NCEA Numeracy Level 1 - Statistics

Organise data using a stem and leaf plot

Content

This teaching and learning sequence is about organising data using a stem and leaf plot. In the next teaching and learning sequence, Analyse data using a stem and leaf plot, learners will create stem and leaf plots in order to analyse the difference between two sets of data. The sequence is suitable for learners in any context which requires comparison of two or more 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 *Preparing Data for Analysis* Progression.

Intent

After completing the teaching and learning sequence learners will understand how to organise any set of data into a stem and leaf plot.

Sequence

There are three parts to this sequence. Learners will:

1. discuss what a stem and leaf plot is and why it is useful
2. create stem and leaf plots where the value of the stem is in 'tens' and the leaf in 'ones'
3. create stem and leaf plots with a variety of values for the stem and leaf.

Some useful vocab

4365 is a number

4,3,6,5 are digits that make up the number.

There are ten digits:

0, 1, 2, 3, 4, 5, 6, 7, 8, 9

1. Discuss what a stem and leaf plot is and why it is useful

Step one: Show learners a set of data (see example below) and ask them if they have any ideas about how to sort the data into a stem and leaf plot.

Number of minutes taken for a number of people to walk around the base of Mt Maunganui

40, 61, 48, 38, 32, 34, 50, 35, 49, 37, 38, 96, 38

Step two: Ask any learner who knows how to create a stem and leaf plot from the data above to demonstrate. Alternatively, demonstrate yourself.

Key learning point

What is a stem and leaf plot?

A stem and leaf plot is a type of table for organising data from smallest to largest where each value is split into a stem (the first digit or digits) and a leaf (usually the last digit)

Below is a stem and leaf plot for the data above: 40, 61, 48, 38, 32, 34, 50, 35, 49, 37, 38, 96, 38.

Stem (tens)	Leaf (ones)
3	2, 4, 5, 7, 8, 8, 8
4	0, 4, 9
5	0
6	1
7	
8	
9	6

Step three: Discuss with learners that a stem and leaf plot is a way of displaying data that makes it easy to find the range, the median and how the data are distributed. Explain that a stem and leaf plot is especially useful when comparing two sets of data.

2. Create stem and leaf plots where the value of the stem is in 'tens' and the leaf in 'ones'.

Step one: Ask learners to work in pairs to create stem and leaf plots with the two data sets below.

A: **Karaka Netball team's scores for the last 12 games**

15, 23, 5, 34, 46, 22, 18, 33, 9, 28, 28, 41

B. **Number of minutes spent by learners in a carpentry class writing a practice health and safety report**

24, 26, 14, 28, 32, 17, 18, 25, 30, 16, 23, 29

Step two: Ask learners to compare their answers with another pair.

Answer A

Stem (tens)	Leaf (ones)
0	5, 9
1	5, 8
2	2, 3, 8, 8
3	3, 4
4	1, 6

Answer B

Stem (tens)	Leaf (ones)
1	4, 6, 7, 8
2	3, 4, 5, 6, 8, 9
3	0, 2

Key learning point

Note that, when a data value is a single digit, the stem is 0.

3. *Create stem and leaf plots with a variety of values for the stem and leaf*

Step one: Show learners the set of data below and ask what the value of the stem and the leaf will be. (You are looking for the answer that the value of the stem (first digit) is ones and the value of the leaf (second digit) is tenths.).

C. **The fuel consumption in litres per 100 kilometres of 15 cars**

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

M**ake sure you do not assume knowledge!** Check that learners understand what fuel consumption is.

Take the opportunity to reinforce or develop numeracy concepts. Check that learners know that petrol is measured in litres, have a rough idea of the size of 1 litre of petrol and a rough idea of the capacity in litres of a car's petrol tank.

Step two: Ask them to draw the stem and leaf plot.

Step three: Check that their stem and leaf plots are correct.

Answer C

Stem (ones)	Leaf (tenths)
3	7, 8, 9
4	0, 2, 4, 5, 6, 8, 9
5	0, 3, 4, 6
6	3

Step four: Show learners the set of data below and ask what the value of the stem and the leaf will be. (You are looking for the answer that the value of the stem - first digit or first two digits - is tens, and the value of the leaf - second digit - is ones.)

D.   **The writing speed of learners in a class, measured by the number of words written per minute**

100, 54, 91, 123, 127, 110, 87, 114, 115, 130, 102, 94, 131, 120, 118, 104

Step five: Ask them to draw the stem and leaf plot.

Step six: Check that their stem and leaf plots are correct.

Answer D

Stem (tens)	Leaf (ones)
5	4
6	
7	
8	7
9	1, 4
10	0, 2, 4
11	0, 4, 5, 8
12	0, 3, 7
13	0, 1

Key learning point

Take a moment to discuss how many tens there are in numbers – this is a skill that opens lots of calculation doors for learners.

From the data above 123 has 12 tens, 118 has 11 tens.

468 has 46 tens

1247.5 has 124 tens

Step seven: Provide more examples from your context for practice until learners have understood the process.