Year 7 Knowledge Overview

Year 7 Unit 1 – Place Value		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand place value.	That place value can be defined as the value represented by a digit in a number on the basis of its position in the number. The effect of multiplying and dividing by 10. The powers of 10.	Recognise, write, name numbers and explain decimal place value, making links to fractions and decimals. Multiply and divide by powers of 10 Complete calculations involving powers of 10.
Understand the symbols of mathematics.	The meaning of <, >, =, ≤, ≥	Order and compare numbers.
Understand the purpose of rounding.	How to round numbers to their nearest integer, ten, hundred and decimal places.	Round numbers to powers of 10's and to decimal places and check the reasonableness of their answers.
Understand exponents.	The notation of exponents. That an exponent can be called a power or index number and means how many times another number is to be multiplied by itself.	Write repeated multiplications of the same number in index form. Perform calculations with powers of any number.
Make connections in calculations using place value.	The purpose of place value when using known facts to calculate similar calculations (e.g., 7 x 10 = 70, so what is 0.7 x 10?).	Solve calculations without performing the computation; just by multiplying or dividing by powers of 10.
Year 7 Unit 2 – Types of numbers		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand the term multiple.	That a multiple is a number in the integer's multiplication times table.	Identify multiples of numbers and compare lists of multiples to find the lowest common multiple of 2 or more numbers.
Understand the term factor.	That a factor is a number that divides another number with no remainder.	Identify factors of numbers and compare lists of factors to find the highest common factor of 2 numbers.
Understand the terms square numbers, cube numbers and their roots.	That a square number is a number multiplied by itself. That a cube number is a number multiplied by itself 3 times. That the square root is the inverse operation of squaring. That the cube root is the inverse operation of cubing.	Identify square and cube numbers and perform calculations involving these.

Understand and identify prime numbers.	That a prime number has exactly 2 factors, 1 and itself.	Identify prime numbers.
Understand and write a number as a product of its prime factors.	That any non-prime integer can be written as a product of its prime factors.	Use the factors of a given number to reduce it to its prime factors.
Use prime factor decomposition to find LCM's and HCF's.	That once a number has been reduced to its prime factors this can be used to identify LCM's and HCF's using a venn diagram.	Solve problems involving LCM's and HCF's. For example, when lighthouses will flash at the same time or buses will arrive at the same time from different routes.
Year 7 Unit 3 – The Four Operations and directed number		
Learning Outcome	*Students will know and remember …*	*So that they can….*
To perform written calculations using addition, subtraction, multiplication and division.	That the commutative law means a+b = b+a and that the associative law deals with the grouping of numbers in an operation (a + b) + c = a + (b + c).	Perform calculations competently and confidently.
Understand the order of operations.	That there is a hierarchy to perform calculations: Brackets/ Indices/ Division/ Multiplication/ Addition/ Subtraction	Complete calculations accurately.
Interpret negative numbers.	That negative numbers can cross the zero.	Order negative numbers.
To perform calculations with negative numbers.	That when you add a negative number it has the effect of subtracting it. That when you subtract a negative number it has the effect of adding it. When you multiply or divide 2 negative numbers the answer is always positive. When you multiply or divide a positive and a negative number the answer is always negative.	Perform calculation that cross the zero. Add and subtract negative numbers. Multiply and divide negative numbers. Use the order of operations with negative numbers.
Year 7 Unit 4 - Arithmetic with fractions		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand fractions and their equivalence.	That a fraction represents part of a whole. That an equivalent fraction is a multiple of the original fraction's numerator and denominator.	Create equivalent fractions. Simplify fractions by finding common factors. Order fractions.
Understand fraction and decimal equivalence	That tenths, hundredths, thousandths etc can be	Convert between fractions and decimals.

	represented by fractions and decimals. That place value is used to convert decimals to fractions. That short division is used to convert fractions to decimals	Use the most appropriate type of number to perform a calculation efficiently.
Perform calculations with fractions	That to add and subtract a fraction, you must use a common denominator. That to multiply fractions you multiply the numerators and denominators. That the reciprocal of a number is its inverse. That to divide fractions you use the reciprocal and the inverse operation.	Add, subtract, multiply and divide fractions. Calculate fractions of a quantity. Calculate areas and perimeters accurately.
Year 7 Unit 5 – Algebraic manipulation		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand algebraic notation	That a letter represents a variable That the multiplication sign is not used in expressions	Form and interpret algebraic expressions
Substitute into algebraic expressions	That once a variable is a given a value, the expression will have a value	Calculate the value of an expression Appreciate the value of an expression can change when the variable does
Simplify algebraic expressions	That the same variable can be "collected" but different variables cannot x multiplied by x is represented as x^2	Collect like terms Expand a bracketed algebraic expression
To factorise an algebraic expression	That x^2 means x multiplied by x	Factorise an algebraic expression by taking out common factors
Year 7 Unit 6 - Coordinates and the cartesian plane		
Learning Outcome	*Students will know and remember …*	*So that they can….*
To describe geometric information on a coordinate grid.	That a coordinate grid has 4 quadrants. That the x axis is horizontal and the y axis is vertical.	Plot coordinates. Find and plot missing information from geometric shapes.
Draw and plot straight lines.	That horizontal lines are always in the form y= That vertical lines are always in the form x=	Recognise the equation of a horizontal or vertical line. Draw horizontal or vertical lines given their equation.
Understand the "rule" of a straight line.	That straight lines can be defined by an algebraic rule.	Plot and draw straight lines given a rule.

Year 7 Unit 7 - Perimeter and area		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Calculate the perimeter of shapes.	That perimeter is the distance around a shape and comes from the addition of the sides.	Find the perimeter of any shape.
Calculate the area of shapes.	That area is the space inside a shape. That the area of a rectangle = length x width. That the area of a triangle = ½ (length x width). That the area of a parallelogram = length x perpendicular height. That the area of a trapezium = ½ (a + b) h. A shape can be split into other shapes to find its total area – "compound area".	Find the area of rectangles, triangles, parallelograms and trapezia. Find the area of compound shapes.
Year 7 Unit 8 - Ratio and Fractions		
Learning Outcome	*Students will know and remember …*	*So that they can….*
Understand the link between ratios and fractions.	That a ratio represents the parts that make up a whole. That a ratio tells you the parts and the whole so fractions can be created.	Change from ratio's to fractions and vice versa.
Understand the notation of ratio.	A colon is used to separate parts of a ratio.	Simplify ratio's. Describe ratio's. Write a ratio as a unit ratio. Use ratio to describe rates
To divide a quantity into a given ratio.	That the parts of a ratio are added to find the whole. That they need to divide to find one part of the ratio.	Use number lines or bar models to divide in a ratio. Find the totals related to the parts in a given ratio.
To find the original quantity given a ratio and a part.	That the part given is represented by the part in the ratio. That the whole will be larger than the part given.	Use number lines or bar models to divide part of a ratio. Find the total of a ratio when given a part.
Find a fraction of a quantity.	That multiplying is needed when finding a fraction of. That fractions can be simplified prior to a calculation.	Calculate a fraction of a quantity
Express a number as a fraction of another.	That the number given is the numerator. That the number "out of" is the denominator.	
Year 7 Unit 9 - Transformations		

Year 7 Knowledge Overview

Learning Outcome	Students will know and remember …	So that they can….
Understand reflections.	That a reflection is a mirror image and needs a reflection line to perform. Some coordinates may be invariant under a reflection.	Perform and describe reflections
Understand translations.	That a translation moves the object and therefore size, shape and orientation do not change.	Perform and describe translations
Understand rotations.	That a rotation spins an object and needs a centre of rotation, a direction and an angle to perform. Some coordinates may be invariant under a rotation.	Perform and describe rotations
Understand enlargements.	That an enlargement makes a shape bigger or smaller.	Perform and describe enlargements