KEY STAGE 3 Subject Information for Mathematics

For more information, please consult: M Woolley

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Learning Aims / Learning Objectives

The Key Stage 3 Mathematics course is designed to enable all students to progress with fully differentiated resources, to allow students to build on prior knowledge from Key Stage 2 and develop their knowledge, skills and particularly their problem solving abilities. All students will consolidate and embed their learning with practice questions and worked examples. There is a focus on problem solving embedded within the scheme of learning and more explicitly with examples and problem solving activities led by the teacher.

What will I be learning and progressing to each year?

Year	Key Knowledge	Key Skills	Key Vocabulary
7	**Term 1** **Calendar, Time, Money,** **Positive and Negative Numbers,** **Place Value**	**Term 1** **Carry out calculations using time and money.** **Adding and Subtracting positive and negative numbers, Multiplying and Dividing Negative Numbers** **Multiplying by 10,100,1000, 10000, ordering Decimals,**	**Vocabulary and Glossary can be found in the Text books on the Collins Connect Website – all Y7-Y8 Students have access to this.** **A Printable maths dictionary can be found here. DICTIONARY**

	Square Numbers, Rounding, Order of Operations, Short and Long Multiplication, Short and Long Division, Units of measure Calculations with measures, **Term 2** **Function Machines, Square Numbers, Triangular Numbers, <u>nth term of a linear sequence</u>** **Length, Perimeter, Area of Squares and Rectangles, Compound Shapes, <u>Area of Triangle, Parallelogram, Trapezium,</u> volume of cubes and cuboids** **Name solids and shapes and knowledge of properties of solids and shapes.** **Know the compass points, names of angles and their properties, angle facts; angles at a point on a line, angles around a point, angles in a triangle and quadrilateral, <u>angles between parallel lines.</u>** **Line Symmetry, Rotational Symmetry, Reflections, Tessellations** **Term 3** **Expressions and Formulae** **Co-ordinates, Mappings and straight line graphs. Graphs in the real world** **Inverse operations**	**Estimating, Adding, Subtracting, Multiplying and Dividing Decimals** **Be able to carry out calculations and problems in context by rounding and estimating, and then by careful calculations including problems that involve units of measure** **Term 2** **Use Function machines to generate sequences, recognise how a sequence develops from term to term and to be able to calculate missing terms. <u>To be able to work out the nth term of a linear sequence.</u>** **To be able to use units of measure and calculate perimeter, area of squares and rectangles, and compound shapes made from squares ad rectangles triangles, parallelograms and trapeziums. To be able to calculate volume of cubes and cuboids and be able to problem solve with perimeter, area and volume.** **Use knowledge of solids and shapes to draw nets and use nets to construct 3D solids**	

	Term 4 **Recognise a fraction and equivalent fractions, recognise improper fractions and mixed numbers.** **To know key fraction, decimals and percentage equivalents, Find the fraction of or percentage of an amount.** **What is ratio, simplifying ratio, sharing in a ratio, ratios and fractions, <u>problem solving with ratio</u>** **Term 5** **Mode, median, mean and range, bias, tables, graphs and charts** **Language of probability, probability scales, know the difference between theoretical probability and experimental probability. <u>Know how to calculate probability of combined events.</u>** **Pie charts, median, mode, mean and range,** **Term 6** **Knowing parallel and perpendicular lines. Knowing angle facts about triangles and quadrilaterals. Translations and Rotations and**	**To be able to measure and draw angles, calculate angles, use properties of triangles and quadrilaterals to solve angle problems and use knowledge of <u>corresponding and alternate angles</u> to solve angle problems.** **To be able to recognise symmetry and draw a reflection, recognise order of rotation, recognise tessellations and draw them.** **Term 3** **To be able to simplify expressions, substitute values for letters in expressions, substitute values for letters in formulae to solve problems, t be able to write formulae in order to solve a problem.** **To be able to read and plot co-ordinates, to recognise equations of horizonal and vertical lines, to plot and recognise the equation of lines y=ax. To plot lines by creating co-ordinates using a mapping. to plot and recognise lines in the form of x+y=a. To read and real world graphs.**	

	<u>Enlargements</u>. Constructions of line and angle bisectors. To understand the concept of congruent and similar shapes. **Probability scales, mutually exclusive events, collecting data, mixed events, sample spaces and experimental probability.** **Fibonacci Sequence, Algebra and Function Machines and making a sequence from the nth term and calculating the nth term** **<u>The concept of congruency, congruent triangles</u>** **Note Key Knowledge and Skills for the most able is <u>underlined</u> and least able in *italics***	**Finding Unknown numbers from a problem, Solving Equations using reasoning, by using a balance method, complex equations using two steps, setting up and solving equations to solve a problem.** **Term 4** **Identify and use equivalent fractions to compare fractions and carry out addition and subtraction of fractions. To be able to transfer between mixed numbers and improper fractions so that addition and subtraction can be carried out between and number.** **To be able to transfer between fractions decimals and percentages, to recognise the similarity between fractions and percentages and be able to calculate a fraction or a percentage of an amount in the most efficient way. Use percentage of an amount to find the percentage increase or decrease.** **To be able to make a link between common factors and equivalent ratios, to be able to solve a variety of skills involving ratio by dividing into a given ratio.**	

		Term 5 **Collecting, Reading and interpreting data, grouping data, <u>understanding and using discrete and continuous data</u>.** **Use probability language to describe events. Be able to mark the probability of an event on a probability scale, carry out experimental probability and compare it to theoretical probability and be able to explain the differences. <u>Students investigate the outcomes of more than one event and be able to use an appropriate method to calculate the probability of two evets happening at the same time.</u>** **To be able to construct and interpret a pie chart.** **To look at data and calculate mean, median mode and range and use these to form conclusions about the data. To carry out a statistical survey.** **Term 6** **To be able to solve angle problems between parallel lines. To be able to use angle**	

		facts and properties of shapes to solve problems. To be able to rotate, translate and <u>enlarge</u> shapes. To be able to construct angle and line bisectors. To be able to <u>prove</u> that the angles of a triangle add to 180 degrees To be able to argue position on a probability scale. Understand and apply mutually exclusive events. To be able to collect data for a probability experiment. To understand and use sample spaces to calculate the probability of an event. Note Key Knowledge and Skills for the most able is <u>underlined</u> **Identifying a Fibonacci sequence. To be able to generate a sequence from a rule. To find the nth term of a linear sequence.** **<u>To understand and recognise congruent shapes. To apply ASA, SAS, SSS, and RHS to triangles. To problem solve using congruency.</u>**	
	Link to knowledge organiser here **Year 7 Giles Maths Knowledge Organiser**	**Link to homework here** **Mathswatch** **Collins Connect** **Giles App** **Worksheets or Exercise set by teacher in homework book**	**Link to full Y7 vocabulary here** https://www.mathsnetgcse.com/index.php?ref=VOCABULARY
	The content of your curriculum in this academic year for your subject		

Term 1 Autumn 1	**Term 2 Autumn 2**	**Term 3 Spring 1**
a) Using Numbers, **b) Decimal Numbers,**	**a) Sequences** **b) Perimeter, Area and Volume**	**a) Using Algebra** **b) Co-ordinates and Graphs**

	c) Working with Numbers	c) 3D Shapes d) Angles e) Symmetry	c) Solving Equations
	Term 4 Spring 2 a) Fractions b) Percentages c) Ratio	Term 5 Summer 1 a) Statistics b) Probability c) Interpreting Data	Term 6 Summer 2 a) Geometry b) Probability c) Sequences d) congruency

Year	Key Knowledge	Key Skills	Key Vocabulary
8	**Term 1** Four operations with negative numbers. HCF, LCM, squares, cubes and roots, prime factors Place value and powers of 10, rounding to significant figures and estimating calculations using rounding. Understand place value of decimals. To use place value and powers of 10 to write large numbers in standard form. To multiply large numbers in standard form Collect like terms of algebraic expressions, expand brackets and use powers in algebraic expressions. Solving Equations using inverse operations, solving equations with brackets, solving equations with unknowns on both sides, substituting and rearranging formulae **Term 2** Area of; squares, rectangles, parallelograms, triangles, trapeziums. Surface area and volume of cubes, cuboids and prisms Understand congruency, enlargement, scale and ratio, scale	**Term 1** To be able to add, subtract multiply and divide negative numbers. To be able to identify factors and highest common factors, lowest common multiples and prime factors and use them to solve problems. To be able to identify or calculate square numbers and their roots and cube numbers. To be able to use place value to round and use rounding to estimate. To be able to problem solve with decimal numbers. To be able to transfer between large numbers and standard form. To carry out multiplications in standard form. To collect like algebraic terms, multiply terms including answers that give powers and expand a single term over a bracket Solve a variety of algebraic equations, substitute into formulae ad and rearrange	Vocabulary and Glossary can be found in the Text books on the Collins Connect Website – all Y7-Y8 Students have access to this. A Printable maths dictionary can be found here. DICTIONARY

	diagrams. Ratio of lengths area and volume. **Know the parts of a circle, how to calculate circumference and area of a circle.** **Term 3** **Percentage of, percentage increase / decrease and percentage change** **Four operation with fractions, multiply and divide decimals.** **Direct and inverse proportion, proportion on graphs, comparing proportions** **Term 4** **Co-ordinates, straight line graphs, quadratic graphs, distance time graphs, real life graphs.** **Data from charts, Pie Charts, Scatter graphs.** **Data in frequency tables, frequency diagrams, mean median, mode.** **Term 5** **Expanding brackets and collecting like terms, more than one variable in expressions, factorising expressions, solving equations with brackets and fractions, rearranging formula** **Scatter graphs, two-way tables and correlation, cumulative frequency**	**formulae Problem solve using algebra.** **Term 2** **To be able to calculate the area using calculations and understanding the formulae. To understand the concept of volume and surface area.** **Use measurements to produce a ratio sale. Read and use scale drawings, recognise and interpret map ratios.** **Understand how does length scale affect area and volume scale.** **Recall the parts of a circle, use the formulae to calculate the circumference and area of a circle, use the formulae to calculate the radius given the circumference or area. Problem solve with circles for example the perimeter of a semi-circle.** **Term 3** **To be able to calculate the percentage of and increase and decrease, to look at data and calculate a percentage change, e.g. a population increase.** **To be able to carry out four operations using fractions and mixed numbers and multiply and divide with decimals.** **To understand the concept of direct and indirect proportion, read graphs that show proportion, e.g. exchange rates** **Term 4**	

	Step Graphs Time Graphs, Exponential growth graphs, continuous and discrete data. ***Circumference and area of circles*** **Term 6** ***Enlargements*** **Pythagoras theorem** **Decimal numbers, place value, multiplication and division, standard form for small numbers and calculations with standard form. Surface Area and Volume of cubes and Cuboids, Prisms and Cylinders**	**To be able to plot co-ordinates, create co-ordinates by following rules, recognise plot and interpret straight line and quadratic graphs. Interpret time distance graphs and real-life graphs.** **Read data, use data to create and interpret pie charts and scatter graphs.** **Read frequency charts, use frequency charts to draw frequency diagrams and calculate averages. To be able to decide which is the most appropriate measure of average to use.** **Term 5** **To be able to use convectional rules of algebra manipulating expressions and solving equations.** **To draw scatter graphs, two way tables and <u>cumulative frequency graphs</u> to compare two sets of data and draw conclusions.** **To be able to understand the difference between continuous and discrete data and draw and interpret appropriate graphs for the data.** ***To be able to solve problems calculating the circumference and area of circles*** **Term 6**	

		Enlarge shapes by a given scale factor and centre of enlargement. **To apply Pythagoras theorem to finding missing sides on right angled triangles.** **To be able to carry out multiplication and division problems for decimal umbers and small numbers in standard form** **To be able to calculate volume and surface area of cubes, cuboids, prisms and cylinders.**	
	Link to knowledge organiser here **Year 8 Giles Maths Knowledge Organiser**	**Link to homework here** **Mathswatch** **Collins Connect** **Giles App** **Worksheets or Exercise set by teacher in homework book**	**Link to full Y8 vocabulary here** https://www.mathsnetgcse.com/index.php?ref=VOCABULARY

The content of your curriculum in this academic year for your subject

Term1 Autumn 1 **a) Working With Numbers** **b) Simplifying Numbers** **c) Algebra** **d) Formulae and Equations**	**Term 2 Autumn 2** **a) Area of 2D and 3D shapes** **b) Congruence and Scaling** **c) Circles**	**Term 3 Spring 1** **a) Percentages** **b) Fractions and Decimals** **c) Proportion**
Term 4 Spring 2 **a) Graphs** **b) Interpreting Data** **c) Using Data**	**Term 5 Summer 1** **a) Equations and Formulae** **b) Using Data** **c) Applications of Graphs** **d) *Circles***	**Term 6 Summer 2** a) **Pythagoras Theorem** b) ***(Enlargements)*** c) **Decimal Numbers** d) **Surface Area and Volume of 3D Shapes, Prisms and Cylinders**

How will my work be assessed? / assessment components / frequency / term	
Y7	**All year 7 Students and mid year admissions will have a base line assessment, then there are three summative assessments in weeks 9, 22 and 35. Teachers will also give students topic test, these could be written or on line using Collins Connet or Maths Watch at the end of topics. Students will have opportunities to prepare for assessments and topic tests, afterwards students will go through their assessments or topic tests to identify and address misconceptions.**

Y8	**There are three summative assessments in weeks 9, 22 and 35. Teachers will also give students topic test, these could be written or on line using Collins Connet or Maths Watch at the end of topics. Any mid year admissions will have a base line assessment. Students will have opportunities to prepare for assessments and topic tests, afterwards students will go through their assessments or topic tests to identify and address misconceptions.**

Extra-curriculum activities / Trips / Community cohesion / Events participation

Junior Maths Challenges
Uno Club

What qualifications and career paths this subject will enable me to access in KS4? KS4 option subjects / Career Paths

GCSE Mathematics then either A level Mathematics or Level 3 Certificate in Mathematics. All science, social science, engineering, nursing will require Mathematics. Most Level 2 course at College and Sixth form will require at least GCSE grade 4 for entry.

How parents or other members of the public can find out more about the curriculum your subject is following

KS3 Program of study
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/239058/SECONDARY_national_curriculum_-_Mathematics.pdf

Collins KS3 Frameworking Course
https://collins.co.uk/pages/secondary-maths-maths-frameworking

Gifted Maths resources
https://nrich.maths.org/

gilesacademy