Dalmeny Public School

Creative Arts Policy

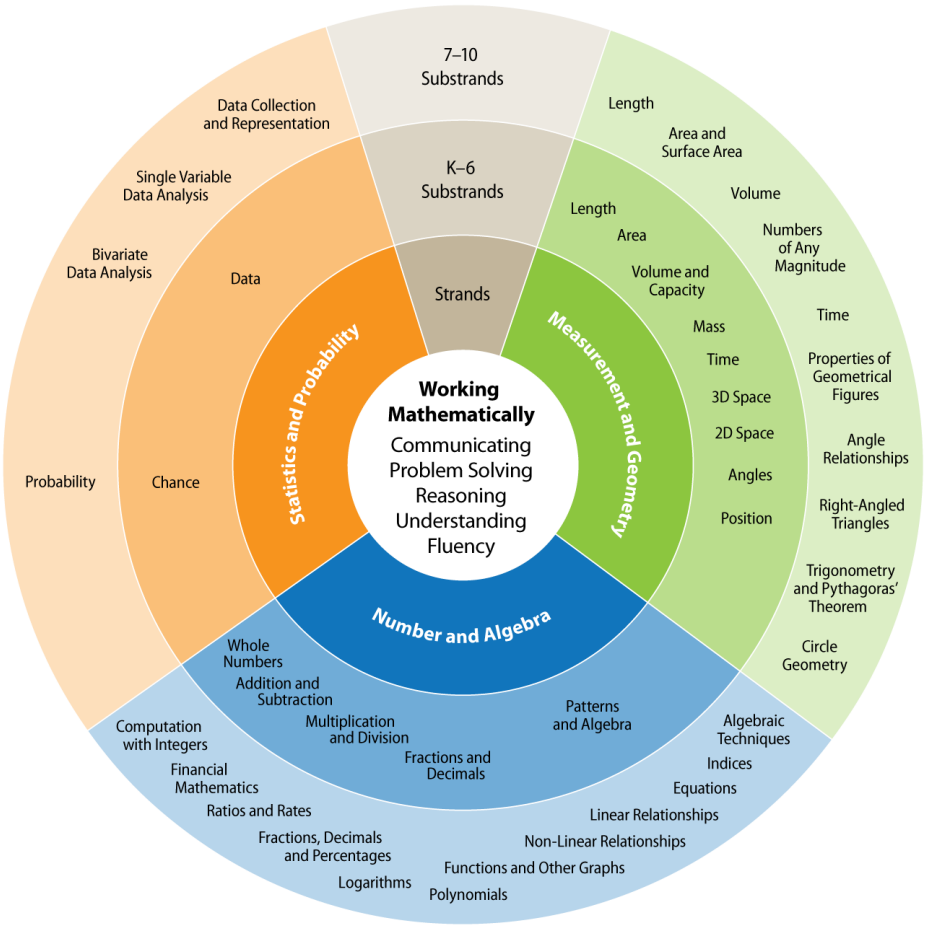
Mathematics Policy

Working Mathematically

Number and Algebra

Measurement and Geometry

Statistics and Probability



The diagram represents the relationships between the strands and substrands only.
It is not intended to indicate the amount of time spent studying each strand or substrand.

1. POLICY STATEMENT

1.1 *"To be numerate is to use mathematical ideas effectively to participate in daily life and make sense of the world. It incorporates the use of numerical, spatial, graphical, statistical and algebraic concepts and skills in a variety of contexts and involves the critical evaluation, interpretation, application and communication of mathematical information in a range of practical situations."*

The NSW Education Standards Authority (NESA) Mathematics K – 10 Syllabus incorporates Working Mathematically and the strands; Number and Algebra, Measurement and Geometry, and Statistics and Probability. Numeracy is embedded across the Syllabus.

At Dalmeny Public School Mathematics is taught in an explicit, differentiated, practical and sequential learning block of at least 60 minutes per day. Approximately 25% of teaching time is allocated to mathematics.

1.2 Planning for Mathematics teaching and learning and assessment meet NSW Department of Education Policy Standards.

1.3 Mathematics

1.3.1 Numeracy Teaching

1.3.2 The teachers of Dalmeny Public School will develop students numeracy skills and understandings.

1.3.3 "Teachers will identify and support the specific mathematics demands of the syllabus leading to knowledge, skills and understandings in:

- mental computation and numerical reasoning.
- patterning, generalisation and algebraic reasoning.
- applying measurement strategies.
- spatial visualisation and geometric reasoning.
- data analysis, including tables.
- graphical representation and analysis."

Numeracy K – 12 Policy NSW Department of Education

1.3.4 Numeracy assessment and reporting

1.3.5 Assessment and evaluation are integral components of all Mathematics programs.

1.3.6 School and State assessment data will be used to guide teaching and learning and to determine each student's numeracy needs and achievements. This information will be provided to parents and caregivers

1.3.7 Students are:

- provided with opportunities to demonstrate the achievement of outcomes for their relevant stage of learning.
- engaged in relevant and reliable assessment strategies.
- assessed using valid data.
- provided with tasks that are time efficient and manageable.
- participate in a variety of activities to determine student achievement.
- engaged in work that is based on data which guides ongoing teaching and learning.
- monitored and evaluated as they progress through the syllabus.
- provided with reports in accord with school requirements and departmental and government policy.

1.4 Reports to parents on student achievement are provided in teacher and parent interviews and formal written reports at the end of semester one and semester two.
Outcomes and intended assessment strategies are outlined in all programs K – 6.
All students are provided with access to the Mathematics syllabus.

2. AUDIENCE and APPLICABILITY

2.1 This policy applies to all Dalmeny Public School staff, students and parents.

3. CONTEXT

3.1 The Mathematics Policy provides greater clarity in response to the delivery of a key learning area syllabus, assessment and reporting to parents

3.2 The school plan identifies numeracy targets that reflects state targets, including Aboriginal Education students.

3.3 The school plan identifies professional development strategies necessary to achieve school and state targets.

RESPONSIBILITIES and DELEGATIONS

4.1 Dalmeny Public School Principal and School Executive will:

- ensure the currency of the Mathematics and support material
- provide oversight of the policy and implementation including advice and assistance to staff
- notify staff of changes to the policy.

5. MONITORING, EVALUATION and REPORTING

5.1 The principal, school executive and delegated teachers will:

- supervise policy implementation and report evaluations to the Director of Educational Learning NSW Public School

5.2 Director of Educational Learning for Glenfield Public Schools NSW will:

- monitor and support the implementation of the policy at Dalmeny Public School and report to Metropolitan North executive director.

5.3. Executive Directors will:

- collect information to inform the Directors, Early Learning and Primary Education and Secondary Education and for evaluation of the policy.

5.4. The Directors, Early Learning and Primary Education, and Secondary Education will:

- monitor the implementation of this policy and will report annually, or as required, to the Executive Director, Learning and Teaching.

IMPLEMENTING THE NSW STATE SYLLABUS IN MATHEMATICS AT DALMENY PUBLIC SCHOOL.

Dalmeny Public School will focus on:

Working Mathematically

Working Mathematically provides students with the opportunity to engage in genuine mathematical activity and develop the skills to become flexible and creative users of mathematics.

In this syllabus, Working Mathematically encompasses five interrelated components:

- *Communicating.* Students develop the ability to use a variety of representations, in written, oral or graphical form, to formulate and express mathematical ideas. They are communicating mathematically when they describe, represent and explain mathematical situations, concepts, methods and solutions to problems, using appropriate language, terminology, tables, diagrams, graphs, symbols, notation and conventions.
- *Problem Solving.* Students develop the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively. They formulate and solve problems when they use mathematics to represent unfamiliar or meaningful situations, design investigations and plan their approaches, apply strategies to seek solutions, and verify that their answers are reasonable.
- *Reasoning.* Students develop an increasingly sophisticated capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising. They are reasoning mathematically when they explain their thinking, deduce and justify strategies used and conclusions reached, adapt the known to the unknown, transfer learning from one context to another, prove that something is true or false, and compare and contrast related ideas and explain their choices.
- *Understanding.* Students build a strong foundation that enables them to adapt and transfer mathematical concepts. They make connections between related concepts and progressively apply the familiar to develop new ideas. Students develop an understanding of the relationship between the 'why' and the 'how' of mathematics. They build understanding when they connect related ideas, represent concepts in different ways, identify commonalities and differences between aspects of content, describe their thinking mathematically, and interpret mathematical information.
- *Fluency.* Students develop skills in choosing appropriate procedures, carrying out procedures flexibly, accurately, efficiently and appropriately, and recalling factual knowledge and concepts readily. They are fluent when they calculate answers efficiently, recognise robust ways of answering questions, choose appropriate methods and approximations, recall definitions and regularly use facts, and manipulate expressions and equations to find solutions.

Scope and Sequence
Number and Algebra

Early Stage 1	Stage 1	Stage 2	Stage 3
Whole Numbers	Whole Numbers	Whole Numbers	Whole Numbers
Addition and Subtraction	Addition and Subtraction	Addition and Subtraction	Addition and Subtraction
Multiplication and Division	Multiplication and Division	Multiplication and Division	Multiplication and Division
Fractions and Decimals	Fractions and Decimals	Fractions and Decimals	Fractions and Decimals
Patterns and Algebra	Patterns and Algebra	Patterns and Algebra	Patterns and Algebra

Measurement and Geometry

Early Stage 1	Stage 1	Stage 2	Stage 3
Length	Length	Length	Length
Area	Area	Area	Area
Volume and Capacity	Volume and Capacity	Volume and Capacity	Volume and Capacity
Mass	Mass	Mass	Mass
Time	Time	Time	Time
Three-Dimensional Space	Three-Dimensional Space	Three-Dimensional Space	Three-Dimensional Space
Two-Dimensional Space	Two-Dimensional Space	Two-Dimensional Space	Two-Dimensional Space
		Angles	Angles
Position	Position	Position	Position

Statistics and Probability

Early Stage 1	Stage 1	Stage 2	Stage 3
Data	Data	Data	Data
	Chance	Chance	Chance

Resources

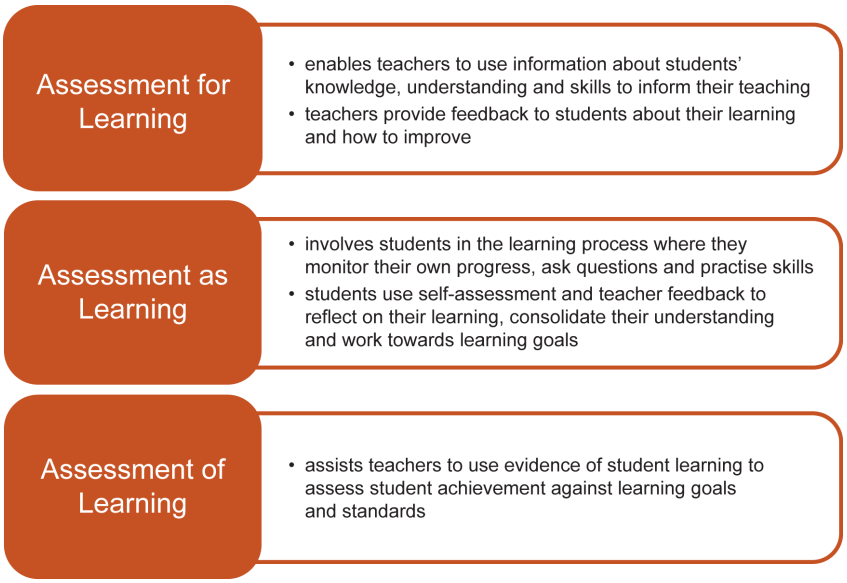
Resource	Author and details
NSW Mathematics K-10 Syllabus	NSW Education Standards Authority
NSW Numeracy Progressions	NSW Department of Education
Count Me In Too Counting On	Explicit teaching strategies to improve students' conceptual understanding in number. These activities are engaging, interactive and tactile.
Developing Efficient Numeracy Strategies (DENS) Book	The DENS book is used to support the Stepping Stones program and is aimed at assessing (SENA 1 and 2) and developing the four central groups of early arithmetical strategies. 1. Emergent counting 2. Perceptual counting stage 3. Figurative Counting stage 4. Counting on stage
Technology	Technology is a support for students to learn and practise accuracy of mathematical skills. It is often individual, differentiated activities with tutorials. It is also an instructional tool.

	• PC Notebooks. Including; Rainforest Maths, Studyladder, interactive mathematical games from the internet (selected by teacher), youtube. • Ipad Apps • Interactive Whiteboard (SMARTBOARD)
Concrete materials / Games	Classroom mathematical games and concrete materials. For example, unifix cubes, base 10 materials, clocks, numeral expanders, visuals, displays, dice, dominoes, counters etc.

Assessment

At Dalmeny Public School teaching and learning programs in Mathematics begin with formative and summative assessment.

Assessment data is used to guide teaching and learning programs and to obtain specific information about each student's mathematical, incorporating numeracy, capabilities for planning and reporting purposes.



(NSW Mathematics K – 10 Syllabus)

Dalmeny PS Assessment Scope and Sequence

Mathematics Assessment Scope and Sequence		
Term	Standardised/diagnostic	Non-standardised
1	As needed: SENA1, SENA 2, SENA 3 and SENA 4 Pat Maths - ACER	Class participation Observations of problem-solving skills in group and pair work Work samples
2	SENA1, SENA 2, SENA 3 and SENA 4 Pat Maths – ACER NAPLAN Tests	Class participation Observations of problem-solving skills in group and pair work Work samples
3	SENA1, SENA 2, SENA 3 and SENA 4 ICAS Maths NAPLAN Results	Class participation Observations of problem-solving skills in group and pair work Work samples
4	SENA1, SENA 2, SENA 3 and SENA 4 Pat Maths - ACER	Class participation Observations of problem-solving skills in group and pair work Work samples

Effective Mathematics Teaching and Learning

Dalmeny Public School will:

- give numeracy improvement a target priority and develop an action plan;
- provide continuing teacher professional development in order to develop understandings about numeracy and the knowledge and skills to apply appropriate strategies in the classroom;
- communicate appropriate teaching strategies for improving numeracy through training and development within the school, using mentors and consultants;
- provide for consistency in student learning through a planned whole school approach;
- provide for teaching strategies that take students from what they know to the partially known through explicit and systematic teaching on a daily basis;

- identify individual student needs through ongoing assessment;
- provide support teaching for students experiencing learning difficulties;
- encourage and provide for parent input into the learning process;
- track and monitor students K – 6;
- provide modelled and guided teaching and learning experiences leading students to independence in mathematics and working mathematically;
- provide meaningful learning situations in which students take knowledge, understandings and strategies through to practice in a variety of settings;
- provide positive and constructive feedback for students, affirming what they know and where to next;
- opportunities to review whole or part of the learning cycle;
- review and organise school resources to ensure their appropriateness for optimal numeracy learning and teaching;
- evaluate the whole-school numeracy program as part of school planning, to measure the progress being made to improve the numeracy outcomes of students and
- report to parents on prior and current learning achievements using the standards framework of syllabus outcomes.

Teachers will provide teaching and learning programs designed to develop mathematics and working mathematically.

Teaching programs will include:

- daily instructional lessons that are explicit, systematic and clear in direction for students using the NSW State Syllabus in Mathematics as the framework;
- modelled, guided and independent learning opportunities;
- the teaching of knowledge, skills and strategies designed to take the student to independence in learning;
- frequent exposure to, and experience with, meaningful mathematical activities;
- individual assessment strategies designed to inform teaching directions;
- texts for instructional teaching in mathematics, appropriate to each student;
- time for critical reflection and opportunities to articulate mathematical concepts and applications;
- regular opportunities for students to articulate and demonstrate their learning;
- opportunities for students to practice mathematical operations;
- opportunities to explore mathematical concepts and understandings as individuals and in groups;
- regular tracking and monitoring of students;
- analysis of assessment and
- feedback on day to day learning and achievement.

The Learning and Support Teacher will:

- liaise with class teachers in assessment, programming and monitoring of identified students;
- support with in class teaching and learning initiatives;
- provide support in programming individual educational programs for identified students;
- mentor class teachers in skills and strategies to assist specific teaching and learning needs of identified students;
- support referrals for district support , where appropriate and
- provide constructive feedback to teachers, students and parents, where appropriate.

Students will:

- engage constructively in teaching and learning activities;
- participate in planning for future learning directions and
- be responsible for their own belongings required for their learning tasks as required by the class teacher eg. pens, sharp pencils, texts etc
- ensure their engagement in maths activities provides other students with the opportunity to learn and their teacher to support that learning without disprution.

Parents will:

- model and encourage positive and enjoyable experiences in mathematics.

  This can be done through everyday activities such as cooking, shopping, art, music and computers. Examples of this could be:
  - counting down the time in months, weeks, days and hours to a special day or holiday;
  - measuring ingredients for a recipe you are cooking;
  - tracking or graphing scores for a favourite sport;
  - estimating change at the store
  - adding up the cost of items when shopping;
  - ask for your child's help whenever using a measuring tape or ruler – explain what you are doing;
  - look for patterns or shapes in the environment;
  - asking your child to explain what they are working on in maths at school, during homework;
  - finding appropriate maths games on line to do together;
  - comparisons e.g. longest, shortest, smallest, biggest, fastest, slowest, hottest, most expensive, least expensive, heaviest, lightest etc;
  - use dice to practice maths facts etc;
  - listen to multiplication tables through songs in the car or at home to help their child develop automaticity of the recall of number facts.

- support their child / children with any class requirements such as, pens, pencils, texts, geometry equipment, calculators etc as suggested by the class teacher.
- work collaboratively and supportively with their child's teacher in order to support their child's growth in mathematics knowledge, skills and understanding.