilities of mutually exclusive events sum to 1.
9. MEASURES & ACCURACY	Round numbers and measures to an appropriate degree of accuracy. Use approximations to make estimates. Check calculations using approximation and estimation. Use standard units of length, mass, volume, capacity, time and area. Use inequality notation to state error intervals and interpret limits of accuracy. **HIGHER TIER only:** **Solve problems involving speed and density.** **Look at a value that has been rounded and work out upper and lower bounds for the original value.**
10. EQUATIONS % INEQUALITIES	Set up and solve linear equations. Solve quadratic equations algebraically by factorising. Derive and solve two linear simultaneous equations in two variables. Find approximate solutions to two linear simultaneous equations using a graph. Solve linear inequalities in one variable and represent the solution on a number line. **HIGHER TIER only:** **Solve quadratic equations using completing the square and the quadratic formula.** **Solve simultaneous equations where one is linear and the other is non-linear.** **Use iterative processes to find approximate solutions to equations.** **Solve inequalities linear or quadratic and display the solution graphically.**

Maths Department Curriculum Intent – YEAR 10

Rationale

Year 10 are studying the AQA GCSE Maths 3-year curriculum. The curriculum is designed to develop knowledge, skills and understanding across units of work that are well sequenced, connecting different aspects of mathematics and builds upon the learning from key stage 2 and key stage 3. Depending on their academic ability in maths, students will follow either the foundation or higher tier content.

The GCSE maths curriculum is designed to:

- ensure that new learning is built on firm foundations
- enable learners to make connections between new ideas and previous learning
- promote depth of learning via a Learning Episode model based on research-based pedagogy
- provide time and scaffolding for all learners to become fluent
- provide opportunities for all learners to develop skills in working mathematically
- enable responsive teaching and learning through integrated formative assessment
- provide support and challenge through personalised next steps
- ensure that learners consolidate learning through interweaving and retrieval.

Topic	Key Concepts within Unit
11. CIRCLES AND CONSTRUCTIONS	Identify and apply circle definitions, properties and formulae. Construct triangles. Use the standard ruler and compass constructions. Solve loci problems. **HIGHER TIER only:** **Calculate arc lengths and areas of sectors.** **Prove and apply circle theorems.**
12. RATIO & PROPORTION	Use fractions and percentages to describe a proportion. Write a ratio in its simplest form and divide a quantity by a given ratio. Use scale factors, scale diagrams and maps. Solve problems involving percentage change, including finding the original amount.
13. FACTORS, POWERS AND ROOTS	Use mathematical language to describe factors, multiples and primes. Use Venn diagrams or factor trees to systematically list the prime factors of a number. Use prime factor decomposition to calculate the HCF and LCM of two or more numbers. Write the HCF and LCM using product notation. Calculate positive integer powers and their roots. Recognise powers of 2, 3, 4 and 5. **HIGHER TIER only:** **Simplify expressions involving surds including rationalising fractions.**
14. GRAPHS 1	Work with coordinates in all 4 quadrants. Plot straight-line graphs including diagonal, horizontal and vertical lines. Identify gradients and intercepts of straight lines graphically and algebraically. Use the form $y = mx + c$ to identify parallel lines. Use one point and the gradient of the line to find its equation. Use two points to find the equation of a line. Interpret the gradient of a straight-line graph as a rate of change. Plot and interpret graphs involving distance, speed and acceleration. **HIGHER TIER only:** **Identify perpendicular lines using their equations.** **Draw quadratic curves.** **Identify roots, intercepts and turning points of quadratic curves using graphical and algebraic methods.**
15. WORKING IN 3D	Identify the number of faces, edges and vertices of 3D shapes. Construct and interpret plans and elevations of 3D shapes. Calculate the volume of cuboids, cylinders and other prisms. Calculate the volume and surface area of spheres, pyramids, cones and composite solids.

	HIGHER TIER only: **Know and apply the relationship between lengths, areas and volumes of similar shapes.**
19. PYTHAGORAS AND TRIGONOMETRY	Use the formulae for Pythagoras Theorem Use the trigonometric ratios and apply them to find angles and lengths in right-angled triangles. Know the exact values of sin and cos for 0, 30, 45, 60 and 90 degrees. Know the exact values of tan for 0, 30, 45 and 60 degrees. Write column vectors and draw vector diagrams. Add, subtract and find multiples of vectors. **HIGHER TIER only:** **Apply Pythagoras and trigonometry in 3D problems and other contexts.** **Use sine and cosine rules to find missing lengths and angles.** **Use the sine formula for the area of a triangle.** **Calculate with vectors and use them in geometric proofs.**
16. HANLDING DATA 2	Interpret and construct tables, graphs and charts for discrete, continuous and grouped data. Use the median, mean and modal class and range to interpret and compare distributions. Use correlation to describe scatter graphs but know that it does not imply causation. Draw estimated lines of best fit and make predictions but understand their limitations. Interpret and construct line graphs for time series data. **HIGHER TIER only:** **Construct and interpret cumulative frequency curves and box plots.**
17. CALCULATIONS 2	Calculate with roots and integer indices. Calculate exactly with fractions and multiples of π Calculate with and interpret numbers written in standard form. **HIGHER TIER only:** **Perform calculations involving fractional and negative indices.** **Perform exact calculations involving surds.**
18. GRAPHS 2	Draw graphs to identify and interpret roots, intercepts and turning points of quadratic functions. Solve a quadratic equation by finding approximate solutions using a graph. Recognise, sketch and interpret graphs of linear, quadratic, cubic and reciprocal functions. Plot and interpret real-life graphs. **HIGHER TIER only:** **Recognise and draw graphs of cubic, reciprocal and exponential functions.** **Recognise and sketch the graphs of trigonometric functions.** **Recognise and sketch translations and reflections of graphs.** **Approximate the gradient of a curve at a given point and the area under the graph.** **Interpret these values in real-life problems including kinematic graphs.** **Recognise and use simple equations of circles and find the tangent to a circle at a point.**
20. THE PROBABILITY OF COMBINED EVENTS	Use Venn diagrams to record outcomes and calculate probabilities of events. Construct possibility spaces and use these to calculate probabilities. Use tree diagrams to show the frequencies or probabilities of two events. Use tree diagrams to calculate the probability of independent and dependent events. **HIGHER TIER only:** **Calculate conditional probabilities.**

Maths Department Curriculum Intent – YEAR 11

Rationale

Year 11 are studying their final year of the AQA GCSE Maths 3-year curriculum. Most of the curriculum content is taught in years 9 and 10 so that year 11 is finishing off the final unit(s) of the curriculum, revising and reviewing topics, and providing students with exam coaching as they go through mock exams.

The GCSE maths curriculum is designed to:

- ensure that new learning is built on firm foundations
- enable learners to make connections between new ideas and previous learning
- promote depth of learning via a Learning Episode model based on research-based pedagogy
- provide time and scaffolding for all learners to become fluent
- provide opportunities for all learners to develop skills in working mathematically
- enable responsive teaching and learning through integrated formative assessment
- provide support and challenge through personalised next steps
- ensure that learners consolidate learning through interweaving and retrieval.

Topic	Key Concepts within Unit
21. SEQUENCES	Find terms of a linear sequence using a term-to-term rule or position-to-term rule. Recognise special types of sequences and find terms using either a term-to-term rule or position-to-term rule. Find terms of a quadratic sequence using a term-to-term rule or position-to-term rule.
22. UNITS AND PROPORTIONALITY	Calculate with standard and compound units. Compare length, area and volumes of similar shapes. Solve direct and inverse proportion problems. Interpret the gradient of a straight line graph as a rate of change. Interpret graphs that illustrate direct and inverse proportion. Set up, solve and interpret growth and decay problems. **HIGHER TIER only:** **Convert between standard units of measure and compound units.** **Use compound measures.** **Describe direct and inverse proportion relationships using an equation.** **Find the instantaneous and average rate of change from a graph.** **Solve repeated proportional change problems.**
	REVISION, REVIEWING AND EXAM COACHING