Garibaldi School
Year 8 Overview
Schemes of Learning

2024-2025 teaching

THE GARIBALDI SCHOOL

PRIDE • RESPECT • ACHIEVE

The Year 8 Scheme of Learning flows seamlessly from Year 7 to ensure that our students continue to build upon their Mathematical fluency, reasoning and problem solving skills.

The maths team have ensured that the order of learning is progressive and logical, and continues to develop fluency, through reasoning and problem solving. In addition, we aim to increase our students love and enthusiasm for maths and improve their understanding for Cultural Capital through an appreciation of everyday uses and application of mathematical concepts.

Our teachers will build on prior learning, by interleaving content, in order to help students consolidate topics and aid retention.

In Year 8, we continue to deliver our ambitious curriculum, with the 'Bowland' problem solving lessons, which continue to improve our students problem solving skills, in addition to developing their oracy, and their confidence in presenting to their peers. Through the delivery of 'Real-world maths' lessons, our students gain a deeper understanding of the maths all around them, setting them up well for life after education.

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	Term 1		Term 2		
Autumn	**Algebra**	**Algebra**	**Geometry**		
	Algebraic Manipulations	Sequences & Order	Angle and Scale reasoning	2D Shape Application/fluency	
Spring	**Geometry**	**Revise/Assess/Improve**	Ratio & Proportion		
	Reasoning in 3D & Fluency in Capacity	Red Assessment Books	Ratio - manipulations Compound Units Direct and Inverse Proportion		
Summer	**Handling Data**	**Algebra**	**Geometry**	**Algebra**	
	Working with Data	Interpret & Use Graphs	Constructions and Loci	Equations	Revise Assess Improve

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Year 8 Scheme of Learning 2024/25

Year 8 Autumn Term 1

Autumn 1

Term 1

Algebraic Fluency

1. Algebraic Manipulations

Substitution	Substitute positive and negative integers and decimals into expressions and formulae. Use varying types of formulae e.g. SDT, DMV
Expanding Single Brackets	Expand single brackets and simplify when adding or subtracting two brackets. INCLUDE FRACTIONS, DECIMALS, PERIMETER & AREA.
Factorising Single Brackets	Factorise fully using both numerical and algebraic values, into single brackets for two or more terms in an expression.
Expanding Double Brackets	Expand and simplify double brackets when the coefficient of x is 1 or greater.
Factorising Quadratics	Factorise quadratic expressions where the coefficient of x is 1. INCLUDE AREA FINDING MISSING EXPRESSIONS FOR LENGTHS.
Expanding Triple Brackets	Expand and simplify triple brackets when the coefficient of x is 1 or greater. INCLUDE FRACTIONS AND DECIMALS.

Algebraic Fluency

2. Equations

Solve one-step Equations/ inequalities	Solve Equations and Inequalities with an unknown on one side. Ensure that the unknown appears on either side of the equation. Link to angles, perimeter and area.
Solve Two-Step Equations/ inequalities	Solve equations and inequalities with an unknown on one side. Ensure that the unknown appears on either side of the equation. Link to angles, perimeter and area.
Solving Equations with Brackets/ inequalities	Solve equations and inequalities with single brackets. Ensure that the bracket appears on either side of the equation. Link to angles, perimeter and area.
Solving Equations with Variables on both sides	Solve Equations and inequalities with an unknown on both sides. Ensure that the highest value unknown appears on either side of the equation. Link to Angles, perimeter and area.

Bowland lesson (wk 3 and 6)	*Magic Sum Puzzle & Patchwork Cushions*
Real-world maths lesson	*Comfort Carpets*

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Autumn 1

Working with Patterns

3. Sequences

Solving Linear Equations and Inequalities	Solve equations and inequalities with an unknown on one or both sides and brackets. Ensure that the highest value unknown appears on either side of the equation.
Arithmetic sequences	Carry on a sequence and identify the term to term rule. Continue pictorial sequences***. INCLUDE FRACTIONAL, DECIMAL, NEGATIVE AND ALGEBRAIC SEQUENCES.***
Change the subject	Rearrange to change the subject, with the subject appearing once only.
Nth Term (linear)	Guide learners to generalise a rule for the nth term of both positive and negative sequences. Use the nth term to find terms and justify if a number is in the sequence.
Draw Linear Equations	Draw linear equations focussing mainly on the link to sequences and substitution.
Geometric & Fibonacci Sequences	Understand and identify different types of sequences. Find missing values in geometric and Fibonacci sequences.
Nth Term (quadratic)	Find the nth term of a quadratic sequence and use them to generate and justify terms.
Iteration	Find approximate solutions to equations numerically using iteration.

Bowland lesson (wk 3 and 6)	*Magic Sum Puzzle & Patchwork Cushions*
Real-world maths lesson	*Comfort Carpets*

THE GARIBALDI SCHOOL

Year 8 Autumn Term 1

Autumn 2

Term 2

Geometry

4. Angle Reasoning

Scale Drawings	Draw and measure line segments and angles in geometric figure, including interpreting scale drawings. Use proportionality and unit conversions.
Bearings	Measure and draw bearings. Know the three 'rules' of bearings.
Angles on Parallel Lines	Recognise parallel lines and calculate missing angles.
Interior/Exterior Angles in Polygons	Calculate Interior and Exterior angles in any polygon. Extend to include angle problems with compound shapes and algebra.
Return Bearings	Calculate return bearings and more complex problems through use of parallel line rules.

5. 2D Shape Application

Area & Perimeter including Compound Area	Calculate area and perimeter of compound shapes including rectangles, triangles and parallelograms. INCLUDE ALGEBRA.
Area of Trapezium	Calculate the area of trapeziums using numerous methods. Find missing lengths when given then area. Include two compound shapes.
Converting between Areas	Understand the relationship between conversions of length and its impact on area.
Circumference of Circles	Understand what PI is and how it is calculated. Use this to understand and generalise the rule to calculate circumference.
Area of Circles	Understand and generalise the rule for calculating the area of circles.
Arcs & Sectors	Calculate the perimeter of arcs and sectors. Using common fractions of a whole circle such as half, quarter and three quarters only.
Area and Perimeter of Arcs and Sectors	Calculate the perimeter and area of arcs and sectors. These being any angle given. Calculate angles when given the perimeter and area.

Bowland lesson (wk 3 and 6)	*Bunting and Sports Bag*
Real-world maths lesson	*Maths Christmas Party*

THE GARIBALDI SCHOOL

Year 8 Autumn Term 2

Spring 1

Term 3

Geometry

6. Reasoning in 3D & Understanding Capacity

Reasoning with properties of 3D Shapes	Recognise, name and describe common 3D shapes. Use specialist terminology such as Face, Edges, Vertices, Prism, Cross, Section , Plane etc.
Nets	Draw nets for common 3D shapes and identify 3D shapes from given nets. INCLUDE SURFACE AREA.
Plans & Elevations	Draw plans and elevations of common 3d shapes from corresponding plans and elevations. INCLUDE FORMING AND SOLVING.
Surface Area	Calculate the Surface Area of 3D Shapes. Excluding those with circular faces. INVOLVE ALGEBRA PROBLEM SOLVING.
Volume of Cubes and Cuboids	Understand that volume is the amount of cubed units. Understand why the cross section is important and why it is multiplied. INCLUDE FORMING AND SOLVING.
Volume of Prisms	Calculate the volume of prisms with cross sections of triangles, parallelograms and trapeziums.
Volume of Cylinders	Calculate the volume of cylinders. Include forming and solving,
Volume of Composite Shapes	Calculate the volume of compound shapes made from a mixture of shapes with missing sections. INCLUDE FORMING AND SOLVING.
Volume of Cones, Pyramids and Spheres	Calculate the volume of cones, pyramids, spheres, hemispheres and frustums when given the formulae.

Interpret & use graphs

7. Graphs of linear/quadratic functions

Midpoint of a line segment	Be able to find the midpoint given two coordinates.
Gradient and intercept	Be able to identify the y-intercept and the gradient from a linear graph. Can draw linear graphs using gradient/intercept method.
Drawing Linear graphs	Be able to use a table of values to draw linear equations in all forms. E.g. $y = \pm ax \pm b$ and $\pm ax \pm by = \pm c$ Drawing linear graphs by finding 3 points. Evaluating if a given point is on a line.
Drawing Quadratic graphs	Be able to draw quadratic graphs given a table of values both non-calculator and calculator. Recognize cubic and quadratic graph characteristics.
Roots and Turning Points	Understand and be able to identify the roots and turning points of a quadratic graph. Be able to use the graph to determine values for specific solutions. EXAMPLE: Find solutions for when $x2 + 3x + 1 = 3$ Draw a line at $y = 3$ and see where it intersect the curve; state the x coordinate.

Bowland lesson (wk 3 and 5)	*Day Out and Problem Page*
Real-world maths lesson	*Calculating Bills*

THE GARIBALDI SCHOOL

Year 8 Spring Term 1

Spring 2

Term 4

Ratio and Proportion

8. Ratio - manipulations

Simplifying Ratios and representing Fractions	As both A as a fraction of the whole. A as a fraction of B. Substituting parts of the ratio into algebraic expressions.
Dividing into a ratio	Divide into a given ratio using a variety of methods, including bar modelling.
Given part of a ratio find the whole or other parts	Solve problems involving one part or more/less than type questions. Use a variety of methods.
Three way Ratio	Find equivalent parts of corresponding ratios in order to solve problems.
Changing Ratios	Find parts and wholes of ratios when the ratios and parts have changed from the original.

9. Compound Units

SDT	Use the SDT triangle to carry out simple calculations.
Distance Time Graphs	Complete distance time graphs and be able to carry out average speed for one/two/the whole of the journey.
DMV	Lead students to generalise the rule to calculate DMV. Solve problems involving substitution into the formula, including calculating volume of shapes.
STD Conversion between Units	Calculate SDT and convert between units of time and distance.
Velocity Time Graphs	Complete velocity time graphs and be able to calculate each from the given graph or information

10. Direct and Inverse Proportion

Recipes	Use proportionality to scale ingredients for required amounts. Use unitary and multiplicative reasoning methods.
Direct proportion (non-algebraic)	Calculate missing values using direct proportion, including pie chart calculations.
Best Buy Problems	Calculate unit costs and scaling methods in order to compare the best value for money.
Conversion Graphs	Use conversion graphs to calculate a variety of conversions.
Exchange Rates	Use given exchange rates of any currency to convert given amounts. Include situations that require more than one conversion.
Similar Shapes with lengths	Calculate similar lengths of shapes both larger and smaller. Understand that the angle is not affected.
Direct and Inverse Proportion (Algebraic)	Understand direct and inverse proportion notation and satisfy given situations in order to find the constant and missing values.
Similar Shapes Area and Volume	Calculate Similar area and volumes.

Bowland lesson (wk 3 and 6)	*Smoothies and Candle Box*
Real-world maths lesson	*Exercise*

THE GARIBALDI SCHOOL

Year 8 Spring Term 2

Summer 1

Term 5

Statistics

11. Working with Data

Listing Outcomes	List all possible outcomes for events and combinations. Develop students logical listing strategies to avoid omissions.
Choosing an appropriate average	Calculate all averages and range from lists of data. Make comparisons of data sets and justify why a particular average is most appropriate.
Averages and Range from Grouped and Non-Grouped Data	Calculate all averages and range from a table. Students must understand how to tabulate data into grouped and ungrouped before calculating.
Scatter Graphs	Draw and interpret scatter graphs. State types of correlation and describe relationships. Draw and use the line of best fit to make predictions and identify outliers. Understand interpolation and extrapolation.
Frequency Polygons & Equal width Histograms	Draw and in interpret frequency polygons and equal width histograms for continuous data.
Product Rule for Counting	Understand the product rule for counting in order to find the total of more complex amounts of combinations.
Cumulative Frequency	Draw and interpret cumulative frequency graphs. Find the min, max, median, LQ, UP and IQR. Draw box and whisker diagrams
Histogram	Draw and interpret Histograms with unequal widths.

Graphs

12. Pythagoras & Trigonometry

Pythagoras	Be able to determine if Pythagoras can be used. Find any missing length of a right angled triangle given the other two lengths. Extend to functional style questions.
Trigonometry Lengths (basic)	Accurately label a right angled triangle with H, A and O Develop a method of using trigonometry SOH CAH TOA to identify and evaluate the correct trigonometric ratio. Rearrange and apply the trigonometric ratio to find the given length.
Trigonometry Angles (basic)	Accurately label a right angled triangle with H, A and O Develop a method of using trigonometry SOH CAH TOA to identify and evaluate the correct trigonometric ratio. Rearrange and apply the trigonometric ratio to find the given angle.

Bowland lesson (wk 3 and 6)	*The 'Z' Factor and Spinner Bingo*
Real-world maths lesson	*Cost & Profit*

THE GARIBALDI SCHOOL

Year 8 Summer Term 1

Summer 1

Graphs

13. Interpret & Use Graphs (higher)

Graphs of cubic functions	Draw cubic graphs and identify key characteristics of this.
Graphs of other functions	Recognise/draw graphs of exponential and reciprocal functions.
Parallel lines	Find the equation of parallel lines given the gradient and one coordinate. Find the equation of the line given two coordinates.
Perpendicular Lines	Find the equations of perpendicular lines.

Bowland lesson (wk 3 and 6)	*The 'Z' Factor and Spinner Bingo*
Real-world maths lesson	*Cost & Profit*

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Year 8 Summer Term 1

Summer 2

Term 6

Constructions

14. Bisectors

Perpendicular Bisector	Construct perpendicular bisectors. Construct perpendicular bisectors from a given point not located at the midpoint of a line segment.
Angle Bisector	Construct angle bisectors. Construct angle bisectors in shapes.
Constructing Triangles Congruency	Construct triangles and identify congruent properties.
Loci	Draw a locus of points and the above constructions to identify regions that satisfy problems. Extend to AO2 and AO3 problems.
Regions	Show the region that satisfies a specific rule.

Algebra

15. Simultaneous Equations

Solving Equations and Inequalities	Solve equations and inequalities with unknowns on both sides or one side including brackets. Ensure the highest value unknown appears on either side. LINK TO SHAPES AND ANGLES.
Solving Simultaneous Graphically	Solve simultaneous equations graphically by plotting and drawing the equations. Ensure that students understand why there is only one possible solution.
Simultaneous Equations (Basic)	Solve simple simultaneous equations pictorially and where the variables don't need manipulation and so can already be compared.
Simultaneous Equations by Elimination	Solve simultaneous equations where equations must first be scaled. Extend to use worded real life scenarios.

Bowland lesson (wk 3 and 6)	*Three of a Kind and Cats and Kittens*
Real-world maths lesson	*First Job*

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Year 8 Summer Term 2

Summer 2

Term 6

Transformations

16. Use of Transformations

Translation	Understand vector notation for movement. Be able to move a given shape using vector translations. Understand that to describe a translation we must use a vector. No invariance.
Reflection	Reflection across a given line (horizontal and vertical). Reflection given an equation of a line. Reflection across a diagonal mirror line. Understand that for a reflection you must be given a mirror line (or the equation of a line to reflect over).
Rotation	Rotations of a shape anywhere on a diagram. Understand rotations clockwise/anticlockwise and by 90o, 180o and 270o. Understand that to be able to rotate a shape we need to know, how many degrees, clockwise/ anticlockwise and from where. Be able to rotate a shape given a point of rotation.
Enlargement	Understand that an enlargement can mean getting bigger or smaller. Enlarge shapes given a positive scale factor. Enlarge shapes given a fractional scale factor.Link the scale factor to where it is being mapped. Enlarge given a centre of enlargement. Understand information needed to enlarge: Scale factor, centre of enlargement. Link vector movement.
Describing Transformations	Be able to identify and describe all transformations. Important that if it states single transformation, that students know as soon as they mix one they score zero. Look at variance and comparing transformations using invariant points.
Vector Resultants	Simple vector resultants. Adding or subtracting any given vectors. Multiplying or dividing any given vectors. Writing a resultant to two or more vector movements. EXAMPLE : Given A and B ; Find 2A + 3B Draw simple vector resultants. Find a vector resultant given a geometric representation.

Bowland lesson (wk 3 and 6)	*Three of a Kind and Cats and Kittens*
Real-world maths lesson	*First Job*

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Year 8 Summer Term 2