Having some fun with maths and numeracy

Friday, 20th May 2022

Dave Tout, ACER
David.Tout@acer.edu.au
Dave@multifangled.com.au

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

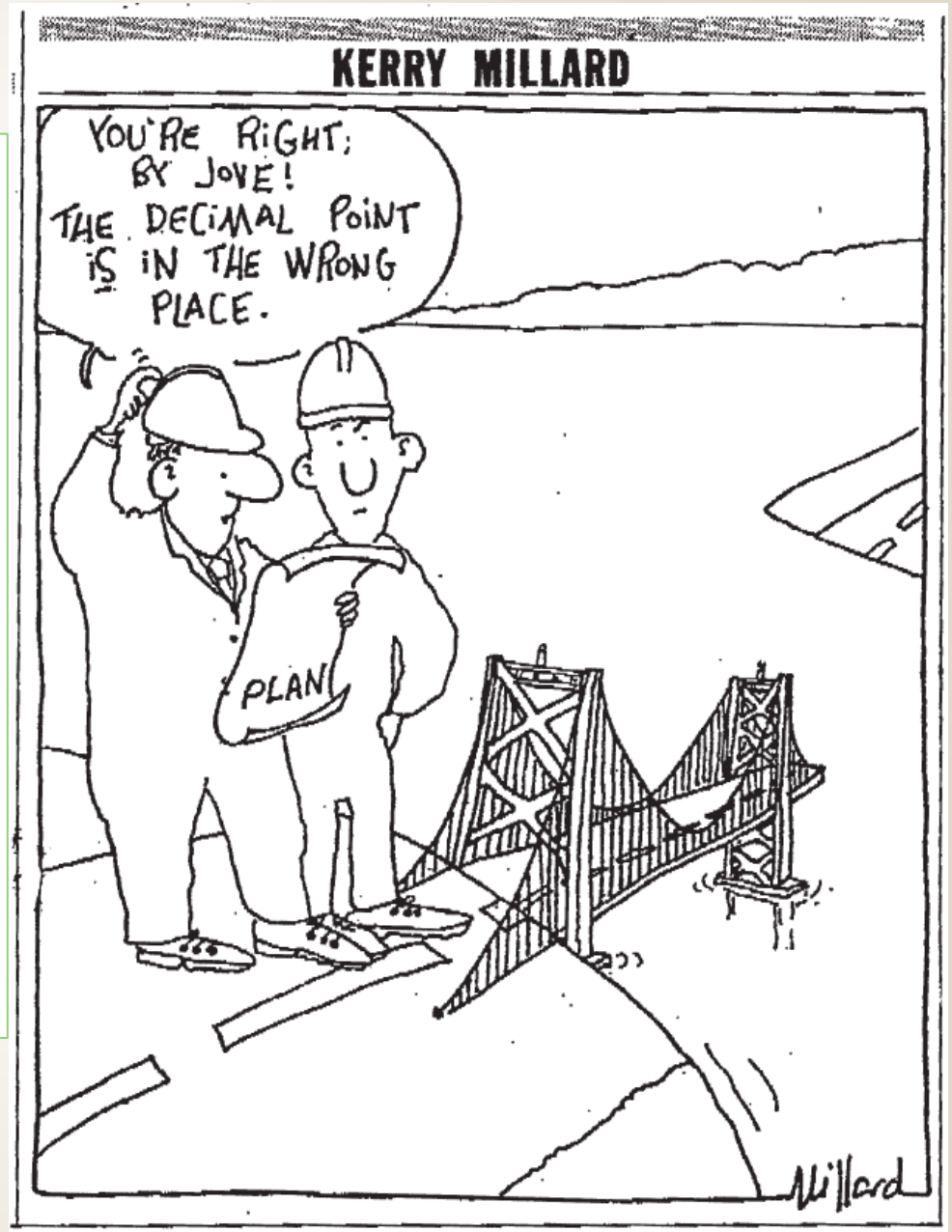
111

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.



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!?

ACER

Measurement:

What does it weigh?

ACER

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 ≈ 20 cm, 1 litre liquid ≈ 1 kg
- **Start measurement with length:**
  - Length uses all the common metric prefixes, other measures don't
  - Visual – easier to learn and to estimate

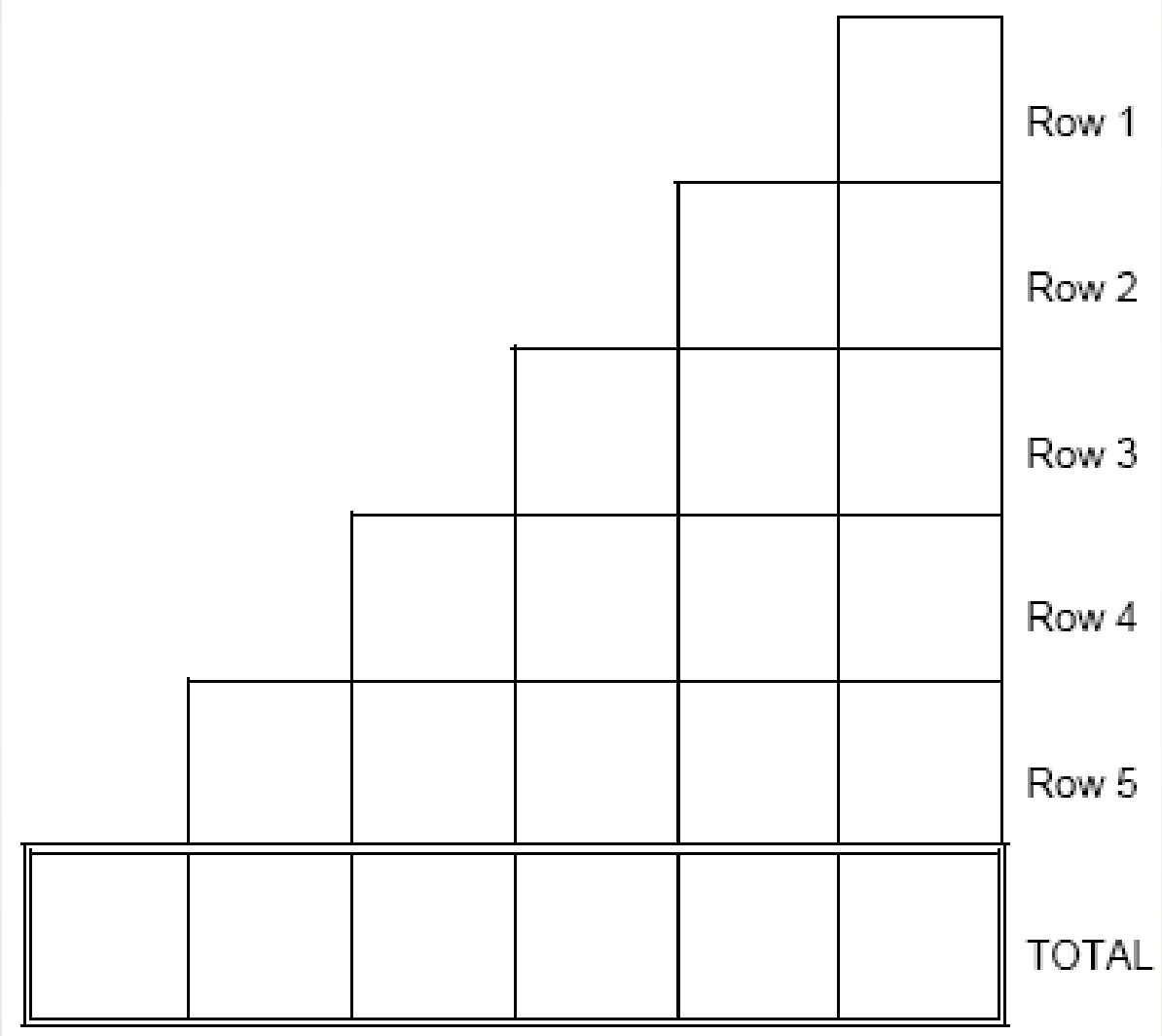
ACER

Measurement

What questions could you ask using these cards?

- Different levels?
- Different areas of maths?

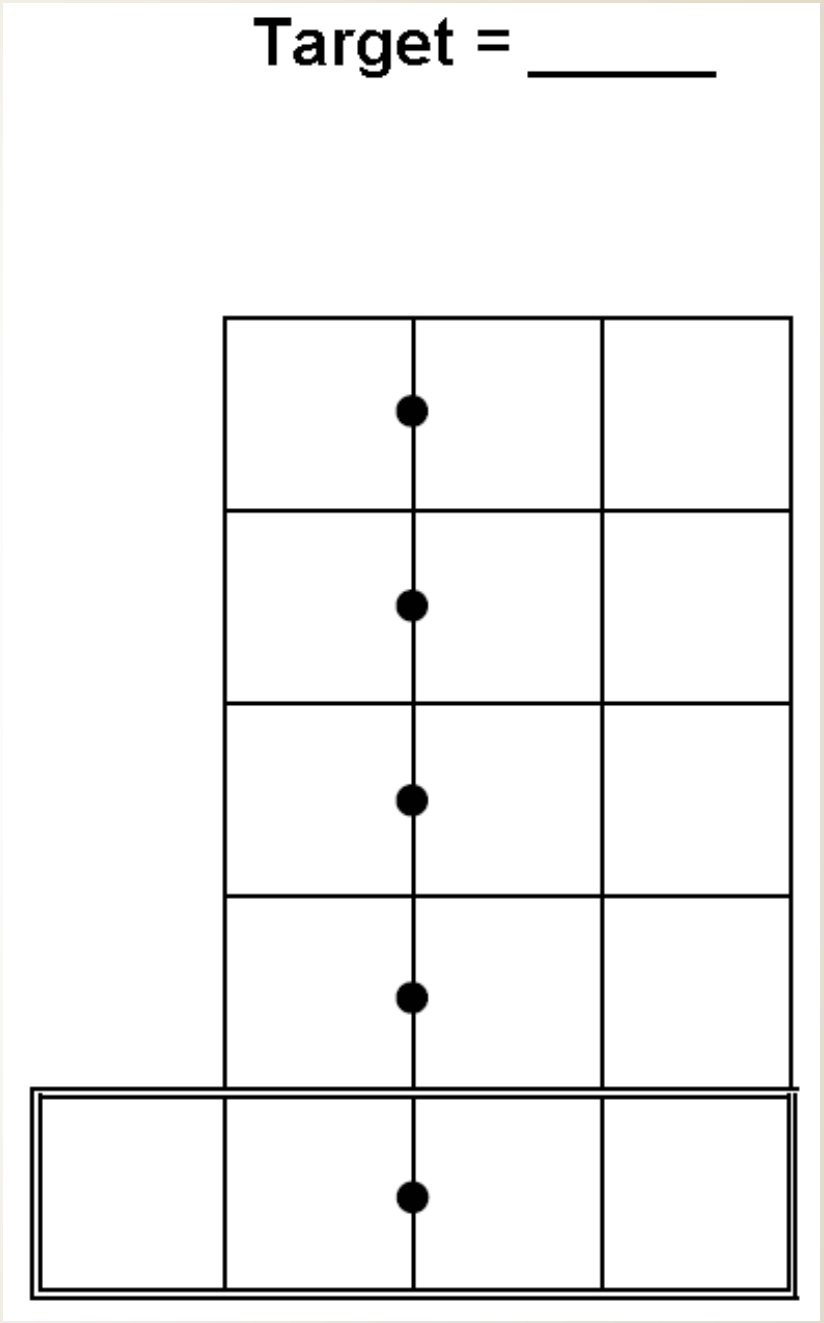
Fun and games



Fun and games

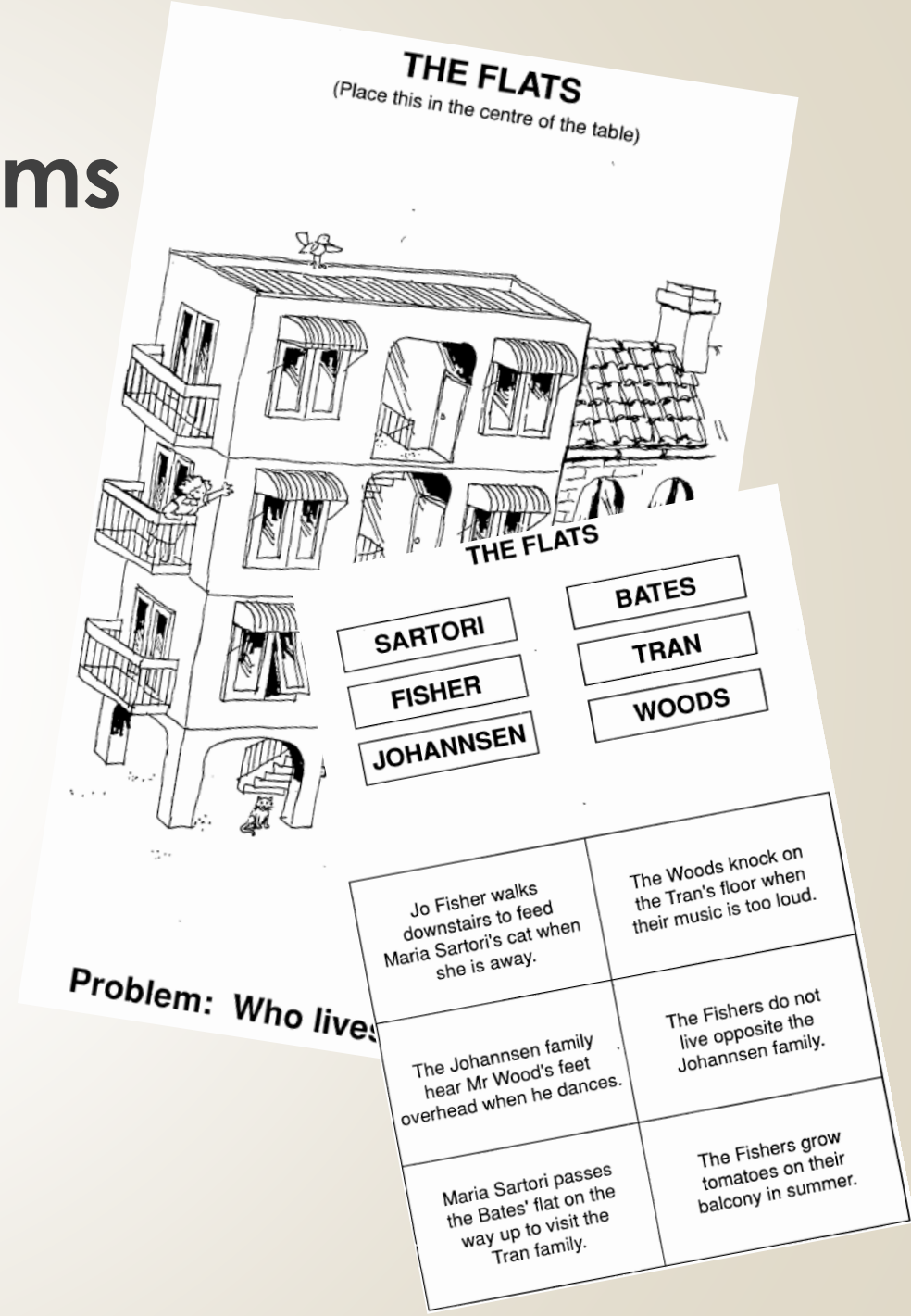
DG6. Decimal digits 3

- 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.



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!



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?

ACER

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

Then 12 x 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!

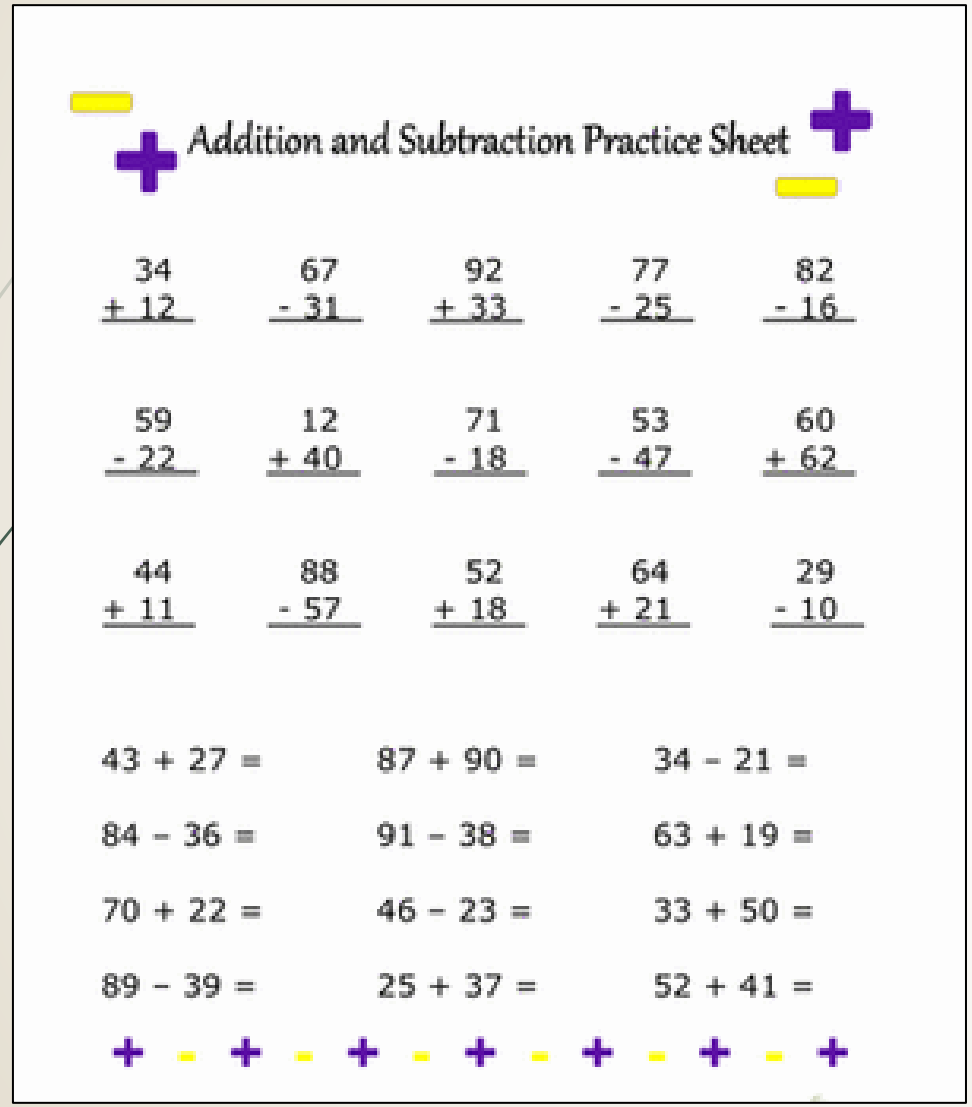
X	5	3	8	2
6	30	15	X	12
10	50	30	80	20
4	20	12	36	8
11	55	33	88	22

6 x 8 = 48

6 x 3 = 18

4 x 8 = 32

NUMERACY IS NOT:



Addition and Subtraction Practice Sheet

34 + 12	67 - 31	92 + 33	77 - 25	82 - 16
59 - 22	12 + 40	71 - 18	53 - 47	60 + 62
44 + 11	88 - 57	52 + 18	64 + 21	29 - 10

43 + 27 =	87 + 90 =	34 - 21 =
84 - 36 =	91 - 38 =	63 + 19 =
70 + 22 =	46 - 23 =	33 + 50 =
89 - 39 =	25 + 37 =	52 + 41 =

+ - + - + - + - + - + - +

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

Section A

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

Section B

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

Section C

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

Section D

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

Section E

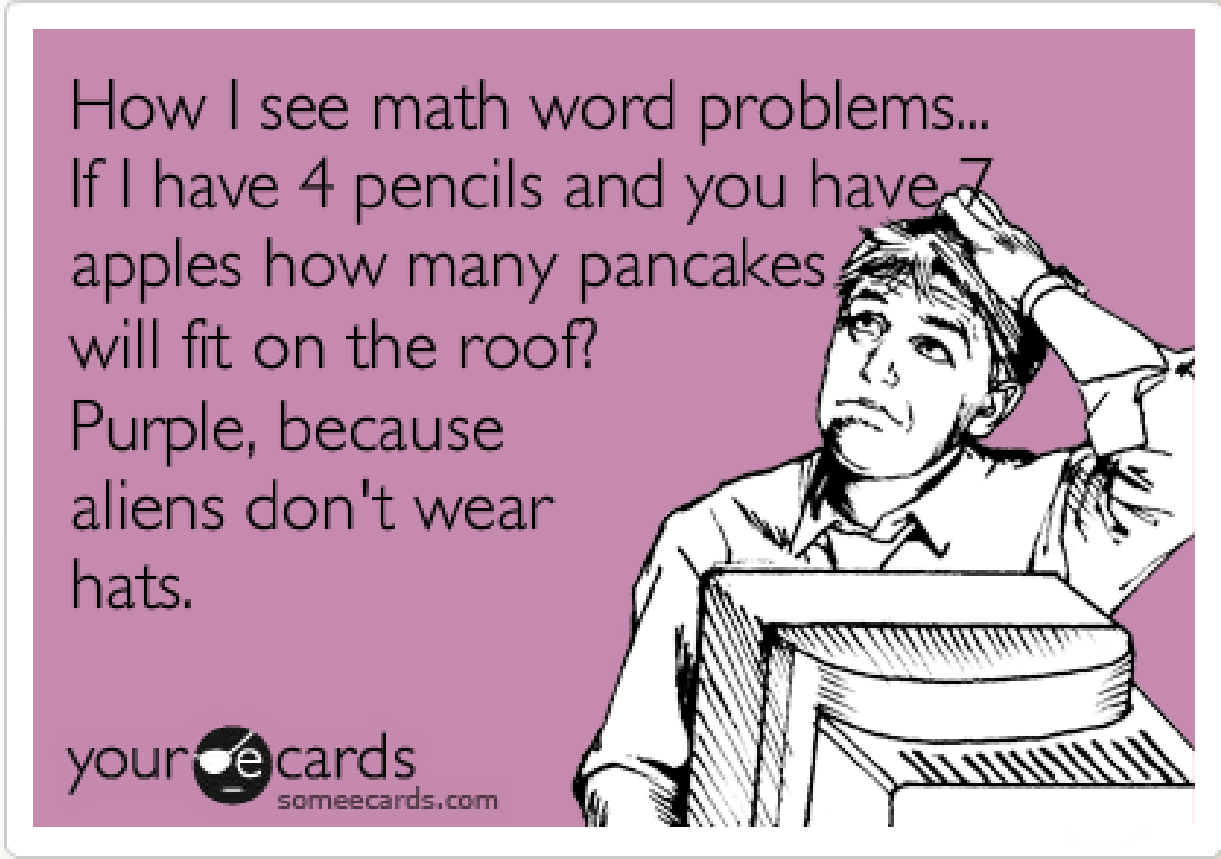
1) $9x+2=4x+12$
2) $5x+4=31+2x$
3) $12+3x=8x+3$
4) $20+2x=6+9x$
5) $7+x=13+4x$
6) $5x-3=2x+6$
7) $5x-6=18-3x$
8) $8-2x=4-6x$
9) $4x-21=6x-3$
10) $x-3=1+7x$
11) $9x-5=7-4x$
12) $-8x+4=-26x+1$

ACER

NUMERACY IS NOT:

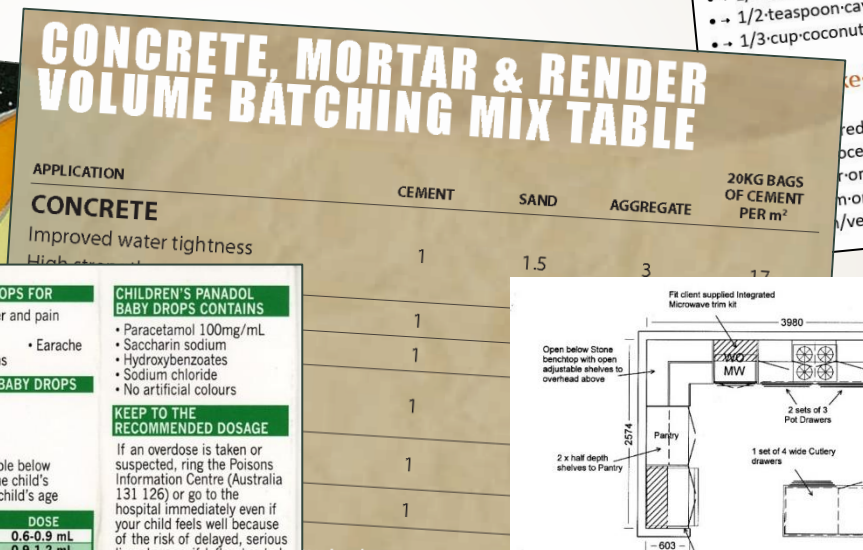
A farmer has cows and chickens. He only sees 50 legs and 18 heads. How many are cows and how many are chickens?

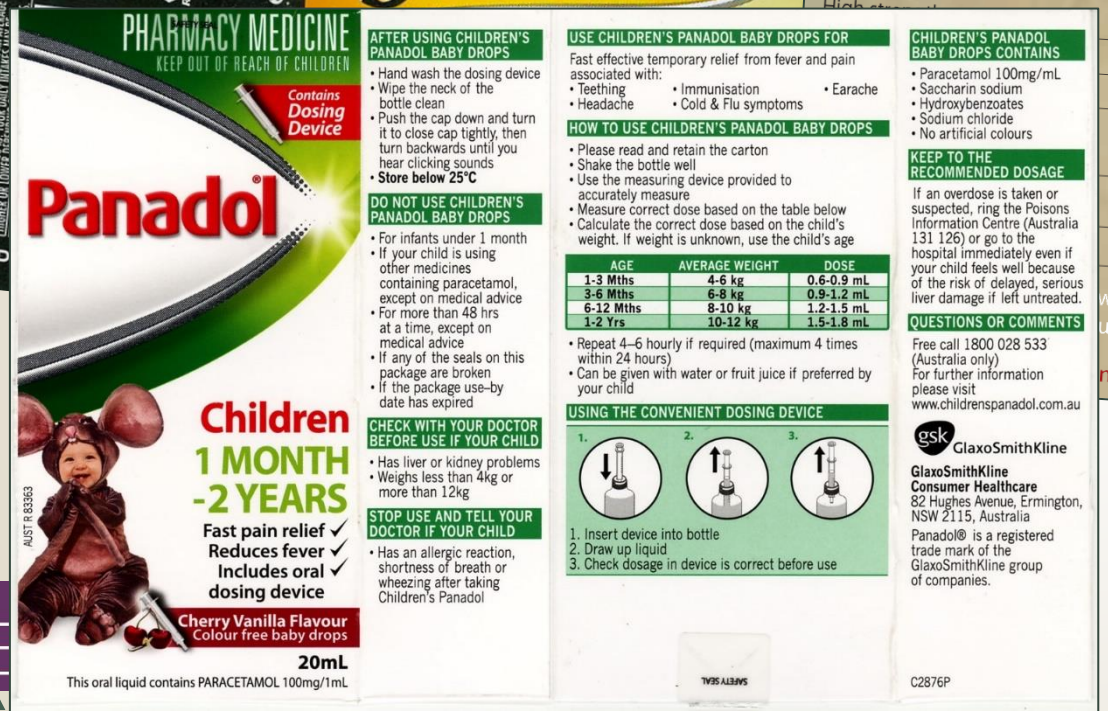
A drum of petrol containing 480 litres was shared between 5 drivers. The first driver took ⅔ of the contents of the drum, the second took ¼ of what was left, and the remainder was shared equally between the last three drivers. How many litres did each of the remaining drivers receive?

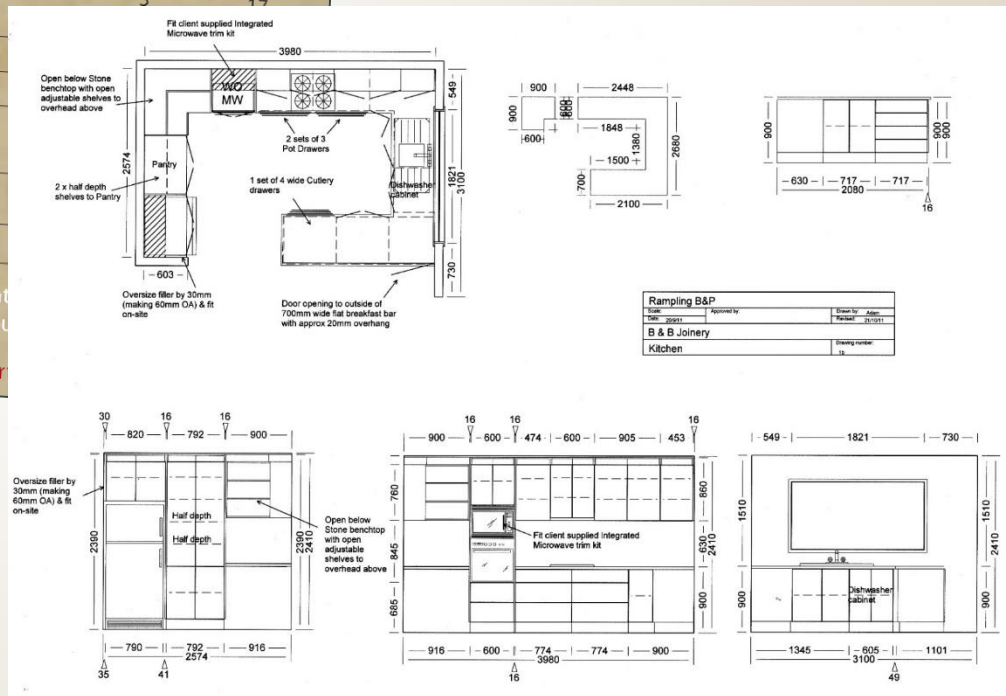


Teaching activities

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

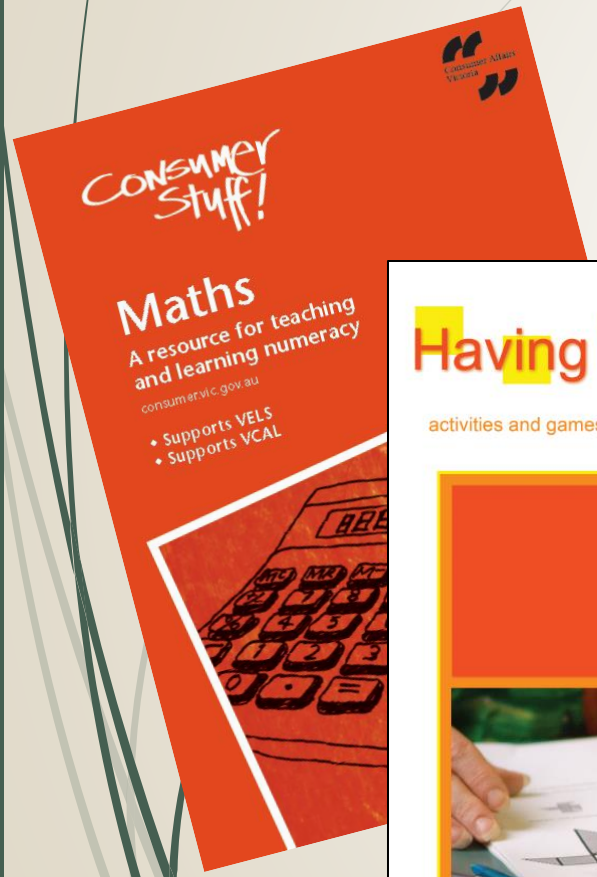


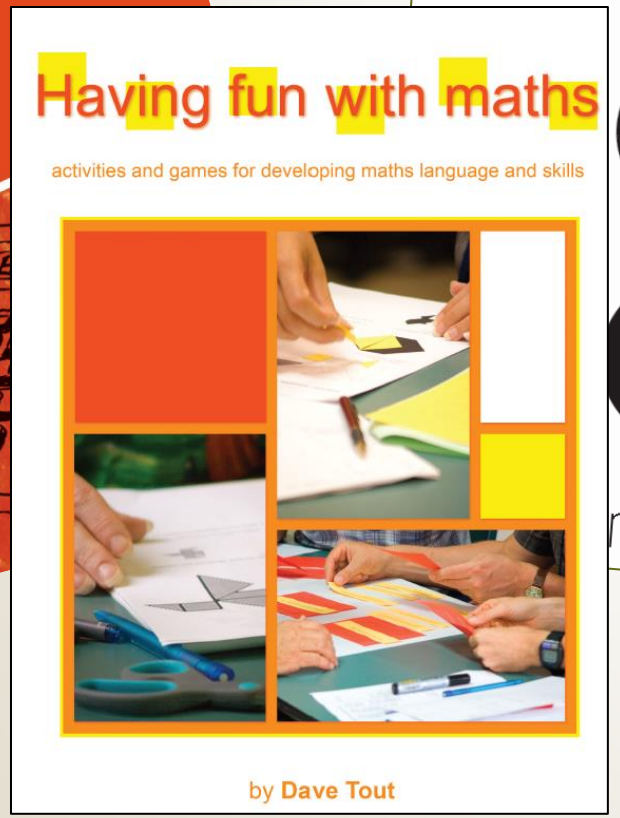




Building numeracy skills - resources

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





Discussion and Q&A