

# Resources for a VELS Maths Curriculum

## CHANCE AND DATA

### STANDARD 1

#### a Recognise 'unpredictability' of some events

- ***Toolbox: concepts and skills***

The Learning Federation [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) Free software from the internet

The slushy sludger, Spinners

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

- ***Mathematical problem-solving***

- ***Real problem-solving***

#### b Collect and display data

- ***Toolbox: concepts and skills***

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

- ***Mathematical problem-solving***

- ***Real problem-solving***

### STANDARD 2

#### a Language from certain to impossible

- ***Toolbox: concepts and skills***

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

64 Chance by intuition, 65 Simulation – chance by experiment,

The Learning Federation [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) Free software from the internet

The slushy sludger, Spinners

Chance and Data Investigations: Volume 1 Chance (CC) Lesson plans

Clothes line, Coloured dice, Walk the plank

- ***Mathematical problem-solving***

Chance and Data Investigations: Volume 2 Data (CC) Lesson plans

Groups and sorting rules,

- ***Real problem-solving***

#### b Collect and display frequency data

- ***Toolbox: concepts and skills***

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

70 Statistics – using data for a purpose, 71 Collecting data, 72 Describing data – tables

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

Column graph

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

• **Mathematical problem-solving**

**Chance and Data Investigations: Volume 2 Data (CC) Lesson plans**

People graphs,

• **Real problem-solving**

## STANDARD 3

### a Intuitive chance language, including ‘fairness’

• **Toolbox: concepts and skills**

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

64 Chance by intuition, 65 Simulation – chance by experiment,

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

Die racing, Drawing pin, Lotto, Coin tossing, Coin tosses, Dice rolling,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) Free software from the internet

Spinners, Mystery spinner, The vile vendor, The foul foodmaker, Dice duels

• **Mathematical problem-solving**

**Chance and Data Investigations: Volume 1 Chance (CC) Lesson plans**

Crazy animals, Early probability, Likely choices, Horse races

**Maths300 (CC) Lesson plans**

1 Win At The Fair, 2 Problem Dice, 3 Dice Differences,

• **Real problem-solving**

### b Experiments (including chance) and display of data

• **Toolbox: concepts and skills**

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

70 Statistics – using data for a purpose, 71 Collecting data, 72 Describing data – tables

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

Die racing, Drawing pin,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) Free software from the internet

Spinners, Mystery spinner, The vile vendor,

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

Adjustable spinner

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

Spinners, Histogram, Boxplot,

• **Mathematical problem-solving**

**Maths300 (CC) Lesson plans**

13 Estimation Walks, 67 Potato Olympics, 106 Finger Knitting Good

**Problem Solving Task Centre (CC) Rich student tasks**

6 Counter Escape, 13 The Frog Pond, 18 Same Or Different, 20 Pack The Box, 34 Dice Differences, 46 Duelling Dice, 53 Have A Hexagon, 58 See-Saw, 76 Tube Toss, 87 First Down The Mountain, 117 Twelve Counters, 131 Walk The Plank, 133 Win At The Fair, 191 Choosing Beads, 198 What's In the Bag? 200 Greedy Pig,

• **Real problem-solving**

**Chance and Data Investigations: Volume 2 Data (CC) Lesson plans**

Performance data, Database debut, Bikes, monkey bars & skeletons, Cemetery maths

## STANDARD 4

### a Calculate probabilities, using symmetric properties

#### • *Toolbox: concepts and skills*

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

66 Probability – chance by prediction,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) *Free software from the internet*

The foul foodmaker,

#### • *Mathematical problem-solving*

#### • *Real problem-solving*

### b Simulate complex events

#### • *Toolbox: concepts and skills*

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

65 Simulation – chance by experiment,

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

Lotto, Coin tossing, Coin tosses, Dice rolling, Marbles, Raffle, Spinner, Dice football, Dice totals, Beetle, One-day cricket, Tennis, Tennis set, Table tennis, Pokies, Six punters@TAB,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) *Free software from the internet*

Random or not, Mystery spinner, Dice duels

#### • *Mathematical problem-solving*

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

29 Danger fractions

**Maths300 (CC)** *Lesson plans*

5 Greedy Pig, 6 Have A Hexagon, 11 This Goes With This, 59 Duelling Dice, 89 Red & Black Card Game, 121 Beetle Game,

**Problem Solving Task Centre (CC)** *Rich student tasks*

1 Final Eight, 47 Red/Black Card Game, 49 Take A Chance, 128 Highest Number 2, 162 Game Show, 197 Chocolate Chip Cookies, 223 Cat and Mouse, 224 Matching Faces,

**Chance and Data Investigations: Volume 1 Chance (CC)** *Lesson plans*

Beetle game, Odds: far and unfair

#### • *Real problem-solving*

**RIME 5/6 (MAV)** *Lesson plans*

Carrot patch, Everybody wins

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

Fire

### c Use appropriate displays and summary statistics

#### • *Toolbox: concepts and skills*

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

73 Describing data – summary statistics, 74 Describing data – graphs

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

Median, Stemplot unordered, Lineplot, Families – Victoria, Olympic track & field,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) *Free software from the internet*

Rice crisp machine, Matchbox machine, Healthy life survey, Home internet survey, Leisure survey

[standards.nctm.org/document/eeexamples/index.htm](http://standards.nctm.org/document/eeexamples/index.htm) *Free software from the internet*

## 6.6 Comparing Properties of the Mean and the Median

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

Circle grapher

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

Bar chart, Histogram, Pie chart,

### • *Mathematical problem-solving*

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

28 Estimating averages,

**Chance and Data Investigations: Volume 2 Data (CC) Lesson plans**

What's in the bag?

### • *Real problem-solving*

**Maths300 (CC) Lesson plans**

11 This Goes With This, 83 Temperature Graphs,

**Chance and Data Investigations: Volume 2 Data (CC) Lesson plans**

Soup kitchen, Pocket money, Chairs and tables: just right? Popcorn

**Working Mathematically: Investigations (CC) Lesson plans**

Unit 7: Historical surveys: family sizes, Unit 8: Games in the playground, Unit 12: Cats, Unit 15: How expensive am I?

[standards.nctm.org/document/eexamples/index.htm](http://standards.nctm.org/document/eexamples/index.htm) *Free software from the internet*

5.4 Accessing and Investigating Data Using the World Wide Web

5.5 Collecting, Representing, and Interpreting Data Using Spreadsheets and Graphing Software

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

Bar grapher

## STANDARD 5

### a Use simulation and long-run relative frequency

#### • *Toolbox: concepts and skills*

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

66 Probability – chance by prediction, 67 Addition laws and Venn diagram, 65 Simulation – chance by experiment, 68 Multiplication law and tree diagrams, 69 Further probability ideas,

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

Probability, Coin tossing, Several coins, Die rolling, Getting, Marbles, Raffle, Spinner, Peg bag, Dice football, One-day cricket, Tennis, Tennis set, Table tennis, Beetle, Pinball, Poker machine, Odds, Lotto, TAB, Winning streaks, Coin in the square,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) *Free software from the internet*

Rice crisp machine, Matchbox machine, Healthy life survey, Home internet survey, Leisure survey

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

30 Coin in the square, 31 Equally likely – games, 32 Equally likely – experiments

#### • *Mathematical problem-solving*

**Maths300 (CC) Lesson plans**

11 This Goes With This, 26 Highest Number, 58 Chocolate Chip Cookies, 59 Duelling Dice, 88 Counter Escape, 121 Beetle Game, 148 Birth Month Paradox, 155 Cat & Mouse

**Problem Solving Task Centre (CC) Rich student tasks**

6 Counter Escape, 13 The Frog Pond, 20 Pack The Box, 46 Duelling Dice, 76 Tube Toss, 99 How Many Beans? 114 Where Is The Rectangle? 117 Twelve Counters, 133 Win At The Fair, 138 A Rectangle Of Squares, 187 Triangle Area, 191 Choosing Beads, 193 Surface Area With Tricube, 197 Chocolate Chip Cookies, 207 Triangle Perimeters, 214 Angle Estimation, 217 Kids On Grids, 223 Cat and Mouse, 224 Matching Faces, 226 Playing With Objects

#### • *Real problem-solving*

**Chance and Data Investigations: Volume 1 Chance (CC) Lesson plans**

Swapping schools, Chocolate chip cookies, Birth month paradox

**b Calculate probabilities using tree diagrams etc.**

**• Toolbox: concepts and skills**

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

66 Probability – chance by prediction, 67 Addition laws and Venn diagram,

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

Guess the chance, Dice rolling, Dice totals, Long term coin tosses,

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

CD1 Coin tossing, CD2 Die-rolling, CD3 Spinner, CD4 Rolling marbles, CD12 Dice totals, CD16 Coin in the square, CD17 Fair and unfair odds, CD18 TAB, CD23 Loaded dice,

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

Adjustable spinner

**• Mathematical problem-solving**

**Chance and Data Investigations: Volume 1 Chance (CC) Lesson plans**

Sums and differences,

**• Real problem-solving**

**Working Mathematically: Investigations (CC)**

Unit 11: The easier keyboard,

**c Discrete and continuous data – displays and summary stats**

**• Toolbox: concepts and skills**

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

73 Describing data – summary statistics, 74 Describing data – graphs, 75 Comparing data sets – tables, 76 Comparing data sets – summary statistics, 77 Comparing data sets – graphs

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

Boxplot, Histogram, Stemplot unordered, Estimating means, Mean vs median, National areas, AFL ladders, Australian weather, Olympic track & field, Mean and quartiles, AFL 1992, Education, Melb/Vic/Aust, English Proficiency, DIY database, Age pyramid, AFL heights, Netball heights, IQR & SD, Birthplaces & languages, Income – Victoria, Marital status, Heights of teenagers,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) Free software from the internet

Foul foodmaker, Healthy life survey, Home internet survey, Leisure survey, Rice crisp machine, Matchbox machine

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

CD5 Estimating lengths using means, CD6 Estimating fractions of lengths, CD7 Some survey questions using numerical responses, CD8 Some survey questions using categorical responses, CD14 Graph review, CD19 Some statistical experiments, CD20 Cumulative frequency graphs,

**Free software from the internet**

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

Histogram tool,

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

Histogram,

**• Mathematical problem-solving**

**Chance and Data Investigations: Volume 2 Data (CC) Lesson plans**

Video data, Duelling dice,

**• Real problem-solving**

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

CD9 Reaction times, CD10 The toy car, CD11 Pocket money and earnings, CD13 Hands – spans and area, CD15 An Australian age pyramid, CD21 Natural data, CD22 AFL and netballer heights; traffic lights,

**Chance and Data Investigations: Volume 2 Data (CC) Lesson plans**

Weather patterns, Dying for a smoke,

<http://illuminations.nctm.org/Activities.aspx> Free software from the internet  
Bar grapher, Box plotter

## STANDARD 6

### a Calculate probability based on data, simulation & experiment

• **Toolbox: concepts and skills**

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

64 Chance by intuition, 65 Simulation – chance by experiment, 81 Sampling and inferring

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

Rolling a 6, TAB, How many rolls, Cards, Chuck-a-luck, Birthday, Final 8, Card collecting, Birthday, Exponential decay, Yowee,

**The Learning Federation** [www.thelearningfederation.edu.au/tlf2/](http://www.thelearningfederation.edu.au/tlf2/) Free software from the internet

Rice crisp machine, Matchbox machine, Healthy life survey, Home internet survey, Leisure survey, Foul foodmaker

• **Mathematical problem-solving**

**Maths300 (CC) Lesson plans**

3 Dice Differences, 4 First Down The Mountain, 5 Greedy Pig, 6 Have A Hexagon, 7 Radioactivity, 60 Game Show, 80 Cylinder Volumes, 81 Biggest Volume, 100 Planets, 125 What's In The Bag? 149 Sporting Finals, 153 Same Or Different, 161 Dice Footy

**Problem Solving Task Centre (CC) Rich student tasks**

1 Final Eight, 18 Same Or Different, 34 Dice Differences, 49 Take A Chance, 53 Have A Hexagon, 156 Photo Angles, 162 Game Show, 198 What's In the Bag? 219 The Hole In The Triangle, 232 Dice Footy

**Chance and Data Investigations: Volume 1 Chance (CC) Lesson plans**

Myths and misconceptions, Probability smorgasbord,

• **Real problem-solving**

**Chance and Data Investigations: Volume 1 Chance (CC) Lesson plans**

Matching, Radioactivity, Winning streaks, Medical testing

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

3 Interpreting statistics, 4 Describing with statistics,  
15 Taking your chances, 16 Combining chances, 17 Punting on ponies, 18 Games of chance,

### b Calculate probability for compound events, inc dependent, independent

• **Toolbox: concepts and skills**

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

64 Chance by intuition, 65 Simulation – chance by experiment, 66 Probability – chance by prediction, 67 Addition laws and Venn diagram, 68 Multiplication law and tree diagrams, 69 Further probability ideas,

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

Several coins, Addition law, (no overlap), Addition law (with overlap), Multiplication law, Cards, Coincidences, Lotto, AIDS testing, Smith family, Four marbles, Two cards, Quiz show, Betting on equal odds, Betting on unequal odds, Craps, Roulette, Ruin,

• **Mathematical problem-solving**

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

Stick or switch (i.e. Quiz show!),

• **Real problem-solving**

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

3 Interpreting statistics, 4 Describing with statistics,  
15 Taking your chances, 16 Combining chances, 17 Punting on ponies, 18 Games of chance,

## c Sampling from populations, interpreting displays and summary statistics

### • *Toolbox: concepts and skills*

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

81 Sampling and inferring

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

AFL heights, Aust netball scores, Netball goal-shooting, Birthplaces & languages, Family types – Victoria, Incomes, Marital status, Netball heights, Opinion survey, Heights of teenagers, Age pyramids, Stemplot, B2B stemplot, Boxplot, Parallel boxplots, Normal samples,

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

3 Interpreting statistics, 4 Describing with statistics,

### • *Mathematical problem-solving*

**Problem Solving Task Centre (CC) Rich student tasks**

90 The Grubby Pages Effect,

### • *Real problem-solving*

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

CD24 Doing things with data, CD25 Doing more things with data, CD26 Frequency, relative frequency and cumulative frequency, CD27 Percentiles and cumulative relative frequency, CD28 More percentiles and cumulative relative frequency, CD29 Problem solving with data, CD30 Choosing samples from a population, CD31 Sports simulations, CD34 Gold mining and farming, CD35 Unemployment and population, CD36 Marriages, divorces and birth, CD37 Schools and cars

**Chance and Data Investigations: Volume 2 Data (CC) Lesson plans**

Population centre of Australia, Sunsmart, How long is a rod? Colas, Top of the class

## d Bivariate data, scatter, estimate and predict using line of fit

### • *Toolbox: concepts and skills*

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

78 Relating data sets – tables, 79 Relating data sets – summary statistics 80 Relating data sets – graphs,

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

Young adults, Two-way relating, Rank-order correlation, Scatterplot & correlation, Breast-feeding and death, Line of fit, Sampling lines of fit,

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

27 Statistical change,

**Free software from the internet**

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

Scatterplot,

### • *Mathematical problem-solving*

### • *Real problem-solving*

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

CD32 Scatterplots, employment and qualifications, CD33 Lines of fit and predictions,