

TRIAL MATERIAL WORK IN PROGRESS

Differentiated plans for Years 5 & 6

Measurement

Ian Lowe, MAV Professional Officer, 2006

**IF YOU USE ANY OF THIS
PLEASE PROVIDE FEEDBACK TO IAN AT**

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**THIS WILL QUALIFY YOU
FOR AN IMPROVED VERSION
WHEN AVAILABLE**

Materials are recommendations only; suitable substitutions may be made.

MAV materials may be bought from www.mav.vic.edu.au/shop

Download the Curriculum Corporation catalogue from

http://www.curriculum.edu.au/catalogue/downloads/pc2007_pages39-54.pdf

and look at pages 48 and 49.

**For Learning Federation materials (Learning Objects),
check out 'Digital Learning Resources' on your laptop, or download them from the new education
website www.education.vic.gov.au/studentlearning/teachingresources/elearning/digilearn.htm.**

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What do we have here?

Measurement ideas are very practical ways of employing the more abstract ideas of number, such as place value. So extra effort is required to create a rich learning environment that can help children to understand and to achieve at their own level. This needs to be achieved in just two weeks, at each level.

This set of units – one per semester for Years 5 & 6 – could achieve this goal. It matches the specifications for VELS, but recognises that there will be a wide spread of achievement in each class. So children are differentiated into working groups by need, for some of the time only. There may be more than one group at any Standard, or some Standards may need to be combined. Plan a stimulating set of activities for homework review, such as Interactive Learning spreadsheets.

It also balances the *toolbox* requirements – concepts and skills – with the need to learn to apply those tools in *problem solving* situations. Hence there are whole class lessons (often from Maths300 or RIME) punctuating the toolbox development, at regular intervals. These are on the same topic, but do not attempt to mesh with the work done by each 'standard' group. They ensure that *Working Mathematically* is always part of the learning process, integrated into each dimension.

The mix of activities will provide a stimulating and rich learning environment, with students learning from and helping one another. Connections between topics will be made and reinforced, and the variety of learning styles will accommodate learners with different needs.

How does it work?

In Years 5 and 6 it is assumed that children will be working largely in Standard 3 to Standard 4. At regular intervals whole class lessons are taught to 'mixed ability' groups.

Between these are cycles of a fixed pattern of lessons. In Years 5 and 6, the cycle has two parts: teaching and worksheet or games.

On any day all are taking place in the same classroom, so only a fraction of the resources are needed. But the cycle also works for the students: they follow the pattern – teaching, worksheet, (problem solving) and computer. As a consequence, teaching is to a different group each day in a regular pattern. Teaching will be for a concentrated 20 minutes or so, and then the teacher will supervise the rest of the class. Instructions on the board will inform the other groups of what they are to do. Encourage students to help each other.

What resources are needed?

Access to 4 or 5 computers daily is expected. Computer pods or laptop trolleys might be the best solution. Membership of Maths300 is a requirement; many schools have membership – here is how to use it.

The pages in the resources are listed for each day's lesson, but are summarised here. Sources are: MAV (Mathematical Association of Victoria), CC (Curriculum Corporation), LF (Learning Federation).

- *Teaching*: Guidelines in Measurement (MAV), Maths Continuum (DE&T), People count (MAV)
- *Worksheets*: Active Learning 1: Measurement, C&D, Active Learning 2: Measurement, C&D (both MAV),
- *Computer*: Interactive Learning (MAV), Learning Objects (LF)
- *Problem solving*: Problem Solving Task Centre (CC), RIME (MAV), Maths300 (CC), RIME 5&6 (MAV)

How could it be adapted to different situations?

If your class does not have the range predicted, or you cannot manage three or four groups, you should adapt by ignoring columns. You may substitute other learning tasks at any time. If you run out of time, leave stuff out. In this rich environment you will be surprised how much is learned outside the 'planned' activities.

How do I assess the learning?

At the end of the tables are sets of questions based on *understanding* at each VELS standard that will allow you to place children into groups and monitor progress at selected times. However your observations, digital photographs and copies of children's work will be more useful than any external 'test'.

Year 5 Semester 1 Measurement

Day	Yr 5 sem 1 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
1	Maths300 #13 Estimation Walks 1/2		
2	<p align="center">Teach</p> <p>Length: formal units (cm)</p> <p>Guidelines in Measurement p40-54</p> <p>People count #31 Length</p> <p>Active Learning 2 (M,C&D) Quickmaths Meas A-C</p>	<p align="center">Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M2 Indoor measurement activities</p> <p>Tuning in with task cards – upper primary p41 - 57</p>	<p align="center">Problem Solving Task Centre</p> <p>99 How Many Beans? 114 Where Is The Rectangle? 138 A Rectangle Of Squares, 193 Surface Area With Tricube, 224 Matching Faces, 226 Playing With Objects, 187 Triangle Area, 207 Triangle Perimeters,</p>
3	<p align="center">Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M1 Estimating distances</p> <p>Tuning in with task cards – middle primary (see contents p6–11)</p>	<p align="center">Problem Solving Task Centre</p> <p>26 Travelling Australia 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters 41 Scale Drawing, 85 Time Swing, 126 Planets, 156 Photo Angles, 158 Brick Walls, 217 Kids On Grids, 227 Volume Line Up</p>	<p align="center">Teach</p> <p>Perimeters of polygons</p> <p>People count #32 Perimeter</p> <p>Computer Interactive Learning Perimeter of polygon</p>
4	Maths300 #13 Estimation Walks 2/2		
5	<p align="center">Problem Solving Task Centre</p> <p>26 Travelling Australia 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters</p>	<p align="center">Teach</p> <p>Length: metric units (m, cm, mm)</p> <p>Guidelines in Measurement p49-56</p> <p>People count #31 Length</p> <p>Active Learning 2 (M,C&D) Quickmaths Meas A-E</p>	<p align="center">Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M21 Estimating metric lengths and areas. OR M22 Estimating irregular areas,</p>
6	RIME M1 Estimating distances, and/or M2 Line length		
7	<p align="center">Teach</p> <p>Length: metric units (m, cm, mm)</p> <p>Guidelines in Measurement p40-54</p> <p>People count #31 Length</p> <p>Active Learning 2 (M,C&D) Quickmaths Meas A-E</p>	<p align="center">Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M3 Outdoor measurement activities</p> <p>Active Learning 2 (M,C&D) Quickmaths Meas U-V</p> <p>Tuning in with task cards – upper primary p41 - 57</p>	<p align="center">Problem Solving Task Centre</p> <p>See Std 5 lesson 2</p> <p>Computer Interactive Learning Conversions, Rectangle</p>
8	<p align="center">Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M2 Indoor measurement activities</p> <p>Tuning in with task cards – middle primary (see contents p6–11)</p>	<p align="center">Problem Solving Task Centre</p> <p>See Std 4 lesson 3</p> <p>Computer Interactive Learning Rectangle area</p> <p>Learning objects Area of triangles</p>	<p align="center">Teach</p> <p>Circumference of circle</p> <p>Guidelines in Measurement p96</p> <p>People count #33 Circumference</p> <p>Computer Interactive Learning Circumference</p>
9	RIME M3 How long is your pace?		

Day	Yr 5 sem 1 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
10	Problem Solving Task Centre 26 Travelling Australia 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters Computer Interactive Learning Conversions, Rectangle	Teach Area (cm², m²) Guidelines in Measurement p70-75 Continuum 4.0 Perimeter and area are not the same People count #34 Area	Worksheet / hands-on Active Learning 1 (M,C&D) M27 The relationship $c = \pi d$

Year 5 Semester 2 Measurement

Day	Yr 5 sem 2 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
1	Maths300 #50 Country Maps 1/2		
2	Teach Area – informal units Guidelines in Measurement p63-69 People count #34 Area Computer Learning objects Area concept	Worksheet / hands-on Active Learning 1 (M,C&D) M22 Estimating irregular areas Tuning in with task cards – upper primary p41 - 57	Problem Solving Task Centre 99 How Many Beans? 114 Where Is The Rectangle? 138 A Rectangle Of Squares, 193 Surface Area With Tricube, 224 Matching Faces, 226 Playing With Objects 187 Triangle Area, 207 Triangle Perimeters,
3	Worksheet / hands-on Active Learning 1 (M,C&D) M24 Tangram areas Active Learning 2 (M,C&D) Quickmaths Meas W-AA Tuning in with task cards – middle primary (see contents p6–11)	Problem Solving Task Centre 26 Travelling Australia, 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters 41 Scale Drawing, 85 Time Swing, 126 Planets, 156 Photo Angles, 158 Brick Walls, 217 Kids On Grids, 227 Volume Line Up	Teach areas of triangles and quadrilaterals Continuum 4.0 Perimeter and area are not the same People count #35 Areas: triangles and parallelograms
4	Maths300 #50 Country Maps 2/2		
5	Problem Solving Task Centre 26 Travelling Australia 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters Computer Learning objects Area concept, Area of triangles	Teach Volume (cm³, m³) and capacity (L and mL) Guidelines in Measurement p123-133 People count #37 Volume, capacity and cuboids Active Learning 2 (M,C&D) Quickmaths Meas F, I	Worksheet / hands-on Active Learning 1 (M,C&D) M26 Pick's rule, OR M32 Outdoor parallelograms, OR M33 Outdoor triangles
6	RIME M4 School ground layout 1/2		
7	Teach Time: h, min, sec, clocks Guidelines in Measurement p196 Continuum 4.0 Time intervals	Worksheet / hands-on Active Learning 1 (M,C&D) M18 Eight fold-up boxes, M19 Making a litre Tuning in with task cards –	Problem Solving Task Centre See Std 5 lesson 2 Computer Interactive Learning

Day	Yr 5 sem 2 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
	<p>People count #42 Time: short durations</p> <p>Active Learning 2 (M,C&D) Quickmaths Meas Q-T, BB</p>	<p>upper primary p41 - 57</p>	<p>Some areas, Quadrilateral areas,</p> <p>Learning objects Area of triangles, Area of compound shapes, Measures</p> <p>http://illuminations.nctm.org/Activities.aspx</p> <p>Area parallelograms, Area Trapezoids, Area Triangles, Areas in Geometry (rectangle, parallelogram and triangle),</p>
8	<p>Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) CD9 Reaction times OR M12 Walking and running OR M13 Bike or car speeds,</p> <p>Tuning in with task cards – middle primary (see contents p6–11)</p>	<p>Problem Solving Task Centre See Std 4 lesson 3</p> <p>Computer Interactive Learning Metric conversions</p>	<p>Teach</p> <p>Areas of circles</p> <p>Continuum 4.75 Area of a circle</p> <p>People count #36 Areas: circles</p> <p>Computer Interactive Learning Circle and square, Circle area</p> <p>http://illuminations.nctm.org/Activities.aspx</p> <p>Circle string, Circle ratios, Circle area,</p>
9	RIME M4 School ground layout 1/2		
10	<p>Problem Solving Task Centre</p> <p>26 Travelling Australia 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters</p> <p>Computer Interactive Learning Time calculations</p> <p>Learning objects Journey planner</p>	<p>Teach</p> <p>Mass (Kg, g, T)</p> <p>Guidelines in Measurement p220-230</p> <p>People count #40 Mass and density</p> <p>Active Learning 2 (M,C&D) Quickmaths Meas J, K L, M9 What is mass? M10 Measuring mass</p>	<p>Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M30 Count the circle areas OR M31 A historical approach to the value of π,</p>

Year 6 Semester 1 Measurement

Day	Yr 6 sem 1 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
1	RIME M9 How many people can stand in your classroom?		
2	<p>Teach</p> <p>Capacity (litres, mL)</p> <p>Guidelines in Measurement p123</p> <p>People count #37 Volume, capacity and cuboids</p>	<p>Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M39 Time and longitude</p> <p>Tuning in with task cards – upper primary p41 - 57</p>	<p>Problem Solving Task Centre</p> <p>99 How Many Beans? 114 Where Is The Rectangle? 138 A Rectangle Of Squares, 193 Surface Area With Tricube, 224 Matching Faces, 226 Playing With Objects, 187 Triangle Area, 207 Triangle Perimeters,</p>
3	<p>Worksheet / hands-on</p> <p>Active Learning 1 (M,C&D) M7 Areas for sport</p> <p>Tuning in with task cards –</p>	<p>Problem Solving Task Centre</p> <p>26 Travelling Australia 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters 41 Scale Drawing, 85 Time Swing, 126</p>	<p>Teach volume, capacity and surface area of prisms</p> <p>People count #38 Volume and surface area: prisms and cylinders</p>

Day	Yr 6 sem 1 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
	middle primary (see contents p6–11)	Planets, 156 Photo Angles, 158 Brick Walls, 217 Kids On Grids, 227 Volume Line Up	Active Learning 2 (M,C&D) M3 Maths@work: Home improvement
4	RIME 5/6 p134 Skinside out		
5	Problem Solving Task Centre 26 Travelling Australia 41 Scale Drawing, 63 Fried Rice, 85 Time Swing 126 Planets, 156 Photo Angles, 204 Decimals With A Tape, 207 Triangle Perimeters	Teach time: clocks & calendars Guidelines in Measurement p186-200 People count #41 Time: calendar Active Learning 2 (M,C&D) Quickmaths Meas M-T	Worksheet / hands-on Active Learning 1 (M,C&D) M34 Side lengths of a box of given volume OR M36 Shapes with 1 litre capacity
6	Maths300 #166 Newspaper Cubes & Volume of a Room 1/2		
7	Teach Volume (cm³, m³) Guidelines in Measurement p133-135 People count #37 Volume, capacity and cuboids	Worksheet / hands-on Active Learning 1 (M,C&D) M41 Using maps and timetables	Problem Solving Task Centre See Std 5 lesson 2 Computer Interactive Learning Cuboids, Box volumes Learning objects Inside cubes
8	Worksheet / hands-on Active Learning 1 (M,C&D) M35 Volume by displacement Tuning in with task cards – middle primary (see contents p6–11)	Problem Solving Task Centre See Std 4 lesson 3 Computer Interactive Learning Calendar, Clock, Time calculations, Daylight, Sundial Learning objects Journey planner	Teach Volume, capacity and surface area of cylinders People count #38 Volume and surface area: prisms and cylinders
9	Maths300 #166 Newspaper Cubes & Volume of a Room 2/2		
10	Problem Solving Task Centre See Std 3 lesson 5 Computer Interactive Learning Cuboids, Box volumes	Teach temperature (°C) Active Learning 2 (M,C&D) Quickmaths Meas G, H, I Active Learning 1 (M,C&D) M15 Cooling coffee	Worksheet / hands-on Active Learning 1 (M,C&D) M36 Shapes with 1 litre capacity OR M38 Estimating small volumes

Year 6 Semester 2 Measurement

Day	Yr 6 sem 2 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
1	Maths300 #83 Temperature Graphs 1/2		
2	Teach mass (kg, g) Guidelines in Measurement p220-227 People count #40 Mass and density	Worksheet / hands-on Active Learning 1 (M,C&D) M10 History of Melbourne Tuning in with task cards – upper primary p41 - 57	Problem Solving Task Centre 99 How Many Beans? 114 Where Is The Rectangle? 138 A Rectangle Of Squares, 193 Surface Area With Tricube, 224 Matching Faces, 226 Playing With Objects, 187 Triangle Area,

Day	Yr 6 sem 2 'Towards Std 3'	'Towards Std 4' group(s)	'Towards Std 5' group(s)
			207 Triangle Perimeters,
3	Worksheet / hands-on Active Learning 1 (M,C&D) M36 Shapes with 1 litre capacity OR M38 Estimating small volumes Tuning in with task cards – middle primary (see contents p6–11)	Problem Solving Task Centre 6 Travelling Australia 63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters 41 Scale Drawing, 85 Time Swing, 126 Planets, 156 Photo Angles, 158 Brick Walls, 217 Kids On Grids, 227 Volume Line Up	Teach density People count #40 Mass and density Computer Interactive Learning Floating
4	Maths300 #83 Temperature Graphs 2/2		
5	Problem Solving Task Centre 26 Travelling Australia 41 Scale Drawing, 63 Fried Rice, 85 Time Swing 126 Planets, 156 Photo Angles, 204 Decimals With A Tape, 207 Triangle Perimeters	Teach converting units (length - mm, cm, m; mass - g, kg; capacity - mL, L; time - h, min, sec) Continuum 4.0 Converting between measurement units People count #31 Length, #37 Volume, capacity and cuboids, #42 Time: short durations	Worksheet / hands-on Active Learning 1 (M,C&D) M37 Melbourne's water OR M58 Finding densities
6	RIME M6 How long is a one-second pendulum? 1/2		
7	Teach time (Calendar) Guidelines in Measurement p186-200 People count #41 Time: calendar Computer Interactive Learning Calendar	Worksheet / hands-on Active Learning 1 (M,C&D) M23 Rectangles: constant perimeter or area Tuning in with task cards – upper primary p41 - 57	Problem Solving Task Centre See Std 5 lesson 2
8	Worksheet / hands-on Active Learning 1 (M,C&D) M10 History of Melbourne OR M41 Using maps and timetables Tuning in with task cards – middle primary (see contents p6–11)	Problem Solving Task Centre See Std 4 lesson 3 Computer Interactive Learning Metric conversions	Teach speed Guidelines in Measurement p199 People count #43 Speed Interactive Learning Time/distance/speed Bike distances and speed, standards.nctm.org/document/eexamples/index.htm 5.2 Understanding Distance, Speed, and Time Relationships
9	RIME M6 How long is a one-second pendulum? 2/2		
10	Problem Solving Task Centre See Std 3 lesson 5 Computer Interactive Learning Metric conversions	Teach converting units (area - cm², m², volume - cm³, m³) Continuum 5.25 Converting between derived units People count #34 Area, #37 Volume, capacity and cuboids	Worksheet / hands-on Active Learning 1 (M,C&D) M14 A rolling ball OR M16 Olympic speeds