

Numeracy VM Unit 1&2 - Coursebook

(Note: Teachers - This is draft version 2 as at June 2024. If you find any errors, or typos please let me know.)

Section 1: Working the Numbers

1C Work it out 7

a.10 b. applied c. \$12/ hour d. applied e. applied f. Need to save >\$60 g. We can't tell without knowing the gender of the 'names', so we shouldn't jump to conclusions.

1D Basic calculations 1 9

1. 1,840.5 e.g. -45 2. -48.5

1E Basic calculations II 10

a. 96 b. 156 c. 927 d. 750 e. 3,024 f. 34,410 g. 6 h. 2 i. 6 j. 38.5 k. 3.5 l. 3.25

1F Quick quiz 11

1. 121 2. 251 3. 1,000 4. 5 5. 68 6. 101 7. -7 8. 55 9. 182 10. 540 11. 35 12. 31 13. 7 14. 19.5 15. 52
16. 152 17. 24 18. 37.5 19. 7/8. 20. 1

1G Who's paying more? 12

Selma \$9,618 vs Linley \$9,6000

1H Rounding 13

Albrut - mistakes by rounding down both amounts. Total cost = $\$220 \times 44 = \$9,680$. He underestimated.

1I Round it out 14

1a. Ilsa 12,600ml/week 655,200ml/year (She is buying the most expensive size/and not in bulk)
1b. John 1,150 kg/workout 3,450 kg/week
2. a. Katie \$156/week \$13/hour b. Robert \$120/week \$15/hour c. Don't judge a job based just on wage rate, there are so many other factors!

1J Mental work 15 //applied

1K Working together 17

1. a. 15 b. 12 c. 5 d. 0
2. a. 871 b. 134 c. Approx 39.60
3. \$13 (singles) vs \$9.85 (for packs)

1L Fractions and Decimals 18

1/4, 1/2, 3/5, 2/3, 7/10, 5/7, 9/10, 19/20, 5/4, 4/3, 3/2, 5/2, 7/2, 11/3, 27/4
0.25, 0.5, 0.6, 0.67, 0.7, 0.71, 0.9, 0.95, 1.25, 1.33, 1.5, 2.5, 3.5, 3.67, 6.75

1M Calculating fractions & decimals 19

a. 7/4 b. 29/10 c. 12.5 d. 25/8
e. 26 f. 1.05 f. 6.875 g. 3

1N Percentages 21

1. //applied visual task
2.

	1%	2.5%	5%	7.5%	10%	20%	25%	33%	40%	50%	60%	66%	75%	80%	100%
100	1.00	2.50	5	7.50	10	20	25	33	40	50	60	66	75	80	100
50	0.50	1.25	2.50	3.75	5	10	12.50	16.50	20	25	30	33	37.50	40	50
1000	10	25	50	75	100	200	250	330	400	500	600	660	750	800	1000
500	5	12.50	25	37.50	50	100	125	165	200	250	300	330	375	400	500
250	2.50	6.25	12.50	18.75	25	50	62.50	82.50	100	125	150	165	187.50	200	250
156	1.56	3.90	7.80	11.70	15.60	31.20	39	51.48	62.40	78	93.60	102.96	117	124.80	156

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1O Percentage calculations 22

1. 1. 50 2. 50 3. 72% 4. 2.77% 5. \$50 6. \$12.02
2. 12.5% 3. 6.25% 4. 62.5g, 31.25g 5. More sharing vs too small
6. 53.04 grams, To cut costs

1P Numbers as words 24

- a. \$3,400 b. \$2,600, c. \$800-\$720 = \$80
- b. 2kg butter, 16 eggs, 1.6kg sugar, 4kg flour

1Q Slippery numbers 25

- a. Not very fast, b. small eggs, c. tiny steak, d. just hyperbole, e. lot of fat per 100gram, f. a bit low, g. yeh right!

Section 2: Shapes and Objects

2A Basic shapes 30

circle, square, rectangle, oval or ellipse, triangle, pentagon, hexagon, octagon

2B 3D shapes 31

cube, pyramid, rectangular prism, ellipsoid, sphere, octahedron

2C Describing shapes 32 //applied visual task

2D Recognising shapes 33 //applied design task

2E Cube net 34 //applied design task

2F Solid objects 35

1. Triangle 2-5. //applied design task

2G Shapes at work 36-37

1. //applied visual task 2. To fit more in the track/van. 3. To minimise costs. Yes you have a limited amount of time, and fuel also costs. 4. applied 5. They can't display as many; nor so easily.

2H Scale and ratio 39 //applied measuring and design task

2I Transforming objects 41

reduction (dilation), rotation 180° , rotation 90° or 270° , dilation & rotation 180° , reflection, reduction & rotation 270°

2J Floorplan 42 //applied design task

2K Working plans 44 //applied measuring and design task

2L Plan symbols 45 //applied investigative task

2M Plans 46 // applied investigative task

2N Classroom floorplan 47 //applied design task

2O Organic infographic 49 //applied analytical and design task

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Section 3: Measure by Measure

3A Measuring 55

1-2.

Length: Common Units: Metre (m), centimetre (cm), millimetre (mm), kilometre (km)

Measuring Devices: Ruler, tape measure, caliper, micrometre, odometre (for longer distances)

Mass (Weight): Common Units: Gram (g), kilogram (kg), tonne (t)

Measuring Devices: Weighing scale, balance

Volume: Common Units: Litre (L), millilitre (mL), cubic metre (m³), cubic centimetre (cm³)

Measuring Devices: Graduated cylinder, beaker, measuring cup

Temperature: Common Units: Celsius (°C), Fahrenheit (°F), Kelvin (K)

Measuring Devices: Thermometer (digital or analogue)

Distance: Common Units: Metre (m), kilometre (km) Measuring Devices: Odometer (in vehicles), pedometer (for counting steps), GPS devices Capacity (Volume):

Common Units: Litre (L), millilitre (mL), gallon (US or imperial), pint, quart

Measuring Devices: Measuring cups, pitchers, bottles

Price/Cost: Common Units: Currency (AUD, cents, USD, EUR, GBP, etc.)

Measuring Devices: Point of sale system, cash register, price tag

Common Units: Second (s), minute (min), hour (hr), day, week, month, year

Measuring Devices: Clock (analogue or digital), stopwatch, timer, calendar, sundial (for daylight tracking)

3B Units of measurement 57

1. millilitre, cm, kg, Celsius //situations = applied

2. a.5 tonnes, b. 1ml, c. 1 tonne, d, 375m, f. 2.5ML, g. 60min, h. 80⁰, i. 13,000km j. 2.02m

3. a. 2.5 kg, b. 375ml, c. 500m,

d. 275mm, e. 250ml, f. km 0.5km,

g. 5 minutes, h. 120minutes, i. 37.78⁰ C

3C Estimating 59 //Applied

3D Distance 60

1. 2,400mm 2. 17,300m 3. 106.5 4. applied 5. 3,200m 6. applied 7. 42.195km 8. 12,600km 9. 1.6km + 2km + 4km + 2km + 4km = 13,600m or 13.6km 10. 800-840km (depending on how many weeks), approx to Sydney or Adelaide.

3E Perimeter - Rectangle 61

i. 30m ii. 600 (10 per metre + overlap of 10 per metre) = 20 x 30 = 600 palings

3F Perimeter - Triangle 62

i. 36cm ii. 51cm iii. 140cm iv. 164cm

3G Making it work 63 //applied investigation

3H Short and long 64 //applied investigation

3I Length in action 65

1. //applied measuring task

2. b. 16m e. 16.8 + 15.2 = 32m f. \$1,600 GST exc.

3J Area in action 67

box 600cm² land = 336m² //applied

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3K Volume - Solids 69

1. Box 1: 960 cm^3 Box 2: $1,920 \text{ cm}^3$ Box 3: $5,400 \text{ cm}^3$ Box 4: $11,000 \text{ cm}^3$

2. each box = $135,000 \text{ cm}^3$,

There are 16 boxes facing with a total width of 180cm

There are 4 layers stacked with a total height of 200cm

To fit neatly there must be 4 columns in total, i.e 4×45 smaller boxes which = 180cm // the same as 3×60 cm for the larger boxes

Assume rows 1&3 (bottom to top) extend back $45 \times 4 = 180$ cm

Assume rows 2&4 extend back $60 \times 3 = 180$ cm

So its $200\text{cm} \times 180\text{cm} \times 180\text{cm} = 6,480,000 \text{ cm}^3$ or 6.48m^3

or: $48 \times 135,000 \text{ cm}^3 = 6,480,000 \text{ cm}^3 = 6.48\text{m}^3$

3. //applied

3L Volume - Fluids 70

1. how much fluid a container can hold, 2. litre,

3. with chemicals such as bleach, 4. in medicine and health-care

3M Food and drink 71

1-2. //applied

Treat...

1. 20ml 2. cream = 1,200ml (if tablespoon = 20ml or approx 900 if 15ml) 3. icing sugar = approx 160g; chocolate = 1kg

3N Volume - Fluid units 72-73

a. 75-100ml b.25ml c.3,000ml d.2,000,000l e&f. //applied g. approx 26,000 to 35,000l h. 2.5 millionl i. \$1.50 to \$5 j. 0.02 to 0.05c k. 10-20l l. 70-100l m. cooking n. medicine dosages

3O Temperature in action 74-75

1. applied; 50.7° at Oodnadatta; 1960;

applied; -23° at Charlotte Pass, 1994;

latte: 65° ; radiator: $90-105^{\circ}$;

baby bath: $37-38^{\circ}$; shop fridge: $1-4^{\circ}$

adult temp: about 37° ; applied;

fever: $38^{\circ}+$; applied

2. //applied investigation

Section 4: What's The Time

4A Different times 81

// applied visual task

4B Telling the time 82

1. 6 o'clock; 12:15; 6.15;

9.40; 9 o'clock; 4 o'clock

4C 12 v 24 83

1. 15:30 = 3:30 PM, 13:45 = 1:45 PM, 21:30 = 9:30 PM, 23:15 = 11:15 PM,

06:00= 6:00 AM, 04:55= 4:55 AM, 09:30= 9:30 AM, 21:45= 9:45 PM,

18:00= 6:00 PM, 00:00= 12:00 AM (midnight), 12:00= 12:00 PM (noon), 24:00 =12:00 AM (midnight), same as 00:00

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4D You and time 85 //applied

4E Converting time 87

1. a. 60 minutes, b. 120 minutes c. 75 minutes d. 270 minutes
 e. 240 minutes f. 1,200 minutes g. 135 minutes h. 1,440 minutes
 i. 2 hours j. 3 hours k. 5.5 hours l. 8.25 hours
 m. 10 hours n. 16 hours o. 16.5 hours p. 15 minutes

2. a. 3 hours (180 minutes) b. 3 hours 45 minutes (225 minutes) c. 4 hours 15 minutes (255 minutes)
 d. 6 hours 15 minutes (375 minutes) e. 5 hours (300 minutes) f. 4 hours (240 minutes)
 g. 2 hours 30 minutes (150 minutes) h. 6 hours (360 minutes) i. 80% = 54.4 mins plus time-on about 12-15 mins = approx 67 - 70 min (1 hour 7 mins to 1 hr 10 min)

4F Duration 89

1. 12 to 12:10 = 10 mins; 12:00 to 12:45 = 45 mins; 12 to 12:30 (30 min) + extra time to 11:50 (11:20) = 11:50 // or 30 min + 11:50 = 12 hr 20 min depending on how the question is read and applied
 2. a. 5 hrs, 4.5 hrs, 10 hrs 30 min, 7 hrs 45 min

4G Elapsed time 91

1. a. 4 hours b. 3 hours 15 minutes c. 5 hours 15 minutes
 d. 13 hours 30 minutes e. 13 hours 30 minutes f. 18 hours 45 minutes
 2. For Mon-Fri, the total opening hours is 15 hours per day \times 5 days = 75 hours.
 For Sat, it's 14.5 hours. For Sun, it's 13 hours.
 Total weekly opening hours is $75 + 14.5 + 13 = 102.5$ hours.

For weekdays, the total opening hours is 8 hours per day \times 5 days = 40 hours. For Saturday, it's 7 hours.
 Total weekly opening hours is $40 + 7 = 47$ hours.

3. //applied discussion

4H My timetable 92 // applied investigative task

4I Timetables in action 93 //applied investigative task

4J Rosters in action 95

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
7.00							
8.00							
9.00							
10.00							
11.00							
12.00							
13.00							
14.00							
15.00							
16.00							
17.00							
18.00							
19.00							
20.00							
21.00							
22.00							

2. Edwina = $44 = 8+8+8+6+6+8$ Reg = $12 = 4+4+4$ Adut = $16 = 8+8$ Jo = $14 = 4+5+5$ Frankie = 6
 Total = 92 hours

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4K Timesheets in action 97

Employer:	applied						
Name:	applied				Work period:	May 1-7, 2022	
Employee number:	applied			Classification:	Retail Worker Level 1	Adult	
	Date	Start	Finish	Break	Hours Worked	Rate	Total
Monday	1-May	8:15	17:00	13:00 to 13:45	8	\$23.38	\$187.04
Tuesday	2-May	8:15	17:00	13:00 to 13:45	8	\$23.38	\$187.04
Wednesday	3-May	8:15	17:00	13:00 to 13:45	8	\$23.38	\$187.04
Thursday	4-May	8:15	17:00	13:00 to 13:45	8	\$23.38	\$187.04
Friday	5-May	8:15	17:00	13:00 to 13:45	8	\$23.38	\$187.04
Saturday							
Sunday							
Totals					40		\$935.20

Section 5: Relationships

5A Relationships 103 //applied

5B Proportions 105

- a. 0.7 70% b. 0.25 25% c. 0.6 60% d. 0.9 90%
- a. 0.5 = five tenths b. 0.25 = twenty-five hundredths c. 0.10 = ten hundredths d. 0.01 = one hundredth
- a. 75% = seventy-five percent b. 33% = thirty-three percent c. 10% = ten percent d. 2.9% = two point nine percent
- Approx: Yellow: 25%, Red: 33%, Blue: 11%, Green: 20%, Purple: 11%

5C Ratios 107

- a. 2:1 b. 4 to 3 c. $\frac{5}{3}$ d. 2.5:1
- a. 1:2 Fraction: $\frac{1}{2}$ Decimal: 0.50 Percentage: 50%
- b. 1:4 Fraction: $\frac{1}{4}$ Decimal: 0.250 Percentage: 25%
- c. 1:5 Fraction: $\frac{1}{5}$ Decimal: 0.20 Percentage: 20%
- d. 7:8 Fraction: $\frac{7}{8}$ Decimal: 0.875 Percentage: 87.5%
- e. 2:1 Fraction: $\frac{2}{1}$ Decimal: 2.0 Percentage: 200%
- f. 4:1 Fraction: $\frac{4}{1}$ Decimal: 4.0 Percentage: 400%
- g. 16:9 Fraction: $\frac{16}{9}$ Decimal: ≈ 1.78 Percentage: $\approx 177.78\%$
- h. 4:3 Fraction: $\frac{4}{3}$ Decimal: ≈ 1.33 Percentage: $\approx 133.33\%$

3. //applied investigation

5D Rates 109

- a. kilometres & hours: speed b. litres & kilometres: fuel consumption c. litres & minutes: water use in shower d. dollars & hours: wage rate
- a. Fast jogger b. car at speed limit c. jet plane d. echidna
- a. = 5 l/100km
5 l/100km means the vehicle consumes 5 litres of fuel for every 100 km travelled.
10 l/100km means the vehicle consumes 10 litres for the same distance.

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b. = 7.3 l/100km

7.3 l/100km means the vehicle consumes 7.3 litres of fuel for every 100 km travelled.

7.3 l/100m means 7.3 litres of fuel for every 100 meters travelled. This is equivalent to 730 litres per 100 km, indicating very high fuel consumption

c. Generally, a motorbike tends to be more fuel-efficient than a car.

4. a. 60 km/hour b. 60 km/h c. 800 km/h

d. \$20 per hour e. \$100 per day f. \$1,000 per week

g. 15 litres per 100 km h. 10 litres per 100 km i. 8 litres per 100 km

5E Working the numbers 111

a. For 6: 750g pasta, 6 eggs, 750ml milk, 750g cheese, 375ml cream, 3 onions, and 4.5 garlic cloves.

b. Fuel consumption is approximately 28.6 litres per 100 km, and it would cost \$140 to fill the tank at \$2.00 per litre. Stav gets 3.5 km/litre.

c. A 45-minute trip at an average speed of 30 km/h, the distance is approximately 22.5 km.

5F Common formulae 113

➤ Simple Interest Rate

$I = P \times r \times t$ where I is the interest, P is the principal, r is the rate, and t is the time in years.

➤ GST to Add to a Price

Original Price \times 10%

➤ GST Already in a Price

Total Price / 11

➤ Male Shoe Size Based on Foot Length

Shoe Size (US) = $(3 \times \text{Foot Length in inches}) - 24$.

➤ Female Shoe Size Based on Foot Length

Shoe Size (US) = $(3 \times \text{Foot Length in inches}) - 22.5$.

➤ Fuel Economy of a Vehicle

Fuel Economy = $\frac{\text{Fuel Consumed}}{\text{Distance Driven}} \times 100$.

➤ BMI - Normal Person

BMI = $\frac{\text{Weight in kg}}{\text{Height in meters}^2}$

➤ BMI - Muscular Athlete

Same as the formula for BMI, but interpretation can vary.

➤ Cat Years in 'Equivalent' Human Years

No exact formula, but the general estimation is:

- First year = 15 human years. Second year = 24 human years (15 + 9).
- Subsequent years = 4 human years each.

➤ Dog Years in 'Equivalent' Human Years

General estimation:

- First year = 15 human years. Second year = 24 human years.
- Each additional year \approx 5 human years.

➤ Unemployment Rate

Unemployment Rate = $\frac{\text{Total Unemployed}}{\text{Labour Force}} \times 100$

5G Relationship formulae 115

1. i. $2+4=6$ ii. $4+12=16$ iii. $30+72+100=202$ iv. $100+80-125=55$

2. a. $3E + 1F + 1stb + 0.3M = \text{recipe}$

b. $4B + 1W = \text{mix}$

c. For 1 cup of rice: Mix = $1R + 2W //$ or 1:2 rice to water

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For 2 cups of rice: $Mix = (1R + 2W) + (1R = 1.5W)$ // or First cup of rice: 1:2 rice to water, then 1:1.5 rice to water thereafter. (Note: the true formula beyond one cup is complex involving 'n' and is more easily understood, and better expressed in words.

d. $4S + 2B + 1ST = L$; then $L \times 20 = \text{structure}$ //or $80S + 40B + 20ST = \text{structure}$

4. a. 60km/hr b. 90km/hr

5H Visual change 117

//applied visual and graphing activity

5I Visualisations 118-119

//applied investigation

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6. Data and Systematics

6B Me and data 128 //applied

6C Data and tables 129

Month	Lu	Adot	Fran	Grace	Mark	Total
Jan	\$70	\$0	\$800	\$180	\$40	\$1,090
Feb	\$90	\$0	\$600	\$180	\$80	\$950
Mar	\$120	\$70	\$200	\$180	\$120	\$690
Apr	\$45	\$110	\$150	\$180	\$160	\$645
May	\$180	\$140	\$0	\$160	\$200	\$680
Jun	\$120	\$140	\$400	\$180	\$240	\$1,080
Total	\$625	\$460	\$2,150	\$1,060	\$840	\$6,135
Average	\$104.17	\$76.67	\$358.33	\$176.67	\$140.00	\$1,022.50

1. Monthly wage earnings by student: 2023
2. rows = monthly wage earnings; columns // earnings each month by student over 6 months
3. Easier to analyse and calculate
- 4 a. Fran earned the most with total earnings of \$2150.
b. Adot earned the least with total earnings of \$460.
c. Grace has the most even income pattern with earnings of \$180 for most months (5 out of 6 months) and a small variation in May.
d. Fran has the most uneven income pattern with earnings fluctuating significantly from \$0 to \$800.
e. Adot got a job in March, as their earnings started from that month.
f. Mark is likely to have worked more over the summer holidays, as his earnings increased significantly in June (\$240, the highest among his earnings).
g. Lu seems to be getting an extra shift each month, as their earnings increased steadily from January to March.
h. The average wage earned was the highest in January with an average of \$218.00.
i. So, the average earnings per student for the 6 months is \$1227 // or the average earnings for students per month is \$855.33 // or the average earnings per student per month = \$204.50

6D Interest comparison 131 //applied spreadsheet activity

6E Bar graphs 133

- 1, 3&4. //applied graphing activities
2. Most Texts: Chuck (98 texts/day); Least Texts: Juice (15 texts/day); Total texts per day = 331
Average Texts per Day: 55.17; Median Texts per Day: 52.5; Range of Texts per Day: 83

6F Pie charts 135

- 1, 3&4. // applied graphing activities
2. Rip spends the most time texting, which accounts for 24% of his daily mobile usage.
Rip spends the least time on phone calls and web pages, each accounting for 4% of his daily mobile usage.
The top three activities are: **Texts**: 24%, **Social media**: 19% and **Other**: 19%
Rip spends 38% of his time on activities other than the top three.

6G Line graphs 137

- 1, 3&4. // applied graphing activities
2. March: High and fluctuating expenses; April: Gradual decrease in spending; May: Stabilised and low expenses
The overall pattern indicates that the twins did well in managing their shopping expenses by progressively reducing and stabilising them over the three months. They moved from a high-spending, fluctuating pattern in March to a low-spending, stable pattern in May, showing significant improvement in their financial habits.

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6H Mean 138

1. Mean weight: 72 kg

Mean height: 174.6 cm

Mean wage: \$14.13

Mean mark: 75

Mean driving hours: 67.8 hours

This analysis suggests that there is some skewing in the data sets, particularly for driving hours and, to a lesser extent, wages and marks.

6I Range 139

Range of weight: 49 kg

Range of height: 44 cm

Range of wage: \$9.40

Range of mark: 39

Range of driving hours: 145 hours

Weight: Slight left skew (negative skew)

Height: Little to no skew

Wage: Slight right skew (positive skew)

Mark: Slight right skew (positive skew)

Driving hours: Significant right skew (positive skew)

2. Median is the middle number for an odd set of values; or the 2 middle numbers/2 for an even set of values.

Better? Well that's for discussion!

6J Systematics 141

2.

a. Larry (Plasterer)

Inputs: Internal dimensions of a room (length, width, height)

Outputs: Volume of the room (for plastering estimation)

Analog Devices: Tape measure (analog tool for measuring dimensions)

Digital Devices: Smartphone app for calculating volume or area

b. Lucee (Soccer Player)

Inputs: Distance run during each training session (in kilometers)

Outputs: Total kilometers run per session or over a period

Analog Devices: Fitness tracker (analog sensors for distance measurement)

Digital Devices: Smartwatch or fitness app (digital display and storage of distance data)

c. Lanny (Gamer)

Inputs: Number of hits or points required to level-up

Outputs: Progress towards the level-up goal

Analog Devices: Game controller (analog input device for gameplay)

Digital Devices: Gaming console or PC (digital processing and display of game progress)

d. Lucki (Chef)

Inputs: Internal temperature of meat (in Celsius or Fahrenheit)

Outputs: Temperature readings for determining meat doneness

Analog Devices: Meat thermometer (analog tool for temperature measurement)

Digital Devices: Digital meat thermometer (digital display of temperature)

e. Laurie (Saver)

Inputs: Weekly spending amounts (to cut down on)

Outputs: Reduced weekly spending target

Analog Devices: Pen and paper (analog recording of spending)

Digital Devices: Budgeting app or spreadsheet (digital tracking and analysis of spending)

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f. Lillie (Gardener)

Inputs: Seasonal variations in vegetable growth conditions

Outputs: Optimal growth conditions for different vegetables

Analog Devices: Garden journal (analog recording of growth observations)

Digital Devices: Weather app or gardening software (digital data on weather and growth conditions)

g. Leni (Traveler)

Inputs: Budget limit for the trip (\$1,500)

Outputs: Actual expenditure during the trip

Analog Devices: Wallet (analog method of carrying and spending money)

Digital Devices: Budgeting app or travel expense tracker (digital record of expenses)

h. Laddy (Diabetic)

Inputs: Blood glucose levels (measured in mg/dL or mmol/L)

Outputs: Blood glucose readings for monitoring health

Analog Devices: Glucose meter (analog device for blood glucose measurement)

Digital Devices: Digital glucose meter (digital display and recording of blood glucose levels)

i. Loni (Vegetarian)

Inputs: Sources of vegetarian protein substitutes

Outputs: List of alternative protein sources

Analog Devices: Recipe books or nutrition guides (analog sources of information)

Digital Devices: Nutrition apps or websites (digital databases of protein sources)

j. Leslie (Business Owner)

Inputs: Cost and selling price of each cake sold

Outputs: Profit margin per cake

Analog Devices: Ledger (analog record of transactions)

Digital Devices: Accounting software (digital calculation of profit margins)

6K Collecting data 143

Primary Data Collection:

1. Surveys and Questionnaires:
 - Joanie can design surveys or questionnaires to gather information directly from teenagers. She could inquire about their current physical activity levels, dietary habits, sleep patterns, stress levels, and overall health perceptions.
 - Tools and Devices: Online survey platforms (e.g., Google Forms, SurveyMonkey) for data collection. Digital scales or height measurement tools for anthropometric data.
2. Physical Assessments:
 - Conducting fitness assessments such as cardiovascular fitness tests (e.g., beep test), strength assessments (e.g., push-ups, sit-ups), flexibility tests (e.g., sit and reach), and body composition measurements (e.g., BMI).
 - Tools and Devices: Stopwatches, fitness assessment tools (e.g., measuring tapes, skinfold calipers), and heart rate monitors.
3. Activity Tracking:
 - Using activity trackers or apps to monitor teenagers' daily physical activity levels, step counts, and sleep patterns over a period of time.
 - Tools and Devices: Fitness trackers (e.g., Fitbit, Garmin), smartphone apps (e.g., Apple Health, Google Fit).

Secondary Data Sources:

4. Research Studies and Literature Reviews:
 - Reviewing existing research studies, academic journals, and meta-analyses related to teenage health, physical activity guidelines, nutritional requirements, and mental health factors.
 - Tools and Devices: Online academic databases (e.g., PubMed, Google Scholar), institutional libraries.
5. Government Reports and Health Surveys:
 - Accessing data from national health surveys or reports published by health departments that provide statistics on teenage health behaviors, obesity rates, physical activity guidelines, etc.

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- Tools and Devices: Government health websites (e.g. Health.gov.au, WHO), statistical databases.
- 6. Educational Resources:
 - Utilizing educational resources such as health education textbooks, online courses, and educational websites that focus on adolescent health and fitness.
 - Tools and Devices: E-books, educational websites.

Tools and Devices for Joanie:

- Digital Tools: Smartphone apps for surveys and fitness tracking, digital scales, heart rate monitors, and fitness assessment tools.
- Analog Tools: Measuring tapes, skinfold calipers, stopwatches, and traditional survey methods (paper-based questionnaires).

2. //applied

6L Organising data 145

1. Use a table or spreadsheet

2. Tools used:

- Digital spreadsheet software: I used a digital spreadsheet tool (like Microsoft Excel, Google Sheets, or similar) to create the organised table format.
- Data entry: Manually entered each client's step data for each day of the week into the spreadsheet.

Benefits of organising the data:

1. Readability: Data organised in a tabular format makes it easier to read and compare across clients and days.
2. Analysis: Facilitates quick analysis of trends, such as identifying which clients have higher or lower step counts on specific days.
3. Visualisation: Allows for the use of charts and graphs within spreadsheet software to visualize trends over time or among different clients.

Client	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Average
Millie	2458	7145	10256	11256	1220	11250	759	7268
Villie	2546	5845	1258	5892	10258	2587	1985	4560
Willy	10256	14568	19560	1758	14568	2890	11258	10676
Tilly	9899	9745	10125	4568	5689	4520	6458	7621
Jillee	11002	5625	9998	4521	5689	17850	16529	9785
Zylie	2500	750	3500	4500	5500	1250	6500	3657
Sav	11196	6696	14251	2170	4499	44250	8260	12450

2 & 3. //applied discussion

4. Ladder: % = {the cells with} PF / {the cells with} PA * 100%;

Pts = ({the cells with} W * 4) + ({the cells with} D * 2)

Temperature: there are no calculations

Chickens: =sum({the cells in the weight columns with a kg weight amount});

=sum({the cells in the weight columns with a litres volume amount})

6M Analysing data 147 //applied analysis and investigation

B. 1b. Error likely to be Sav M on Sat because 44250 is a lot of steps and might take 7-8 hours or more// but maybe Sav was on a hike?

6N Let's get physical 149 //applied analysis and investigation

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7. Location and Direction

- 7A **Compass directions** 156 //applied visual activity
- 7B **Angles and dimensions** 159 //applied angles activity
- 7C **Language of location** 160- 161 //applied visual activity
- 7D **Preferred directions** 162 //applied
- 7E **The road less travelled** 163 //applied mapping activity
- 7F **Maps: Pathways** 164 // applied discussion
- 7G **Maps: Landmarks & scale** 165 // applied discussion
- 7H **Getting around** 167 //applied estimation activity
- 7I **Whereabouts?** 168- 169 //applied visual interpretative activity
- 7J **Check out da 'hood** 170 //applied mapping activity
- 7K **School map grid** 170- 171 //applied mapping activity
- 7L **Get me here!** 172- 173 //applied mapping activity
- 7M **Training time** 174- 176 //applied investigative mapping activity
- 7N **Word up** 177 //applied mapping communication activity
- 7O **Maps vs apps** 178 //applied

8. What's the Chances

- 8A **What are the chances?** 185
1 out of 2 50%; 1 out of 2 50%; 1 out of 4 25%;
1 out of 6 16.7%; 1 out of 6 16.7%; 1 out of 36 2.7%;
Who knows?; European rules = 48.6% (just under 1 in 2 chance); Seems to be almost always!!
- 8B **Uncertainty and likelihood** 187 //applied discussion
- 8C **Coincidence** 189 //applied interpretation and discussion
- 8D **Luck** 191 //applied investigation, interpretation and discussion
- 8E **Not likely**
2. Tomot is likely to have won \$100. 3. I wouldn't! 4. By losing everything. It's all random!

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9. Money

9A Money basics 205 //applied discussion

9B Money calculations 206

1. \$2.28 dollars; So, the change from a \$10 note is \$7.72.
2. Find out! Would \$50 cover it?
3. \$189.98; Since the total exceeds \$175, the belt is free. New total = \$174.98. Change = \$25 rounded

9C Notes and coins 207

- a. Total: \$65, Change: \$35
- b. Total: \$76.50, Change: \$3.50
- c. Total: \$194.99, Change: \$5 (rounded)
- d. Total: \$73.11, Change: \$0.90 (rounded)
- e. Total: \$29.60, Change: \$70.40
- f. Total: \$26.10, Change: \$4.00
- g. Total: \$104.90, Shortfall: \$4.90

9D Making change 209

Purchase	Amount	Change	Currency
\$5.75	\$10	\$4.25	\$2 \$2 20c 5c
\$3.15	\$10	\$6.85	\$ 5 \$1 50c 20c 10c 5c
\$9.45	\$10	\$0.55	50c 5c
\$7.50	\$10	\$2.50	\$2 50c
\$2.20	\$10	\$7.80	\$5 \$2 50c 20c 10c
\$4.80	\$10	\$5.20	\$5 20c
\$1.45	\$10	\$8.55	\$5 \$2 \$1 50c 5c
\$6.60	\$10	\$3.40	\$2 \$1 20c x2
\$0.75	\$10	\$9.25	\$5 \$2 x2 20c 5c
\$5.99	\$10	\$4.01	\$2 x2 (rounded)

Purchase	Amount	Change	Currency
\$9.25	\$20	\$10.75	\$10 50c 20c 5c
\$17.50	\$20	\$2.50	\$2 50c
\$15.00	\$20	\$5.00	\$5
\$3.75	\$20	\$16.25	\$10 \$5 \$1 20c 5c
\$19.40	\$20	\$0.60	50c 10c
\$11.55	\$20	\$8.45	\$5 \$2 \$1 20c x2 5c
\$6.95	\$20	\$13.05	\$10 \$2 \$1 5c
\$14.50	\$20	\$5.50	\$5 5c
\$7.30	\$20	\$12.70	\$10 \$2 50c 20c
\$0.95	\$20	\$19.05	\$10 \$5 \$2 x2 5c

Purchase	Amount	Change	Currency
\$11.80	\$50	\$38.20	\$20 \$10 \$5 \$2 \$1 20c
\$2.75	\$50	\$47.25	20 x2 \$5 \$2 20c 5c
\$29.95	\$50	\$20.05	\$20 5c
\$48.50	\$50	\$1.50	\$1 50c
\$49.75	\$50	\$0.25	20c 5 c

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\$17.50	\$50	\$32.50	\$20 \$10 \$2 50c
\$22.00	\$50	\$28.00	\$20 \$5 \$2 \$1
\$0.95	\$50	\$49.05	\$20 x2 \$5 \$2 x2 5c
\$32.50	\$50	\$17.50	\$10 \$5 \$2 50c
\$15.25	\$50	\$34.75	\$20 \$10 \$2 x2 50c 20c 5c

Purchase	Amount	Change	Currency
\$62.50	\$100	\$37.50	\$20 \$10 \$2 50c
\$28.75	\$100	\$71.25	\$50 \$20 \$10 \$1 20c 5c
\$75.50	\$100	\$24.50	\$20 \$2 x2 50c
\$92.00	\$100	\$8.00	\$5 \$2 \$1
\$82.25	\$100	\$17.75	\$10 \$5 \$2 50c 20c 5c
\$16.75	\$100	\$83.25	\$50 \$20 \$10 \$2 \$1 20c 5c
\$9.60	\$100	\$90.40	\$50 \$20 x2 20c x2
\$33.50	\$100	\$66.50	\$50 \$10 \$5 \$1 50c
\$54.15	\$100	\$45.85	\$20 x2 \$5 50c 20c 10c 5c
\$41.75	\$100	\$58.25	\$50 \$5 \$2 \$1 20c 5c

9E It's all in your head 210

- a. \$2.25 b. \$14.40 c. \$184.99
d. \$6.45 e. \$4.25 f. \$1,400

9F Calculating money 211

- a. \$1,734.50 b. \$92.74 c. \$955
d. -\$6,450 e. \$1,663,366.50
f. (Price of Pepsi + Price of salad roll + Price of apple + Price of doughnut) - \$5

9G Percentages 212-213

1. a. 50% of \$100 = \$50; b. 25% of \$150 = \$37.50; c. 66.67% of \$300 = \$200
d. 80% of \$2,000 = \$1,600; e. 37.5% of \$1,000 = \$375; f. 75% of \$25 = \$18.75;
g. 90% of \$50,000 = \$45,000; h. 20% of \$99.95 = \$19.99; i. 75% of \$1,000,000 = \$750,000;

2. a. \$36 b. \$60 c. \$975
d. \$450 e. \$562,500 f. \$1.30
g. \$143 h. \$120 i. \$13.50

3. Abe

1. Ten items at \$5 each: $10 \times \$5 = \50
2. Twenty items at \$10 each: $20 \times \$10 = \200
3. Fifty items at \$20 each: $50 \times \$20 = \1000

Total before GST: $\$50 + \$200 + \$1000 = \1250

GST: $\$1250 \times 0.10 = \125

Total including GST: $\$1250 + \$125 = \$1375$

Baal

1. Five items at \$7.70 each: $5 \times \$7.70 = \38.50
2. Ten items at \$16.50 each: $10 \times \$16.50 = \165
3. Twenty items at \$49.50 each: $20 \times \$49.50 = \990

Total including GST: $\$38.50 + \$165 + \$990 = \$1,193.50$

GST: $\$1,193.50 \div 11 = \108.50

Total before GST: $\$1,193.50 - 108.50 = \$1,085$

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Carin

1. Three items: \$50, \$125, \$75
2. Special discount: 10% off the least expensive item (\$50): $\$50 \times 0.10 = \5

Discounted for the least expensive: $\$50 - \$5 = \$45$

Total including GST: $\$45 + \$125 + \$75 = \245

GST: $\$245 \div 11 = \22.27 // Total before GST: $\$245 - \$22.27 = \$222.73$

Summary of Answers:

Abe: Total before GST: \$1,250; GST: \$125; Total including GST: \$1,375

Baal: Total including GST: \$1,193.50; GST portion: \$108.50; Total before GST: \$1,085

Carin: Discounted total including GST: \$245; GST portion: \$22.27; Total before GST: \$222.73

9H Change in prices 215 //applied investigation

10. Income and Pay

10A Types of income 221

1. Kaylene: payment in kind 50% wages and 50% payment in kind // \$800/week

Regina: salary // \$1298.08/week

Lorelei: commission // extra \$1,000/week

Bob: wage // \$855/week \$4,460/year

Dash: piece rate // \$9 to \$12/hour \$45 to \$60 per 5-hour

Yusuf: retainer & commission // \$200/week commission (10.4%) = $\$89,600 (89.4\%) / 52 = \$1,723.08$ /week so \$1923.08/week

2. //applied

10B Pay up 222-223

1-2. //applied investigation

3. Nermi: \$260.70/week. Must be a junior possibly in retail or perhaps a piece-rate worker with a fixed amount of units?

Abe: $12 \times \$15 = \180 and $\$5 \times 18.75 = \93.75 Total = \$273.75/week. Abe might a junior in retail or hospitality or perhaps an Australian apprentice.

Vesna: \$150 Job = you decide!

Herriot: \$855 Job = you decide!

Ngoc: \$342 Job = you decide!

Tahir: \$456 (next year \$547.20) Job = you decide!

Barrie: \$240 (for the public holiday) Job = you decide!

Mertrude: \$1,391.25 Job = you decide!

Stacee: \$883.74 (\$23.23 for 2023/24) Job = you decide!

Adot: \$1,692.31 Job = you decide!

10C Different agreements 225

	55%	60%	80%	95%
20	\$ 11.00	\$ 12.00	\$ 16.00	\$ 19.00
	\$ 418.00	\$ 456.00	\$ 608.00	\$ 722.00
	\$ 21,736.00	\$ 23,712.00	\$ 31,616.00	\$ 37,544.00
25	\$ 13.75	\$ 15.00	\$ 20.00	\$ 23.75
	\$ 22.50	\$ 570.00	\$ 60.00	\$ 02.50
	\$ 27,170.00	\$ 29,640.00	\$ 39,520.00	\$ 46,930.00
30	\$ 16.50	\$ 18.00	\$ 24.00	\$ 28.50
	\$ 27.00	\$ 684.00	\$ 12.00	\$ 1,083.00
	\$ 32,604.00	\$ 35,568.00	\$ 47,424.00	\$ 56,316.00

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10D Traineeship pay rates 227

1. 2022/23

\$363.40	\$400.10	\$475.90
\$11.95	\$13.16	\$15.65
\$18,896.80	\$20,805.20	\$24,746.80
\$400.10	\$475.90	\$553.90
\$13.16	\$15.65	\$18.22
\$20,805.20	\$24,746.80	\$28,802.80
\$475.90	\$553.90	\$644.50
\$15.65	\$18.22	\$21.20
\$24,746.80	\$28,802.80	\$33,514.00

2. //applied

10E Pay slips 229 //applied investigation

10F Pay slips in action 230-231

1.

Mc Jaks Food Truck	ABN: 21 256 253 56	Date: ???		
Week 1	Period: ???			
Employee: ???				
Entitlements			Deductions	
	Total	Total		
Ordinary hourly rate:	8	\$100.00		
\$12.50				
Overtime hourly rate:	8	\$125.04		
\$15.63				
Gross entitlement		\$225.04	Tax deducted:	\$28.13
Net entitlement		\$196.91		
Paid into account: ???	BSB: ???			
Gross entitlement	Year to date	\$225.04	Year to date	\$28.13
Net entitlement	Year to date	\$196.91		

Mc Jaks Food Truck	ABN: 21 256 253 56	Date: ???		
Week 2	Period:			
Employee: ???				
Entitlements			Deductions	
	Total	Total		
Ordinary hourly rate:	8	\$100.00		
\$12.50				
Overtime hourly rate:	0	\$0.00		
\$15.63				
Gross entitlement		\$100.00	Tax deducted:	\$12.50
Net entitlement		\$87.50		
Paid into account: ???	BSB: ???			
Gross entitlement	Year to date	\$325.04	Year to date	\$40.63
Net entitlement	Year to date	\$284.41		

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Mc Jaks Food Truck	ABN: 21 256 253 56	Date: ???		
Week 3	Period:			
Employee: ???				
Entitlements			Deductions	
	Total	Total		
Ordinary hourly rate:	8	\$100.00		
\$12.50				
Overtime hourly rate:	8	\$125.04		
\$15.63				
Gross entitlement		\$225.04	Tax deducted:	\$28.13
Net entitlement		\$196.91		
Paid into account: ???	BSB: ???			
Gross entitlement	Year to date	\$550.08	Year to date	\$68.76
Net entitlement	Year to date	\$481.32		

2. Ordinary hourly rate: total = \$300 // Overtime hourly rate = \$18 // Overtime total = \$72
Gross entitlement = \$372 // Net entitlement = \$297.60
3. $\$74.40/\$372 = 20\%$ (tax rate)
4. $\$1,488/372 = 4$ (weeks) so hours worked = 96

11. Managing Money

11A **Managing money** 237 //applied discussion

11B **Attitudes to money** 239 //applied discussion and investigation

11C **Income** 241 //applied discussion and investigation

11D **Expenses** 243 //applied discussion and investigation

11E **Bills** 244 //applied discussion and investigation

11F **Electricity bill** 245 //applied investigation and analysis

11G **Surplus or deficit?** 247

a. -\$51 (deficit) b. \$9,000 (surplus) c. -\$41(deficit) d. \$300 (surplus) e. \$16,600 (surplus)

11H **My budget** 248- 249 //applied investigation and analysis

11I **Banking - Deposit accounts** 251 //applied discussion and investigation

11J **Bank statement** 253

A 1&2.

Account Holder: Mr. Joe D. Mirto

Branch & Account No.: St Lanbans Branch & 1265-12345

Account Descriptor: Savings Booster

Branch No: 013 238

Statement Period: September 22, 2023, to October 21, 2023

Statement Number: 43

Opening Balance: \$2,173.52

Fortnightly Salary Amount: \$1,154.00

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Number of Withdrawals & Total \$: 7 withdrawals & \$1,579.76

Number of Deposits & Total \$: 1 deposit & \$1,154.00

Closing Balance: \$1,763.52

Impact on Budget: Mr. Joe D. Mirto received a salary deposit of \$1,154.00 during the statement period. He made seven withdrawals totaling \$1,579.76. The net result was a decrease in the closing balance from \$2,173.52 to \$1,763.52. This indicates that expenses exceeded deposits during this period, affecting the account holder's budget by reducing the balance by \$410.00.

B 2. Bank Account Statement

Account Holder: [Account Holder's Name]

Branch & Account No.: [Branch] & [Account Number]

Statement Period: September 1, 2023, to September 30, 2023

Opening Balance: \$85 **Closing Balance:** \$633.25

Date	Transaction Details	Withdrawals (\$) DR	Deposits (\$) CR	Balance (\$)
Sep-01	Opening Balance			85.00
Sep-01	MC EFTPOS - Coles Springwood	61.50		23.50
Sep-03	Northpoint News - Wages		250	273.50
Sep-03	MC EFTPOS - El Munchos	14.50		259.00
Sep-06	DD 34546764 - HiTunes	30		229.00
Sep-08	MC EFTPOS - Lunch Blitz	10		219.00
Sep-09	Springwood - ANZ - ATM	200		19.00
Sep-10	Northpoint News - Wages		250	269.00
Sep-10	MC EFTPOS - Lunch Blitz	14		255.00
Sep-10	MC EFTPOS - IGA Dandetown	27.80		227.20
Sep-14	Deposit		75	302.20
Sep-14	MC EFTPOS - Burger Treat	15.50		286.70
Sep-16	MC EFTPOS - McJacks	9.50		277.20
Sep-17	Northpoint News - Wages		450	727.20
Sep-18	MC EFTPOS - Romonos	17.50		709.70
Sep-19	MC EFTPOS - Lunch Blitz	10		699.70
Sep-20	DD 2175268 - Netstan	20		679.70
Sep-22	MC EFTPOS - Yum Truck	22		657.70
Sep-23	Big Gully - NAB - ATM	120		537.70
Sep-24	Northpoint News - Wages		250	787.70
Sep-26	MC EFTPOS - Burger Treat	15.50		772.20
Sep-28	MC EFTPOS - Muscle Mode	45.95		726.25
Sep-29	Non-bank ATM	90		636.25
Sep-29	Non-bank ATM fee	3		633.25

11K Digital Wallets 255 //applied discussion and investigation

11L Mortgages and loans 256- 257 //applied discussion and investigation

11M 'Easy' money, hard debt 259

1a. Applied - It will take much longer pay off the debt as the minimum amount is too low. Check with the calculator. (approx \$1,539 over 5 years 2 months)

1b. Applied - It will take less time off the debt as the minimum amount being paid back is now higher. Check with the calculator. (approx \$1,367 over 3 yrs 10 mths)

1c. Applied - It will take even less time off the debt as the amount being paid back is now even higher. Check with the calculator. (approx \$1,177 over 2 yrs)

1d. Applied - It will much less time off the debt as the monthly amount being paid back is now much higher. Check with the calculator. (approx \$1,074 over 11 mths)

1e. //applied advice

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2a. $\$1,000 + \200 establishment cost = $\$1,200$

2b. $\$64.62/\text{fortnight}$ over 26 periods = $\$1,680.12$

2c. $\$480$

2d. $\$680.12/\$1,000 \times 100\% = 68\%$ 'effective interest rate'

2e-f. //applied investigation

11N **Comparing credit** 260-261 //applied investigation and analysis

12. How Does it Work? //applied