

Having some fun with maths and numeracy

Friday, 20th May 2022

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Welcome

Acknowledgement of country

The Australian Council for Educational Research acknowledges the Traditional Custodians of the lands on which we are all located. We pay our respects to Elders past, present and future. We acknowledge the Aboriginal and Torres Strait Islander people who continue to contribute to our work to improve Indigenous learning, educational research and development.

Why is maths/numeracy vital?

Northumbria Uni fined £400K after boffin's bad math gives students a near-killer caffeine high

Pair needed dialysis after downing equivalent of 300 cups of coffee

Shaun Nichols in San Francisco

Thu 26 Jan 2017 // 08:04 UTC

111



Northumbria University in England has been fined £400,000 (\$503,000) after a botched experiment resulted in two students almost dying from caffeine overdose.

Newcastle Crown Court issued the fine on Wednesday after hearing the case of two 20-year-old students who, as part of a study on the effects of the stimulant, were mistakenly given as much caffeine as what's in 300 standard cups of coffee.

According to [reports](#) from court, Luke Parkin and Alex Rosetta had enrolled in a March 2015 sports science experiment on the effects of caffeine on exercise.

While administering the powdered caffeine for the study, a staff researcher had calculated the dosages on a mobile phone and missed a decimal point in the calculations. As a result, they both ended up getting 30g of the stimulant mixed into orange juice and water rather than the intended 0.3g. One cup of coffee typically has 0.1g of caffeine.

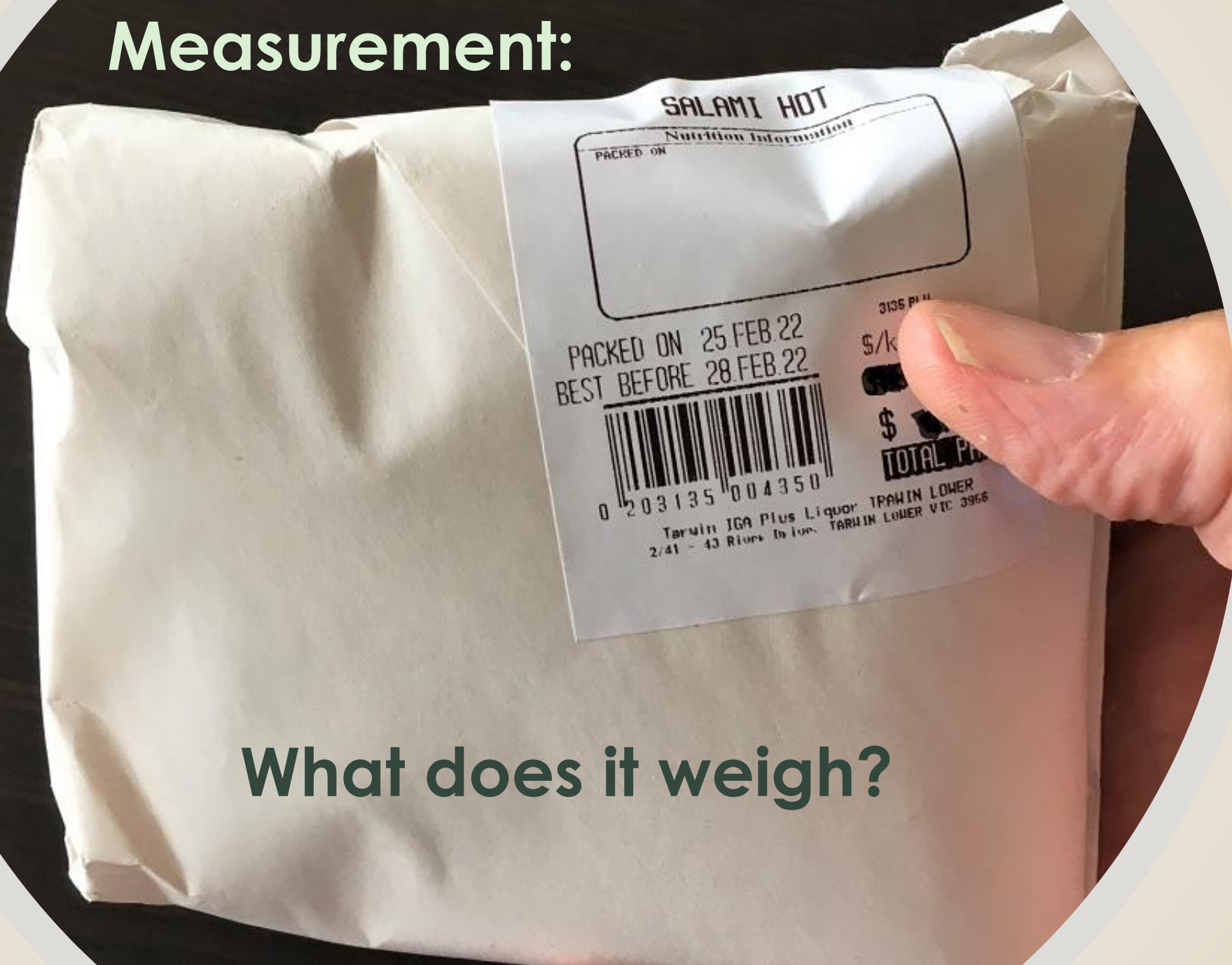


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Teaching tips

- Use different strategies and activities – support and encourage students' ways of doing
- Use a problem solving, investigative, open-ended approach
- Connect to the real world – use real texts and real situations – use relevant and interesting topics and themes (the world is rich in maths) to engage students
- Use hands-on materials
- Scaffold and model – support the learners
- Use individual, small and whole group activities
- Connect language and maths – talk maths - crucial
- Build confidence – have fun and success!
- Throw out text books!?

Measurement:



What does it weigh?

What does it weigh?

- On each of your tables try to work out what each item weighs.
- First guess – before you pick them up! Write down your guesses before discussing with the others.
- Now pick them up and discuss and agree on what you think each one weighs.
- Which is heaviest?
- Which is lightest?
- Now come out and weigh them.
- How close were you?
- What info did you use to estimate the weights?



What does it weigh?

- Make it hands on
- Use guess/estimate/measure approach
- Use benchmarks, e.g. Handspan \approx 20 cm, 1 litre liquid \approx 1 kg
- **Start measurement with length:**
 - Length uses all the common metric prefixes, other measures don't
 - Visual – easier to learn and to estimate

Measurement

What questions could you ask using these cards?

- Different levels?
- Different areas of maths?



0 200842 504621
OLIVES

PRICE/kg	USEBY
\$ 19.60	06.10.22
NETWTkg	TOTALPRICE
0.415	\$8.13




0 200765 505354
TASTY CHEESE

PRICE/kg	USEBY
\$ 9.90	10.06.22
NETWTkg	TOTALPRICE
0.525	\$5.20



0 200851 404676
SALAMI

PRICE/kg	USEBY
\$ 14.85	21.06.22
NETWT kg	TOTALPRICE
0.451	\$6.70



0 200400 405304
DRIED TOMATOES

PRICE/kg	USEBY
\$ 17.99	06.06.22
NETWTkg	TOTALPRICE
0.531	\$9.55

Fun and games

						Row 1
						Row 2
						Row 3
						Row 4
						Row 5
						TOTAL

Fun and games

DG6. Decimal digits 3

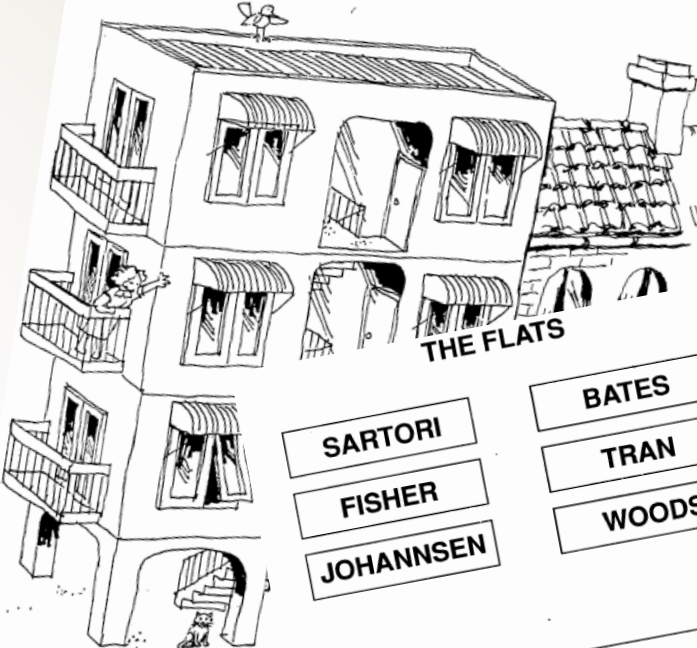
- Set a target – I start with 21
- Twelve rolls of the dice
- You can enter your digit anywhere, in any row or column.
- Closest to the Target wins – but if you go over the Target you are bust and cannot win.

Target = _____

Co-operative logic problems

- Encourages maths talk
- Encourage sharing of knowledge and understanding
- Enable the teacher to observe the skills and knowledge of students
- Support problem solving skills and teamwork too
- Fun too!

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



THE FLATS

SARTORI	BATES
FISHER	TRAN
JOHANNSEN	WOODS

Problem: Who lives where?

Jo Fisher walks downstairs to feed Maria Sartori's cat when she is away.	The Woods knock on the Tran's floor when their music is too loud.
The Johannsen family hear Mr Wood's feet overhead when he dances.	The Fishers do not live opposite the Johannsen family.
Maria Sartori passes the Bates' flat on the way up to visit the Tran family.	The Fishers grow tomatoes on their balcony in summer.

Teaching activity

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		

- How much is your first name worth?
- Who has the most valuable surname? Who's the cheapest!?
- What's the most expensive/least expensive 2 and 3 letter word you can think of?
- Can you find a word worth exactly \$100?

Teaching numeracy – the perennial times tables issue!

- Do they understand what multiplication is?
- Use different methods
- Dice
- Chart/table



Using dice

Roll the dice and add the numbers on the matching coloured dice, then multiply the two answers:

$$6 + 6 = 12$$

$$4 + 6 = 10$$

$$\text{Then } 12 \times 10 = ???$$

Teaching numeracy – the perennial times tables issue!



Teaching numeracy – the perennial times tables issue!

X				

Teaching numeracy – the perennial times tables issue!

X	5	3	8	2
6				
10				
4				
11				

Teaching numeracy – the perennial times tables issue!

X	5	3	8	2
6	30	15	X	12
10	50	30	80	20
4	20	12	36	8
11	55	33	88	22

$$6 \times 8 = 48$$

$$6 \times 3 = 18$$

$$4 \times 8 = 32$$

NUMERACY IS NOT:

Addition and Subtraction Practice Sheet

$$\begin{array}{r} 34 \\ + 12 \\ \hline \end{array} \quad \begin{array}{r} 67 \\ - 31 \\ \hline \end{array} \quad \begin{array}{r} 92 \\ + 33 \\ \hline \end{array} \quad \begin{array}{r} 77 \\ - 25 \\ \hline \end{array} \quad \begin{array}{r} 82 \\ - 16 \\ \hline \end{array}$$

$$\begin{array}{r} 59 \\ - 22 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ + 40 \\ \hline \end{array} \quad \begin{array}{r} 71 \\ - 18 \\ \hline \end{array} \quad \begin{array}{r} 53 \\ - 47 \\ \hline \end{array} \quad \begin{array}{r} 60 \\ + 62 \\ \hline \end{array}$$

$$\begin{array}{r} 44 \\ + 11 \\ \hline \end{array} \quad \begin{array}{r} 88 \\ - 57 \\ \hline \end{array} \quad \begin{array}{r} 52 \\ + 18 \\ \hline \end{array} \quad \begin{array}{r} 64 \\ + 21 \\ \hline \end{array} \quad \begin{array}{r} 29 \\ - 10 \\ \hline \end{array}$$

$$43 + 27 = \quad 87 + 90 = \quad 34 - 21 =$$

$$84 - 36 = \quad 91 - 38 = \quad 63 + 19 =$$

$$70 + 22 = \quad 46 - 23 = \quad 33 + 50 =$$

$$89 - 39 = \quad 25 + 37 = \quad 52 + 41 =$$

+ - + - + - + - + - +

Solve the following equations. Some questions will have negative, fraction or decimal answers.

Section A

- | | | | |
|---------------|---------------|----------------|----------------|
| 1) $4x+10=30$ | 4) $9+4x=-15$ | 7) $5+10x=-15$ | 10) $-4=12-2x$ |
| 2) $4x-8=20$ | 5) $14+6x=2$ | 8) $10=7-x$ | 11) $25=46-3x$ |
| 3) $5+2x=65$ | 6) $2x-3=-2$ | 9) $-3=16-x$ | 12) $8=9-5x$ |

Section B

- | | | | |
|------------------------|-----------------------|------------------------|------------------------|
| 1) $\frac{x}{2}+11=19$ | 4) $3=\frac{x}{4}-3$ | 7) $-1=6+\frac{x}{2}$ | 10) $\frac{x+5}{3}=12$ |
| 2) $\frac{x}{7}-6=1$ | 5) $7=\frac{x}{2}-4$ | 8) $14-\frac{x}{3}=10$ | 11) $\frac{x-4}{11}=9$ |
| 3) $12+\frac{x}{5}=20$ | 6) $-2=\frac{x}{8}-5$ | 9) $5-\frac{x}{9}=-1$ | 12) $\frac{x+3}{8}=-2$ |

Section C

- | | | |
|------------------|------------------|---------------------|
| 1) $3(x+2)=15$ | 5) $5(4x-3)=11$ | 9) $2(3x-1)+3=21$ |
| 2) $2(x+5)=24$ | 6) $-3(2x+1)=21$ | 10) $2(x+1)+3x=37$ |
| 3) $6(x-9)=12$ | 7) $-9(x-4)=54$ | 11) $12+4(2x+4)=68$ |
| 4) $2(3x+5)=-44$ | 8) $7(x-4)-3=46$ | 12) $3x-2(6x-3)=42$ |

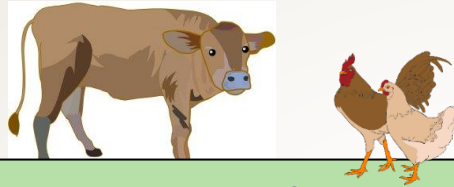
Section D

- | | | |
|---------------|---------------|-------------------|
| 1) $x+8=3x$ | 5) $4x+7=6x$ | 9) $2-4x=6x$ |
| 2) $6+x=2x$ | 6) $9x+13=7x$ | 10) $4(x+3)=7x$ |
| 3) $10+x=6x$ | 7) $12x-5=7x$ | 11) $5(2x-1)=16x$ |
| 4) $3x-24=5x$ | 8) $5-2x=8x$ | 12) $3(6x+4)=2x$ |

Section E

- | | | |
|-----------------|-----------------|--------------------|
| 1) $9x+2=4x+12$ | 5) $7+x=13+4x$ | 9) $4x-21=6x-3$ |
| 2) $5x+4=31+2x$ | 6) $5x-3=2x+6$ | 10) $x-3=1+7x$ |
| 3) $12+3x=8x+3$ | 7) $5x-6=18-3x$ | 11) $9x-5=7-4x$ |
| 4) $20+2x=6+9x$ | 8) $8-2x=4-6x$ | 12) $-8x+4=-26x+1$ |

NUMERACY IS NOT:



A farmer has cows and chickens. He only sees 50 legs and 18 heads. How many are cows and how many are chickens?

A drum of petrol containing 480 litres was shared between 5 drivers. The first driver took $\frac{2}{3}$ of the contents of the drum, the second took $\frac{1}{4}$ of what was left, and the remainder was shared equally between the last three drivers. How many litres did each of the remaining drivers receive?

How I see math word problems...
If I have 4 pencils and you have 7 apples how many pancakes will fit on the roof?
Purple, because aliens don't wear hats.

your  cards
someecards.com



Teaching activities

Use relevant, real life materials – requires literacy skills to solve the problem – provides purpose too.

Thai Sate sauce

Ingredients

- 1-cup-fresh-dry-roasted-peanuts-(unsalted)
- 1/3-cup-water
- 1-to-2-cloves-garlic-(minced)
- 1/2-teaspoon-dark-soy-sauce
- 2-teaspoon-sesame-oil
- 2-tablespoons-brown-sugar
- 1-tablespoon-fish-sauce-(vegetarians-substitute-1/2-tablespoons-regular-soy-sauce)
- 1/2-teaspoon-tamarind-paste-(or-1/2-tablespoon-lime-juice)
- 1/2-teaspoon-cayenne-pepper-(or-1-teaspoon-Thai-chili-sauce; more-or-less, to-taste)
- 1/3-cup-coconut-milk



Image by Huahom from Pixabay

CONCRETE, MORTAR & RENDER VOLUME BATCHING MIX TABLE

| APPLICATION | CEMENT | SAND | AGGREGATE | 20KG BAGS OF CEMENT PER m ² |
|--------------------------|--------|------|-----------|--|
| CONCRETE | 1 | 1.5 | 3 | 17 |
| Improved water tightness | | | | |
| High strength | | | | |

Ingredients in a blender or food processor. Process until sauce is smooth. If you prefer a runnier peanut sauce, add a little more or coconut milk. Do a taste test. Serve warm or at room temperature with Thai chicken satay, Thai pork satay or vegan Thai satay.

Schweppes
1783

DISCOVER MORE SCAN THIS WITH YOUR QR CODE READER APP

100% RECYCLED AT A VINTAGE COLLECTION REPORTS IN STATE/TERRITORY OF PURCHASE.

Pharmacy Medicine
KEEP OUT OF REACH OF CHILDREN

Panadol

Contains Dosing Device

Children 1 MONTH - 2 YEARS

Fast pain relief ✓
Reduces fever ✓
Includes oral dosing device ✓

Cherry Vanilla Flavour
Colour free baby drops

20mL

This oral liquid contains PARACETAMOL 100mg/1mL

USE CHILDREN'S PANADOL BABY DROPS FOR

Fast effective temporary relief from fever and pain associated with:

- Teething
- Immunisation
- Earache
- Headache
- Cold & Flu symptoms
- No artificial colours

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)

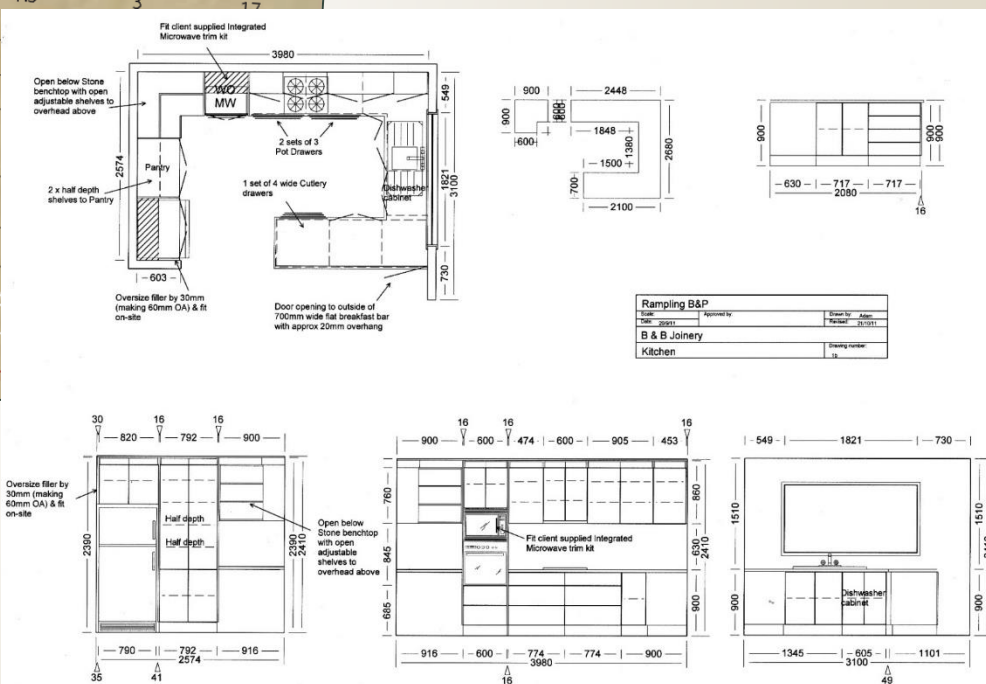
Can be given with water or fruit juice if preferred by your child

USING THE CONVENIENT DOSING DEVICE

- Insert device into bottle
- Draw up liquid
- Check dosage in device is correct before use

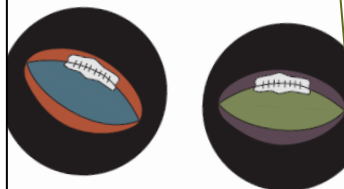
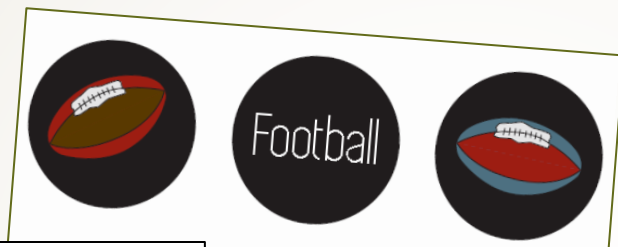
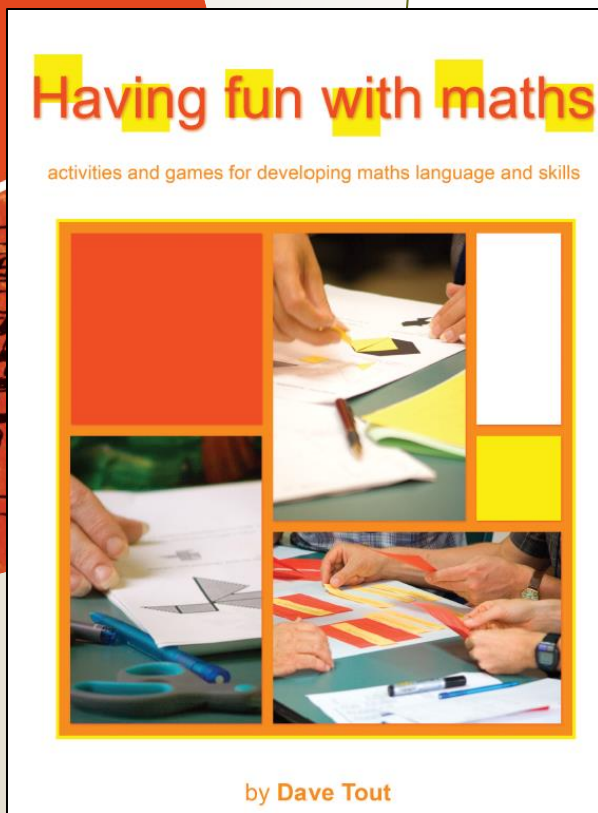
GlaxoSmithKline
GlaxoSmithKline Consumer Healthcare
82 Hughes Avenue, Ermerston, NSW 2115, Australia
Panadol® is a registered trade mark of the GlaxoSmithKline group of companies.

water in precise quantity
volume measure like a bucket
in good concrete, more

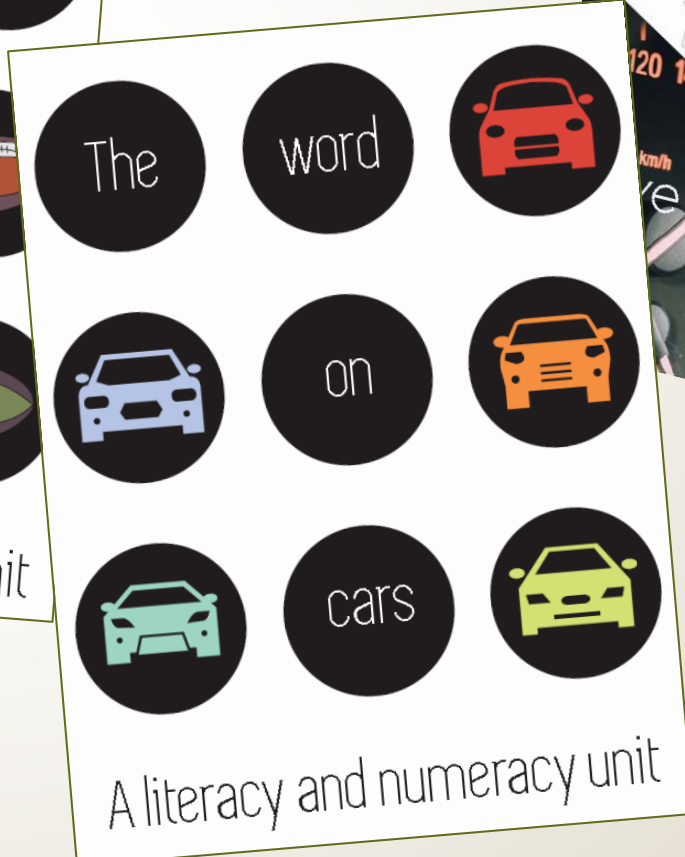


Building numeracy skills - resources

➤ Dave's list of numeracy resources will be sent to you.



and numeracy unit



Discussion and Q&A

