Year 10 Foundation ~ Curriculum Map for Maths

What are the intended aims for this year's curriculum? To start the GCSE Scheme of Work to build on topics learnt in year 9 and extend idea's further.

	Term 1	Aim of A&R	Term 2	Aim of A&R	Term 3	Aim of A&R	Term 4	Aim of A&R	Term 5	Term 6	Aim of EoY exam
	Topic(s): Number		Topic(s): Transformations and vectors Substitution and compound measures.		Topic(s): Angles Functions and Sequence		Topic(s): Shape Percentages		Topic(s): Solving Equations Data Handling	Topic(s): Ratio and Proportion Probability	
'Big idea(s)' / fundamental concepts	To carry out calculations using numbers written in a vareity of different forms including fractions, decimals and standard form		To carry out transformations To understand and use a variety of different formula		To find missing angles in different shapes using a variety of angle facts To find the nth term rule of different sequences and use it to find other terms in the sequence		Find the perimeter, area, surface area and volume of different shapes To calculate fluently with percentages		To set up and solve different types of equation. To calculate different averages and ranges and to represent data graphically.	To use ratio and proportion to find missing quantities To find a probability and use different types of probability diagrams to calculate the chance of two or more events occurring.	
Knowledge to be learnt	Revise HCF and LCM Revise PFD Revise equivalent fractions and four operations with fractions Calculate a fraction of amount Convert fractions to decimals and vice versa and ordering numbers Revise BIDMAS Revise four operations with decimal numbers Revise squares/cubes/roots and be able to write positive integer indices – Understand the laws of indices- include calculating with integer negative powers (eg 2-3) Revise using a calculator to work out complex calculations Revise writing numbers in standard form – including calculating with numbers in standard form both with and without a calculator Estimate answers by rounding use the ≈ symbol appropriately Use bounds to write down an error interval	No A & R Assessment	Recap drawing and describing reflections Recap drawing and describing rotations Recap drawing and describing translations Recap drawing and enlarging a shape given a scale factor Enlargement by a fractional scale factor Identifying single transformations Understand addition, subtraction and scalar multiplication of vectors Represent a 2D vector as a column vector and draw column vectors on a square or coordinate grid. Know the meaning of variable, term, expression, equation, formula and identity Substitute into expressions – include questions involving BIDMAS, substituting negative, decimal and fractional numbers with and without a calculator Substitute into more complex formulae – including powers, roots and algebraic fractions Substitute into Kinematic formulae – the formulae will be given, but students need to interpret the meaning of SUVAT (v= u + at, s = ut + ½ at² and v² = u² + 2as only) Use and substitute into compound measure formulae (SDT, FPA, DMV)- ensure students know how to put a time into their calculator and that they know how to put a mixed number into their calculator. Include questions where students have to convert units into the same format and questions where students must calculate the area and volume in order to use	Assess term 1	Know and use the properties of all types of triangles and quadrilaterals (including rectangles, parallelograms and trapeziums) Draw and measure angles Angles about a point, vertically opposite, on a straight line, in a triangle and in a quadrilateral Angles in parallel lines Prove two triangles are congruent using angles in parallel lines facts Plot points on a map given a bearing and a distance – links to scales and angles in parallel lines Find and use the sum of the interior angles of a polygon Find and use exterior angles in polygons Interpret a simple expression as a function with inputs and outputs and use function machines Generate a sequence by using a term-to-term rule of position-to-term rule Generate a sequence from a nth term rule Find the nth term rule of an arithmetic sequence Use the nth term rule to prove whether a number is a term in a sequence Recognise sequences of square, cube and triangular numbers	No A & R Assessment	Draw net, plans and elevations of 3D shapes Revise perimeter of a shape Revise area of rectangle, triangle, parallelograms and trapeziums Revise area of compound shapes - Understand and use circle key words Calculate the circumference and area of circles Calculate arc length and sector area Calculate the surface area and volume of spheres, pyramids, cones and simple composite solids Use and convert between standard units of measure for length, area and volume Convert between percentages, fractions and decimals Express one quantity as a percentage of another Calculate a percentage of an amount Calculate a percentage increase or decrease –ensure students are familiar with keywords such as depreciate and interest, include using multipliers *and questions involving step by step multipliers and repeated percentage change* *Calculate reverse percentages* Calculate simple interest, including in financial contexts *Calculate compound interest*	Review of Term 2 + 3 (40% each) and Term 1 (20%)	Solve one step equations Set up and solve two step equations Draw linear graphs and solve two linear simultaneous equations graphically *Set up and solve simultaneous equations algebraically* Expand and factorise single and double brackets *Set and solve quadratic equations* Find the roots of a quadratic equation graphically. Rearrange a formula to change the subject Recap finding mean, median, mode and range from a list Calculate averages and the range from an ungrouped frequency table, including stem and leaf diagrams *Calculate averages and the range from a grouped frequency table* Make simple comparisons Revise, bar charts, pictograms, vertical line charts if needed Revise designing tables to classify data if needed Identify graphical mis-interpretation Draw scatter diagrams and recognise correlation Draw and line of best fit by eye and use this to interpolate and extrapolate Identify outliers	Revise simplifying ratio – including where a metric conversion is required, and students are required to write the answers in the form 1:n Revise finding a missing part of a ratio Use ratios in best-buy and recipe problems Calculate one quantity from another, given the ratio of the two parts. Interpret a ratio of two parts as a fraction of a whole *Solve ratio problem which compare two ratios such as here is A:B and B:C, what is A:C* Find the missing sides of similar shapes – *including where one shape is within another and the scale factor is fractional.* Revise proportion including the unitary method *Solve questions involving direct or indirect proportion algebraically.* Recognise and interpret graphs that illustrate direct and inverse proportion Revise finding a probability as a fraction, a percentage, a decimal and the probability scale Use relative frequency as an estimate of probability Draw and use two-way tables and find a probability from it Draw frequency trees and find probability from it Draw tree diagrams with replacement	End of Year Exam approx 20% on each of term 1-5

		the formulae. Construct and interpret graphs in real world contexts – e.g. distance-time, money conversion, temperature conversion. Interpret straight line gradients as rates of change – e.g. gradient of a distance-time graph is velocity.	Recognise Fibonacci and quadratic sequence and simple geometric progressions		Interpret and construct time series Interpret and construct pie charts Understand sampling definitions Understand simple random sampling –	Draw a Venn Diagram List outcomes systematically given options *Understand set notation and use it to find a probability of a given event.* *Derive or informally understand and apply the formula P(A u B) = P(A)+P(B)-P(AnB)*
Key vocabulary	PFD, LCM, HCF, fractions, decimals. square, cube, roots, indices, integer, truncation, rounding, estimate, standard form	reflection, rotation, enlargement, translation, transformation, scale factor, coordinate, vector, scalar substitute, power, root, kinematic, speed, distance, time, force, pressure, area, mass, density, volume.	acute, obtuse, reflex, quadrilateral, polygon, co-interior, alternate, corresponding, congruent, interior, exterior, regular, sum, bearing. function, input, output, sequence, arithmetic, geometric, quadratic, term-to-term, n-th term.	plan, elevation, perimeter, area, polygon, parallelogram, trapezium, kite, rhombus, tangent, arc, sector, segment, arc length, circumference, radius, diameter, cuboid, sphere, pyramid, prism, cone, volume percentage, increase, decrease, depreciate, interest, simple, compound, annum.	solve, equation, unknown, substitute, expand, factorise, linear, point of intersection, quadratic, reciprocal, root. mean, median, mode, range, frequency, sum, correlation, interpolate, extrapolate, outlier, pie chart, time series, key.	ratio, proportion, unitary, simplify likely, unlikely, probability, frequency, event, outcome, fair, random, impossible, equal chance, certain, AND, OR, NOT.
The role of reading and comprehension	To understand the difference between evaluate, calculate and estimate	To describe different combinations of transformations. To substitute into different formulae, ensuring that consistent units are used and the rules of BIDMAS are followed. To interpret real-life graphs.	To use the correct mathematical names for different 2D shapes	To use the correct mathematical names for shapes and parts of shapes and to decode real-life worded questions such as calculating the cost to paint a room. To understand a variety of different words that means increase/decrease (such as depreciate) and to understand the subtle differences in a question where you are being asked to calculate a percentage increase/decrease and those in which you are given the increase/decrease and you have to find the original.	To convert a worded question into an algebraic question to solve.	To decode questions and to comprehend subtle difference in mathematical questions such as 'and,' 'or,' and 'not.'
The role of independent extended writing	N/A	N/A	N/A	N/A	N/A	N/A
The role of maths/ numeracy	In all the above	In all the above	In all the above	In all the above	In all the above	In all the above
Links to careers/ aspirations	Prime numbers are used in cryptography, encryption and computer security. Science based careers used standard form. Bounds are used in engineering and manufacturing. Chefs convert between fractions and decimals (eg ounces to KG)	Tiling, art and design, graphic design including computer animation. Vectors are used in physics	Navigation, air traffic control, plumbers, computer programming, cryptography	Architects, builders, manufacturing industry, painters and decorators Any retails industry or anything where a sale occurs. Nutritionists, finance, statistics, biology, hairdressing (mixing dye). Real life application to mortgages, credit cards etc	Construction workers, taxi drivers, financial modelling, chemistry Business modelling, Government feedback, Pharmaceutical industry, science, journals	Ratios are using in baking, betting and mixing paint/cement etc Banking and finance use ratios in mortgages, stocks and loan. Surveyors, architects and cartographs. Probabilities are used by statisticians, meteorologists and financial analysts. They are also used in medicine and farming.
Core skills *A skill is a performance built on what a person knows*	To carry out all four operations with fractions and decimals and to convert freely between the two. To carry out calculations involving powers and to understand index laws. To understand place value and the effect of multiplying and dividing by multiple of 10 and consequently be able to carry	To be able to manipulate shapes by reflecting, rotating, translating and enlarging them and to describe different transformations. To substitute into a variety of formula, ensuring that the units are consistent and rearranging where appropriate. To interpret real-life graphs.	To measure angles and to use a variety of angle facts to find a missing angle. To draw and measure bearings. To recognise different types of sequences. To use the nth term rule to generate a sequence and to find the nth term rule when given a sequence and use it to find missing terms.	To calculate the perimeter of a variety of different shapes. To calculate the area, surface area and volume of a variety of different shapes by selecting and substituting into the correct formula, finding missing lengths where required and ensuring units are consistent. To convert fluently between fractions and percentages. To calculate percentages increase and decreases	To set up and solve equations to find unknowns algebraically. To set up and solve equations graphically. To rearrange equations. To find averages and the range from data presented in different ways.	To use ratios or proportion to find a missing quantity, including working out exchange rates, recipe changes and best buys. To calculate a probability and use different statistical diagrams to find the probability of two or more event occurring.

	out all four operations with numbers written in standard form To be able to round numbers to different levels of accuracy to to understand the limitations of this and when it is appropriate to round up or down. To use rounding to estimate answers.				using a variety of methods and to find the original amount.		To draw and interpret different statistical diagrams.	
Dept. enrichment activities		Use of practical activities to measure distance, time and speed.						
Home learning opportunities	Estimate different calculations, such as the cost of the shopping. Research standard forms.	Research tesselation art, can you describe what transformation has happened to the shapes? Can you draw your own? Questions sometimes involve real life examples such as standing charges in gas/electric bills. Discuss different bills with you child such as gas/electric/mobile phone/water bills and make sure they are familiar with them.		Name different 2D shapes around the house and calculate the area or perimeter. Walk around the perimeter of the garden	Name different 3D shapes around the house and calculate the surface area/volume of different shapes around the house such as tins or cereal boxes. Look at percentages in real-life context. Can you calculate the reduction in a 10% off sale? Look at mortgage rates, credit cards, finance arrangements, interests rates, inflation, price index numbers with your child and discuss what these mean.	Can you find missing values? Look at a receipt, can you child find the missing number if you cross out one of the prices? Think of a number, carry out some operations and tell your child the answer. Can they work out what number you started with? EG I am thinking of a number, I add 2 and multiply it by 5 and my answer is 20, what number did I start with? Look at different statistical diagrams (you can find these in newspapers or online articles, can you discuss what they mean?	Cook with your child, can they adjust the recipe for more or less people? Look at exchange rates in travel agents, can you work out how many dollars etc you would get for £500? What is commission? Why is the exchange rate from pounds to a foreign currency different from the one from a foreign currency into pounds? Mix primary coloured paints in different ratios, what is the result? Play cards with your child, it is helpful if they are familiar with what a deck looks like. Play any board game that involve a dice.	