Newport Girls' High School **Y7-11 Learning Overview**

Subject:	Mathematics	**Lead Teacher:**	Mrs C Petford	**Year:**	8

Curriculum organisation

Students are taught in mixed groups of 30 for **three** hours per week. They are not grouped by ability.

Overview of Topics & Key Information

Term	Unit(s) of Work	Key Enquiry Questions	Key Content/ Terminology	Skills developed
Autumn Term	• Sequences • Equations, expressions and formulae • Percentages • Circles • Pythagoras' Theorem • Multiplicative reasoning • Ratio and proportion • Prisms and cylinders	• How does the nth term of a linear sequence relate to the terms of the sequence? • What are the differences between arithmetic, geometric and Fibonacci-type sequences? • How many different ways can you manipulate an expression? • Can you form an equation for this problem and can you solve it? • What are the similarities and differences between an inequality, an equation and an expression? • How can you check your answer to an equation? • Expand (x+1)(x-3) • Rearrange the formula for area of a circle to make r the subject • How can you use multipliers to increase an amount by a percentage? • What do you notice when you increase an amount by 20% then decrease this by 20%?	• Arithmetic sequences, other types of sequences • Working with letter symbols, expanding brackets, factorising expressions, rearranging formulas, solving equations including unknowns on both sides and brackets, expanding brackets • Working with percentages, multipliers and reverse percentages • Circumference and area of circle • Pythagoras' Theorem • Percentage increase and decrease, percentage change • Ratio and proportion, conversion graphs, best buys • Working with ratios, direct proportion and inverse proportion • Volume & surface area of prisms	• Finding missing terms of sequence, finding the nth term of an arithmetic sequence, recognise the difference between arithmetic, geometric and Fibonacci-type sequences • Simplifying, expanding and factorising expressions, number machines, rearranging formulas, solving equations and inequations including unknown on both sides and brackets, solving equations with fractions, know & apply index laws with algebraic expressions, expand double brackets • Calculate percentages of a quantity, percentage increase/decrease, interest, using multipliers, find the original amount given the amount after a percentage increase/decrease • Parts of a circle, circumference and area of circle • Apply Pythagoras' theorem • Share a quantity in a given ratio, direct proportion, conversion graphs • Equivalent ratios, using directly proportional and inversely proportional relationships and finding formulas • Find the volume and surface area of a prism, find the volume of cylinder

How will your child be learning?

- Whole class discussion
- Pair work
- Problem-solving tasks
- Independent work
- Group work
- Investigations

		• How can you link the area and circumference of a circle? • What is Pythagoras' Theorem and when can you use it? • How can you compare different 2D and 3D shapes? • How do you split an amount in a ratio? • Which of these is the best buy? • Give examples of direct and inverse proportion • Five pipes can fill an empty tank of water in 50 minutes. The tank is empty. How long does it take four pipes to fill it? • Which cuboid has the largest volume? Surface area? Does the formula for volume of prism work for cuboids? Does the formula for the volume of a cuboid work for all prisms?			
Spring Term	• Using measures • Powers and indices • Fractions • Accuracy • Working with data • Graphs • Real-life graphs • Transformations	• A cyclist rides at a constant speed of 25 km/h. They cycle for 210 minutes. How far has the cyclist ridden? • How do you convert between index notation and numbers? • What is the most efficient way to find the LCM/HCF of two small/large numbers? • Which digits are significant? • y = mx + c, what happens with different values of m? c? • What are the features of a quadratic equation/graph? • How can you find the speed on a distance/time graph?	• Speed, density, converting between metric units • Working with indices and roots, standard form, factors and multiple • Calculations with mixed numbers and improper fractions • Rounding, estimating and accuracy • Frequency tables, pie charts • Straight-line and quadratic graphs • Work with distance-time graphs and other real-life graphs • Translate, reflect & rotate, enlargement	• Know & use speed = distance ÷ time, density mass ÷ volume, convert between metric units for lengths, areas and volumes • Index notation including negative, 0 or 1 powers, roots, standard form, factors, multiples & primes, prime factorisation, HCF and LCM • Equivalent fractions & decimals, Adding, subtracting, multiplying and dividing mixed numbers and improper fractions • Rounding to Significant figures, estimating, upper and lower bounds • Mode, median, mean and range from a table, using averages, constructing and interpreting pie charts • Find gradient of line, equation of line, plot linear and quadratic graphs	

		• Use a single transformation to describe shape A to shape B		• Draw and interpret distance/time graphs, Draw and interpret other real-life graphs eg, showing growth, tides • Given one point or shape on axes; Translate by a vector, reflect in line, rotate about a point, enlarge about a point by scale factor, including fractional	
Summer Term	• Constructions • Trigonometry • Probability	• How many different triangles can you draw given ….? • A 1m ruler casts a shadow of 0.8m. What is the height of a tree casting a shadow of 4.2m? Which trigonometric ratio does this relate to? • Two coins are thrown, why isn't the probability of getting HH a third?	• Construct triangles, perpendicular lines & angle bisectors, congruent triangles • Similar Triangles and right-angled trigonometry • Probability of two-events	• Construct triangles given 3 lengths or 2 lengths and one angle, construct perpendicular bisector or perpendicular through a point, construct angle bisector • Use scale factor to find missing sides in similar triangles; use sine, cosine and tangent ratios to find missing sides and angles in right-angled triangles • Listing outcomes, using Venn diagrams & two-way tables to find probabilities	

Equipment needed for lessons	**How will learning and progress be assessed?**
• Standard school stationery (Pencil, Blue/Black Pen, Green Pen, Whiteboard Pen, Rubber, Sharpener, Ruler) • Exercise book • Scientific Calculator • Pair of Compasses • Protractor	• End of half term tests • Formal assessment week • Peer and self-assessment • Homework tasks • Retrieval practice activities

Extension & Enrichment opportunities	**What can you do to support your child?**
• Junior mathematics challenge • House mathematics competition • KS3 Puzzle and problem-solving lunchtime club	• Several websites are very useful that include videos, questions and walked through examples, these are: mymaths.co.uk, corbettmaths.com and drfrostmaths.com • Encourage regular revision

Inclusion	Inclusion within Y8 Maths
• Teachers follow student passports to ensure that the needs of all students with SEND are met. • Work is enlarged to the necessary size for visually impaired students. • Teachers will ensure that classrooms are quiet learning environments where possible and will dim lights to support students with sensory needs. • Students have the use of laptop if they have a SEND need whereby use of a laptop supports them. • Hearing impaired students are supported through use a radio aid and teachers ensure that students can lip read at all times during lessons. • Dyslexic students are encouraged to use coloured overlays when they are required to read long passages. • Use of dyslexic friendly fonts and coloured backgrounds used in PowerPoints/resources. • Students with ADHD are given movement breaks, fidget toys and lessons are 'chunked' to aid concentration. • Students are seated according to their needs, students work with the SENDCo to decide upon this.	• Equipment is adapted wherever necessary to accommodate the needs of students with SEND • Where necessary, pupils are given frequent one to one tutorials to revisit previous topics and methods taught to support their understanding • Pupils are provided with online resources to help with learning outside of the classroom and homework, such as videos and worked examples • Students have access to spare mathematical equipment to help with organisation

If you have any questions about this Learning Overview, please contact the named Teacher above.