What's the problem - teaching numeracy?

Strategies for teaching Maths and Numeracy

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Australian Council *for* Educational Research

Welcome

Q. 1 Where are you from? Use the clipart button to put a tick next to your state/territory

- TAS
- VIC
- NSW
- ACT
- QLD
- NT
- SA
- WA

Welcome

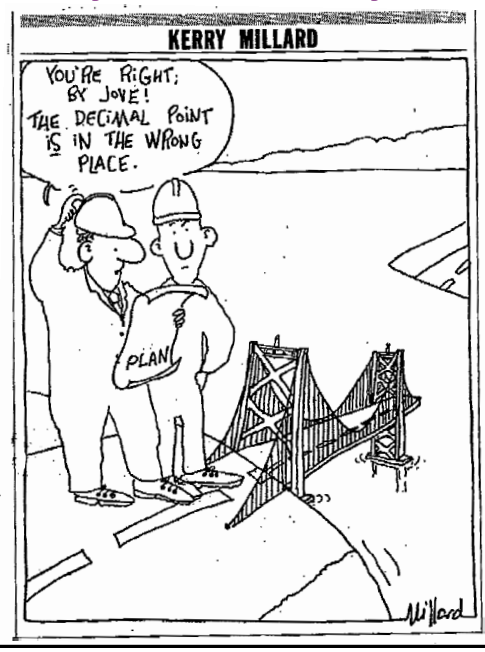
Q. 2 Do you (mainly) teach:
A. Literacy
B. ESL
C. Numeracy?

Vote by clicking on your selection.

Q. 3 How many years having you been teaching adults?
A. < 2
B. 2 – 5
C. 6 – 10
D. > 10

Vote by clicking on your selection.

Why is numeracy vital?



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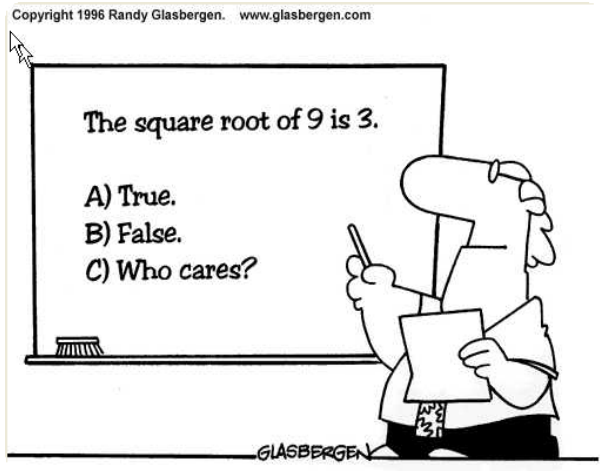


Why is numeracy vital?

The messages from the ALL survey

Number and proportion of persons in each group with skill levels 1 or 2

Numeracy scale	
1,000s	**%**
Australia:	
7,935.6	52.5

Gender:

47.5% of males are at levels 1 or 2

57.6% of females are at levels 1 or 2

A difference of over 10%!

What is numeracy?

- Numeracy is the bridge between mathematics and the real world
- Numeracy is about making meaning of mathematics and therefore maths is seen as a critical tool to be used efficiently and effectively – and it can be low level maths through to high level maths
- Numeracy is about using maths for social purposes (personal, community, work, further education)

What is numeracy?

Lynn A. Steen, probably the most articulate spokesperson for Quantitative Literacy/Numeracy, states that:

"...numeracy is not the same as mathematics, nor is it an alternative to mathematics. Today's students need both mathematics and numeracy. Whereas mathematics asks students to rise above context, quantitative literacy is anchored in real data that reflect engagement with life's diverse contexts and situations.

Teaching numeracy

- Teach in context – connect to the real world – use real texts and real situations – get students to solve real problems
- Use different strategies and activities – cater for different learning styles – encourage team work
- Start from where students are at – allow for different levels, different interests
- Scaffold and model – support the learners
- Integrate with literacy teaching and activities (and assessment)
- Make the maths skills explicit
- Use individual, small and whole group activities
- Connect language and maths – crucial
- Build confidence – have fun and success!

Teaching numeracy/mathematics

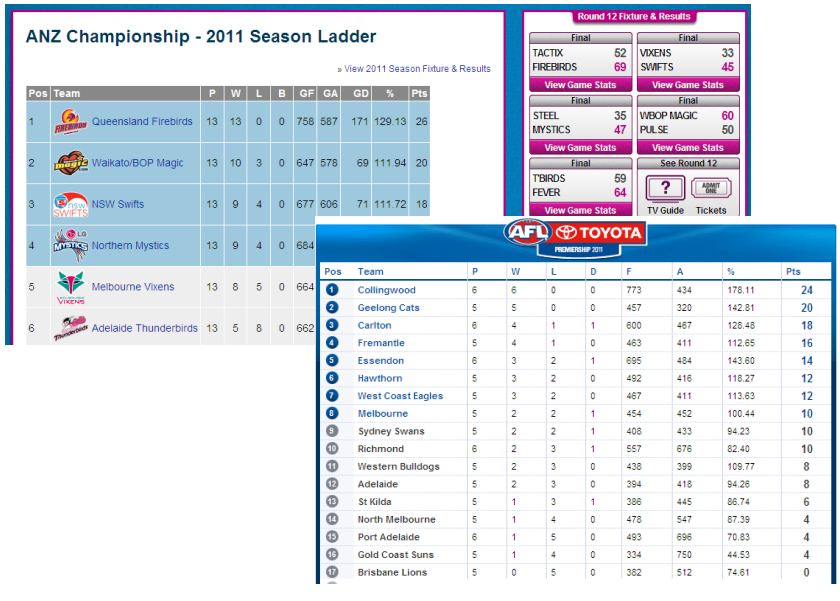
http://www.bestevidence.org.uk/:

The results of their review (for secondary school maths ages 12-18) show that:

- the most successful programmes focus on **changing daily teaching practices**, particularly the use of **co-operative learning methods**
- the most successful programmes **encourage student interaction.**

Some contexts – shopping and $s

Some contexts – sports



ANZ Championship - 2011 Season Ladder

» View 2011 Season Fixture & Results

Pos	Team	P	W	L	B	GF	GA	GD	%	Pts
1	Queensland Firebirds	13	13	0	0	758	587	171	129.13	26
2	Waikato/BOP Magic	13	10	3	0	647	578	69	111.94	20
3	NSW Swifts	13	9	4	0	677	606	71	111.72	18
4	Northern Mystics	13	9	4	0	684				
5	Melbourne Vixens	13	8	5	0	664				
6	Adelaide Thunderbirds	13	5	8	0	662				

Round 12 Fixture & Results

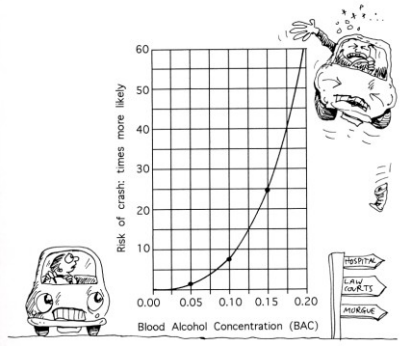
Final	TACTIX 52, FIREBIRDS 69	Final	VIXENS 33, SWIFTS 45
	View Game Stats		View Game Stats
Final	STEEL 35, MYSTICS 47	Final	WBOP MAGIC 60, PULSE 50
	View Game Stats		View Game Stats
Final	T'BIRDS 59, FEVER 64	See Round 12	
	View Game Stats	TV Guide	Tickets

AFL TOYOTA PREMIERSHIP 2011

Pos	Team	P	W	L	D	F	A	%	Pts
1	Collingwood	6	6	0	0	773	434	178.11	24
2	Geelong Cats	5	5	0	0	457	320	142.81	20
3	Carlton	6	4	1	1	600	467	128.48	18
4	Fremantle	5	4	1	0	463	411	112.65	16
5	Essendon	6	3	2	1	695	484	143.60	14
6	Hawthorn	5	3	2	0	492	416	118.27	12
7	West Coast Eagles	5	3	2	0	467	411	113.63	12
8	Melbourne	5	2	2	1	454	452	100.44	10
9	Sydney Swans	5	2	2	1	408	433	94.23	10
10	Richmond	6	2	3	1	557	676	82.40	10
11	Western Bulldogs	5	2	3	0	438	399	109.77	8
12	Adelaide	5	2	3	0	394	418	94.26	8
13	St Kilda	5	1	3	1	386	445	86.74	6
14	North Melbourne	5	1	4	0	478	547	87.39	4
15	Port Adelaide	6	1	5	0	493	696	70.83	4
16	Gold Coast Suns	5	1	4	0	334	750	44.53	4
17	Brisbane Lions	5	0	5	0	382	512	74.61	0

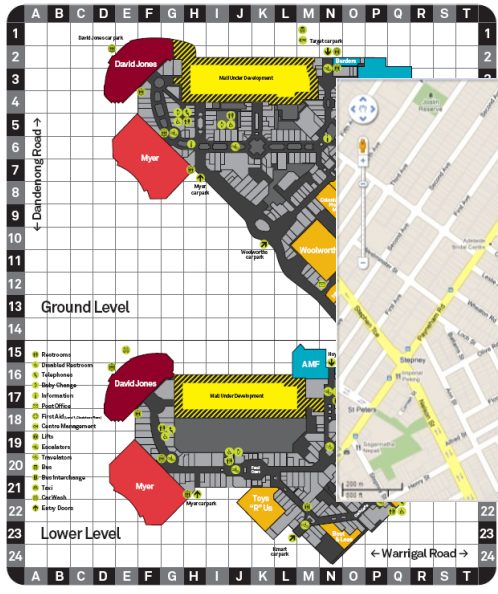
Some contexts – cars/driving

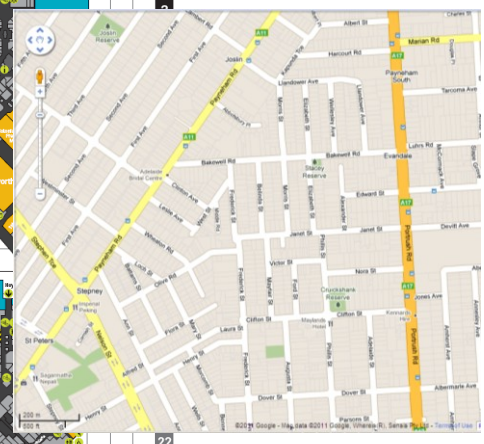
Relative Probability of Crashing at different Blood Alcohol Concentrations



MAZDA MX-5	
IN THE POCKET	
List price	$43,620
On-road cost	$4000
Model price range	$41,860-$45,790
Warranty	36mths/100,000km
Service intervals	10,000km
IN THE DRIVER'S SEAT	
Safety features	
ABS	std
Airbags driver/passenger/side	std/std/std
Stability control	n/a
Security feature	
Immobiliser	std
Data dots/alarm	n/a / n/a
Convenience features	
Auto transmission	$2175
Air-conditioning	std
Central locking	std-remote
Power windows	std
CD player	std 6-disc
Leather upholstery	$1760
Alloy wheels	std
Hardtop	$2940
Cruise control	std
UNDER THE BONNET	
Engine capacity	1998cc
Engine type	in-line 4cyl/16V/DOHC
Max power	118kW@6700rpm
Max. torque	188Nm@5000rpm
Transmission/drive	6-speed manual/rear
MEASURING UP	
Kerb mass	1105kg
Length	3995mm
Width (incl. mirrors)	1720mm
Height	1245mm
Wheelbase	2330mm
Tyres	205/45 R17
Spare wheel	none
Turning circle	9.4m

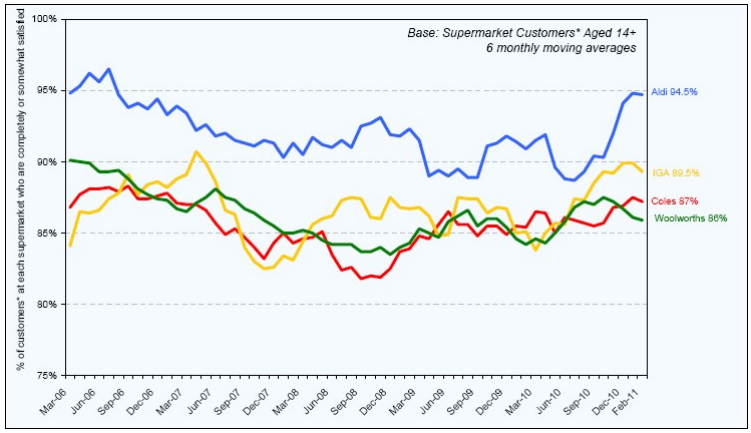
Some contexts – maps/directions





Some contexts – stats/data

Supermarket Customer Satisfaction



Some contexts – medicine

Baby Drops Colourfree

Age	Average Weight	Dose
1 - 3 month	4 - 6 kg	0.6 - 0.9 ml
3 - 6 month	6 - 8 kg	0.9 - 1.2 ml
6 - 12 month	8 - 10 kg	1.2 - 1.5 ml
1 - 2 years	10 - 12 kg	1.5 - 1.8 ml

Elixir & Colourfree Suspension 1-5 Yrs

Age	Average Weight	Dose
1 - 2 years	10 - 12 kg	6 - 8ml
2 - 3 years	12 - 14 kg	8 - 9 ml
3 - 4 years	14 - 16 kg	9 - 10 ml
4 - 5 years	16 - 18 kg	10 - 11 ml
5 years	18 - 20 kg	11 - 13 ml

Elixir & Colourfree Suspension 5-12 Yrs

Age	Average Weight	Dose
5 - 6 years	18 - 20 kg	6 ml
6 - 7 years	20 - 22 kg	6 - 7 ml
7 - 8 years	22 - 25 kg	7 - 8 ml
8 - 9 years	25 - 28 kg	8 - 9 ml
9 - 10 years	28 - 32 kg	9 - 10 ml
10 - 11 years	32 - 36 kg	10 - 11 ml
11 - 12 years	36 - 41 kg	11 - 13 ml

Numeracy counts in the workplace

And in workplaces they use:

- Measurement, including of areas and volumes
- Numbers in all forms – whole, fractions, decimals, percentages
- Quantities – rates, \$/m, \$/m^3 etc
- Statistics – tables, graphs, averages
- Geometry and shapes
- And yes, they do use algebra!!

What are some questions you could ask based on this text? At different ACSF levels?

What maths areas can be covered?

- Number and algebra?
- Measurement and geometry?
- Statistics and probability?

In the classroom?

Context work – application

Projects/investigations/demonstrations

Theory, Skills & knowledge

Skills & practice

Whole & small group

Skills & practice

Individual work

In the classroom?

- Fun and games – e.g. dice games (multidigit etc)
- Small group work – e.g. solving problems, playing games, working together – talking, helping and sharing
- Whole group work – e.g. student(s) presenting, teacher presenting/revising, playing games, group discussion, etc
- Individual work - e.g. working on project, solving problems, revision, practice

Fun and games

Each letter of the alphabet is given a dollar value:

A $1	**B** $2	**C** $3	**D** $4	**E** $5	**F** $6	**G** $7
H $8	**I** $9	**J** $10	**K** $11	**L** $12	**M** $13	**N** $14
O $15	**P** $16	**Q** $17	**R** $18	**S** $19	**T** $20	**U** $21
V $22	**W** $23	**X** $24	**Y** $25	**Z** $26		

Some resources

See **Handouts** for a list of resources

Questions?