

## Mathematics Curriculum Principles

**Our unifying 'sentence' is: "Students were taught to be confident mathematicians in calm and purposeful lessons".**

**By the end of their education, a student of Mathematics at Dixons Unity Academy will:**

- Know fundamental mathematics skills and understand how to use them in future learning and employment. These include money management; reading timetables; discovering and understanding patterns in data and being able to solve problems.
- Recognise the links between different areas of mathematics and mathematical methods; be analytical thinkers and have a thirst for mathematical reasoning. Students will have developed fluency in procedures and be strong problem solvers.

**To achieve a true understanding of Mathematics, topics have been intelligently sequenced based on the following rationale:**

- The overall aim of the mathematics curriculum is to provide students with the knowledge they need to increase their cultural capital and be successful in their lives beyond the academy. With this in mind the schemes of work sequence topics in a spiral curriculum, in which students revisit and extended their knowledge and understanding of topics several times throughout their time at Dixons Unity Academy. This sequence of learning promotes a deeper understanding of the mathematical concepts being taught.
- Within the classroom, teachers introduce new learning in small chunks, which allows students to develop their understanding of mathematical concepts without experiencing cognitive overload. Teachers introduce new concepts using clear modelling, linking the new learning to prior learning and in almost all cases, ensuring students understand how and why the mathematical concept works. When learning a new concept, students develop strong fluency before using and applying their new learning in different contexts.
- The concept of interrupting the forgetting process permeates the mathematics long term plan (LTP) and schemes of work (SOW). Interleaving and spaced learning are utilised in several ways. Across each year, new learning is split into units of work arranged in a spiral curriculum which means that students revisit and develop concepts that they have previously learned. As a result, students will consistently revisit topics (spaced learning) and interleave concepts throughout their mathematics career. Every lesson begins with a 'Learn Now', which promotes recall of integral knowledge from topics previously learned, allowing for further spaced practice. At the end of some lessons, the 'Learn Now' is specific to each class and is linked to the IP sheet for the class. Fortnightly mini tests provides a further opportunity for interleaving, with topics which have recently been taught tested alongside key knowledge from earlier learning. Students receive whole class feedback on these mini tests and teachers re-teach whole class next steps through 'DIRT lessons'. Spaced learning through retrieval practice and brain dumps in morning meetings and recall homework on Sparx, are supplementary ways in which the forgetting process is interrupted, leading to true mastery of the mathematical curriculum

**The Mathematics curriculum will address social disadvantage by addressing gaps in students' knowledge and skills":**

- The spiral nature of the mathematics curriculum is designed with the most vulnerable student in mind, assuming a basic mathematical understanding from previous learning, each unit of work builds the students' knowledge. Key Stage 3 in particular is used to ensure fluency in fundamental mathematics by closing any knowledge gaps evidenced in assessment, whilst also providing suitable extension.
- students with additional needs or disabilities are often place in the E band group, which benefits from an additional lesson each week to support students to catch up or stay ahead of their peers. All students access the same curriculum in years 7 and 8, and we have the highest expectations of all. This allows all students to achieve and experience the very best of what has been thought and said in mathematics.

**We fully believe that Mathematics can contribute to the personal development of students at Dixons Unity Academy:**

- Students will be encouraged to develop socially in mathematics lessons through the celebration of making mistakes and setting high expectations helps students to develop listening and speaking skills. Taking part in 'The Maths Challenge' and 'Dixons Group Cup' events also encourages teamwork in problem solving. Self-awareness is developed through self-assessment, which enables students to have an accurate understanding of their strengths and weaknesses, to accept them and the understand how to learn from them
- Developing morality is evident in much of the mathematics curriculum where there is reference to real life contexts and students are encouraged to make decisions thus developing an understanding that certain choices may have different consequences and outcomes. One example where this applies is in percentages where comparing interest rates occurs and the role of 'loan sharks' can be discussed. Additionally, topics such as tracking and how the media use misleading statistical diagrams are also addressed.
- Encouraging students to question how mathematics impacts the way the world works promotes the spiritual growth of our students. Referring to 'big issues' such as the gender pay gap, birth and death rates, gambling through probability and global warming within contextual questions allows students to have a concrete understanding of where mathematics fits into the bigger picture. Teaching a variety of strategies that allow creativity to blossom (i.e. construction and symmetry) and incorporating enrichment tasks during Maths Week such as money management and sport investigations allow students to develop more than just their problem solving skills in this subject
- Being a universal language, and having phenomena developed all over the world, lends mathematics to promoting cultural capital. Discussion when introducing many topics, such as place value, time, Fibonacci sequences, Pythagoras and Trigonometry to name a few, allows cultural influences to be explored..



**Our belief is that homework should be interleaved revision of powerful knowledge that has been modelled and taught in lessons. This knowledge is recalled and applied through a range of low stakes quizzing and practice.**

**Opportunities are built in to make links to the world of work to enhance the careers, advice, and guidance that students are exposed to:**

- The mathematics curriculum provides students with opportunities to consider the world of work and how mathematics leads to successful careers. Teachers take every opportunity to link learning to specific careers or a future life context. For example, when teaching constructions, reference can be made to any form of design work or navigational career.
- Students have the opportunity to engage in enrichment opportunities and take part in competitions, such as those offered by the local AMSP. In lessons, KS3 students have the opportunity to take part in application lessons, where they are required to solve a problem or complete a challenge which requires the skills that they have recently learnt. Map and scale reading skills developed as part of the Duke of Edinburgh Award, which students are able to participate in, further develops mathematical skill.

**A true love of English involves learning about various cultural domains. We teach beyond the specification requirements, but do ensure students are well prepared to be successful in GCSE examinations:**

- Being a universal language, and having phenomena developed all over the world, lends mathematics to promoting cultural capital. Discussion when introducing many topics, such as place value, time, Fibonacci sequences, Pythagoras and Trigonometry to name a few, allows cultural influences to be explored.



## Curriculum Overview

All children are entitled to a curriculum and to the powerful knowledge which will open doors and maximise their life chances. Below is a high-level overview of the critical knowledge children will learn in this subject, at each key stage from Year 7 through to Year 11, to equip students with the cultural capital they need to succeed in life. Our powerful, knowledge-rich curriculum teaches both **substantive knowledge** (facts; knowing that something is the case; what we think about) and **procedural knowledge** (skills and processes; knowing how to do something; what we think with). There are no skills without bodies of knowledge to underpin them. The curriculum is planned vertically and horizontally giving thought to the optimum knowledge sequence for building secure schema.

	Cycle 1	Cycle 2	Cycle 3
YEAR 7	<b>New learning</b> Unit 1: Algebra Order of operations, algebraic notation, simplifying including expanding and factorising single brackets, negative numbers, substituting, forming expressions, solving 1, 2 and 3-step equations, common sequences, nth term Unit 2: Number Place value, inequalities, comparing numbers, +/- methods, decimals, money calculations, factors & multiples, HCF & LCM, product of prime factors, x/÷ methods, decimals, estimation, rounding, perimeter and area including compound shapes, time	Unit 3: Geometry Reading scales, powers of 10, unit conversions, identify, draw & measure angles, properties of 2D shapes, angle facts, tessellation Unit 4: Fractions Fractions of amounts, converting improper fractions and mixed numbers, simplifying including algebraic fractions, equivalent fractions, four operations including algebraic fractions, comparing, ordering	Unit 5: Percentages Fraction/decimal/% conversions, ordering fractions/decimals/%, % of (calculator and non-calculator), expressing %, % increase and decrease Unit 6: Probability and Statistics Averages, probability scale, sample space and listing outcomes, single event probability, probability 'not', frequency trees, pictograms, bar graphs, line graphs, pie charts
	<b>Revisited learning</b> Basic algebra (KS2) 4-operations (KS2) Place value (KS2) Inequalities (KS2) Factors and multiples (KS2) Area + Perimeter (KS2) Rounding (KS2)	Converting units (KS2) Angles (KS2) Fractions (KS2)	Fractions, decimals and percentages (KS2) Averages (KS2) Fractions (Cycle 2)
	<b>Additional information</b> Careers in animation (Unit 1: linear sequences) and interior design (Unit 2: perimeter)	Careers in astronomy (Unit 3: angles) and catering (Unit 4: fractions of amounts)	Careers in accountancy (Unit 5: % increase/decrease) and medicine (Unit 6: statistical diagrams)
YEAR 8	<b>New learning</b> Unit 1: Number Index laws, powers and roots, Pythagoras' theorem, standard form, prime factorisation for HCF and LCM, set notation, Venn diagrams including problem solving Unit 2: Algebra Inequalities, complex simplifying including algebraic fractions, formulae, transposing formulae, solving equations involving brackets and with variables on both sides, forming and solving from worded and geometric problems, expanding binomials, factorising quadratics, fractional sequences, problem solving with linear sequences, plotting linear functions from a table	Unit 3: 2D Geometry Constructions including triangles, angle facts involving parallel lines, conversions of units including squared and cubed units, composite shapes, area of specific quadrilaterals, circumference and area of circles and part circles Unit 4: Proportional Reasoning % increase/decrease, percentage change, repeated percentage change, simple and compound interest, reverse percentage, rates and ratio, speed/distance/time, density/mass/volume, pressure/force/area	Unit 5: 3D Geometry Properties of 3D shapes, nets, plans and elevations, volume of prisms, pyramids and cones, surface area Unit 6: Statistics Representing data, comparing data sets, scatter graphs, time series and moving averages, MMR from tables, frequency diagrams including polygons and simple histograms, identifying errors from statistical diagrams
	<b>Revisited learning</b> Prime factors (Y7)	Angles (Y7)	Area and perimeter (Y7)



	Expanding brackets (Y7) Sequences (Y7)	Converting units (KS2) Percentages (Y7)	Averages (Y7)
<b>Additional information</b>	Careers in ecology (Unit 1: index laws) and cryptoanalysis (Unit 2: forming and solving)	Careers in fashion design (Unit 3: area) and space travel (Unit 4 : speed, distance, time)	Careers in architecture (Unit 5 : plans and elevations) and data analysis (Unit 6 : MMMR from tables)
<b>New learning</b>	Unit 1: Stats Averages, bar charts, two-way tables, stem and leaf diagrams Unit 2: Number Decimals, multiplication, negative numbers, place value Unit 3: Algebra Manipulating algebra, expanding and factorising, index laws, substitution, proof Unit 4: Converting units Converting metric units, converting between metric and imperial units, converting units of area	Unit 5: Probability Frequency trees, one event, two events, probability scale, relative frequency Unit 6: Fractions and decimals Calculating with decimals, converting between fractions and decimals Unit 7: Area and perimeter Area of triangles and quadrilaterals, area and circumference of circles, area problems Unit 8: Ratio Interpreting ratio, equivalent ratio, sharing into a ratio, ratio problems	Unit 9: Sequences  Unit 10: Percentages Percentage of an amount, percentage increase/decrease, simple interest, percentage change Unit 11: Number problems Money problems, timetables, utility bills, mixed number problems Unit 12: Proportion Unitary method for proportion, adapting a recipe, best buys
<b>Revisited learning</b>	Stats (Y8) Number (Y7) Algebra (Y7) Converting units (KS2)	Decimals (Y7) FDP conversions (Y7) Area (Y8) Ratio (Y7) Probability (Y7)	Sequences (Y7) Percentages (Y7) 4 operations (Y7) Proportion (Y8)
<b>Additional information</b>	Careers in data analysis (statistics)	Careers in medicine and risk analysis (probability)	Careers in animation and computer game design (sequences)
<b>New learning</b>	Unit 1: Algebra Expanding triple brackets Inequalities Substitution Forming and solving equations Simultaneous equations Unit 2: Proportion Unitary method Inverse proportion (word problems) Algebraic direct proportion Unit 3: Angles Angles in polygons Angles in parallel lines Algebra problems related to angles Unit 4: Standard Form Converting between standard and ordinary form Calculating with standard form Solving problems related to standard form	Unit 5: Statistics Averages Capture, recapture Scatter graphs Frequency polygons Unit 6: Fractions and decimals Calculating with mixed numbers Converting between fractions and recurring decimals Prime factors, LCM, HCF Using a calculator Unit 7: Transformations Rotations, reflections, translations Enlargements (including negative and fractional scale factors) Invariant points Describing transformations Combining transformations Unit 8: Percentages Percentage change Repeated percentage change	Unit 9: Graphs Plotting graphs Linear graphs Perpendicular and parallel lines Unit 10: Venn Diagrams Probability Venn Diagrams Unit 11: Quadratics Factorising and solving quadratics Sketching quadratics Quadratic formula Completing the square Unit 12: Constructions Constructions Loci Plans and Elevations Sketching solids

YEAR 9F

YEAR 9H



	Index laws (including negative and fractional)	Reverse percentages		
<b>Revisited learning</b>	Algebra (Y8) Proportional reasoning (Y8) Angles (Y7/Y8) Powers and roots (Y8) Multiplying and dividing by powers of 10 (Y7)	Stats (Y8) Fractions, decimals and percentages (Y8) Factors and multiples (Y7) Properties of 2D shapes (Y7)	Plotting graphs (Y8) Venn Diagrams (Y8) Probability (Y7) Factorising quadratics (Y8) Constructions (Y8) Plans and elevations (Y8)	
<b>Additional information</b>	Careers in ecology (index laws)	Careers in finance (percentages)	Careers in medicine and risk analysis (probability)	
<b>YEAR 10F</b>	<b>New learning</b>	Geometry: perimeter, area and volume  Algebra: real life graphs, straight line graphs  Geometry: transformations  Ratio: simplifying and sharing	Ratio: proportion, direct and inverse  Pythagoras and trigonometry  Probability: single events, tree diagrams, Venn diagrams, set notation  Ratio: multiplicative relationships, speed, density, compound interest,  Geometry: plans and elevations	Geometry: Construction and loci, perimeter, area and volume, similarity, vectors  Algebra: Quadratics, indices  Number: fractions
	<b>Revisited learning</b>	Area and perimeter from year 8 cycle 1  Transformations from year 8 cycle 3  Ratio from year 8 cycle 2	Ratio from year 8 cycle 2  Pythagoras from year 8 cycle 1  Probability from year 8 cycle 3	Fractions has been covered extensively in all KS3  Quadratics from year 8 cycle 2  Indices from year 8 cycle 1  Area and perimeter covered extensively in KS3 and year 10 cycle 1
	<b>Additional information</b>	Careers in interior design and landscaping (area and perimeter)	Careers in catering (proportion) Careers in surveillance and cartography (Trigonometry)	
<b>YEAR 10H</b>	<b>New learning</b>	Geometry: transformations, constructions, bearings and loci  Algebra: Solving Quadratics, simultaneous equations, inequalities  Probability: independent events, tree diagrams, Venn diagrams, set notation, relative frequency,	Ratio: Multiplicative relationships, compound interest, depreciation, speed, density, pressure, direct and inverse proportion  Geometry: Similarity and congruence  Algebra: Graphs of trig functions, sine rule, cosine rule, area of triangle,	Geometry: circle theorems, equation of circle, vectors  Number: recap surds  Algebra: algebraic fractions, change the subject for a formula, functions,



	Ratio: Multiplicative relationships, compound interest, depreciation, speed, density	Statistics: stratified sampling, cumulative frequency, box plots, histograms  Algebra: complete the square, triple brackets, sketch quadratics, graphical inequalities	
<b>Revisited learning</b>	<b>Geometry transformation in year 8 cycle 3</b> <b>Ration in year 8 cycle 2</b> Probability in year 8 cycle 3	Ratio from year 8 cycle 2 Algebra from Proportional reasoning from year 8 cycle 2 Algebra studied in y7-9	Surds in year 9 cycle 1 Angles in year 9 cycle 3 Algebra studied in y7-9
<b>Additional information</b>	Careers in medicine and risk analysis (probability)	Careers in scientific research (functions)	

Year 11

Year 11 groups follow a bespoke long term plan, based on the class next steps from their previous assessment



## Y7 Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Cycle 1	Induction						Assessment Weeks						
		Baseline Unit 1 Algebra Algebraic notation	Unit 1 Algebra Substitution	Unit 1 Algebra Simplifying	Unit 1 Algebra Simplifying	Unit 1 Algebra Solving	Unit 1 Algebra Solving	Unit 1 Algebra Sequences	Unit 2 Number Place value, inequalities and ordering	Unit 2 Number Four operations inc. decimals	Unit 2 Number Four operations inc. decimals	Unit 2 Number Factors and multiples	Unit 2 Number Factors and multiples
Cycle 2							Assessment Weeks						
	Unit 2 Number Rounding and estimation	Unit 2 Number Application	Unit 2 Number Application	Unit 3 Geometry Unit conversion	Unit 3 Geometry Angle types, estimating, draw and measure	Unit 3 Geometry Angle types, estimating, draw and measure	Unit 3 Geometry Angle facts	Assessments Unit 3 Geometry Mixed angle facts	Unit 4 Fractions Fractions of amounts	Unit 4 Fractions Fraction equivalence	Unit 4 Fractions Four operations with fractions	Unit 4 Fractions Four operations with fractions	Unit 4 Fractions Compare and order fractions
Cycle 3							Assessment Weeks						
	Unit 4 Fractions Worded fraction problems	Unit 5 Percentages FDP conversions and Ordering FDP	Unit 5 Percentages Percentages of amounts non-calculator	Unit 5 Percentages Percentage increase and decrease non-calculator	Unit 5 Percentages Percentages of amounts and percentage increase and decrease non-calculator	Unit 5 Percentages Expressing as a percentage and percentage change	Unit 6 Probability and Statistics Probability scales and simple probability	Unit 6 Probability and Statistics Probability NOT and from listing outcomes and frequency trees	Unit 6 Probability and Statistics Calculating MMMR	Revision and Assessments	Unit 6 Probability and Statistics Simple statistical diagrams	Unit 6 Probability and Statistics Pie charts	Catch Up

## Y8 Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Cycle 1	Induction						Assessment Weeks						
		<b>Unit 1 Percentages</b> FDP conversions and Ordering FDP	<b>Unit 1 Percentages</b> Percentages of amounts non-calculator and	<b>Unit 1 Percentages</b> Percentage increase and decrease non-calculator	<b>Unit 1 Percentages</b> Expressing as a percentage and change	<b>Unit 2 Probability and Statistics</b> Probability scales and simple probability	<b>Unit 2 Probability and Statistics</b> Probability NOT and from listing outcomes and frequency trees	<b>Unit 2 Probability and Statistics</b> Calculating MMMR	<b>Unit 2 Probability and Statistics</b> Simple statistical diagrams	<b>Unit 2 Probability and Statistics</b> Pie charts	<b>Unit 3 Number</b> Index laws	<b>Unit 3 Number</b> Calculating with powers and roots, inc. Pythagoras	Catch up
Cycle 2							Assessment Weeks						
	<b>Unit 3 Number</b> Standard form	<b>Unit 3 Number</b> Prime factorisation, HCF and LCM	<b>Unit 3 Number</b> Sets and Venn diagrams	<b>Unit 4 Algebra</b> Inequalities	<b>Unit 4 Algebra</b> Complex manipulation	<b>Unit 4 Algebra</b> Formulae	<b>Unit 4 Algebra</b> Forming and Solving	<b>Unit 4 Algebra</b> Forming and Solving	<b>Unit 4 Algebra</b> Sequences	<b>Unit 5 2D Geometry</b> Constructions	<b>Unit 5 2D Geometry</b> Angles in parallel lines	<b>Unit 5 2D Geometry</b> Unit conversions	<b>Unit 5 2D Geometry</b> Area of trapezia and compound shapes
Cycle 3									Assessment Weeks				
	<b>Unit 5 2D Geometry</b> Circles	<b>Unit 6 Proportional Reasoning</b> Percentage increase/decrease inc. simple and compound interest	<b>Unit 6 Proportional Reasoning</b> Repeated percentage change and reverse percentages	<b>Unit 6 Proportional Reasoning</b> Ratio	<b>Unit 6 Proportional Reasoning</b> Compound measures	<b>Unit 7 3D Geometry</b> Solids' properties, nets, plans, elevations	<b>Unit 7 3D Geometry</b> Volume of prisms and cylinders	<b>Unit 7 3D Geometry</b> Volume of prisms and cylinders	<b>Unit 7 3D Geometry</b> Surface area	<b>Revision and Assessments</b>	<b>Unit 8 Statistics</b> Collecting and organising data	<b>Unit 8 Statistics</b> Interpreting and comparing data sets	Catch Up

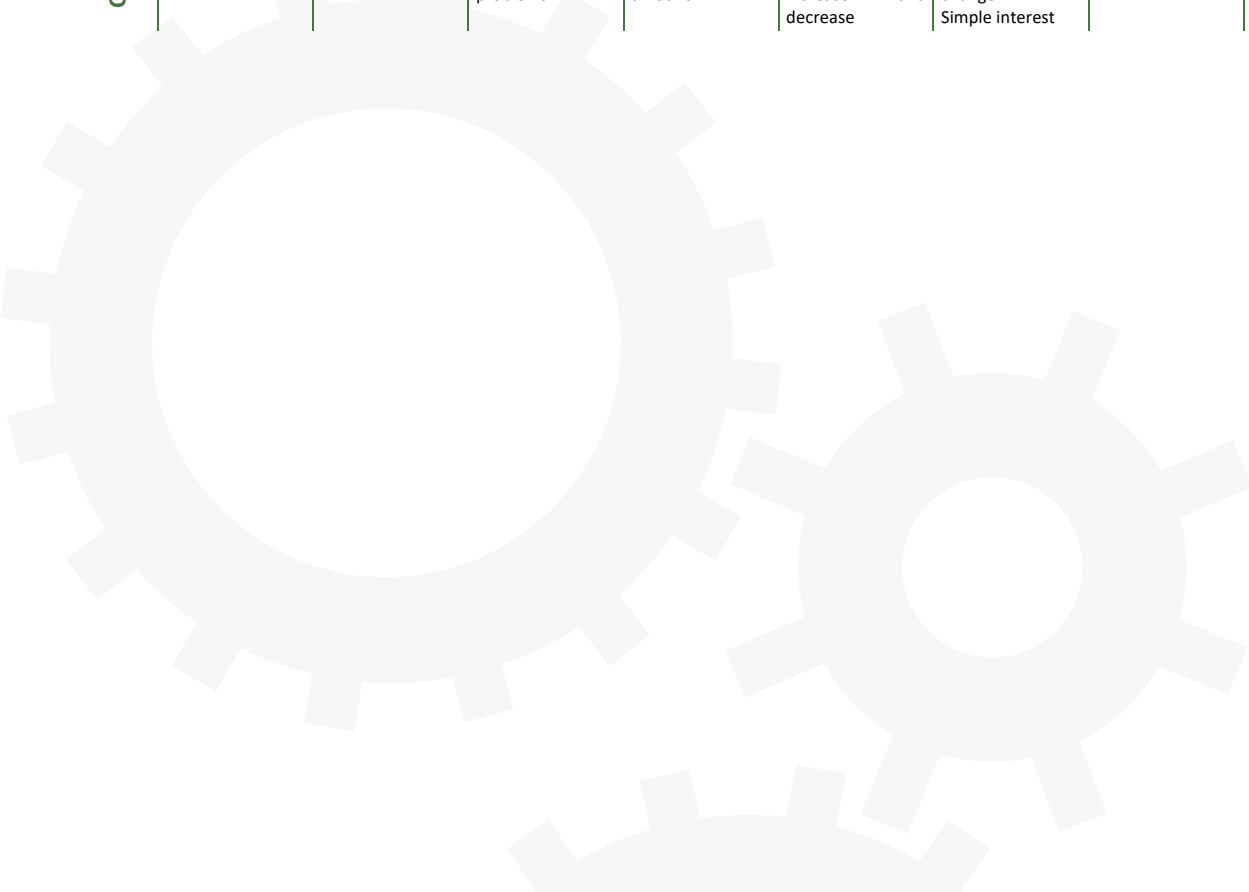


## Y9 Higher Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
<b>Cycle 1</b>	<b>Induction</b>						<b>Assessment Weeks</b>						
		<b>Algebra</b> Expanding brackets Changing the subject	<b>Algebra</b> Solving equations Substitution	<b>Algebra</b> Inequalities and Forming and solving equations	<b>Algebra</b> Simultaneous equations	<b>Proportion</b> Unitary method Exchange rates	<b>Proportion</b> Algebraic direct proportion	<b>Angles</b> Angles in triangles Angles in parallel lines	<b>Angles</b> Angles in polygons	<b>Angles</b> Angles with algebra	<b>Standard Form</b> Index laws	<b>Standard Form</b> Converting Calculating	<b>Catch Up</b>
<b>Cycle 2</b>							<b>Assessment Weeks</b>						
	<b>Statistics</b> Averages Averages from a table	<b>Statistics</b> Capture-recapture	<b>Statistics</b> Scatter graphs Frequency polygons	<b>Fractions and Decimals</b> Prime factors HCF, LCM Using a calculator	<b>Fractions and Decimals</b> Fraction calculations	<b>Fractions and Decimals</b> Recurring decimals	<b>Transformations</b> Reflections, Rotations, Translations	<b>Transformations</b> Enlargements	<b>Transformations</b> Combining transformations Describing transformations	<b>Percentages</b> Percentage change	<b>Percentages</b> Repeated percentage change	<b>Percentages</b> Reverse percentages	<b>Catch Up</b>
<b>Cycle 3</b>							<b>Assessment Weeks</b>						
	<b>Graphs</b> Mid points Plotting graphs	<b>Graphs</b> Parallel and perpendicular lines $Y=mx+c$	<b>Graphs</b> Real life graphs	<b>Venn Diagrams</b> Relative frequency Expected outcomes	<b>Venn Diagrams</b> Sets and Venn Diagrams	<b>Venn Diagrams</b> Sets and Venn Diagrams	<b>Quadratics</b> Factorising and solving quadratics Forming quadratic equations	<b>Quadratics</b> Completing the square	<b>Quadratics</b> Quadratic formula Sketching quadratics	<b>Constructions</b> Constructions	<b>Constructions</b> Loci	<b>Constructions</b> Plans and elevations	<b>Catch Up</b>

## Y9 Foundation Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Cycle 1	Induction						Assessment Weeks						
		<b>Statistics</b> Charts and tables	<b>Statistics</b> Averages Stem and Leaf diagram	<b>Statistics</b> Stem and Leaf diagram	<b>Number</b> Place value	<b>Number</b> 4 - operations	<b>Number</b> Negative numbers	<b>Algebra</b> Simplifying algebra Index laws	<b>Algebra</b> Expanding and factorising	<b>Algebra</b> Substitution Proof by counterexample	<b>Converting Units</b> Distance	<b>Converting Units</b> Mass Capacity	<b>Converting Units</b> Speed
Cycle 2							Assessment Weeks						
	<b>Probability</b> Probability scale One event	<b>Probability</b> Listing outcomes Relative Frequency	<b>Probability</b> Frequency trees	<b>Fractions and decimals</b> Decimal calculations	<b>Fractions and decimals</b> Fraction calculations	<b>Fractions and decimals</b> FDP conversions	<b>Area and perimeter</b> Perimeter	<b>Area and perimeter</b> Area	<b>Area and perimeter</b> Area and circumference	<b>Ratio</b> Writing a ratio Simplifying a ratio	<b>Ratio</b> Sharing into a ratio Ratio and fractions	<b>Ratio</b> Ratio problems	<b>Catch Up</b>
Cycle 3							Assessment Weeks						
	<b>Sequences</b> Term to term rules	<b>Sequences</b> Nth term rule	<b>Sequences</b> Sequence problems	<b>Percentages</b> Percentages of an amount	<b>Percentages</b> <b>Percentage</b> increase and decrease	<b>Percentages</b> Percentage change Simple interest	<b>Number Problems</b>	<b>Number Problems</b>	<b>Number Problems</b>	<b>Proportion</b> Unitary method	<b>Proportion</b> Proportion problems	<b>Proportion</b> Best buys	<b>Catch Up</b>



## Y10H Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
<b>Cycle 1</b>	<b>Induction</b>						<b>Assessment Weeks</b>						
		1) Area and perimeter of compound shapes 2) Problem solving with area and perimeter 3) Problem solving with area and perimeter <b>Circles:</b> 4) Area of a circle 5) Circumference	1) Arc length 2) Area of sector 3) Compound area and circumference  <b>Unit 7b 3D forms</b> 4) SA of prisms 5) SA of cylinder	-1) Volume of prisms 2) Volume of a cylinder  <b>Unit 7c Accuracy and Bounds</b> 3) Upper and lower bounds 4) Error intervals 5) Truncation	1) Calculations with bounds 2) Problems solve with bounds (by considering bounds)  <b>Unit 8a Transformations</b> 3) Reflection and describing reflection 4) Translation and describing translation	1) Rotation and describing rotation 2) Enlarge and describe enlargements (positive and fractional) 3) Enlarge and describe enlargements (negative) 4) Perform multiple transformations (mixed) 5) Describe multiple transformations in one	<b>Unit 8b Construction</b> 1) Construct ASA, SAS and SSS triangles 2) Perpendicular bisector, from a point to a line, from a point on a line 3) Angle bisector, construct a 45, 60 and 90 degree angle 4) Draw front, side and plan elevations of a 3D shape; draw a sketch given the elevation	1) Draw and measure bearings 2) Bearings; lengths and real-life problems using maps and scales 3) Bearings with trigonometry 4) Locus of a point, line, angle 5) Apply knowledge of loci to worded problems including shading regions 6) Loci with bearings	<b>Unit 9b: Inequalities</b> 1) Draw and interpret inequalities on number lines, including finding integer values that satisfy 2) Solve linear inequalities 3) Solve compound inequalities 4) Draw graphical inequalities 5) Interpret graphical inequalities	<b>Unit 14a: Collecting Data</b> 1) Understand types of data - primary and secondary 2) Sampling and bias 3) Stratified sampling 4) Capture recapture	1) Interpret a c.f. graph (median, LQ, UQ, IQR and values less than/more than) 2) Find c.f. and draw a c.f. graph 3) Interpret box plots to find median, quartiles, range and IQR to draw conclusions 4) Box plots 5) Box plots	1) Interpret histograms with unequal class intervals 2) Construct histograms 3) Estimate the mean and median from a histogram <b>Unit 7b: Volume and surface area of non-prisms (substitution)</b> 4) Volume of pyramids 5) SA of pyramid	Catch up
<b>Cycle 2</b>		1) Find the nth term of a basic quadratic sequences 2) Find the nth term of quadratic sequences (harder) 2.5) Practice finding the nth term of a quadratic sequence 3) Factorise and solve quadratic equations 4) Factorise and solve quadratic equations in the form $ax^2 + bx + c = 0$ 5) Solve quadratics using the formula	1) Write in the form $(x+a)^2 + b$ (complete the square) 2) Solve by completing the square 3) Solve quadratic equations in any form link to shape <b>- Unit 9a: Simultaneous Equations</b> 4) Solve linear equations by elimination where neither, 5) Solve equations by substitution	1) Set up and solve from worded problems 2) Solve simultaneous equations graphically 3) Solve quadratic sim. equations without rearranging Inc integer/fractional/decimal solutions 4) Solve quadratic sim. equations with rearranging integer / fractional / decimal solutions 5) Solve linear and equation of circle	<b>Unit 10: Probabilities</b> 1) Calculate basic probabilities 2) Probabilities add to 1, probability tables 3) Listing outcomes, sample space 4) Product rule for counting including probability 5) Relative and expected frequency	1) Frequency trees 2) Two-way tables 3) Independent events including successive events 4) Tree diagrams for independent event 5) Conditional probability with tree diagrams	<b>Assessment Weeks</b> <b>Cycle 2 assessment</b>	1) Algebraic tree diagrams 2) Set theory notation 3) Venn diagrams 4) Conditional probability using Venn diagrams 5) Triple Venn diagrams	<b>Unit 15: Quadratics and Graphs</b> 1) Sketch a quadratic graph by factorizing or using the formula 2) Sketch a quadratic graph by completing the square 3) Identify roots, 4) Sketch graphs 5) Solve simultaneous equations	1) Solve quadratic inequalities including graphically 2) Shade regions for two or more inequalities on a graph 3) Shade regions for quadratic inequalities 4) Iteration with 5) Iteration	<b>Unit 11: Multiplicative Reasoning</b> 1) Use of multiplier for repeated proportion change 2) Compound interest and depreciation 3) Growth and decay 4) Converting units of length, area and volume 5) Speed, distance, time	1) Problem solve with speed, distance and time 2) Density 3) Density of multiple compounds 4) Pressure 5) Exchange rates	Catch up
	<b>Cycle 3</b>		<b>Unit 19a: Area under curve and tangent to curve:</b> 1) Estimate area under a graph 2) Calculate and interpret gradient of a graph ( <b>889</b> ) 3) Interpret gradient of real life graphs 4) Instantaneous rate of change 5) Recognize proportion graphs	<b>Unit 12: Similarity and Congruence</b> 1) Similar triangles/similar polygons 2) Areas of similar shapes 3) Volumes of similar shapes 4) Find missing length, area and volume in similar 3D solids	1) Congruence – use SSS, SAS ASA and RHS to prove congruence 2) Solve angle problems using similarity and congruence 3) Solve problems involving frustums of cones where you have to find missing lengths first using similar triangles.	<b>Unit 16a: Circle Theorems</b> 1) Identify and draw parts of a circle 2) Angle at the centre 3) the angle in a semicircle 4) Chords and perpendiculars 5) angles in the same segment are equal; 6) alternate segment theorem;1)	<b>Cycle 3 assessment</b>	<b>DIRT</b>	1) opposite angles of a cyclic quadrilateral sum to 180° 2) Find and give reasons for missing angles on diagrams <b>Unit 16b: Circle Geometry</b> 3) Construct graph of a circle using $x^2 + y^2 = r^2$ 4) finding the gradient of the radius that meets the circle at that point	1) finding the gradient of the tangent perpendicular to it 2) Find the equation of a tangent and radius <b>Unit 13a: Graphs of Trig Functions</b> 3) Transforming basic graphs 4) Exact trig values	1) Transform any graph by $f(x) + a$ and $f(x + a)$ 2) Transform any graph by $-f(x)$ and $f(-x)$ 3) Draw graphs of sin, cos and tan 4) Use trig functions to work out angles 5) Transformation of trig graphs by $f(x) + a$ and $f(x + a)$	1) Transformation of trig graphs <b>- Unit 13b: Further Trigonometry</b> 2) Sine rule to find lengths Sine rule to find angles 3) Cosine rule to find lengths Cosine rule to find angles 4) Area of a triangle $\frac{1}{2} ab \sin C$ 5) Sine or Cosine rule	1) Sine or Cosine rule with bearings 2) 3D Pythagoras 3) 3D Trigonometry finding sides and lengths 4) 3D Trigonometry finding sides and lengths



# Y10F Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
<b>Cycle 1</b>	<b>Induction</b>						<b>Assessment Weeks</b>						
		1) Converting metric units of lengths, mass 2) Converting metric units of mass and capacity 3) Find the perimeter of 2D shapes 4) Find the perimeter compound shapes 5) Find the area of shapes on a grid.	1) Find the area of a rectangle 2) Find the area of a triangle 3) Find the area of a trapezium (included shaded regions). 4) Find the area of a parallelogram (included shaded regions). 5) Find the area and perimeter of compound shapes.	1) 3D shape properties. 2) Nets of 3D shapes including finding surface area 3) Surface area of cuboids, 4) Surface area triangular prisms and 3D shape prisms. 5) Surface area cylinders	1) Volume of cuboid prisms. 2) Volume of triangular prisms. 3) Volume of cylinder 4) Volume of other prisms	1) Volume of all prisms. 2) Volume of compound shapes. 3) Plotting coordinates 4) Midpoint of coordinates	1) (OPTIONAL) 3d coordinates 2) Interpreting conversion diagrams. 3) Drawing conversion diagrams. 4) Distance Time Speed formula. 5) Problem solve speed	1) Interpret distance time graphs. 2) Draw distance time graphs. 3) Interpret and draw speed time graphs 4) Plotting linear graphs with positive gradients. 5) Plotting linear graphs with negative gradients.	1) Rearranging with linear graphs. 2) Finding the equation of a line from a graph 3) Finding the equation of a line from gradient and a point 4) Identifying parallel lines	1) Reflecting shapes and describing. 2) Rotating shapes and describing. 3) Translating 2D shapes. 4) Describing translations. 5) Positive enlargement on a grid	1) Positive and Fractional enlargement from a point 2) Describing enlargements 3) Describing Transformations. 4) Multiple / combinational transformations 5) Writing ratios and simplifying.	1) Ratios as fractions 2) Scale up a ratio 3) Write ratios in the form 1:n 4) Sharing ratios (including problem solving) 5) More than ratio problems 6) Comparing ratios	<b>Catch Up</b>
<b>Cycle 2</b>							<b>Assessment Weeks</b>						
	1) a:b to b:c 2) Fraction, ratio, and percentage problems 3) Recipes 4) Recipes problems (run out of ingredients) 5) Best Value 6) Scales (converting units)	1) Scales (maps) <b>Unit 11b: Proportion</b> 2) Direct Proportion 3) Direct proportion (really basic simultaneous equations) 4) Inverse proportion worded 5) 3-D Pythagoras'	<b>Unit 12: Pythagoras' Theorem and Trigonometry</b> 1) Finding the hypotenuse 2) Finding the shorter side 3) Worded Pythagoras' 4) Length of line segment 5) 3-D Pythagoras'	1) Trigonometry- labelling the sides and finding missing angles. 2) Trigonometry- finding missing angles. 3) Finding missing lengths. 4) Trigonometry mixed problems, angles of elevation and depression. (2)	1) and 2) Trigonometry and Pythagoras' mixed problems (2) <b>Unit 13: Probability</b> 3) probability scale. 4) listing events	1) and 2) sample space diagrams (2) 3) probability tables (1-p) 4) Relative frequency 5) Theoretical probability	1) Independent events 2) and 3) Probability tree diagrams Independent (2) 4) Conditional probability 5) Mixed tree diagrams lesson	1) Venn diagrams reading and completing 2) Venn diagrams set theory notation. <b>Unit 14: Multiplicative reasoning</b> 3) Distance Time Speed (recap if needed) and Change units of speed 4) Mass, density and volume. 5) Density problems	1) express an amount as a percentage and percentage change 2) percentage of an amounts (multiplier calculator method) 3) Percentage increase and decrease multiplier method 4) reverse percentages 5) compound interest	1) compound depreciation 2) exchange rates 3) Direct proportion 4) Inverse proportion 5) Direct and inverse proportion graphs	<b>Unit 15a: Plans and Elevations</b> 1) Draw circles, arcs and sectors 2) Draw and measure angles and lines 3) isometric drawings 832, 837- 4) 3d shapes – faces, vertices and edges 5) plans and elevations 6) Sketching solids	<b>Unit 15b: Constructions and Loci.</b> 1) Constructing triangles. 666, 683 2) Angle bisectors 661 3) Perpendicular bisectors. 660 4) Constructing other angles. 669	
<b>Cycle 3</b>							<b>Assessment Weeks</b>						
	1) Loci 2) Multiple loci 3) Bearings 4) Bearings 5) Loci and bearings	<b>Unit 16: Quadratic equations (expanding and factorising)</b> 1) Expand brackets (recap folder) or mixed lesson 2) Factorising expressions 3) Factorising quadratics 4) Solving quadratics by factorising. (2) 5) Linear graphs	1) Linear graphs and rearranging. 2) Quadratic graphs 3) Quadratic graphs roots, turning points, intercepts, line of symmetry 4) Quadratic graphs – find approximate solutions <b>Unit 17: Perimeter, Area and Volume 2.</b> 5) perimeter of compound shapes (recap)	1) Area of shapes recap 2) Parts of a circle, 3) Area of circle including in terms of pi 4) Circumference of a circle including in terms of pi 5) Arc lengths	1) Sector areas 2) Area compound circles 3) SA Cuboid Triangular prism -- Volume of all prisms 4) SA cylinder 5) Volume of a cylinder	<b>Revision</b>	<b>Cycle 2 Assessment</b>	<b>DIRT</b>		1) SA parts of cone 2) SA pyramid (substitution) 3) Volume of sphere (substitution) 4) SA of Sphere (substitution) 5) Volume of cone and pyramids (substitution)	1) Volume of composite solids. (substitution) <b>Unit 18a: Fractions</b> 2) Add and subtract mixed fractions 3) Multiply and divide including mixed fractions. 4) Reciprocal	1) Index laws power 0 and 1 2) and 3) Index Laws (multiplication, division) 4) Index laws brackets Mixed index laws	1) Fractional negative indices. 2) Writing large numbers in Standard form (2) 3) Writing small numbers in Standard form (2)