FERNDALE PRIMARY SCHOOL	**Stage 7 -Number Programme of Study Objectives**	**Comment**
Number – Number and place value		
Understand and use place value for decimals, measures and integers of any size		
Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥		
Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property		
Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative		
Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals		
Recognise and use relationships between operations including inverse operations		
Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations		
Interpret and compare numbers in standard form A × 10n 1≤A>10, where n is a positive or negative integer or zero		
Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$)		
Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%		
Interpret fractions and percentages as operators		
Use standard units of mass, length, time, money and other measures, including with decimal quantities		
Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]		
Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$		
Use a calculator and other technologies to calculate results accurately and then interpret them appropriately		
Appreciate the infinite nature of the sets of integers, real and rational numbers		
Ratio, Proportion and Rates of Change		
change freely between related standard units (for example time, length, area, volume/capacity, mass)		
use scale factors, scale diagrams and maps		
express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1		
use ratio notation, including reduction to simplest form		

divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio	
understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction	
relate the language of ratios and the associated calculations to arithmetic of fractions and to linear functions	
solve problems involving percentage change, including: percentage increase, decrease and the original value problems and simple interest in financial mathematics	
solve problems involving direct and inverse proportion, including graphical and algebraic representations	
use compound units such as speed, unit pricing and density to solve problems	
Algebra	
Use and interpret algebraic notation, including: ab in place of $a \times b$, $3y$ in place of $y + y + y$ and $3 \times y$, $a2$ in place of $a \times a$, $a3$ in place of $a \times a \times a$; $a2b$ in place of $a \times a \times b$, ab in place of $a \div b$, coefficients written as fractions rather than as decimals, brackets.	
substitute numerical values into formulae and expressions, including scientific formulae	
understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors	
simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms, multiplying a single term over a bracket, taking out common factors, expanding products of two or more binominals.	
understand and use standard mathematical formulae; rearrange formulae to change the subject	
model situations or procedures by translating them into algebraic expressions or formulae and by using graphs	
use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)	
work with coordinates in all four quadrants	
interpret mathematical relationships both algebraically and graphically	
reduce a given linear equation in two variables to the standard form y=mx+c; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically	
use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations	
find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs	
generate terms of a sequence from either a term-to-term or position-to-term rule	
recognise arithmetic sequences and find the nth term	
recognise geometric sequences and appreciate other sequences that arise	