

Stem-and-leaf plots

WALT: Read and display stem and leaf plots

Success Criteria: I can

- Represent numerical data
- Split numbers into two parts when there are two digits
- Understand that each number is split into a stem (first digit) and a leaf (the last digit)

Teacher Introduction



A stem-and-leaf plot is a useful way of presenting numerical data. It allows trends to be spotted easily. Each number is split into a stem (the first digit or digits) and a leaf (the last digit).

	Stem	Leaf
53 is	5	3
78 is	7	8
125 is	12	5

▶ Let's start: Test score analysis

In a class, students' results on two recent tests out of 50 are recorded.

Test 1 results

43, 47, 50, 26, 38, 20, 25, 20, 50, 44,
33, 47, 47, 50, 37, 28, 28, 22, 21, 29

- For each test, try to find how many students:
 - achieved a perfect score (i.e. 50)
 - failed the test (i.e. less than 25)
 - achieved a mark in the 40s.
- If there are 100 test results to analyse, would you prefer a list or a stem-and-leaf plot? Why?

Test 2 results

Stem	Leaf
1	8
2	7 8
3	2 2 4 5 5 7 9
4	0 1 2 3 3 6 8 8
5	0 0

Key Ideas

- A **stem-and-leaf plot** is a way to display numerical data.
- Each number is split into a stem (the first digit or digits) and a leaf (the last digit).

For example:

	Stem	Leaf
The number 7 is	0	7
The number 31 is	3	1
The number 152 is	15	2

- Leaves are aligned vertically, getting bigger as you move away from the stem.

Stem-and-leaf plot

A table that lists numbers in order, grouped in rows

1 Copy and complete:

In a stem-and-leaf plot the first digit(s) of a data value is called the _____ and the last digit is called the _____.

2 The number 52 is entered into a stem-and-leaf plot.

- a Which digit is the stem?
b Which digit is the leaf?

3 What number is represented by the following combinations?

a 3|9

b 2|7

c 13|4

4 In this stem-and-leaf plot, the smallest number is 35.

What is the largest number?

Stem	Leaf
3	5 7 7 9
4	2 8
5	1 7

Interpreting Stem and Leaf Plots

Average daily temperatures are shown for some different countries.

- a Write out the temperatures as a list.
b How many countries' temperatures are represented?
c What are the maximum and minimum temperatures?
d What is the range of temperatures recorded?
e What is the median temperature recorded?

Stem	Leaf
1	3 6 6
2	0 0 1 2 5 5 6 8 9
3	0 2

Solution

a 13, 16, 16, 20, 20, 21, 22, 25, 25, 26, 28, 29, 30, 32

b 14

c minimum = 13
maximum = 32

d range = 19

e median = 23.5

Explanation

Each number is converted from a stem and a leaf to a single number.
For example, 1|3 is converted to 13.

The easiest way is to count the number of leaves – each leaf corresponds to one country.

The first stem and leaf is 1|3.
The last stem and leaf is 3|2.

Range = maximum – minimum = 32 – 13 = 19

The middle value is halfway between the numbers 2|2 and 2|5, so median
 $= \frac{1}{2} (22 + 25) = 23.5$

Solve the following problems

5 This stem-and-leaf plot shows the ages of people in a group.

- a** Write out the ages as a list.
b How many ages are shown?
c Answer true or false to each of the following.
i The youngest person is aged 10.
ii Someone in the group is 17 years old.
iii Nobody listed is aged 20.
iv The oldest person is aged 4.

Stem	Leaf
0	8 9
1	0 1 3 5 7 8
2	1 4

6 For each of the stem-and-leaf plots below, state the range and the median. (See Example 8 parts **d** and **e**.)

a

Stem	Leaf
0	9
1	3 5 6 7 7 8 9
2	0 1 9

b

Stem	Leaf
1	1 4 8
2	1 2 4 4 6 8
3	0 3 4 7 9
4	2

c

Stem	Leaf
3	1 1 2 3 4 4 8 8 9
4	0 1 1 2 3 5 7 8
5	0 0 0



7 Copy and complete the stem-and-leaf plot for this set of data.
 25, 27, 29, 30, 32, 39, 41, 42, 45, 51

Stem	Leaf
2	
3	
4	
5	

Remember to list the leaves in increasing order across each row.



Creating Stem and Leaf Plot

Represent this set of data as a stem-and-leaf plot: 23, 10, 36, 25, 31, 34, 34, 27, 36, 37, 16, 33

Solution

Sorted list: 10, 16, 23, 25, 27, 31, 33, 34, 34, 36, 36, 37

Stem	Leaf
1	0 6
2	3 5 7
3	1 3 4 4 6 6 7

Explanation

Sort the list in increasing order so that it can be put directly into a stem-and-leaf plot.

Split each number into a stem and a leaf. Stems are listed in increasing order. Leaves are written vertically, listed in increasing order across each row.

1 a stem, leaf

2 a 5 b 2

3 a 39 b 27 c 134

4 57

5 a 8, 9, 10, 11, 13, 15, 17, 18, 21, 24 b 10
c i false ii true iii true iv false

6 a range = 20, median = 17
b range = 31, median = 26
c range = 19, median = 40.5

Stem	Leaf
2	5 7 9
3	0 2 9
4	1 2 5
5	1

8 a

Stem	Leaf
1	1 2 3 4 4 5 7
2	0 4 8 9
3	1 2 3 5

b

Stem	Leaf
2	0 2
3	9
4	5 7 9 9
5	1 2 2 3 5 6 8 8

9 a

Stem	Leaf
1	6 6 8
2	1 4 8 9
3	1 2 3 5
4	1 8 9
5	0

10 a

Stem	Leaf
8	0 4 5 6
9	0 6
10	1 4 5
11	0 3 4 4 5 9

b

Stem	Leaf
39	1 5 6
40	1 2 4 5 6 6 8 9
41	1 2 3 3 5 6 7 8
42	0

11 a 10 b 1 c 8 d 58

12 a 15 b 13
c a is 5 or 6, b is 0, c is 8 or 9, d is 0.

13 a i 49 years ii 36 years b radio station 1
c i 33 to 53 years ii 12 to 32 years