St. Elizabeth's Parish School Dandenong North

Mathematics Policy

Rationale

The goals of education in mathematics at St Elizabeth's Parish School reflect and develop the goals of education as expressed in the school's vision statement. We believe that our students' success in belonging, participating and contributing to society is promoted and enhanced when they are numerate.

We believe that numeracy skills effectively develop when students are taught from a base of concrete experience and involved in everyday, relevant problem solving activities. In this way mathematics is made meaningful and founded on the establishment of authentic purpose. At all levels teachers draw on students' knowledge of the world to ensure that abstract ideas are linked to something familiar.

We believe that cooperative group work and the provision of opportunities for discussion and interaction promote the learning of mathematics.

Curriculum Focus

We aim to provide a program that allows students to:

- Demonstrate useful mathematical and numeracy skills for successful general employment and functioning in society.
- Solve practical problems with mathematics, especially industry and work based problems.
- Develop specialist knowledge in mathematics that provides for further study in the discipline.
- See mathematical connections and be able to apply mathematical concepts, skills and processes in posing and solving mathematical problems.
- Be confident in one's personal knowledge of mathematics to feel able to apply it and to feel able to acquire new knowledge and skills when needed.
- Be empowered through knowledge of mathematics as a numerate citizen, able to apply this knowledge critically in societal and political contexts.
- Develop understanding of the role of mathematics in life, society and work; the role of mathematics in history' and mathematics as a discipline – its big ideas, history, aesthetics and philosophy.

Domain Structure

The Mathematical Domain is part of the Discipline Strand in the Victorian Essential Learning document. The Dimensions within this Domain are;

Number

Number provides for our sense of counting, magnitude and order. The natural (counting) numbers with zero extend to positive and negative signed whole numbers (integers) and through part-whole relations and proportions of whole numbers to the rational numbers (fractions and finite decimals or infinite recurring decimals). Proportions of lengths involving sides and/or diagonals of right-angled triangles and rectangles and arcs of a circle lead to the introduction of certain irrational real numbers such as the square root of 2, the golden ratio phi and fractions or multiples of pi. Principal operations for computation with number include various algorithms for addition (aggregation), subtraction (disaggregation) and the related operations of multiplication, division and exponentiation carried out mentally, by hand using written algorithms and using calculators, spreadsheets or other numeric processors for calculation.

Structure

Structure provides for our sense of set, logic, function and algebra. It is fundamental to the concise and precise nature of mathematics and the generality of its results. Key elements of mathematical structure found in each of the dimensions of Mathematics are membership, operation, closure, identity, inverse, and the commutative, associative and distributive properties as well as other notions such as recursion and periodic behaviour. While each of these can be considered in its own right, it is in their natural combination as applied to elements of number, space, function, algebra and logic with their characteristic operations that they give rise to the mathematical systems and structures that are embodied in each of these dimensions. Principle operations for computation with structure include mental, by hand and technology-assisted calculation and symbolic manipulation, by calculators, spreadsheets or computer algebra systems, with sets, logic, functions and algebra.

Space

Space provides for our sense of shape and location. These are connected through forms of representation of two- and three-dimensional objects and the ways in which the shapes of these objects and their ideal representations can be moved or combined through transformations. Key spatial concepts include continuity, edge, surface, region, boundary, connectedness, symmetry, invariance, congruence and similarity. Principal operations for computation with space include identification and representation, construction and transformation, by hand, using drawing instruments, and also by using dynamic geometry technology.

Measurement and Chance & Data

Measurement, chance and data provides for our sense of unit, measure and error, chance and likelihood and inference. Measure is based on the notion of unit (informal, formal and standard) and relates number and natural language to measuring characteristics or attributes of objects and/or events. Various technologies are used to measure, and all measurement involves error. Important common measures relate to money, length, mass, time and temperature, while probability is a measure of the chance or likelihood of an event. Other measures include area, volume and capacity, weight, angle, and derived rates such as density, concentration and speed. Principle operations for computation with measurement include the use of formulas for evaluating measures, the use of technology such as data-loggers for direct and indirect measurement and related technologies for the subsequent analysis of data, and estimation of measures using comparison with prior knowledge and experience, and spatial and numerical manipulations.

Working Mathematically

Working mathematically provides for our sense of mathematical inquiry: problem posing and problem solving, modelling and investigation. It involves the application of principled reasoning in mathematics, in natural and symbolic language, through the mathematical processes of conjecture, formulation, solution and communication; and also engages the aesthetic aspects of mathematics. In this dimension the nature, purpose and scope of individual work is connected to that of the broader mathematical community, and the historical heritage of mathematics through the discourse of working mathematically. Mental, by hand and technology-assisted methods provide complementary approaches to working mathematically.

These statements are taken from the Victorian Essential Learning Standards Framework.

LEVEL 1 [PREP]

At Level 1 students construct small sets of objects and elements according to simple descriptions and form correspondences between these sets based on simple relationships. They use one-to-one correspondence to identify when two sets are equal in size or when one set is larger than another set or smaller than another set.

They form collections of sets of equal size. Students place sets in sequence of increasing size and use the numbers 0 to 20 to count and to determine the size of a given set, including zero for the empty set. They describe the position of an element in an ordered set using ordinal numbers up to ten. They use materials to model addition and subtraction by the aggregation (grouping together) and disaggregation (moving apart) of elements in sets. They add and subtract by counting forward and backward using the natural numbers from 0 to 20.

LEVEL 2 [YEAR ONE & YEAR TWO]

At Level 2 students partition a collection (the universal set) into distinct subsets according to simple criteria, and recognise when one set is a subset of another set. They construct and use sets of size 1, 10 and 100 to model place value and order natural numbers from 0 to 1000. Students describe simple fractions in terms of equal sized parts of a whole object, such as of a pizza (part-whole relationship), and collections such as of a set of 20 coloured pencils (subset-set relationship). They use linear and rectangular arrays of like objects, and natural numbers, to skip count by 2s, 4s and 5s from zero to one hundred and to count to 1000 by 1s, 10s and 100s starting from any natural number. Students add and subtract one- and two-digit numbers by counting on and counting back. They mentally compute simple addition and subtraction calculations involving one- or two-digit natural numbers using number facts such as complement to 10, doubles and near doubles. Students describe and calculate simple multiplication as repeated addition such as 3 x 5 = 5 + 5 + 5; and division as repeated subtraction, such as 8 divided between 4, and as partitioning of a set into equal-sized subsets. They use commutative and associative properties of addition and multiplication in mental computation.

LEVEL 3 [YEAR THREE & YEAR FOUR]

At Level 3 students use place value to determine the size and order of numbers from hundredths to tens of thousands. They round numbers up and down to the nearest unit, ten, hundred, or thousand. They compare and order simple common fractions such as. Students skip count forwards and backwards, from various starting points using multiples of 2, 3, 4, 5, 10 and 100. Students devise and use algorithms for whole number problems of addition and subtraction involving three-digit numbers; multiplication by single digits (based on automatic recall of multiplication tables) and multiples and powers of ten; and division by a single-digit divisor (based on inverse relations in multiplication tables). They devise and apply algorithms for the addition and subtraction of numbers to two decimal places. They add and subtract simple common fractions with the assistance of physical models. Students perform mental computations involving numbers up to 30 accurately and reliably. Numbers are estimated and ordered to two decimal places. They predict the accuracy of estimations for computation and recognise whether these are likely to be over-estimates or under-estimates.

LEVEL 4 [YEAR FIVE & YEAR SIX]

At Level 4 students comprehend the size and order of small and large numbers (from thousandths to millions), including negative numbers, common fractions and decimals. Students accurately estimate the size of fractions and decimals in the vicinity of 0 and 1 relative to 0, ½ and 1. They identify numbers and their factors as square, prime or composite, and interpret these numbers and their factors in terms of the area and the

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[continued]

dimensions of their corresponding rectangular geometric arrays. They recognise and evaluate simple powers of natural numbers such as 24 = 16. Students explain and use mental and written algorithms for the addition, subtraction, multiplication and division of natural numbers; the addition, subtraction, multiplication of decimals (to two decimal places); and the addition, multiplication and subtraction of common fractions. They represent natural numbers in other bases. They construct and recognise multiples of integers (including lowest common multiple) and common fractions, and interpret constant multiples of a number as scale factors of the number. They use decimals, ratios and percentages to find equivalent representations of common fractions. Students identify and interpret remainders as fractions and recognise the role that remainders play in algorithms for finding the factors of natural numbers. They use repeated division by increasing primes to express numbers as a product of powers of prime numbers, for example, 360 = 23 x 32 x 51. When using estimates of numbers in computation, students apply strategies appropriate for the situation, in particular, mental computations. They develop and use criteria for deciding if an estimate of a computation is reasonable or not.

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These statements are taken from the Victorian Essential Learning Standards Framework. There are no Standards at Levels 1 and 2.

LEVEL 3 [YEAR THREE & YEAR FOUR]

At Level 3 students construct number collections using counting of composite sets of units such as 2, 3, 4, 5, 10 and 100. Students investigate and record sequences of decimal numbers generated using multiplication or division by 10. They partition sets into equal-sized subsets to carry out division and recognise that the sharing of a collection into equal-sized parts frequently leaves a remainder. Students identify the set of all possible outcomes of a simple chance event (the event space) and use Karnaugh maps to specify the possible combinations of two attributes.

Students recognise the importance and meaning of the '=' in mathematical statements and technology displays to indicate the result of a computation and to indicate equivalence. They use the commutative and associative properties in combination to facilitate computations such as 7 + 10 + 13 = 10 + 7 + 13 = 10 + 20. They use the distributive property for multiplication over addition in simple computation.

Students classify and describe angles, polygons and solids according to their properties. They describe and summarise the effects of rotations, reflections, transformations and shadow projections on shapes with respect to what changes and what does not change (invariance). Students identify variables and perform simple operations on variables. They construct and solve simple equations involving missing numbers and '='. They recognise samples as subsets of a set (the population under consideration). They organise data into lists and Karnaugh maps.

LEVEL 4 [YEAR FIVE & YEAR SIX]

At Level 4 students form and specify sets of numbers, shapes, transformations and data according to given criteria and/or conditions such as equivalence, congruence and sampling for particular attributes. They identify the nature of the set (the population) and data from which samples are drawn as finite or infinite and discrete or continuous. They use Venn diagrams and Karnaugh maps to test the validity of simple deductive arguments involving simple applications of the quantifiers *none*, *some* or *all* to sets.

Students identify variables and related variables in everyday situations, and explain the ideas of change, dependency and allowable values in relationships between pairs of variables. They interpret sketch graphs involving functions of a single variable. They construct rules for sequences using recursion relations and relations that depend on the position of the term in the sequence. They describe the features of

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[continued]

shapes or solids that remain the same or change when the shape or solid is enlarged or reduced.

They describe general patterns using words, numbers, diagrams and symbols. They establish equivalence of simple mathematical expressions involving properties, such as the distributive property for multiplication over addition, $a(b + c) = ab + ac$. They identify and apply the identity and inverse elements for the arithmetic operation on integers and rational numbers and for simple transformations in space.

SPACE
Course Advice

LEVEL 1 [PREP]
At Level 1 students recognise, copy and draw points, lines and simple free-hand curves and identify interior and exterior, edges; basic two-dimensional shapes such as triangles, circles and squares and basic three-dimensional solids and objects such as boxes and balls. They use attributes of shapes to construct small sets of geometric objects according to simple descriptions and form correspondences between these sets based on simple relationships. They place and orientate shapes according to simple descriptions of relative location such as next to, beside, in front of, behind, over, under, and give and follow simple directions for locating an object and for movement from one place to another over a short distance. They develop and follow simple instructions to move and place shapes and objects in familiar situations in relation to what they can see, and to move themselves from one place to another

LEVEL 2 [YEAR ONE & YEAR TWO]
At Level 2 students recognise lines, surfaces and planes, corners and boundaries; familiar two dimensional shapes including rectangles, rhombuses and hexagons, and three-dimensional shapes and objects including pyramids, cones, and cylinders. They partition a collection of geometric shapes, such as a set of attribute blocks, into distinct subsets according to simple criteria, and recognise when one set of shapes is a subset of another set of shapes. They recognise and describe symmetry, asymmetry, and congruence in these shapes and objects. They accurately draw simple two-dimensional shapes by hand and construct, copy and combine these shapes using drawing tools and geometry software. Students apply simple transformations to shapes (flips, turns, slides and enlargements) and depict both original and transformed shape together. They specify location as a relative position, including left and right, and interpret simple networks, diagrams and maps involving a small number of points, objects or locations.

LEVEL 3 [YEAR THREE & YEAR FOUR]
At Level 3 students recognise and describe the orientation of lines as vertical, horizontal and diagonal. They describe angle in terms of rotation of line segments which meet at a common end-point. Students recognise polygons, prisms and pyramids and their component parts such as edges, vertices and faces. They use and interpret two-dimensional representations of three dimensional objects or parts of these objects, for example, nets, cross-sections and simple projections. They describe what is seen and not seen of a simple object from different positions. They recognise and construct simple tessellations and follow instructions to produce geometric designs such as tan grams. Students use and compare ways of locating and identifying places on maps and diagrams. They develop and test instructions to specify travel directions and location using compass directions, N, S, E and W, and grid references such as 'A5' on a street directory.

LEVEL 4 [YEAR FIVE & YEAR SIX]
At Level 4 students identify the mathematical properties of horizontal, vertical, parallel and perpendicular lines in relation to each other; shapes and solids, including prisms, pyramids, cylinders and cones; and incorporate the ideas of angle, size and scale into descriptions of the features of these shapes and solids. They explain the idea of finiteness and non-finiteness in relation to lines and surfaces, and use recursion to

SPACE Course Advice [continued]

investigate the idea of self-similarity of shapes. They make two-dimensional representations of three-dimensional objects. Students use sketches of shapes and solids to represent the surrounding environment, and describe in mathematical language their relative sizes in that environment. Students also use the ideas of size, scale and direction when referring to the relative positions of places and objects in maps, and demonstrate understanding of shape and connectedness in diagrams of networks. Students develop a sequence of instructions for drawing a shape, solid or net of a solid, and adjust these instructions to take account of scale. They formulate and test procedures, expressed in terms of compass points and simple coordinate systems, that describe how to get from one place to other places. They use and interpret conventional symbols and language in activities relating to place, direction, paths and scale in maps

MEASUREMENT, CHANCE & DATA Course Advice

LEVEL 1 [PREP]

At Level 1 students measure and compare length, area, capacity and mass in relation to various familiar objects that are seen and handled using descriptive terms and/or informal units such as the length of a line segment using steps or paces, simple area covered such as a shape by two handprints, the capacity of containers such as half a glass of water, the weight of common objects such as a heavy schoolbag and duration such as the number of days until a birthday.

They recognise the flow and continuity of time and the use of natural cycles such as day/night, the seasons, and informal units such as heartbeats and hand claps at regular intervals to segment and describe the passage of time.

Students recognise and respond to unpredictability and variability in events, such as getting or not getting a certain number on the roll of a die in a game.

They identify and describe the outcomes of simple chance events such as the toss of a coin, and collect and display these using simple pictograph data related to their own activities which may include games or events such as a birthday party

LEVEL 2 [YEAR ONE & YEAR TWO]

At Level 2 students use physical models, money and diagrams to illustrate ordered and unordered sets of numbers, shapes, objects and data and carry out related computations and manipulations. Students make, describe and compare measurements, characteristics or outcomes such as length, width and height; mass; certain, likely, unlikely and impossible. They develop and apply criteria for the use of informal units, including non-uniform measures, such as hand-span, and uniform measures, such as icy-pole sticks for length; use formal units such as hour for time or litre for capacity; and use the standard units for length (metre), mass (kilogram) and time (second). They describe temperature qualitatively and informally measure and compare areas as enclosed space or space covered. They judge relative capacity of familiar objects and containers by eye and make informal comparisons of weight by hefting. Students recognise the key elements of the calendar and place in sequence days, weeks and months. They describe common and familiar time patterns and such as the time, duration and day of regular sport training and tell the time to hours and half-hours using an analog clock, and to hours and minutes using a digital clock.

Students make predictions for the likelihood of outcomes of simple random and non-random events, using qualitative descriptors for more likely or less likely, such as such as whether 6's are harder to roll than 2's on a die. They collect simple categorical and numerical data (count of frequency) and present this data using pictographs and simple bar graphs and make predictions about the outcome of chance experiments in response to queries.

LEVEL 3 [YEAR THREE & YEAR FOUR]

At Level 3 students extend the range of characteristics and attributes, estimated and measured using informal and formal units to include angle (simple fractions of a complete turn), temperature and weight.

Students estimate and measure length, area, volume, mass and time using appropriate instruments. They recognise and use different units of measurement (informal, formal and standard metric measures) in appropriate contexts, and interpret linear and circular scales in familiar situations such as measuring weight. Students describe and interpret the numbers on analog clocks in relation to the minute and hour hands, and interpret timetables and calendars in relation to familiar events.

Students rate everyday outcomes in terms of likely occurrence and informally and qualitatively describe the *fairness* of events. They plan and conduct chance experiments with respect to natural variability and tally results of these experiments. Students identify numerical data as discrete or continuous and construct column and bar graphs to display frequency data of ordinal categories.

LEVEL 4 [YEAR FIVE & YEAR SIX]

At Level 4 students accurately measure the characteristics of length (including perimeter), area (including surface area), volume, capacity, angle, time (including duration of time) and temperature in formal and standard units using appropriate instruments and scales. They choose accuracy of measurement relevant to the situation at hand and sufficient to distinguish between the sizes of things with the same characteristic, and find the corresponding difference between these sizes to that accuracy.

Students refine their descriptions of chance (random) events in the range from impossible to certain using words and fractions or decimals between 0 and 1. They explain the role of symmetry in chance situations and experiments involving equally likely events (for example, that the symmetry inherent in a device used to generate random events may be used to calculate the probability of the outcomes in each event). They comprehend that experimental estimates of probabilities (relative frequencies) converge to the theoretical probability values in the long run. They comprehend how chance events may be simulated (for example, randomly choosing a birth month by selecting from a shuffled pack of cards without kings), and that simulations provide models (estimates) of situations that are impractical to deal with without using an empirical approach.

Students classify numerical data as discrete or continuous, and collect, organise, analyse, interpret and represent categorical, ordinal and numerical data in response to planned questions. They attend to the clarity of the questions, sampling techniques, and methods used to present data. They recognise and describe the relationship between measures of centrality and simple measures of spread used to describe and order data in a set. Students follow a plan and sequence of instructions involving shapes and measurements to construct an object from prefabricated parts, for example, a piece of furniture or a model car. They calculate and compare the times taken by various people to complete activities.

Students calculate probabilities associated with experiments involving equally likely events (for example, the probability of each outcome when two die are rolled), and the probabilities of symmetric events in the event space, and the mean, median and range for grouped and ungrouped data. They construct graphs to represent data sets and devise suitable scales (nominal, ordinal or interval) for the reference lines (axes) for the categories and frequencies of the data.

LEVEL 1 [PREP]

At Level 1 students make and test simple conjectures such as 'the larger an object the heavier it is', 'it is likely to rain after school today' and 'nine is four more than five'. They make rough estimates and check their work with respect to computations and constructions in *Number, Space, Measurement, chance and data* and *Structure*.

Students devise and follow ways of recording computations involving the use of materials, mental calculations and the digit keys and +, - and = keys on a four function calculator. Students use drawing tools such as simple shape templates and geometry software to draw points, lines, shapes and simple patterns and to copy a picture of a simple composite shape such as a child's sketch of a house using these shapes.

LEVEL 2 [YEAR ONE & YEAR TWO]

At Level 2 students make and test simple conjectures by finding examples, counter-examples and special cases and informally decide whether a conjecture is likely to be true in general.

Students use place value to enter and read displayed numbers on a calculator. They use a four-function calculator, including use of the constant addition function and x key, to check the accuracy of mental and written estimations and approximations and solutions to simple number sentences and equations.

LEVEL 3 [YEAR THREE & YEAR FOUR]

At Level 3 students use brackets to give priority to an operation in a simple sequence of operations. Students follow and interpret algorithms and methods of approximation used by others. They formulate and test conjectures to investigate number (for example, the shapes that can be used to model common fractions); computations (for example, the nature of the product of even and/or odd numbers); number patterns (for example, the patterns of last digits produced by multiples of a given number); measurement (for example, the relationship between size and capacity of a container); and shapes (for example, the effects of reflections, slides/translations and rotations on the orientation of a shape).

Students describe and explain why some shapes tessellate, why some shapes have different forms of symmetry, and which solids have nets. Students represent depth in drawings and describe 'what is not seen' in three-dimensional drawings. They use and interpret physical models, the place-value model, and diagrams to explore the properties of numbers, shapes, and location, and to represent computations and measurements. Students develop and apply appropriate methods for collection and presentation of survey and simulation data.

Students apply number skills to everyday contexts such as shopping, with appropriate rounding to the nearest five cents. Students illustrate tiling patterns and stacking of solids. They identify familiar places and routes from local and regional maps and diagrams, and relate daily activities to clock times. Students describe uses of mathematics in earlier times with respect to different numeration systems and bases, place value and algorithms for computation.

Students use a calculator to check the accuracy of estimations and computations involving whole numbers and decimals to two places. They use a calculator to identify and classify the form of decimal values that result from division of natural numbers. Students use computer software to create shapes, tessellations, maps and diagrams, and to organize and present data. They use a range of mechanical and electronic measuring instruments to support mathematical development at this level

LEVEL 4 [YEAR FIVE & YEAR SIX]

At Level 4 students explain why a few successful examples are not sufficient to form a generalisation and how a single counter-example suffices to invalidate a

WORKING MATHEMATICALLY
Course Advice [continued]

generalisation. They make and test conjectures about the generalised forms of numbers in terms of divisors, factors and remainders; shapes and their properties and related measurements.

Students use appropriate physical models and graphs when testing the truth of conjectures. They design algorithms as models of mathematical processes such as the construction of an equilateral triangle. They engage in a planned investigation involving mathematical modelling and refine a model in terms of its formulation and interpretation. They identify the historical evolution of key mathematical ideas such as the emergence of negative numbers.

Students identify situations in everyday life where estimates of numbers and computations are considered appropriate, and investigate the methods used to make these estimates and estimate likelihood from simulations. They collect and analyse data about people's beliefs about fairness in games of chance. Students use the memory function on a scientific or graphics calculator to do computations with a series of operations involving small and large numbers, and, with the aid of a scientific or graphics calculator, use estimation procedures to predict and check the results of computations. They use a scientific or graphics calculator to implement algorithms to find factors and prime factors of numbers and to explore facts and puzzles involving numbers. They use graphics calculators or computer-drawing packages and application programs to represent shapes and solids under a range of transformations, and use technology to generate simple simulations of events such as gender and order of children born in a family

Planning, Assessment & Expectations

Mathematics Session Overview

At St. Elizabeth's Parish School, it is expected that sessions follow the format outlined below. Please note that there is no time constraint/limit attached to each component or to the overall session itself. Teachers are encouraged to use their professional judgement in deciding the length of components and sessions. E.g. If your Warm Up session brings about rich discussion or the students are totally engaged, you can extend it as needed. Each session should incorporate all the components, however there may be times when this is not the case and once again professional judgement is used. It is expected that, where possible, Mathematics curriculum be incorporated into the Inquiry Unit.

Planning

At the beginning of each new unit, prior to recording ideas, teachers together with the Mathematics and Learning & Teaching co-ordinators will consult VELS and planned Inquiry units to ascertain the expected content for their Year Level. Then teachers brainstorm ideas, vocabulary, strategies and activities that best suit the needs of their students according to data and anecdotal information. The content covered should be highlighted on the Yearly Overview as a way of auditing what is being taught. The Yearly Overview is kept in work programs. All outcomes to be assessed can be found in teachers' assessment records. Report indicators should be highlighted at the planning stage to ensure consistency across the Level.

Assessment

In line with formal units of work outcomes for mathematics learning at each level of schooling are delineated by professional learning teams and progress towards achievement is monitored and electronically tracked for each student.

Student work samples are collected and analysed on a regular basis to ascertain competencies and areas for improvement. This data informs teaching and learning in the mathematics block and supports each student's progress to achieving the targets for mathematics learning at particular levels of schooling as indicated in VELS.

Planning, Assessment & Expectations [continued]

Standardised and diagnostic testing is implemented in Term 1 and 4 each year. The information gained informs learning and teaching in classrooms and identifies those students for whom Individual Learning Plans will be provided.

Student self assessment is a regular feature of the school's assessment practices and particularly applied to students in the middle years of schooling.

Staff engage in Moderation against the Victorian Essential learning Standards awarding each student with a score applicable to their current achievement. This practice also assists in ensuring consistent teacher judgements about student achievement.

The National Assessment Plan for Literacy and Numeracy (NAPLAN) informs our curriculum development and provides further information about individual student progress.

Implementation

The Essential Components of a Mathematics Session:

Warm Up	• Time to practise and developmental computation and problem solving skills. • It is desirable to link this with other components of Numeracy Session. • The purpose of the activity and its mathematics needs to be made explicit. • The structure of this component can be varied according to the needs of the student. Eg; whole class or ability groups • Use a variety of resources and strategies such as mental computation, short open-ended questions, counting activities and especially games.	
Student Learning Activity (Including Introduction)	• Time to introduce the purpose of the lesson; instructional teaching time. • Assessment drives our teaching • The needs of the students is paramount to the content of the whole class focus • The content of the lesson is based on VELS, Course of Study, Nelson Maths, Maths Task Centres, C@Work, etc.	
Learning Centres / Independent Tasks	**Learning Centres** • The purpose of the learning centres is a time for practice, reinforcement and extension of understandings. • The structure of the groups can be individual, pair or small group. In group activities, the structure should always be made up of mixed abilities. • Assessment should drive the group structure. • The group structure is dependent on the needs of the students • The nature of the activity has a bearing on the group structure	**Focus Group** • The purpose of the Focus Group is a time forteacher directed, reinforcement and extension of understandings. • The structure of the groups can be individual, pair or small group. In group activities, the structure should always be made up of like abilities. • Assessment should drive the group structure. • The group structure is dependent on the needs of the students • The nature of the activity has a bearing on the group structure
Share **Reflect** **Assess**	• The purpose of share time is for children to share their learning with the group, rather than share the activity they completed • This needs to be teacher directed • The teacher can direct specific students to present their response and the strategy used • The teacher assists the students to make the mathematical connections • Share time does not necessarily come at the end of a session. It may occur throughout the session. • Students may respond through verbal responses or written reflections • The teacher concludes the numeracy session with a statement (written or verbal) reinforcing key mathematical ideas. • This needs to be short and explicit summarising of the numeracy session.	