Year 8 Curriculum Plan
Maths

	Term 1	Term 2	Term 3
PRIOR LEARNING	**From KS2 pupils should have learnt:** • Measuring. • Lines and angles. **From Year 7 pupils should have learnt:** • Place value. • Vectors on a number line. • Equality & inverse operations. • Solving equations. • Simplifying expressions. • Expanding brackets. • Multiplicative reasoning. • Fractions. • Double number lines and ratio tables. • Percentages.	**From KS2 pupils should have learnt:** • Measuring and drawing angles. • Area of a rectangle. • Bar charts and pictograms. • Perimeter. **From Year 7 and Year 8 term 1, pupils should have learnt:** • Basic angle facts. • Median. • Mean. • Range. • Area of rectilinear shapes. • Types of polygons. • Multiplication and division; multiples and factors. • Writing values as a fraction; equivalent fractions. • Ratio tables.	**From Year 7, Year 8 term 1 and 2, pupils should have learnt:** • Arithmetic strategies. • Order of operations. • Negative numbers. • Algebraic expressions. • Solving equations. • Number lines. • Substitution. • Writing expressions, equations and formulae. • Number lines. • Reading tables. • Interpreting graphs and charts. • Mean. • Arithmetic. • Solving linear equations. • Formulae. • Linear graphs.

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KNOWING WHAT...

Geometry/ Measure unit 1 -
Using a protractor to measure angles. Labelling angles correctly, type of angles.
Estimating angles.
Construction.
Simple loci.

Algebra unit 3 –
Difference between identity and equations.
Expanding a single bracket.
Factorising into a single bracket.
Expanding two simple binomials and the difference of two squares.
Writing more complex algebraic expressions.

Algebra unit 4 -
Understanding equality and balancing.
Simple one-step solutions.
Two-step solutions.
Collecting like terms.
Solving equations with the unknown on both sides, simple equations with the unknown in the denominator.
Applications and problems, including forming and solving equations in a geometric or "real-life" context.

Number unit 10 -
Direct and Inverse proportion - use double number line and can be connected to other known representations.
Comparing quantities (value for money, exchange rate).
Scaling up/down - recipes, shapes (simple enlargements), etc, use scaling diagram to represent and connect to other known representations.

Geometry/Measure unit 2 -
Naming, labelling and recognising the features of triangles, quadrilaterals (including sum of angles).
Naming and recognising the features of other polygons, including interior angles increasing by 180.
Angles on a straight line, around a point, vertically opposite.
Angles in parallel lines (alternate, corresponding, cointerior).

Statistic/Probability unit 1 -
The data handling cycle.
Bar charts, pictograms, pie charts.
Ungrouped and grouped frequency tables.
Vertical line, stem and leaf.
Ungrouped data - mean, mode and median, from lists and from a frequency table.
Measures of spread - range, interquartile range, outliers (by sight).
Compare data sets through graphs, central tendency and spread. Selecting the best graph for the job. Know how graphs can mislead.

Geometry/Measure unit 3 –
Bearings.
Defining area, counting squares, rectilinear area.
Area of triangles and quadrilaterals (incl. kite, parallelogram, trapezium).
Area of a circle, always give answers in exact form and rounded.
More complex areas of compound shapes, problems involving area.
Scale drawings.

Algebra unit 5 -
Evaluating expressions and formulae by substitution.
Writing formulae in words and letters, including SDT/DMV/PFA.
Generating sequences from formulae.
Rearranging linear and non-linear formulae.

Algebra unit 6 -
Plotting 2D coordinates in four quadrants.
Introduction to two-dimensional vectors.
Finding the midpoint of a line segment.
Expressing number relationships algebraically and graphically, as a means of picturing the relationship.
Plotting quadratic number relationships on a Cartesian grid.
Reading values of variables from a graph (including quadratic, piecewise linear, exponential and reciprocal graphs).
Drawing and recognising graphs of $y=n$ and $x=n$.
Finding integer gradients.
Use the gradient and y-intercept of a line to write the equation in the form $y = mx+c$.
Identify parallel lines from their equations.

Statistic/Probability unit 2 -
Scatter graphs.
Interpret and construct tables and line graphs for time series data.

Algebra unit 7 -
Generate terms of a sequence.
Find and use the nth term of an arithmetic (linear) sequence.
Recognise common sequences (triangular numbers, square numbers, cube numbers, Fibonacci-style sequences).

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KNOWING HOW...

- Understanding of mathematical equipment such as compass and protractor.
- Use a Multiplication grid to expand and factorise.
- Use of algebra tiles and double-sided counters to solve equations.
- Vectors on a number line and ratio tables to scale recipes or shapes.
- Ratio tables and number lines to understand proportion.
- Read axis to convert two variables.

- Label 2D shapes.
- Reason with angle rules.
- Construct bar charts, pie charts, pictograms.
- Construct and read frequency tables.
- Use area formula for multiple shapes.

- Substitution.
- Rearrange equations.
- Plot coordinates.
- Construct axis.
- Use gradient formula.
- Construct / read scatter graphs.
- Construct / read time series.
- Understand nth term rule.
- Recognise sequences.

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ASSESSMENT	After each unit pupils complete a short assessment based on each bullet point from above. The test is split into 3 parts. Part 1 - skill questions and key definitions/literacy. Part 2 - more difficult reasoning questions. Part 3 - problem solving questions which also link to prior knowledge from other units. Pupils also sit two larger assessments; one is at the halfway point for the year and the other is during whole school exam week in June.

Assessment 1

- Solving problems with time accurately and by estimating.
- Approximation.
- Error intervals.
- Truncation.
- Algebraic notation.
- Collecting like terms.
- Simplifying indices.
- Writing algebraic expressions
- Points, lines, rays and segments, using a ruler to measure lines, labelling segments correctly.
- Using a protractor to measure angles, labelling angles correctly, type of angles, and estimating angles.
- Using a compass to draw circles and arcs; construct and equilateral triangle and a hexagon (60/120-degree angles).
- Constructing triangles given SSS, SAS, ASA.
- Constructing a perpendicular bisector.
- Constructing 30, 45, 90 angles.
- Simple loci.
- Expanding a single bracket.
- Simplifying expressions.
- Factorising into a single bracket.
- Expanding two simple binomials and the difference of two squares.
- Writing more complex algebraic expressions.
- Simple one-step solutions (four rules).
- Two-step solutions (four rules), including with brackets.
- Solving equations with the unknown on both sides.
- Simple equations with the unknown in the denominator.
- Forming and solving equations in a geometric or "real-life" context.
- Direct and inverse proportion.
- Comparing quantities (value for money, exchange rates).
- Scaling up/down - recipes, shapes (simple enlargements).
- Percentage increase and decrease, decimal multipliers.
- Finding a percentage change.

Assessment 2

- Naming, labelling and recognising the features of triangles (including sum of angles).
- Naming, labelling and recognising the features of quadrilaterals (including sum of angles).
- Naming and recognising the features of other polygons, including interior angles increasing by 180.
- Angles on a straight line, around a point, vertically opposite.
- Angles in parallel lines (alternate, corresponding, co-interior).
- Bearings.
- The data handling cycle.
- Ungrouped and grouped frequency tables.
- Vertical line, bar charts, pie charts, pictograms, stem and leaf.
- Measures of central tendency of ungrouped data - mean, mode and median.
- Measures of spread - range, interquartile range, outliers.
- Misleading graphs.
- Area of triangles and quadrilaterals (incl. kite, parallelogram, trapezium).
- Area of a circle, always give answers in exact form and rounded.
- Areas of compound shapes.
- Ratio notation and using ratio table.
- Simplifying ratios.
- Unit ratios, applications to scale drawings and maps.
- Fractions and ratios.
- Evaluating expressions and formulae by substitution, including inputs and outputs.
- Generating sequences from formulae.
- Rearranging linear formulae.
- Rearranging non-linear formulae.