CURRICULUM, PEDAGOGY AND BEYOND









Critical connections between language, literacy, mathematics and numeracy

Acknowledgement of country





Outline

Intros

- What is numeracy (& maths)
- Lessons from my learners
- Language and literacy in N&M
- Teaching activities
- Discussion and Q&A

What is numeracy and maths?

Panadol

R 83363

Children

1 MONTH

-2 YEARS

Fast pain relief ✓

dosing device

Cherry Vanilla Flavour Colour free baby drops

This oral liquid contains PARACETAMOL 100mg/1mL

Reduces fever ✓

Includes oral ✓

20mL

Contains

Dosing

Device

 For more than 48 hrs. at a time, except on medical advice

. If any of the seals on this package are broken If the package use-by

AFTER USING CHILDREN'S PANADOL BABY DROPS

Hand wash the dosing device

Push the cap down and turn

it to close cap tightly, then

turn backwards until you

DO NOT USE CHILDREN'S

· For infants under 1 month

containing paracetamol, except on medical advice

PANADOL BABY DROPS

If your child is using

other medicines

hear clicking sounds

Store below 25°C

· Wipe the neck of the

bottle clean

date has expired

CHECK WITH YOUR DOCTOR BEFORE USE IF YOUR CHILD

· Has liver or kidney problems Weighs less than 4kg or more than 12kg

STOP USE AND TELL YOUR DOCTOR IF YOUR CHILD

· Has an allergic reaction, shortness of breath or wheezing after taking Children's Panadol

USE CHILDREN'S PANADOL BABY DROPS FOR

Fast effective temporary relief from fever and pain associated with:

- Teething Immunisation Earache
- Cold & Flu symptoms Headache

HOW TO USE CHILDREN'S PANADOL BABY DROPS

- Please read and retain the carton
- · Shake the bottle well
- · Use the measuring device provided to accurately measure
- Measure correct dose based on the table below

 Calculate the correct dose based on the child's weight. If weight is unknown, use the child's age

AGE	AVERAGE WEIGHT	DOSE
1-3 Mths	4-6 kg	0.6-0.9 mL
3-6 Mths	6-8 kg	0.9-1.2 mL
6-12 Mths	8-10 kg	1.2-1.5 mL
1-2 Yrs	10-12 kg	1.5-1.8 mL

• Repeat 4-6 hourly if required (maximum 4 times within 24 hours)

• Can be given with water or fruit juice if preferred by vour child

USING THE CONVENIENT DOSING DEVICE



1. Insert device into bottle 2. Draw up liquid 3. Check dosage in device is correct before use

SAFETY SEAL

CHILDREN'S PANADOL BABY DROPS CONTAINS

- Paracetamol 100mg/mL
- Saccharin sodium
- Hydroxybenzoates
- Sodium chloride
- No artificial colours

KEEP TO THE RECOMMENDED DOSAGE

If an overdose is taken or suspected, ring the Poisons Information Centre (Australia 131 126) or go to the hospital immediately even if your child feels well because of the risk of delayed, serious liver damage if left untreated.

QUESTIONS OR COMMENTS

Free call 1800 028 533 (Australia only) For further information please visit www.childrenspanadol.com.au



GlaxoSmithKline **Consumer Healthcare** 82 Hughes Avenue, Ermington, NSW 2115, Australia

Panadol® is a registered trade mark of the GlaxoSmithKline group of companies.

C2876P

What is numeracy and maths?

Boom Sprayer Calibration

To apply the correct amount of chemical you must know the output of the boom sprayer. Applying too much pesticide can cause crop damage, increase any residues and cost more than is necessary. Too little pesticide will not control the problem. This can cause yield losses, harvest contamination or the extra cost of respraying.

To determine the boom output (for P.T.O. or engine driven pumps) follow these steps:

(Note use water only in spray tank)

- Select pressure (usually between 200 and 300kPa)
- 2. Check nozzle wear and measure boom output.
- (a) Measure output of each nozzle (ml/min).

(b) Replace any nozzle that exceeds manufacturer's recommended output by 25%. (Charts are available from manufacturer or reseller).

- (c) Measure output of new nozzles.
- (d) Calculate average output per nozzle
 - = total output of all nozzles number of nozzles
- (e) Replace any nozzle that delivers 10% more or less than the average.
- (f) Measure output of replacement nozzles.
- (g) Calculate total boom output of all nozzles (litres per minute).

3. Determine speed of spraying

(a) Select gear that gives suitable ground speed and required r.p.m.

(b) Measure time to travel over a measured distance (e.g. 100 metres).(c) Speed (Kilometres per hour).

= distance travelled (metres) x 3.6

time taken (seconds) **Example:** Time to travel 100 metres was 36 seconds Speed = 100×3.6 36= 10 km/hr Calculate spray output (litres/ha)
 600 x boom output (litres/minute)

spraying width (metres) x speed (km/hour) (Spraying width = number of nozzles x distance between each nozzle) **Example:** Boom Output = 10 litres/min

Width = 12 metres Speed = 10km/hour $Output = 600 \times 10$ 12×10 = 50 litres/ha 5. To calculate amount of chemical to add to spray tank application rate (litres or kilograms/ha) x volume of water in tank (litres) output (litres/ha) Example: application rate of chemical (0.5 litres/ha [= 500ml/ha]) volume of water in tank (2,000 litres) output (50 litres/ha) Amount of chemical to add = 0.5 x 2,000 50

= 20 litres



CONCRETE, MORTAR & RENDER Volume Batching Mix Table

CEMENT	SAND	AGGREGATE	OF CEMENT PER m ²
1	1.5	3	17
Alter and the			
1	2	3	16
1	3	3	13
1	4		15
1	6	+1 Hydrated Lime	8
1	3		20
	CEMENT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CEMENT SAND 1 1.5 1 2 1 2 1 3 1 4 1 6 1 3	CEMENT SAND AGGREGATE 1 1.5 3 1 2 3 1 2 3 1 3 3 1 4 - 1 6 +1 Hydrated Lime 1 3 -

Always use clean drinking water in precise quantities specified
 Always use an accurate volume measure like a bucket or gauge box

× Excess mixing water can ruin good concrete, mortar and render

What is numeracy and maths?

Lynn A. Steen, probably the most articulate spokesperson for "Quantitative Literacy", 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."

Numeracy intersections with literacy

You never meet maths expressions like this in the real world:

• 37.5 – 20% x 37.5

or

• 0.8 x 37.5

Cotton Up END OF SEASON SALE: Take a further 20% off already discounted prices.



- You **only** ever meet straight sums in the maths classroom!
- You need to **read/listen and interpret** the real world in order to solve any numeracy problem or task.
- You need to be able to **identify** the maths embedded in the situation/context and then decide what maths to use and how.
- You need literacy skills, alongside the maths skills.

Numeracy intersections with literacy

Melbourne earthquake **Earth**: are they **becoming more common?** A seismology expert explains

Published: May AFST

Last night at local time, the greater Melbourne region was shaken by a magnitude earthquake – as calculated by the Seismology Research Centre – centred near Sunbury, approximately north of the CBD.

Geoscience Australia have so far received more than people who felt this earthquake, some as far as Hobart, which is away from the epicentre.

In the Melbourne region, the earthquake reportedly produced shaking which lasted roughly seconds, according to witness reports on social media. It was followed minutes later by a magnitude aftershock, which was reported by some people in the epicentral region between Sunbury and Craigieburn.

Are earthquakes becoming more common in Melbourne?

In September a magnitude earthquake rattled Melbourne, its epicentre being at Woods Point to the east of the city. This earthquake was felt as far away as Brisbane and Adelaide. Last night's earthquake follows a magnitude earthquake near Ferntree Gully, to the east of Melbourne, ago on Another one with a magnitude of was felt by about

people in roughly the same region on _____, according to Geoscience Australia.

[•]Numeracy intersections with literacy

AFL grand final 2024: Brisbane Lions dominate Sydney Swans to win first premiership since 2003 with 60-point victory The Brisbane Lions have claimed their first AFL premiership in 21 years after dominating the Sydney Swans in a 60-point victory in the grand final at the MCG.

The Lions led at every change to triumph 18.12 (120) to 9.6 (60) in front of 100,013 spectators, with their win built on a blistering performance in the second and third quarters.

They kicked seven goals — including a stretch of six straight in the second term to establish a 46-point lead at half-time and tightened their stranglehold in the third to push their advantage out to 73 points at the final change.

The victory caps off a 2024 campaign that began nervously for Chris Fagan's team, with last year's runner-up opening the season with three consecutive defeats.

They finished the home-and-away season in fifth place on the ladder to become the first team since the Western Bulldogs in 2016 to win the premiership from outside the top four.

Numeracy intersections with literacy

PROCESSING INSTRUCTIONS

Sheet'.

- 1. Product to be held in Blast Chiller no less than 12 hours before slicing.
- 2. Move cage with Roast Beef to Shingled Meat Room.
- 3. Check internal temperature. The optimum internal temperature of logs before slicing should be between 0 to +4°C. If above 4°C, move to Blast Freezer for 30 to 60 minutes. When temperature is satisfactory, return product to Shingled Meat Room & record on 'Temperature Control Check

Time

- 4. Fit logs on slicer (end of logs may need trimming to get gripper to hold).
- 5. Check weight of slices as per procedure 5-09-07.
- 6. The net weight of 7 slices should be between 100 and 105 grams.
- 7. Adjust slices if net weight is outside those specifications.
- Place 7 slices in the moulded bottom film on Tiromat machine.
- Avoid meat contacting the sealing edges of the film
- 10. Place loose packs in the plastic bin (remove sliced product and re-package).
- 11. Assemble the box for Roast Beef, place 8 labelled packs and fold the box.
- 12. Place folded box inside the tape machine.
- 13. Stack boxes on the pallet and move to Despatch Childer.

Linear

dimensions

QUALITY CHECKS

- Log internal temperature before slicing: 0 to 4°C
- Net weight: 100-105 grams
- Slice thickness: approx. 2 mm
- Unit size: approx. 105 mm
- Unit per package: 7 slices
- Correct use-by date (refer to daily use-by date listing
- Correct label positioning visual inspection
- Digital scales accuracy ±0.001 kg

Temperature

Weight

Numeracy intersections with literacy

Temperature

Weight

PROCESSING INSTRUCTIONS

Sheet'.

- 1. Product to be held in Blast Chiller no less than 12 hours before slicing.
- 2. Move cage with Roast Reef to Shingled Heat Room
- Checkinternal temperature. The optimum internal temperature of logs before slicing should be between 0 to +4°C. If above 4°C, move to Blast Freezer for 30 to 60 minutes. When temperature is satisfactory, return product to Shingled Meat Room & record on 'Temperature Control Check.

Time

- 4. Fit logs on slicer (end of logs may need trimming to get gripper to hold).
- 5. Check weight of slices as per procedure 5-09-07.
- 6. The net weight of 7 slices should be between 00 and 105 grams.
- Adjust slices if net weight is outside those specifications
- 3. Place 7 slices in the moulded bottom film on Tiromat machine.
- 9. Avoid meat contacting the sealing edges of the film
- 10. Place loose packs in the plastic bin (remove sliced product and re-package).
- 11. Assemble the box for Roast Beef, place 8 labelled packs and fold the box.
- 12. Place folded box inside the tape machine.
- 13. Stack boxes on the pallet and move to Despatch Childer.

Linear

dimensions QUALITY CHECKS

- Log internal temperature before slicing: 0 to 4°C
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- Unit per package: 7 slices
- Correct use-by date Defer to daily use-by date listing
- Correct label positioning visual inspection
- Digital scales accuracy±0.001 kg

Look at these four sums and see if you can work out how or why the learners got them "wrong":

• 352 – 225 = 133

- $1/_2 + 1/_4 = 2/_6$
- 225 ÷ 5 = 177

What's the error that has been made here?

352 - 225 = 133

352

-<u>225</u> <u>133</u>

 $\frac{1}{2} + \frac{1}{4} = \frac{2}{6}$

The numerals on the page are representing something! What do they represent and mean? That's what is **critical** and what gives them meaning and enables them to make sense. Verbalise! Relate to a context/real-world. Take the smallest from the biggest – much easier!

- But what words do we use?
 - take away from
 - minus
 - Subtract

$$\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$$

$$\frac{1}{2} + \frac{1}{4} = \frac{2}{6}$$

And what about this one? Same "error" in both:

- 225 ÷ 5 = 177 Or
- $7235 \div 5 = 2775$



7235 ÷ 5 = 2775



 $1 \times 5 = 5$

2 x 5 = 10

3 x 5 = 15

 $4 \times 5 = 20$

5 x 5 = 25

 $6 \times 5 = 30$

7 x 5 = 35

etc

My method:5 into 7 goes 2 with 3 overCorrect method:5 into 7 goes 1 with 2 over

Why?

- Words over! Took it literally
- No context no meaning no understanding.

Language – the words of maths are critical



Interviewer: Child: Interviewer:

Child:

Do you know what volume means? Yes Could you explain to me what it means? Yes, it's what is on the knob on the TV set.



Language – the words of maths are critical

John Munro: Maths words can be of three types:

- 1. Words that maintain their meaning in both maths and everyday use. Eg "take away"
- 2. Words that only have a mathematical usage and are not used in everyday contexts. Eg "isosceles"
- 3. Words that have different meanings in their maths and their everyday usage. Eg "volume", "odd"



Language – the words of maths are critical

• Which category are these words in? Talk to your neighbour(s)

Square	Degrees	Irrational	Multiply
Numerator	Negative	Perimeter	Difference

- > 1. Words that maintain their meaning in both maths and everyday use.
- 2. Words that only have a mathematical usage and are not used in everyday contexts.
- 3. Words that have different meanings in their maths and their everyday usage.

Discuss this with your students - YOU NEED TO **TALK** MATHS!

Lessons from my learners about language/literacy

The lessons:

- The language and words are crucial
- A context provides meaning
- Getting your learners to talk to you is critical tell you what's in their heads – to verbalise it – tell their story. This is not normal in maths, so it can be a challenge.
- Understanding crucial and a need for unlearning too!

Literacy and Language are critical elements of teaching numeracy/maths

The Language of maths: What you can do:

- Before you start identify what maths words are part of what you are working on. Can they be misinterpreted like volume and odd?
- Discuss these with your learners? What do they think the words mean?
- You could ask students to research them and then discuss as a group.
- Then explain how they are used (precisely) in maths.
- Encourage maths talk with small group activities and work
- Keep word lists
- Play word games do word finds/crosswords/cloze activities.

Teaching activities

Р	0	V	0	L	U	М	Е	Ν	М	М	А	S	S	L
А	Q	С	Е	Ν	Т	I	I	В	S	Е	I	L	К	А
Q	U	R	W	V	Т	L	С	L	I	Т	R	Е	0	н
Υ	J	S	S	U	S	L	R	А	Е	R	J	Ν	0	L
В	R	С	Е	L	S	Т	U	S	В	Е	D	G	Р	Т
А	x	А	А	D	U	L	Q	Μ	Ρ	С	Е	Т	S	Μ
С	М	L	Е	Ρ	Е	V	Ρ	Н	Ι	Ν	С	H	F	Ν
D	Е	Е	G	Е	А	T	Е	В	Ν	Т	F	U	W	S
Е	М	Е	Т	R	I	С	0	Х	Т	0	V	Е	Н	S
G	F	R	Z	F	Т	к	Ι	L	0	Т	W	R	T	S
Т	L	U	М	А	Н	Е	Ν	Т	А	Y	G	0	Ρ	U
R	U	L	R	G	F	М	В	I	Y	J	R	Е	т	W
D	W	Е	I	G	Н	Т	L	Α	R	Е	А	Ζ	I	Т
N	I	R	Ν	J	0	Ρ	R	К	С	К	М	D	Α	Н
Н	G	F	Е	D	С	D	Е	G	R	Е	Е	S	В	А

DINIT

KILO

HECTARE

VOLUME

FOOT

SCALE

1		2		3			4		5		6
		7					8				
				9							
10	11		12					13		14	
			15	16		17	18				
19		20							21		22
		23	24		25		26	27			
					28						
29	30							31		32	
				33			34				
	35						36				
37				38						39	

oss dozen vo more than three thousand 5 + 316 (100 e number of days in a normal year e number of seconds in one hour x 8 lalf a century he product of five and eleven he number of minutes in 2 hours ho difference between 000 and 546

Down
1. 642 + 365
2. 4 dozen
3. Three hundred plus three
4. Double 115
5. Five multiplied by eleven
The number of metres in a kilometre
11. 456 – 241
12. The missing number: 45, 35,, 15, 5
13. The number of minutes in a third of an hour
14. 53 x 10
16 Two bundred more than 325

CENTI	MILLI
METRE	LITRE
MASS	WEIGHT
CAPACITY	INCH
	CENTI METRE MASS CAPACITY



Teaching activities

Co-operative logic problems

Why?

- research based addressed gender challenges
- encourages maths language/talk/dialogue
- Collaborative: encourages sharing of knowledge and understanding
- supports problem solving skills and teamwork
- fun too so helps overcome maths anxiety
- enables the teacher to observe the skills and knowledge of students.





Co-operative logic problems

THE FLATS (Place this in the centre of the table)



Language

Symbol	Maths words we use	Other words we use
+	Plus	total
	Minus	from
×	Multiply	times
/ or ÷	Divide	how many?
=	Equals	is

Language

Symbol	Maths words we use	Other common words we use
+	Plus, sum, add	total, and, altogether,
	Minus, subtract, difference	from, less, fewer, how much change, difference between,
×	Multiply, product	times, by, lots of,
/ or ÷	Divide, quotient	how many?, goes into,
=	Equals	is, the same as,

Teaching activities



E53g

- Car

O vodafone

Per Car

Teaching activities



Use your numeracy words/vocab to make up some numeracy problems to solve (spoken or written depending on the level and their literacy skills).

For example, make up one +, -, x and ÷ problem.

Write or say it in **words** and also using the **maths symbols**.

Discussion and Q&A



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Event App

App Download Instructions

Step 1: Download the App 'Arinex One' from the App Store or Google Play



- Step 2: Enter Event Code: mav
- Step 3: Enter the email you registered with
- Step 4: Enter the Passcode you receive via email and click 'Verify'. Please be sure to check your Junk Mail for the email, or see the Registration Desk if you require further assistance.





Be in it to WIN!

<

A02 - (Year 1 to Year 6) Supporting High Potential and Gifted Learners in Mathematics

Pedagogy

Add to Favourite(건) Complete the Survey

>

>

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(i) Description

R∃ Speaker



Dr Chrissy Monteleone

