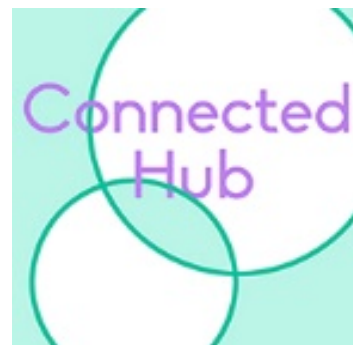# Curriculum Map

Mathematics

Curriculum Map for Mathematics 2020/2021

This is an overview of the years study and incorporates the functional mathematics skills as well as the GCSE syllabus. Students follow varying paths depending on their individual needs. Activities are differentiated depending on previous knowledge and application of skills. Activities are broken down into small chunks and there are various activities to learn the objectives depending on students' areas of interest and favoured ways of learning. (RAG sheets are used regularly by students at the beginning and end of lessons giving student's autonomy over assessment of their own learning and so they can clearly see where they have made progress) Running alongside the differentiated syllabuses are individualised programmes of study to support students to achieve their individual targets which they have input in setting and to make good progress.

Year 11 Autumn Term Functional skills	Aims/Objectives/Knowledge	Skills	Understanding
● introduce students to new areas of life and work so that they are exposed to concepts and problems which, while not of immediate concern, may be of value in later life; and ● enable students to develop an appreciation	**Using numbers and the number system – whole numbers, fractions, decimals and percentages** Learners at Level 1 are expected to be able to count in steps of various sizes, including negative numbers; and read, write and understand positive whole numbers to one million. They can order and compare whole numbers of any size, and fractions, ratios and decimals, and recognise the effect of multiplying and dividing by powers of 10, 100 and 1000. They can identify, compare and extend a range of numerical and spatial patterns, use, understand and calculate with fractions, decimals and percentages and calculate simple interest. **Using common measures, shapes**	**Using numbers and the number system – whole numbers, fractions, decimals and percentages** Level 1 1 Read, write, order and compare large numbers (up to one million) 2 Recognise and use positive and negative numbers 3 Multiply and divide whole numbers and decimals by 10, 100, 1000 4 Use multiplication facts and make connections with division facts 5 Use simple formulae expressed in words for one or two-step operations 6 Calculate the squares of one-digit and two-digit numbers 7 Follow the order of precedence of operators 8 Read, write, order and compare common fractions and mixed numbers 9 Find fractions of whole number quantities or measurements 10 Read, write, order and compare decimals up to three decimal places 11 Add, subtract, multiply and divide decimals up to two decimal places 12 Approximate by rounding to a whole number or to one or two decimal places 13 Read, write, order and compare percentages in whole numbers	Students can – ● demonstrate a sound grasp of the underpinning skills and basics of mathematical skills appropriate to the level, and ● apply mathematical thinking to solve simple problems in familiar situations. Functional Mathematics skills at these levels, level1 and level 2 should - * indicate that students can demonstrate their ability in mathematical skills and their ability to apply these, through appropriate reasoning and decision making, to solve realistic problems of

of the role played by mathematics in the world of work and in life generally.	**and space** Learners at Level 1 are expected to be able to work out simple relationships between common units of measurement to define quantities, also involving mathematical terms for position and direction. They can apply and use calculations with common measures including money, time, length, weight and capacity. They can visualise, draw and describe 2-D and 3-D shapes and use properties of 2-D shapes in calculations. **Handling information and data** Learners at Level 1 are expected to be able to select, construct and interpret a range of statistical diagrams in various contexts; select and use methods and forms to present and describe outcomes. They can extract and interpret information from tables, diagrams, charts and graphs; apply simple statistics and recognise features of charts to summarise and compare sets of data; recognise and use the probability scale and interpret probabilities.	14 Calculate percentages of quantities, including simple percentage increases and decreases by 5% and multiples thereof 15 Estimate answers to calculations using fractions and decimals 16 Recognise and calculate equivalences between common fractions, percentages and decimals 17 Work with simple ratio and direct proportions **Using common measures, shapes and space** 18 Calculate simple interest in multiples of 5% on amounts of money 19 Calculate discounts in multiples of 5% on amounts of money 20 Convert between units of length, weight, capacity, money and time, in the same system 21 Recognise and make use of simple scales on maps and drawings 22 Calculate the area and perimeter of simple shapes including those that are made up of a combination of rectangles 23 Calculate the volumes of cubes and cuboids 24 Draw 2-D shapes and demonstrate an understanding of line symmetry and knowledge of the relative size of angles 25 Interpret plans, elevations and nets of simple 3-D shapes 26 Use angles when describing position and direction, and measure angles in degrees **Handling information and data** 27 Represent discrete data in tables, diagrams and charts including pie charts, bar charts and line graphs 28 Group discrete data and represent grouped data graphically 29 Find the mean and range of a set of quantities 30 Understand probability on a scale from 0 (impossible) to 1 (certain) and use probabilities to compare the likelihood of events 31 Use equally likely outcomes to find the probabilities of simple events and express them as fractions	increasing complexity. Problem Solving Learners at Level 1 are expected to be able to: 1. read, understand and use mathematical information and mathematical terms used at this level; 2. recognise and obtain a solution or solutions to a straightforward problem 3. use knowledge and understanding to a required level of accuracy; 4. analyse and interpret answers in the context of the original problem; 5. check the sense, and reasonableness, of answers; and 6. present results with appropriate explanation and interpretation demonstrating simple reasoning to support the process and show consistency with the evidence presented.

Using numbers and the number system – whole numbers, fractions, decimals and percentages Learners at Level 2 are expected to be able to use numbers of any size; read, write and make use of positive and negative integers of any size; use, order and compare integers, fractions, decimals, percentages and ratios as well as recognise the value of a digit in any whole or decimal number. They can use numerical and spatial patterns for a purpose and calculate with, and convert between, numbers written as fractions, decimals, percentages and ratios. See below for specific content on numbers and the number system. **Using common measures, shape and space** Learners at Level 2 are expected to be able to handle relationships between measurements of various kinds, use angles and coordinates when involving position and direction and make use of geometric properties in calculations with 2-D and 3-D shapes and understand the relationships between them. **Handling information and data**	Level 2 **Using numbers and the number system – whole numbers, fractions, decimals and percentages** 1 Read, write, order and compare positive and negative numbers of any size 2 Carry out calculations with numbers up to one million including strategies to check answers including estimation and approximation 3 Evaluate expressions and make substitutions in given formulae in words and symbols 4 Identify and know the equivalence between fractions, decimals and percentages 5 Work out percentages of amounts and express one amount as a percentage of another 6 Calculate percentage change (any size increase and decrease), and original value after percentage change 7 Order, add, subtract and compare amounts or quantities using proper and improper fractions and mixed numbers 8 Express one number as a fraction of another 9 Order, approximate and compare decimals 10 Add, subtract, multiply and divide decimals up to three decimal places 11 Understand and calculate using ratios, direct proportion and inverse proportion 12 Follow the order of precedence of operators, including indices **Common measures, shape and space** 13 Calculate amounts of money, compound interest, percentage increases, decreases and discounts including tax and simple budgeting 14 Convert between metric and imperial units of length, weight and capacity using a) a conversion factor and b) a conversion graph 15 Calculate using compound measures including speed, density and rates of pay 16 Calculate perimeters and areas of 2-D shapes including triangles and circles and composite shapes including non-	Learners at Level 2 are expected to be able to: 1. read, understand, and use mathematical information and mathematical terms; 2a. identify suitable operations and calculations to generate results; 2b. recognise and obtain a solution or solutions to a complex problem 3. use knowledge and understanding to a required level of accuracy; 4. analyse and interpret answers in the context of the original problem; 5. check the sense and reasonableness of answers; and 6. present and explain results clearly and accurately demonstrating reasoning to support the process and show consistency with the evidence presented. During this term students have an opportunity to take the Functional skills mathematics exam at the appropriate level.

Learners at Level 2 are expected to be able to construct, interpret and evaluate a range of statistical diagrams. They can calculate and interpret probabilities. They can calculate, analyse, compare and interpret appropriate data sets, tables, diagrams and statistical measures such as common averages (mean, median, mode) and spread (range), and use statistics to compare sets of data. They can identify patterns and trends from data as well as recognise simple correlation.

rectangular shapes (formulae given except for triangles and circles)
17 Use formulae to find volumes and surface areas of 3-D shapes including cylinders (formulae to be given for 3-D shapes other than cylinders)
18 Calculate actual dimensions from scale drawings and create a scale diagram given actual measurements
19 Use coordinates in 2-D, positive and negative, to specify the positions of points
20 Understand and use common 2-D representations of 3-D objects
21 Draw 3-D shapes to include plans and elevations
22 Calculate values of angles and/or coordinates with 2-D and 3-D shapes

Handling data and information
23 Calculate the median and mode of a set of quantities
24 Estimate the mean of a grouped frequency distribution from discrete data
25 Use the mean, median, mode and range to compare two sets of data
26 Work out the probability of combined events including the use of diagrams and tables, including two-way tables
27 Express probabilities as fractions, decimals and percentages
28 Draw and interpret scatter diagrams and recognise positive and negative correlation.

Year 11 Spring Term GCSE	Aims/Objectives/Knowledge	Skills	Understanding
	Unit 1. Groundwork Number – This unit focuses on the numerical skills required throughout the GCSE course.	(N1, N2, N3, N4, N5, N6, N10, N12)	Red, Amber, Green RAGs evaluation of skills/learning objectives for each area/topic at the beginning and end of the week or in some cases the beginning and end of a lesson. Learning objectives are evaluated by students themselves.
	Unit 2. Groundwork Statistics – This unit focuses on all the statistical skills required throughout the GCSE course.	(S2, S5)	
	Unit 3. Groundwork Geometry This unit focuses on the geometry skills required throughout the GCSE course.	(G1, G3, G4, G11, G12, G14, G16)	Understanding of the knowledge and skills is also evaluated through teacher assessment throughout each lesson through tasks completed individually and as a group.
	Unit 4. Groundwork Algebra – This unit focuses on the algebraic skills required throughout the GCSE course	(A1, A2, A5, A8)	
	Percentages and Converting Fractions, Decimals and Percentages	(N12, N13, R9, R16)	Assessment questions are used throughout the learning to check understanding of objectives and related vocabulary. At the end of each topic, questioning and exam style questions are used to evaluate learning. During this term student's take their mock exams formally and also have the opportunity to
	Indices and Roots	(N7, N9)	
	Algebraic Manipulation	(A3, A4)	
	Equations and Inequalities	(A17, A22)	
	Probability and Probability of Combined Events	(N1, P1, P2, P3, P4, P5) and (P6, P7, P8)	
	Scatter Graphs (Bivariate data) and Straight-Line Graphs	(S6) and (A7, A9, A10, A12, A17, R11, R14)	

	Angle Properties in Shapes and Angles in Triangles, Quadrilaterals, Straight Lines and Polygons.	(G5, G6, G19)	complete past papers and mock practice papers in class or 1 to 1 in a quiet space.
	Accuracy	(N14, N15, N16)	Students also have another opportunity to sit functional skills exam at the appropriate level.
	Real-Life Graphs	(A7, A9, A10, A12, A17, R11, R14)	
	Quadratics and Quadratic Graphs	(A4, A18) and (A11, A18)	
	Sequences	(A23, A24, A25)	
	Circles and Constructions	(G9, G16, G17, G18, N8) and (G2, G13, G15)	
	Ratio and Compound Measures	(R1, R3, R4, R5, R6, R7, R8, R10, R11, N11, N13)	
	Proportion	(R11, R13)	
	Solving Equations and Simultaneous Equations	(A19, A21)	
	Pythagoras' Theorem		
	Statistical Graphs and Measures	(G20)	
	Transformation of Shapes and Vectors	(S2, S4)	
		(G7, G24, G25, R2)	
	Volume and Surface Area	(G16, G17)	

Year 11 Summer Term

Revision – revision sessions differentiated and individualised for each individual students' needs. Revision sessions can be both on and off site and are with a maximum of 2 students. Revision sessions run up to and during the GCSE exams.

Students also have opportunities to gain their functional skills qualification at the appropriate level.