

Resources for a VELS Maths Curriculum

MEASUREMENT

STANDARD 1

a Language (compare, label, sequence)

- *Toolbox: concepts and skills*

The Learning Federation www.thelearningfederation.edu.au/tlf2/ Free software from the internet

Shape overlays

- *Mathematical problem-solving*

- *Real problem-solving*

b Informal units

- *Toolbox: concepts and skills*

- *Mathematical problem-solving*

- *Real problem-solving*

STANDARD 2

a Measure and compare (informal units)

- *Toolbox: concepts and skills*

People Count: book and/or CD (MAV) Text for teachers, with spreadsheets for students.

31 Length, 32 Perimeter, 33 Circumference

Guidelines in Measurement (MAV) Hands-on teaching ideas

Length: p21-41, Area: p57-67, Perimeter: p81-87, Volume: p99-114, Money: p137-151, Time: p161-, Mass: p203-216

- *Mathematical problem-solving*

- *Real problem-solving*

b Use some formal and standard units

- *Toolbox: concepts and skills*

National Library of virtual manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html> Free software from the internet

- *Mathematical problem-solving*

- *Real problem-solving*

STANDARD 3

a Use informal and formal units for length, area, volume, capacity, mass, time

- *Toolbox: concepts and skills*

People Count: book and/or CD (MAV) Text for teachers, with spreadsheets for students.

31 Length, 32 Perimeter, 33 Circumference, 34 Area, 37 Volume, capacity and cuboids, 40 Mass and density,

Guidelines in Measurement (MAV) Hands-on teaching ideas

Length: p42-48, Area: p68-71, Perimeter: p88-91, Volume: p115-121, Money: p152-155, Mass: p222-227

The Learning Federation www.thelearningfederation.edu.au/tlf2/ Free software from the internet

Area concept, Area of triangles

National Library of virtual manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html> Free software from the internet

• **Mathematical problem-solving**

Maths300 (CC) Lesson plans

13 Estimation Walks, 14 The Farmer's Puzzle, 67 Potato Olympics, 106 Finger Knitting Good

Problem Solving Task Centre (CC) Rich tasks for students

63 Fried Rice, 204 Decimals With A Tape, 207 Triangle Perimeters

• **Real problem-solving**

Working Mathematically: Investigations (CC) Lesson plans

Unit 5: Coming to school

b Timetables and calendars

• **Toolbox: concepts and skills**

People Count: book and/or CD (MAV) Text for teachers, with spreadsheets for students.

41 Time: calendar, 42 Time: short durations,

National Library of virtual manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html> Free software from the internet

• **Mathematical problem-solving**

Problem Solving Task Centre (CC) Rich tasks for students

26 Travelling Australia,

• **Real problem-solving**

The Value of Time (MAV)

STANDARD 4

a Estimate and measure in metric units, inc temp and angle

• **Toolbox: concepts and skills**

People Count: book and/or CD (MAV) Text for teachers, with spreadsheets for students.

35 Area: triangles & parallelograms, 36 Area: circles, 37 Volume, capacity and cuboids, 38 Volume & surface area: prisms and cylinders, 39 Volume: pyramids & cones, 40 Mass and density, 41 Time: calendar, 42 Time: short durations

Guidelines in Measurement (MAV) Hands-on teaching ideas

Length: p49-556, Area: p72-77, Perimeter: p92, 95, Volume: p122-133, Money: p156-160, Time: p??, Mass: p228-232

Active Learning: Measurement, Chance & Data (MAV) Worksheets

M1 Estimating distances, M2 Indoor measurement activities, M3 Outdoor measurement activities, M5 Centimetre grid, M6 Pentomino area problems

The Learning Federation www.thelearningfederation.edu.au/tlf2/ Free software from the internet

Area of triangles, Area of compound shapes, Inside cubes

• **Mathematical problem-solving**

RIME: Measurement, Space, C&D (MAV) Lesson plans

1 Estimating distances, 2 Line length, 3 How long is your pace? 4 School ground layout, 5 Eye chart, 6 How long is a one-second pendulum?

Maths300 (CC) Lesson plans

50 Country Maps, 83 Temperature Graphs, 100 Planets, 131 Feet-uring Mathematics

Problem Solving Task Centre (CC) Rich tasks for students

41 Scale Drawing, 85 Time Swing, 114 Where Is The Rectangle? 126 Planets, 155 $64 = 65$, 156 Photo Angles, 158 Brick Walls, 187 Triangle Area, 193 Surface Area With Tricube, 214 Angle Estimation, 217 Kids On Grids, 227 Volume Line Up

National Library of virtual manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html> *Free software from the internet*

The Learning Federation

Journey planner,

• **Real problem-solving**

RIME 5/6 (MAV) Lesson plans

Dinner ready, Pulse rates, Shape of things, Lunch, Money trails, Scrabble,

The Value of Time (MAV)

b Convert metric units

• **Toolbox: concepts and skills**

People Count: book and/or CD (MAV) Text for teachers, with spreadsheets for students.

31 Length, 32 Perimeter, 33 Circumference, 34 Area,

Interactive learning for concepts and skills (MAV) Demo on whiteboard or student use

Conversions, Rectangle, Circumference, Bike distances and speed, Rectangle area,

• **Mathematical problem-solving**

National Library of virtual manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html> *Free software from the internet*

• **Real problem-solving**

Active Learning: Measurement, Chance & Data (MAV) Worksheets

M4 Miniature solar system,

STANDARD 5

a Estimate and measure as above

• **Toolbox: concepts and skills**

People Count: book and/or CD (MAV) Text for teachers, with spreadsheets for students.

34 Area, 40 Mass and density, 41 Time: calendar, 42 Time: short durations

Interactive learning for concepts and skills (MAV) Demo on whiteboard or student use

Metric conversions,

The Learning Federation www.thelearningfederation.edu.au/tlf2/ *Free software from the internet*

Area of triangles, Area of compound shapes, Inside cubes

RIME: Measurement, Space, C&D (MAV) Lesson plans

7 Perimeters of rectangles, 8 Newspaper ads., 9 How many people can stand in your classroom? 10 How fast do I travel? 11 Car speeds, 12 Areas of triangles, 13 Brick walls, 14 How far is it round a circle? 15 Round and round

Active Learning: Measurement, Chance & Data (MAV) Worksheets

M8 Shadow clocks, M9 Pendulum, M11 Perpetual calendar, M15 Cooling coffee, M17 Scale factors, M20 Floating, M21 Estimating metric lengths and areas. M22 Estimating irregular areas, M24 Tangram areas, M26 Pick's rule, M29 Non-circular rollers, M35 Volume by displacement, M42 The traveller's problem, CD5 Estimating lengths using means, CD6 Estimating fractions of lengths, CD9 Reaction times, CD10 The toy car, CD13 Hands – spans and area,

<http://illuminations.nctm.org/Activities.aspx> *Free software from the internet*

Area parallelograms, Area Trapezoids, Area Triangles

National Library of virtual manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html> *Free software from the internet*

• **Mathematical problem-solving**

Maths300 (CC) Lesson plans

13 Estimation Walks, 68 Pulse Rates, 133 Angle Estimation,

Problem Solving Task Centre (CC) Rich tasks for students

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

standards.nctm.org/document/eexamples/index.htm Free software from the internet

5.2 Understanding Distance, Speed, and Time Relationships

• **Real problem-solving**

RIME 5/6 (MAV) Lesson plans

Danger distance

Active Learning: Measurement, Chance & Data (MAV) Worksheets

M7 Areas for sport, M10 History of Melbourne, M16 Olympic speeds, M28 Bicycle chain, M37 Melbourne's water, M39 Time and longitude, M40 Tripping around Victoria, M41 Using maps and timetables, M43 Furniture and curtains, M44 A brick barbie and bounce wall, M45 To rain or not to rain

The Value of Time (MAV)

Recreation (MAV)

b Develop and use formulas (for area, perimeter, circles, surface area, volume, rates)

• **Toolbox: concepts and skills**

People Count: book and/or CD (MAV) Text for teachers, with spreadsheets for students.

35 Area: triangles & parallelograms, 36 Area: circles, 37 Volume, capacity and cuboids, 38 Volume & surface area: prisms and cylinders, 39 Volume: pyramids & cones,

Interactive learning for concepts and skills (MAV) Demo on whiteboard or student use

Perimeter of polygon, Circumference, Bike distances and speed, Rectangle, Rectangle area, W,H,A&P, Some areas, Quad areas, Circle and square, Circle area, Value of π , Area of polygon, Cuboids, Bpx volumes, Boxes, Calendar, Clock, Time calculations, Daylight, Sundial, Time/distance/speed, Planets, Scale/area/volume,

The Learning Federation www.thelearningfederation.edu.au/tlf2/ Free software from the internet

Measures

Active Learning: Measurement, Chance & Data (MAV) Worksheets

M12 Walking and running, M13 Bike or car speeds, M14 A rolling ball, M18 Eight fold-up boxes, M19 Making a litre, M23 Rectangles: constant perimeter or area, M25 Design a shape, M27 The relationship $c = \pi d$, M30 A historical approach to the value of π , M31 Count the circle areas, M32 Outdoor parallelograms, M33 Outdoor triangles, M34 Side lengths of a box of given volume, M36 Shapes with 1 litre capacity, M38 Estimating small volumes,

<http://illuminations.nctm.org/Activities.aspx> Free software from the internet

Circle string, Circle ratios, Area parallelograms, Area Trapezoids, Area Triangles, Circle area, Areas in Geometry (rectangle, parallelogram and triangle),

National Library of virtual manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html> Free software from the internet

• **Mathematical problem-solving**

Maths300 (CC) Lesson plans

43 Area of a Circle (Calcs), 44 Area of a Triangle, 45 Circumference of a Circle,

Problem Solving Task Centre (CC) Rich tasks for students

187 Triangle Area, 207 Triangle Perimeters,

• **Real problem-solving**

Working Mathematically: Investigations (CC)

Unit 16: Packing containers

STANDARD 6

a Estimate and measure (as above, considering scale and errors)

• *Toolbox: concepts and skills*

People Count: book and/or CD (MAV) *Text for teachers, with spreadsheets for students.*

34 Area, 40 Mass and density, 41 Time: calendar, 42 Time: short durations

The Learning Federation www.thelearningfederation.edu.au/tlf2/ *Free software from the internet*

Measures

standards.nctm.org/document/eexamples/index.htm *Free software from the internet*

6.3 Learning about Length, Perimeter, Area, and Volume of Similar Objects Using Interactive Figure

7.3 Understanding Ratios of Areas of Inscribed Figures

• *Mathematical problem-solving*

Active Learning: Measurement, Chance & Data (MAV) *Worksheets*

M46 Imperial units and conversions, M63 A large protractor, M64 Estimating angles and slopes, M65 The height-measurer, M66 Triangle of forces,

• *Real problem-solving*

Active Learning: Measurement, Chance & Data (MAV) *Worksheets*

M47 Solar system model, M48 Earth-moon model and phases, M49 Sports fields, M51 Renovating a garden, M52 Kite areas, M53 Athletics tracks, M54 The Gregorian calendar, M55 Racetrack simulation game, M56 The speed of sound, M57 Experiments on a slope, M58 Finding densities, M59 Area of a dam, M60 Distances you can't measure directly, M61 As the crow flies, M62 Plane table surveying, M67 Ski slopes,

b Use formulas (for area, perimeter, circles, surface area, volume, rates)

• *Toolbox: concepts and skills*

People Count: book and/or CD (MAV) *Text for teachers, with spreadsheets for students.*

35 Area: triangles & parallelograms, 36 Area: circles, 37 Volume, capacity and cuboids, 38 Volume & surface area: prisms and cylinders, 39 Volume: pyramids & cones,

Interactive learning for concepts and skills (MAV) *Demo on whiteboard or student use*

Boxes, Sun position, Max volume cone, Volume of pyramid, Decibels, Surface area to volume, Pyramid and cone, Truncated pyramid, Truncated cone, Floating, Day of year, Earth-moon,

The Learning Federation www.thelearningfederation.edu.au/tlf2/ *Free software from the internet*

Area of triangles, Area of compound shapes,

<http://nlvm.usu.edu/en/nav/vlibrary.html> *National Library of Virtual Manipulatives Free software from the internet*

• *Mathematical problem-solving*

RIME: Measurement, Space, C&D (MAV) *Lesson plans*

18 Biggest volume

Maths300 (CC) *Lesson plans*

80 Cylinder Volumes, 81 Biggest Volume, 100 Planets, 109 Newspaper Pathways,

Problem Solving Task Centre (CC) *Rich tasks for students*

84 Rectangle Nightmare, 85 Time Swing, 126 Planets, 156 Photo Angles, 219 The Hole In The Triangle,

• *Real problem-solving*

RIME: Measurement, Space, C&D (MAV) *Lesson plans*

16 Bicycle chain, 17 Pizza value,

Maths at work (MAV) *Student text on CD*

21 Creating an image, 22 Making maps,

c Pythagoras' theorem

• *Toolbox: concepts and skills*

People Count: book and/or CD (MAV) *Text for teachers, with spreadsheets for students.*

47 Pythagoras

Interactive learning for concepts and skills (MAV) *Demo on whiteboard or student use*

Squares and triangle, Pythagoras, Pythagorean triples,

Active Learning: Measurement, Chance & Data (MAV) *Worksheets*

M68 Dissection proofs, M69 Proving the theorem for Pythagoras, M70 Pythagorean triples, M71 Pythagorean quadruples, M72 Pythagoras and circles, M73 Finding side lengths,

Geometry Everywhere (MAV) *Teaching ideas and worksheets with answers*

Page 50, 54, worksheet 76;

standards.nctm.org/document/eexamples/index.htm *Free software from the internet*

6.5 Understanding the Pythagorean Relationship Using Interactive Figures

<http://illuminations.nctm.org/Activities.aspx> *Free software from the internet*

Pythagorean theorem,

<<http://nlvm.usu.edu/en/nav/vlibrary.html>> National Library of Virtual Manipulatives *Free software from the internet*

• **Mathematical problem-solving**

Maths300 (CC) *Lesson plans*

157 Pythagoras & Other Polygons,

Problem Solving Task Centre (CC) *Rich tasks for students*

97 Pythagoras Rods, 155 '64 = 65', 175 Pythagoras, 189 Pythagoras 3, 196 Cross & Square,

• **Real problem-solving**

d Trigonometry

• **Toolbox: concepts and skills**

People Count: book and/or CD (MAV) *Text for teachers, with spreadsheets for students.*

46 Scale drawing & trigonometry,

Interactive learning for concepts and skills (MAV) *Demo on whiteboard or student use*

Lissajous figures, Trigonometry, Triangle, Projectiles, Great circle distance, Venus, Clifftop, River, Sun position, Daylight, Sundial, Sound waves

The Learning Federation www.thelearningfederation.edu.au/ttf2/ *Free software from the internet*

Trigonometry

Active Learning: Measurement, Chance & Data (MAV) *Worksheets*

M74 Latitude, longitude and trigonometry, M75 Identities and equations, M76 The sliding ladder, M77 Practical projectiles, M78 Finding angles, M79 Trigonometry out of this world!

Geometry Everywhere (MAV) *Teaching ideas and worksheets with answers*

Page 50, 52, 53, 55, 56, worksheets 74, 75, 76

• **Mathematical problem-solving**

Maths300 (CC) *Lesson plans*

108 Trigonometry Walk,

• **Real problem-solving**

Maths at work (MAV) *Student text on CD*

23 Measuring from afar