Year 8 Knowledge Overview

Year 8 Unit 1 – Estimating and rounding		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Round numbers to any given decimal place.	That rounding to one decimal place is the same as rounding to tenths. That rounding to two decimal place is the same as rounding to hundredths.	Round answers to a suitable degree of accuracy.
Round integers to a required number of significant figures.	That the most significant figure is the number in the largest place value column.	Round answers to a sensible degree of accuracy.
Estimate numerical calculations.	When it is appropriate to use an estimate. That errors can be expressed using inequality notation $a \leq x < b$	Determine whether calculations will be an underestimate or overestimate Understand the impact of rounding errors.
Year 8 Unit 2 – Sequences		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Continue and recognise key sequences.	That linear sequences have a constant difference. That square and cube numbers form special sequences. That to continue the Fibonacci sequence you add the previous 2 terms.	Generate sequences and predict patterns. Recognise sequences and describe them.
Generate sequences from a rule.	That a term to term rule tells you how to continue a sequence once started. That a position to term rule generates any term of a sequence. That when finding terms in a sequence you use substitution	Use a rule to generate a sequence. Recognise when to substitute numbers into algebra.
Find a nth term rule of an arithmetic sequence.	That linear sequences have an nth term rule in the form an+b	Understand that the nth term rule allows you to calculate any term of the sequence. Determine whether a number is a term of a given sequence.
Year 8 Unit 3 – Graphical representations of linear relationships		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand and identify gradients as a ratio.	That gradient tells you how steep a line is. That gradient describes for every 1 unit to the right, the movement up or down.	Calculate gradients as a ratio. Understand the larger the gradient, the steeper the line.

Generate and plot coordinates from a rule.	That graphs have 4 quadrants That coordinates are always written (x, y) That the x axis is horizontal and the y coordinate is vertical That a straight line extends infinitely	Plot geometrical information and infer missing information knowing geometric properties of shapes.
Understand that writing linear equations in the form y = mx + c reveals their structure.	That the form y = mx + c represents a straight line. That the m is the value of the gradient. That the c is where the line crosses the y axis. The same gradient means the lines will be parallel.	Plot straight lines. Interpret the value of the gradient. Interpret the y intercept.
Year 8 Unit 4 – Solving Linear Equations		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand the language of algebra.	That an equation has an equal's sign. That ≡ is the sign for an identity. That letters represent variables	Identify algebraic notation. Substitute values into algebraic expressions.
Solve linear equations.	That there is one solution to a linear equation. That inverse operations solve equations.	Find the solution to an equation.
Form linear equations.	That a problem can be represented pictorially or algebraically.	Use algebra to represent a problem and solve it.
Year 8 Unit 5 – Multiplicative relationships: Percentages and Proportionality		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Use diagrams to represent multiplicative relationships.	That bar models and double number lines can represent multiplicative relationships. That direct proportion means that as one variable increases so does the other	Choose the most appropriate model to solve a problem.
Find percentages of an amount.	That percentage means out of 100. That a percentage can be more than 100. That percentages can be converted to decimals and fractions.	Calculate a percentage of a given amount
Describe one number as a percentage of another	That as a fraction, the total amount is the denominator and the given amount the numerator.	Compare quantities by calculating numbers as percentages of others.

	That a fraction can be written as a percentage.	
Find percentage increases and decreases.	That a percentage increase will mean the result is more. That a percentage decrease will mean the result is less. That a multiplier can be used to perform the action in one calculation.	Calculate the result after a specific percentage increase or decrease.
Calculate a reverse percentage.	That calculating a reverse percentage uses the inverse operation of dividing. That the divisor will be the decimal equivalent of the percentage.	Calculate the original value given the final value after a stated percentage increase or decrease
Understand percentage profit or loss.	That profit and loss is the difference between the amount of money made and the amount paid. That the profit or loss is compared the original spend. That a decimal is converted to a percentage by multiplying by 100.	Calculate percentage profit or loss
Understand inverse proportionality.	That inverse proportion means that as one variable increases the other decreases	Recognise inverse proportionality. Perform calculations with inverse proportionality.
Year 8 Unit 6 – Statistical Representations		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand types of data.	That qualitative data is data that can only be written in words. That quantitative data can be counted.	Construct and interpret surveys and questionnaires.
Use charts to represent statistics.	That pictograms, bar charts and pie charts are used to represent qualitative data. That bar charts, line charts and frequency polygons are used to represent quantitative data. That scatter graphs are used for bivariate data.	Understand data can be displayed in a variety of ways. Choose the most appropriate chart to display information. Argue the advantages and disadvantages of charts. Interpret misleading graphs.
Year 8 Unit 7 - Statistical analysis		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand the types of averages.	That the mean is calculated by dividing the total by the frequency.	Compare data sets by calculating averages such as the mode, median and mean. Compare the spread of data sets by using the range

	That the median is the middle number when in numerical order. That the mode is the most common number. That the range is the difference between the largest and smallest. That the mean, median and mode are types of averages That the range is a measure of spread	
Analyse data sets.	How to calculate averages and measures of spread.	Identify anomalies. Identify when to use averages and draw conclusions from them. Identify when to use information given to work backwards to find averages or spread.
Recognise relationships between bivariate data represented on a scatter graph.	That bivariate data is displayed on a scatter graph That positive correlation is represented by both variables increasing. That negative correlation is represented by one variable increasing and the other decreasing. A line of best fit can help make an estimate.	Interpret the relationships displayed on a scatter graph.
Year 8 Unit 8 – Perimeter, Area and Volume.		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Calculate area of quadrilaterals and triangles.	That the area of a shape is the space inside it and measured in square units. That the area of a rectangle = l x w That the area of a parallelogram = l x perpendicular height That the area of a triangle = ½ (l x w) That the area of a trapezium = ½ (a+b) h	Identify a shape and it's corresponding formula for area. Calculate areas of quadrilaterals, triangles and shapes made from these.
Know the relationship between the circumference and diameter of a circle.	That the circumference of a circle can be defined as πd That the distance across the circle at its widest point is called the diameter.	Calculate the circumference of a circle given its radius or diameter. Calculate the radius or diameter of a circle given its circumference.

	That half a diameter is called a radius.	
Know the relationship between the area and radius of a circle.	That the area of a circle can be defined as πr^2	Calculate the area of a circle given its radius or diameter. Calculate the radius or diameter of a circle given its area.
Draw nets of 3D shapes.	That 3D shapes can be "opened up" and can be represented as 2D net.	Identify 3D shapes from their nets. Draw nets of 3D shapes.
Investigate the surface area of 3D shapes.	That nets are made up of 2D shapes. How to find the areas of quadrilaterals and triangles.	Calculate the surface area of 3D shapes.
Understand volume of 3D shapes.	That volume is the space a 3D solid takes up. That volume is calculated by multiplying the cross-sectional area by its depth.	Calculate volume of 3D shapes.
Year 8 Unit 9 - Polygons		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand angles created by intersecting lines and parallel lines.	That a pair of intersecting lines create vertically opposite angles. Vertically opposite angles are equal. That parallel lines will never meet. A line crossing 2 parallel lines is called a transversal. Parallel lines and a transversal create 3 types of angles. Alternate angles are equal. Corresponding angles are equal. Co-interior angles add up to 180 degrees.	Calculate missing angles in parallel and intersecting lines.
Understand angles in triangles and quadrilaterals.	That angles in a triangle sum to 180 degrees. That angles in a quadrilateral sum to 360 degrees.	Calculate missing angles in triangles and quadrilaterals.
Understand angles in polygons.	That the exterior angles of a polygon sum to 360 degrees. That an interior angle and an exterior angle of a polygon sums to 180 degrees. That the sum of interior angles of a polygon can be calculated using (sides – 2) x 180.	Calculate missing angles in polygons.
Year 8 Unit 10 - Constructions		

Year 8 Knowledge Overview

Learning Outcome	Students will know and remember …	So that they can….
Use a pair of compasses.	That a pair of compasses draws a circle. That an arc is part of the circumference of a circle.	Confidently use a pair of compasses. Accurately construct a hexagon.
Construct triangles.	that there are 4 types of triangles: scalene, equilateral, isosceles, right angles	Accurately construct triangles using a pair of compasses.
Construct a rhombus.	That a rhombus is a 2D shape where all sides are equal and opposite sides are parallel. That perpendicular means at right angles to. That to bisect an angle means to cut it exactly in half. That construction lines are not erased.	Accurately construct a perpendicular bisector of a line segment. Accurately construct a perpendicular to a given line through a given point. Accurately construct an angle bisector