

Sale Primary School

Mathematics Policy

2002

## **Purposes**

Through learning mathematics at 545 students will:

- Acquire mathematical skills and knowledge so that they can deal confidently and competently with daily life
- Recognize the fundamental importance of mathematics in the real world
- Understand and appreciate the nature of mathematical thinking
- View mathematics at school as a positive experience

## **Broad guidelines**

- A positive attitude towards mathematics among students, staff and the school community will be promoted
- At least four hours a week will be allocated to teaching mathematics at all levels
- The CSF and DET support documents will form the basis for the planning and implementation of classroom programs in Mathematics
- Planning in the P-4 should be based on The Early Years Numeracy model
- Planning in the 5/6 should be based on The Middle Years Numeracy approach
- Inclusive teaching strategies should be employed for the teaching of mathematics
- A consistent approach to the teaching of mathematics will be encouraged and facilitated by the Mathematics Committee, including a consistent approach to using mathematics terminology (*see Appendix - major terminology*) and an appreciation of students' cultural backgrounds and previous experiences.
- 545 Mathematics profiles will be used as the major assessment and reporting tool and will be updated by classroom teachers at least twice a year.
- Assessment should be ongoing and should form the basis for planning in order to meet individual needs
- Resourcing needs will be carefully planned and regularly reviewed
- P.D. in the teaching of Mathematics will form an integral part of the whole school P.D.

**Implementation**

- Family Mathematics evenings, and Mathematics activity days will be conducted regularly - newsline articles will appear regularly
- Teacher surveys will be conducted to ascertain P.D. needs of teachers
- Regular P.D will be held at team and staff meetings
- Yearly planners in Mathematics will be devised with an emphasis on Number (*see egs in Appendix-yearly planners*)
- A two year planner for Measurement will be followed

<b>Level 1 - introduction to all areas</b>	
<b>Levels 2,3,&amp;4</b>	
<b><i>ODD YEARS</i></b>	<b><i>EVEN YEARS</i></b>
Capacity Length	Mass Area/Perimeter
Time	

\*this planner can be flexible according to children's needs e.g volume may be left until Year 6

- The Early Years model will be used for weekly /daily planning of Mathematics sessions in prep - 4

<b>Whole Class Focus</b>
<b>Small group focus</b>  <i>Teaching groups</i> <i>Independent Mathematics</i>
<b>Whole class share time</b>

\* *see Appendices - sample lesson plans, teaching approaches, considerations for learning*

- Open-ended tasks will be widely used in the Mathematics program
- Problem- solving will form an integral part of the Mathematics program
- Assessment tools may include
  - PEAP assessment
  - EY Numeracy interview
  - Teacher observations
  - Self assessment
  - Structured assessment tasks
  - Mathematics projects

## References

### General

Early Years Numeracy Pack

[Curriculum@work](#) CD

Sofweb idea bank <http://www.sofweb.vic.edu.au/ideabank/index.htm>

Teaching Primary Mathematics– George Booker Denise Bond	<b>T MATH 510 BOO</b>
Number Sense – Alistair McIntosh Barbara Rey	<b>T MATH 510 MACI</b>
Open Ended Mathematics Activities – Peter Sullivan Pat Lilburn	<b>T MATH 372 SUL</b>
Think Mathematically - Alistair McIntosh Ellita De Nardi	<b>T MATH 510 MACI</b>
Action Mathematics - Pat Lilburn Pam Rawson	<b>T MATH 510 LIL</b>
RIME -Richard Cooney	<b>T MATH 510 RIM</b>
MTCP -Charles Lovitt Doug Clarke	<b>T MATH 510 LOV</b>
Work It Out	
Figure It Out Sandra Cohen	<b>T MATH 510 COH</b>

### Assessment

Early Years Numeracy interview booklet &CD

Profiling Mathematics Rachel Griffiths Margaret Clyne	<b>T MATH 372 GRI</b>
---	-----------------------

### Series

Young Australia	<b>T MATH 510 YOU</b>
-----------------	-----------------------

MacMillan Mathematics	<b>T MATH 510MACM</b>
-----------------------	-----------------------

Rigby Mathematics	<b>T MATH 510 RIG</b>
-------------------	-----------------------

# Appendix

# Major Terminology

Language is crucial to the learning of mathematics because it is through discussion that learners can come to terms with mathematical ideas.(Booker p16).

At 545 we would like to develop consistency with the language we use and ensure that we use terminology that makes sense to the students and that helps them to understand mathematical concepts. Some examples of helpful terminology are:

## NUMBER

### Place Value/Counting

**Uneven** numbers rather than odd

**Zero** rather than nought or 0

**Base 10 materials** rather than MAB

Refer to **places** (eg hundreds place) rather than columns when using place value charts and developing place value and computation ideas.

Numbers in ones place always called **ones** rather than units.

**Renaming** rather than trading or borrow and pay back

### Addition:

'**and**' rather than "plus" in early stages (p133/134 Booker)

### Multiplication :

4 **multiplied by** 3 or 4 **by** 3 or simply 4 threes rather than times or lots of. (p186 Booker)

### Division :

**shared among** in early stages then **divided by** (p222/223 Booker)

## SPACE

3D SHAPES - vertices, faces, edges, apex

2D SHAPES – corners, sides

oblong rather than rectangle (all 4 sided figures are rectangles)

## DATA

**Mean:** average

**Mode:** the data/number that occurs most frequently

**Median:** in on ordered set of data, the middle number

\* Graphs with bars can be **column or bar graphs**, referred to as horizontal or vertical bar/column graph depending on the direction of the bars/columns. (p372 Booker)

## Considerations for selecting learning experiences

- the students' stages of mathematical growth
- appropriate types of learning contexts
- appropriate use of materials
- teaching conversations
- use of teaching approaches
- cultural and socio- economic backgrounds

# TEACHING APPROACHES

Modelled mathematics	Shared mathematics	Guided mathematics
<p><b>a teaching approach used in small group focus</b></p> <p><b>The teacher:</b> presents the learning experience models and describes effective strategies, making links to the students' previous experiences shares other related skills and understandings that can be brought to the experience uses materials and records the mathematics allows time for students to think and work independently</p> <p><b>The students:</b> talk about the demonstration model the strategies using materials and/or diagrams</p> <p><b>The teacher:</b> articulates key mathematical ideas supports students to model strategies discusses, questions and models how connections are made to form a generalisation</p> <p><b>The students:</b> use their own words and representations to describe these connections and generalisations</p> <p><b>Prompts...</b> Watch me while I... Do you remember how we... Let's try that now... Listen while I explain... Imagine yourselves... Now you try... Tell me about... When have you used this before? How is this the same? How is this different?</p>	<p><b>a teaching approach used in whole class focus small group focus</b></p> <p><b>The teacher:</b> introduces the learning experience</p> <p><b>The teacher and students:</b> identify and practise the known skills and understandings relevant to the experience</p> <p><b>The teacher and students:</b> highlight and explore other related skills and understandings</p> <p><b>The teacher:</b> introduces the key mathematical ideas and provides time for individual thought leads the discussion and questions students, helping them to make connections</p> <p><b>The teacher and students:</b> explore the mathematics using materials, oral language and/or written recording share and justify their ideas make connections between mathematical ideas to create a generalisation</p> <p><b>The students:</b> articulate their own ideas to describe these connections and generalisations</p> <p><b>The teacher and students:</b> use materials and written recording, as appropriate to support a discussion to use the generalisation in a new situation</p> <p><b>Prompts...</b> Today we are looking at... What do you know about... Do you remember when we... Why do you think that would work? What do you now know about...? Show me... Tell me about... How is this different? When could you use?</p>	<p><b>a teaching approach used in small group focus</b></p> <p><b>The teacher:</b> introduces the learning experience encourages students to identify relevant known skills and understandings provides time for individual thought guides students scaffolds individual learning</p> <p><b>The students:</b> talk, think and work their way towards making sense of the mathematical ideas engage in conversations with the teacher make connections to develop a generalisation</p> <p><b>The teacher:</b> reinforces the generalisation with the group addresses any issues that may arise</p> <p><b>The students:</b> question, explain and justify their own views and interpretations</p> <p><b>The teacher and students:</b> use materials, oral language and/or written recording to support the use of the generalisation in new situations</p> <p><b>The teacher:</b> acknowledges successful problem solving and appropriate estimation and checking strategies</p> <p><b>Prompts...</b> Today you will be... What mathematics could you use? Tell me about... When have you used something like this before? How are these the same? How are these different? What do you know that you didn't know before? What do you know about... that helps you understand? When else might you use this strategy?</p>

## **Whole Class Share Time**

### **Reflecting on, sharing and celebrating student learning.**

- ❖ Time for sharing and celebrating achievements.
- ❖ Time for clearly articulating the mathematics, making connections and forming generalisations.
- ❖ Time for reflecting on experiences and strategies used.
- ❖ Time for building a community of learners.
- ❖ Time for reflecting on ways of learning.

### **During Share time**

#### **Students:**

- Capture the interest of their audience by explaining what the mathematics is about and why they chose particular strategies
- Clearly articulate the mathematics
- Share and reflect on the strategies used
- Are supported in making connections between mathematical ideas.

#### **The teacher:**

- Targets students to share
- Emphasises connections
- Encourages sharing of strategies
- Makes mathematics explicit
- Raises challenges
- Promotes a language to talk about mathematics
- Encourages students to reflect on what they have learned and how they learned / what assisted them in their learning.

#### **Some ways to implement:**

- use concrete materials / visual
- peer assessment
- have focus questions introduced in Whole Class Focus
- in roving conferences approach students to share at the end
- question prompts
- question cubes
- stick sticky note on children's shirt so they know/ you know who will share
- have a special toy / cushion
- nominate child to lead share time
- ***never*** tidy up first
- over week all children have a go
- jigsaw
- circuit brainstorm (pass problem around –children can't repeat a solution)

- Don't forget the conversation prompts listed on the teaching approaches green card.
- This is a great time for assessment.

# Yearly Planners

# Yearly Planner CSF Level 1

Term 1	Term 2	Term 3	Term 4
<p><b><u>Space</u></b></p> <ul style="list-style-type: none"> <li>• Draws and builds things remembered, imagined, seen and handled.</li> <li>• Follows and gives oral directions based on everyday language of position and movement.</li> <li>• Introduce location term RIGHT (hand)</li> <li>• Matches shape with outlines</li> </ul>	<p><b><u>Space</u></b></p> <ul style="list-style-type: none"> <li>• Review location term – right</li> <li>• Matches shape with outlines</li> </ul>	<p><b><u>Space</u></b></p> <ul style="list-style-type: none"> <li>• Recognises similarities and differences between things seen and handled (eg starts to use such terms as flat, curved, round)</li> <li>• Makes simple connections between shape and function (eg. What shapes are good for rolling, or holding a drink?)</li> <li>• Introduce location term LEFT HAND</li> <li>• Matches shapes without outline</li> <li>• Introduce concept of symmetry</li> </ul>	<p><b><u>Space</u></b></p> <ul style="list-style-type: none"> <li>• Review location term – left</li> <li>• Matches shape without outline</li> <li>• Review concept of symmetry</li> </ul>
<p><b><u>Number</u></b></p> <ul style="list-style-type: none"> <li>• Explores the relationship between small numbers based on counting and part-whole concept (eg. <math>6=3+3</math>, <math>6=4+2</math>). Using numbers up to 5 (by June).</li> <li>• Copies, continues and devises repeating and counting patterns and uses numbers to represent these patterns.</li> <li>• Records results of mental computation activities.</li> </ul>	<p><b><u>Number</u></b></p> <ul style="list-style-type: none"> <li>• Explores the relationship between small numbers based on counting and part-whole concept (<math>6=3+3</math>, <math>6=4+2</math>). Using numbers up to 5 (by June).</li> <li>• Copies, continues and devises repeating and counting patterns and uses numbers to represent these patterns.</li> <li>• Records results of mental computation activities.</li> </ul>	<p><b><u>Number</u></b></p> <ul style="list-style-type: none"> <li>• Explores the relationship between small numbers based on counting and part-whole concept (<math>6=3+3</math>, <math>6=4+2</math>). Using numbers up to 10 (by December).</li> <li>• Counts and estimates collections, orders two or more collections, orders things within collections.</li> <li>• Records results of mental computation activities.</li> <li>• Develops an awareness of the role of money.</li> </ul>	<p><b><u>Number</u></b></p> <ul style="list-style-type: none"> <li>• Explores the relationship between small numbers based on counting and part-whole concept (<math>6=3+3</math>, <math>6=4+2</math>). Using numbers up to 10 (by December).</li> <li>• Represents number stories involving small numbers using materials or drawings.</li> <li>• Records results of mental computation activities.</li> </ul>

## Yearly Planner CSF Level 1 (cont'd)

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>	<u>Term 4</u>
<p>Measurement and Data</p> <ul style="list-style-type: none"> <li>Understands everyday language of comparison for length.</li> <li>Compares and orders lengths of objects.</li> <li>Estimates the size of objects, (movement and actions), in non-numerical language (eg. this is too heavy for me, I think I can reach the light switch).</li> <li>Relates to and describes <b>time</b> in terms of regular events and activities within his/her own life (eg. I woke up, got dressed, had breakfast..... Also with birthdays, weekends and holidays).</li> <li>Poses questions about collected objects and information.</li> <li>Describes data orally.</li> </ul>	<p>Measurement and Data</p> <ul style="list-style-type: none"> <li>Understands everyday language of comparison for volume and capacity.</li> <li>Compares and orders capacities of two containers.</li> <li>Estimates the size of objects, (movement and actions), in non-numerical language (eg. this is too heavy for me, I think I can reach the light switch).</li> <li>Poses questions about collected objects and information.</li> <li>Describes data orally.</li> <li>Recognises elements of chance in familiar situations (eg. I rolled a six this time but I may not next time).</li> <li>Classifies and sequences objects using different criteria (size, color, numbers of, etc.</li> </ul>	<p>Measurement and Data</p> <ul style="list-style-type: none"> <li>Understands everyday language of comparison for mass.</li> <li>Compares and orders weights of objects.</li> <li>Estimates the size of objects (movement and actions), in non-numerical language (eg. this is too heavy for me, I think I can reach the light switch).</li> <li>Begins to understand the purpose of <b>clocks</b>.</li> <li>Poses questions about collected objects and information.</li> <li>Describes data orally.</li> <li>Represents data concretely and pictorially (eg. draws a picture of a graph showing favorite fruits in the room and using real pieces of fruit).</li> </ul>	<p>Measurement and Data</p> <ul style="list-style-type: none"> <li>Review all aspects of measurement.</li> <li>Recognises attributes of familiar objects (eg. it is a large, red apple. It is also round).</li> <li>Poses questions about collected objects and information.</li> <li>Describes data orally.</li> </ul>

### **Reasoning and Strategies**

- Recognise what is correct and incorrect in mathematical situations.
- Detect and correct inconsistencies in simple repeating patterns.
- Make judgements based on simple criteria (eg. what will, might, won't happen).
- Use materials to explain a mathematical story.

## Yearly Planner CSF Level 2

TERM ONE	TERM TWO	TERM THREE	TERM FOUR
<p style="text-align: center;"><u>Data</u></p> <ul style="list-style-type: none"> <li>• Posing questions and collecting /classifying data</li> <li>• Summarising and representing data</li> <li>• Describing and Interpreting data</li> </ul> <p style="text-align: center;"><b>3 weeks</b></p>	<p style="text-align: center;"><u>Chance</u></p> <p style="text-align: center;"><b>3 weeks</b></p>	<p style="text-align: center;"><u>Data</u></p> <ul style="list-style-type: none"> <li>• Posing questions and collecting data</li> <li>• Summarising and presenting data</li> <li>• Interpreting data</li> </ul> <p style="text-align: center;"><b>2 weeks</b></p>	
<p><b><u>Number</u></b> Numbers, counting and numeration</p> <p style="text-align: center;"><i>5 weeks</i></p>	<p><b><u>Number</u></b> Mental computation and estimation</p> <p style="text-align: center;"><i>5 weeks</i></p>	<p><b><u>Number</u></b> Computation and Applying number</p> <p style="text-align: center;"><i>5 weeks</i></p>	<p><b><u>Number</u></b> Number patterns and relationships</p> <p style="text-align: center;"><i>5 weeks</i></p> <p>Revision of all areas</p> <p style="text-align: center;"><i>3 weeks</i></p>
	<p><b><u>Space</u></b> Location</p> <p style="text-align: center;"><i>3 weeks</i></p>	<p><b><u>Space</u></b> <b>Shape and Space</b> Identify properties and functions.</p> <p>Recognise,interpret and represent)</p> <p style="text-align: center;"><i>3 weeks</i></p>	<p><b><u>Space</u></b> <i>Space and shape</i> Patterns and transformation</p> <p style="text-align: center;"><i>3 weeks</i></p>
<p><b><u>Measurement</u></b> Mass</p> <p style="text-align: center;"><i>Weekly session</i></p>	<p><b><u>Measurement</u></b> Volume</p> <p style="text-align: center;"><i>Weekly session</i></p>	<p><b><u>Measurement</u></b> Time</p> <p style="text-align: center;"><i>Weekly session</i></p>	<p><b><u>Measurement</u></b> Capacity</p> <p style="text-align: center;"><i>Weekly session</i></p>
<p><b><u>Problem Solving</u></b></p>			

# Yearly Planner CSF Level 3

<u>Term 1</u>	<u>Term 2</u>	<u>Term 3</u>	<u>Term 4</u>
<p style="text-align: center;"><u>Measurement</u></p> <p><b>Volume and Capacity</b> Select suitable and uniform objects to use as informal units to estimate, measure, order and compare capacity. <i>3 weeks</i></p> <p><u>Number</u> Place Value Place-value in the whole number system students extend their knowledge of place-value and develop facility with whole numbers up to 5 digits. They extend their ability to skip-count starting from any number appropriate to this level. <i>5 weeks</i></p> <p>Number <i>Mental Computation and Numeration.</i> Students develop automatic recall of basic number facts, supported by increasing knowledge of the properties of operations. Students will extend their range of mental computation and develop estimation strategies to check the results of written computation and calculator use.</p>	<p style="text-align: center;"><u>Shape and Space</u></p> <p>Students use simple conventional geometric terms. Make representations of and interpret conventional representations. They interpret and produce patterns involving repetitions and movements of the same shape and simple combinations of shapes 3 weeks</p> <p><u>Number</u> <i>Computation and Applying Number-Whole Numbers</i> Students use materials, known facts and place-value ideas to refine algorithms for additions and subtractions of whole numbers <i>6 weeks</i></p> <ul style="list-style-type: none"> <li>▪ Revise the language of chance.</li> <li>• Posing questions and collecting data</li> <li>• Summarising and presenting data</li> <li>• Interpreting data</li> </ul> <p><i>3 weeks</i></p>	<p><u>Number</u> <i>Computation and Applying Number</i> Students use materials, known facts and place-value ideas to refine algorithms for multiplication and division of whole numbers <i>6 weeks</i></p> <p><u>Number</u> <i>Computation and Applying Number</i> Practical use of common and decimal fractions Students use materials to explore the relationship between common fractions with related denominators, including simple addition and subtraction facts <i>These ideas are extended to include decimal fractions to hundredths and the solution of fraction and decimal fractions</i></p> <p style="text-align: center;"><u>Money</u></p> <p>Real life situations applied to Money. Revise + - X -/- in the context of money</p>	<p style="text-align: center;"><u>Measurement</u></p> <p style="text-align: center;"><i>Time (2 weeks)</i></p> <p><b>Revision;</b></p> <p style="text-align: center;"><u>Measurement</u></p> <p style="text-align: center;">Area/Perimeter 2 weeks</p> <p style="text-align: center;"><u>Space (after Camp)</u> Location 2 weeks</p> <p style="text-align: center;"><u>Revision</u></p>
<p><b>Counting and number patterns covered in daily Warm up activities.</b> Mental Computation and Numeration covered in daily Warm up activities. Problem Solving- integral part of daily mathematics program. Calculator activities- covered in daily Warm up activities.</p>			

# Yearly Planner CSF Level 4

## Grade Aces Mathematics Yearly Planner.

<u>Term</u>	<u>Space</u>	<u>Measurement</u>	<u>Chance &amp; Data</u>	<u>Number &amp; Algebra</u>
1	<ul style="list-style-type: none"> <li>Location &amp; Mapping.</li> </ul>	<ul style="list-style-type: none"> <li>area</li> <li>problem solving</li> </ul>		<ul style="list-style-type: none"> <li>Place Value.</li> <li>Decimals/ Fractions.</li> <li>calculators</li> <li>Mental Computation.</li> </ul>
2		<ul style="list-style-type: none"> <li>Area / Perimeter.</li> <li>Problem Solving.</li> </ul>	<ul style="list-style-type: none"> <li>Chance and probability</li> </ul>	<ul style="list-style-type: none"> <li>Fractions/decimals</li> <li>Percentages.</li> <li>4 Operations.</li> <li>Estimation &amp; Calculators.</li> <li>Mental Computation.</li> <li>Problem Solving.</li> </ul>
3	<ul style="list-style-type: none"> <li>Location &amp; Mapping.</li> <li>Distance</li> <li>Scale</li> </ul>	<ul style="list-style-type: none"> <li>Volume</li> <li>Problem Solving.</li> </ul>	<ul style="list-style-type: none"> <li>Data Collection.</li> <li>Data Representation.</li> </ul>	<ul style="list-style-type: none"> <li>Fractions.</li> <li>4 operations</li> <li>Mental Computation.</li> <li>Problem Solving.</li> </ul>
4	<ul style="list-style-type: none"> <li>Compare / Classify Shapes.</li> <li>Transformation.</li> <li>Symmetry.</li> <li>Tessellations.</li> </ul>	<ul style="list-style-type: none"> <li>Mass</li> <li>Problem Solving</li> </ul>		<ul style="list-style-type: none"> <li>4 Operations.</li> <li>Pattern &amp; Order.</li> <li>Mental Computation.</li> <li>Problem Solving.</li> </ul>

# School Profiles

# Sale Primary School No 545 Mathematics Profile

Students Name: \_\_\_\_\_

<b>Level 1</b>	<b>Level 2</b>
<p><b>NUMBER</b>            Count, compare and order collections of at least 20 objects.            Model numbers up to at least 10 and verbalise relationships between small numbers.(eg 7 is 5 and 2)            Use terms first, second etc. to indicate place in a sequence of up to 10 objects.            Recognise and write numerals from 1 to 10.            Make up number questions from stories and solve them using counting strategies.            Knows about money and how it is used.            Use materials and a calculator to recognise, generate and represent simple number patterns.</p> <p><b>MEASUREMENT AND DATA</b>            Identify attributes of objects.            Use appropriate language of measurement            Estimate, measure and compare the size of objects using informal methods.            Beginning to understand the purpose of clocks.            Order own daily activities and place stages of an activity in typical order.            Recognise that some events involve chance.            Is able to describe, compare and compose questions about data collected.            Can record results by drawing or using concrete materials.</p> <p><b>SPACE</b>            Make and draw reasonable representations of simple shapes.            Is able to match shapes to simple spatial pictures and patterns.            Can identify and name simple 2D shapes and 3D objects.            Is able to follow and give directions using simple everyday location words.            Follow short paths on simple drawings and models.            Builds models of familiar environments.</p> <p><b>REASONING AND STRATEGIES</b>            Recognise what is correct and incorrect in mathematical situations.            Detect and correct inconsistencies in simple repeating patterns.            Make judgements based on simple criteria.eg. what will, might and won't happen.            Use materials to explain a mathematical story.</p>	<p><b><u>NUMBER</u></b>            Count forwards and backwards to at least 1,000 in 1's, 10's            Count forwards and backwards to at least 1,000 in 100s, 200s            Skip count to at least 100 in 2's, 4's and 5's            Recognise, make and continue number patterns.            Uses estimation to assist counting and operations with numbers larger than 20            Uses informal fraction language (1/2 1/3 1/4) when describing objects            Make, name and record numbers up to 999            Orders numbers up to 999            Uses appropriate mental strategies to solve add. facts to at least 20            Uses appropriate mental strategies to solve sub facts to at least 20            Use materials to solve and record answers to add. problems using numbers to 99            Use materials to solve and record answers to sub. problems using numbers to 99            Create and solve oral story problems which involve a single operation (+ - x ÷).            Read, write and interpret number sentences using these symbols (+ - x =) .            Make, read, write, and order money amounts.            Calculate change in simple shopping situations.</p> <p><b><u>MEASUREMENT AND DATA</u></b>            Choose appropriate attributes and units when comparing and measuring            Use informal units to estimate, measure and compare length, area, mass and capacity            Order objects by comparing either area, length, mass or capacity            Describe, order and sequence events with respect to the time of day or time of the year they usually occur            Recognise o'clock and half past times on an analogue clock            Tell the time on a digital clock in hours and minutes            Identify events as being certain, possible, impossible, likely or unlikely            Collects data to answer simple questions            Make simple graphs using real data eg. bar and pictograph            Describe and interpret simple graphs</p> <p><b><u>SPACE</u></b>            Identify, name and use common terms to describe features of simple shapes and objects            Can draw 2D shapes.            Use shape, orientation (flip, slide, turn) and symmetry to create simple pictures and patterns            Show key features when making simple maps.            Locate, follow and orally describe paths on simple maps, models and mazes.</p> <p><b><u>REASONING AND STRATEGIES</u></b>            Use a variety of strategies to check answers to mathematical problems            (e.g. calculators, mental calculations, materials etc)            Explain solutions to mathematical problems verbally and in writing</p>

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

# Sale Primary School No 545 Mathematics Profile

Students Name: \_\_\_\_\_

Level 3	<u>Level 4</u>
<p><b>NUMBER</b> Recognize the structure of whole numbers up to 5 digits, including place value. Represent, find, compare and order fractional parts (or collections) of objects. [eg: ½, ¼, 1/3, 0.5] Recall or mentally determine basic number facts [+ , x, - , ÷] Use place value ideas and the properties of numbers and operations to assist mental computation. Use knowledge of place value to solve and record solutions to addition problems Use knowledge of place value to solve and record solutions to addition subtraction problems Use knowledge of place value to solve and record solutions to addition multiplication problems Use knowledge of place value to solve and record solutions to addition division problems. Select the appropriate operations and computation methods to solve problems. Counting patterns, including skip-counting strategies of increasing size and difficulty. Construct and complete simple statements of equality involving whole numbers and fractions.</p> <p><b>MEASUREMENT</b> Make increasingly accurate estimates of measurement using informal units and standard units. Estimate, compare and accurately measure using informal and formal units. [length, mass, volume &amp; temp] Estimate short and long periods of time and make use of timetables, schedules and calendars. Tell the time using digital and analogue clocks. [yr 3 - 5 minute intervals] [yr 4 - 1 minute intervals]</p> <p><b>SPACE</b> Explain and compare the spatial properties of shapes and objects. Interpret, recognise ,names and draws 2D shapes. Interpret, recognise ,names and draws 3D objects. Identify, symmetry in regular shapes. Use and understand conventional location language to follow and give directions and describe position. Read and make maps including grid references, compass points and physical features of familiar environments.</p> <p><b>CHANCE AND DATA</b> Identify, compare, order and record outcomes from simple chance experiments Pose, refine and collect appropriate questions for gathering data. Organise, summarise and present data effectively using a variety of graphs. Extract specific information from data in graphs, diagrams and tables.</p> <p><b>REASONING AND STRATEGIES</b> Make judgements about the accuracy of reasoning and results. Identifies the problem/task. Using familiar skills to solve unfamiliar problems. Use the guess-check-improve process to test the correctness of results</p>	<p><b>NUMBER</b> Read, record and order numbers from one to millions including negative numbers Read, record and order decimal fractions to thousandths Rename fractions in different forms, including percentages Automatically recall and use multiplication and division facts to 10 x 10 Choose and apply strategies to calculate mentally and estimate Add and subtract decimal numbers Multiply whole numbers by 2 digits and divide whole numbers by 1 digit Select and use appropriate operations ( + - x &amp; :- ) in problem solving</p> <p><b>MEASUREMENT</b> Chooses and reads instruments and units appropriate to the object being measured. Draws and constructs objects using accurate measurements Tell the time on an analogue and digital clock to the minute Investigate and calculate areas and perimeters of regular and irregular shapes</p> <p><b>SPACE</b> Uses geometric terms( e.g. angles, faces, vertices) to describe shapes Can make and copy 3-D objects using given geometric criteria eg. a right angle Can transform shapes eg. enlarge, reduce, rotate, reflect Investigates and compares the volume and mass of objects. Uses distance, direction coordinates and scales in maps and plans</p> <p><b>CHANCE AND DATA</b> Collects and records data systematically Choose and present appropriate graphical displays Compares, orders and summarises data using simple numerical methods eg. find the average Interpret information in tables and graphs Uses common language of chance</p> <p><b>REASONING AND STRATEGIES</b> Uses appropriate materials in solving problems eg calculators Draws reasoned conclusions and tests ideas eg. why some shapes tessellate while others don't. Uses a variety of strategies to interpret and solve problems Detect and respond to unreasonable mathematical results</p>

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

Year: \_\_\_\_\_ Teacher: \_\_\_\_\_

# Sample Lessons

## Teaching Mathematicians in the Classroom

**Topic:** MEASUREMENT

**Planned Provision for Curriculum Focuses:** Length - estimation, compare the object to the unit, find the number of units

### WHOLE CLASS FOCUS ON MATHEMATICS

**Objectives:** To revisit the strategy of estimating

**Materials:** a piece of string/wool for each child (length of the string/wool to vary, anywhere from about 10cm to 1m)

**Organisation:** children to undertake task individually

**Procedure:** Give each child a piece of string.

"Look around the room. What can you see around the room that you think will be shorter than your piece of string? Go and get that item. Measure to check."

Swap string with a friend.

"Look around the room. What can you see around the room that you think will be longer than your piece of string? Go and get that item. Measure to check."

### SMALL GROUP FOCUS ON MATHEMATICS

Invite the children to think of an object in our room that is longer than three hands but shorter than 4 hands? Ask one child to go and get the object they were thinking of. Ask the child "How could we check that the object is longer than 3 hands but shorter than 4 hands?" Invite another child to select an object and check it.

### **Independent Mathematics**

Find as many objects as you can which are longer than three hands but shorter than 4 hands? Record your findings

#### Teaching Group

##### GUIDED MATHEMATICS

How many objects can you find that are longer than 10cm but shorter than 20cm?

Ask the students to explain how they will go about doing this task?

STEPHEN

JAMES

JANE

WENDY

SUE

ALEX

### **Teacher Roving**

*Observe how children measure. Do they line their hand up against the item to be measured (direct)? Do they mark off the length on a card or piece of paper and then use this to measure (indirect)? Do they use a formal measuring instrument (ie. a ruler) to find how long three hands is then use the ruler to measure.*

### WHOLE CLASS FOCUS ON MATHEMATICS

Discuss the methods used to establish which items met the criteria (more than 3 hands but less than 4)

**Newborough Primary School**  
GIPPSLAND REGION

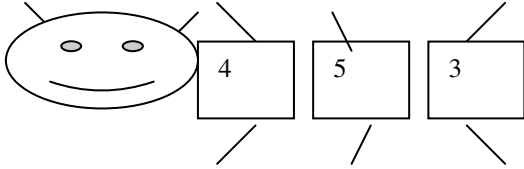
# Teaching Mathematicians in the Classroom

**Topic/Domain:** PLACE VALUE

**Planned Provision for Curriculum Focuses:** Reading, writing and ordering numbers

WHOLE CLASS FOCUS ON MATHEMATICS

Teacher to model some number creatures (a box for each digit, a head and some legs)



SMALL GROUP FOCUS ON MATHEMATICS

Independent Mathematics

Create 4 number creatures (You have to be able to read the number on your number creature). Put them in order.

INDIVIDUAL THINK TIME

"What numbers will be in your first number creature?"

## Teaching Group

### SHARED MATHEMATICS

Let's make some number creatures together. Ask the students to order the numbers creatures. Focus on strategies used to order the numbers. Join with a partner and order your number creatures.

TIM

SAM

H

Roving Conferences

WHOLE CLASS FOCUS ON MATHEMATICS

## Whole Class Reflection

Ask the class to copy on a piece of paper one of their number creatures. As a class order everyone's number creatures and discuss the strategies used.

---

Newborough Primary School

GIPPSLAND REGION

## Teaching Mathematicians in the Classroom

**Topic:** SPACE

**Planned Provision for Curriculum Focuses:**

Recognise and name some simple shapes and objects and use everyday language to describe shape and function  
MAMA0101

Make and draw reasonable representations of simple shapes MAMA0102

Identify, name and use common terms to describe features of simple shapes and objects MASP201

Use simple conventional special language when describing shapes, parts fo shapes, objets, parts of objects and simple cross sections MASPS302

WHOLE CLASS FOCUS ON MATHEMATICS

**Objectives:** Describe 2D and 3D shapes

**Materials:** Feely bag containing 2D and 3D shapes

**Procedure:** Invite a child to feel inside the feely bag and describe the shape that they feel

Teacher to choose a shape to model - Draw the shape or make the shape from a net or toothpicks and peas. Record some features of the shape.

INDIVIDUAL THINK TIME

"What shape will you work on. Will it be a 2D or a 3D shape?"

SMALL GROUP FOCUS ON MATHEMATICS

### Independent Mathematics

*With a partner draw a shape or make a shape. Record some features of the shape.*

#### **Teaching Group**

Play Shape feely bag focusing on 'shape language'.

TIM                      TOM  
JAKE                    EMMA  
CHLOE  
ANDREA

#### **Teaching Group**

*SHARED MATHEMATICS:*

Form a Teaching group with students who chose to work on 2D shapes and together work on a making and describing a 3D shape.

WHOLE CLASS FOCUS ON MATHEMATICS

### Whole Class Reflection

Generate a class list of space descriptive words

## Teaching Mathematicians in the Classroom

**Topic:** NUMBER

**Planned Provision for Curriculum Focuses:** Numbers, counting and numeration

### WHOLE CLASS FOCUS ON MATHEMATICS

With your partner choose 2 numbers from the number basket that you can both read. One person counts forwards from the smallest number to the biggest number and the other counts backwards from the biggest number to the smallest number.

Ask some children to model to the class how they counted. Ask the children if they could think of a different way that they could count from their smallest number to their largest number or visa versa (for example by 2s or 5s or 10s)

### SMALL GROUP FOCUS ON MATHEMATICS

#### Individual Focus on Mathematics

Choose a number from the number basket. Record some number patterns that number could be in.

##### **Teaching Group**

##### SHARED MATHEMATICS

Using the hundred chart look for number patterns. On a paper hundred chart record some number patterns. Discuss the patterns.

ANDY

PAUL

FRANK

SAMANTHA

#### *Roving Conferences*

### WHOLE CLASS FOCUS ON MATHEMATICS

#### Whole Class Reflection

If you have discovered something new today please come and share it with us.

**Newborough Primary School**  
GIPPSLAND REGION

## Teaching Mathematicians in the Classroom

**Topic:** NUMBER

**Planned Provision for Curriculum Focuses:** Numbers, counting and numeration

### WHOLE CLASS FOCUS ON MATHEMATICS

Choose 2 numbers from the hundred chart. Ask a child to count from 1 number to the other. Ask the child to tell the class about the way they counted/their counting pattern.

"Can anyone think of a different way that you could count from 1 number to the other?"

Teacher to record patterns

### SMALL GROUP FOCUS ON MATHEMATICS

#### Individual Focus on Mathematics

Choose a number from the number basket. Record some number patterns that number could be in.

##### **Teaching Group**

##### SHARED MATHEMATICS

Using the hundred chart look for number patterns. On a paper hundred chart record some number patterns. Discuss the patterns.

#### *Roving Conferences*

### WHOLE CLASS FOCUS ON MATHEMATICS

#### Whole Class Reflection

If you have discovered something new today please come and share it with us.

# Rich assessment tasks

The following are eggs of rich assessment tasks. These are tasks that allow teachers to assess a number of areas of Mathematics through the one task.

### **Bedroom blitz.**

1. Design as many rooms as you can with a perimeter of 14m.
2. List the areas that they cover.
3. Which would be the best shape for a bedroom? Why?
4. Choose a room, draw to scale  $1\text{m} = 2\text{ cm}$  and design a room which contains at least three pieces of furniture (a bed, desk and chair). Draw to scale.
5. Now design a bedroom that you would like. Present it to scale. What's its area and perimeter?

### **You rule!!!**

YOU ARE THE RULER OF YOUR OWN COUNTRY.. KING, QUEEN OR PRESIDENT if you like...  
You need to create the following

- ◆ a detailed map which includes
- ◆ the capital city and two smaller towns (you need to show the difference in population of these places), all towns MUST be at least 50 kms apart.
- ◆ A mountain eg Mount Rickerby, and how high above sea level it is.
- ◆ A lake ( SE of the major city) and a river
- ◆ The major highway and at least 4 other roads.
- ◆ Some type of grid reference eg. as for Battle ships or latitude and longitude
- ◆ Legend
- ◆ Physical features- eg rainforest, desert etc.
- ◆ A scale
- ◆ Compass points (N,S,E,W)
- ◆ One famous landmark eg Uluru in Australia- which is NE of the capital city.
- ◆ A flag (this will be a homework task). Your flag should reflect your country eg the aboriginal flag: black is for the people, red is the earth and the yellow is the sun.
- ◆ The area (approximately) and the perimeter.

The Rubric is a rating scale to use when assessing areas of Mathematics during a rich assessment task.

### GENERIC RUBRICS

SCORE	SUMMARY DESCRIPTION	
	<u>SPACE/NUMBER/ MEASUREMENT/ CHANCE AND DATA/ ALGEBRA</u>	REASONING AND STRATEGIES
<b>GOES BEYOND</b>	Fully accomplishes the task, but uses methods and/or makes interpretations significantly beyond those specified for this level.	Strategies/ mathematical communication/ reasoning significantly beyond those specified for this level.
<b>4</b>	Task accomplished. Central mathematical ideas clearly understood and demonstrated.	Appropriate plan. Clear communication of strategies and mathematics used.
<b>3</b>	Substantial progress towards completing the task; indicative of understanding of relevant knowledge, concepts and skills, but some key ideas may be missing.	Some evidence of planning; some communication of strategies and mathematics used.
<b>2</b>	Attempt at the task makes some progress; partial but limited grasp of the central mathematical ideas; reveals gaps in knowledge, conceptual understanding and/or relevant skills.	Little evidence of effective strategies/ communication/ reasoning.
<b>1</b>	Little progress or understanding evident	Ineffective strategies/ communication/ reasoning.

# Planning Pro-forma

# PLANNING FOR NUMERACY

## WHOLE CLASS FOCUS

Focus:

Teaching Approach: Shared Mathematics

Students: Whole Class

Learning Experience:

Materials:

Prompts:

## TEACHING GROUP

Focus:

Teaching Approach:

Students:

Learning Experience:

Materials:

Prompts:

## INDEPENDENT MATHEMATICS

Focus:

Learning Experience:

Materials:

## MOVING CONFERENCES

Prompts:

## WHOLE CLASS FOCUS

Focus:

Students: Whole Class

Materials:

Prompts: