NCEA Level 1 Numeracy - Statistics

Exercises for analysing data using a stem and leaf plot

Content

This resource supports the teaching and learning of analysing data using a stem and leaf plot. The sequence is suitable for learners in any context which requires comparison of sets of data and also where tutors are gathering naturally occurring evidence for the achievement of the NCEA Level 1 Numeracy Unit Standard 26626.

Alignment

The content aligns with Step 4/5 of the *Reason Statistically* strand of the Learning Progressions, in particular the *Analysing Data for Interpretation* and *Interpreting Data to Predict and Conclude* Progressions.

Intent

Learners will complete the exercises below in order to consolidate what they learnt in the teaching and learning sequence *Analyse Data using a Stem and Leaf Plot.*

Exercise 1

Aroha is thinking of buying a car. She knows running a car is expensive and wonders whether buying a car which uses diesel rather than petrol will be cheaper. She has heard that a car running on diesel gets more kilometres to the litre than a car running on petrol. She finds some data that show the fuel consumption of 30 random vehicles: 15 diesel and 15 petrol. The data are in the tables below.

Diesel consumption - litres per 100 km (L/100km)				
3.8	4.5	4.4	5.4	6.3
5.3	5.6	4.6	4.9	4.8
5.0	3.7	4.2	3.9	4.0

Petrol consumption - litres per 100 km (L/100km)				
6.4	6.9	6.3	5.8	6.0
5.9	7.8	7.4	6.9	7.6
7.9	7.9	7.4	7.5	7.9

Step one: Complete a back-to-back stem and leaf plot for the data.

Step two: Calculate the median and the range for each set of data.

Step three: Which type of vehicle, diesel or petrol, would you recommend buying, if Aroha wants to keep her costs down. Why?

Exercise 2

Learners in a class measured their writing speeds. They all wrote for one minute and then counted how many letters they had written. They decided to find out whether males or females in their class wrote faster. The data are in the tables below.

Females' writing speed in letters / min				
103	115	112	126	123
125	116	104	124	120
106	118			

Males' writing speed in letters / min				
100	54	118	120	102
87	114	115	123	130
110	131	91	94	127

Step one: Complete a back-to-back stem and leaf plot for the data.

Step two: Calculate the median and the range for each set of data.

Step three: Who writes faster, males or females? Give reasons for your answer.

Answers to Exercise 1

Stem and leaf plot

Diesel consumption in L/100km		Petrol consumption in L/100km
(tenths)	(ones)	(tenths)
9 ,8, 7	3	
9, 8, 6, 5, 4, 2, 0	4	
6, 4, 3, 0	5	8, 9
3	6	0, 3, 4, 9, 9
	7	4, 4, 5, 6, 8, 9, 9, 9,

Range: 2.6 L/100km **Median:** 4.6 L/100km   **Range:** 2.1 L/100km **Median:** 7.4 L/100km

If cheap fuel costs were important to Aroha, then one would recommend buying a diesel car. Most of the values for fuel consumption for the diesel cars are grouped around 4 and 5 litres per 100km, while those for petrol cars are grouped around 6 and 7 litres per 100km. Also, the median for diesel cars at 4.6 litres per 100km is much lower than 7.4 litres per 100km for petrol cars. The lowest fuel consumption is for a diesel car. There is not a wide range in the fuel consumption for either diesel or petrol cars, so for most cars the fuel consumption for diesel cars is better than for petrol cars.

THE UNIVERSITY OF WAIKATO

Tukua Kia Rere

NATIONAL
CENTRE OF
LITERACY &
NUMERACY
FOR ADULTS

Inspiring Potential

Answers to Exercise 2

Stem and leaf plot

Females writing speed in letters / min		Males writing speed in letters / min	
(ones)	(tens)	(ones)	
	5	4	
	6		
	7		
	8	7	
	9	1, 4	
6, 4, 3	10	0, 2,	
8, 6, 5, 2	11	0, 4, 5, 8	
6, 5, 4, 3, 0	12	0, 3, 7	
	13	0, 1	

Range: 23 letters/min **Median:** 117 letters/min   **Range:** 77 letters/min **Median:** 114 letters/min

The females as a group tend to write faster than the males. There is not a lot of difference in the median between the males (114 letters/min) and the females (117 letters/min), but all the females are clustered around the median (range 23) while the males are spread out (range 77). There is one very slow male in the group and the fastest writers in the class are male. However, one can still conclude that, as a group, the females are faster writers than the males.