

1 Stem-and-Leaf Plots

What Is a Stem-and-Leaf Plot?

A stem-and-leaf plot is a graph where the data are numbers.

The data are organized in categories based on place value.

For data with numbers less than 100, all the numbers less than 10 are together, then all the numbers between 10 and 20 are together, then all the numbers between 20 and 30 are together, and so on.

The first digit (or digits) of each number forms the stem. The stem is written in the left column.

Instead of writing out an entire number, you just write the last part of it as a leaf. This allows you to group numbers in the same category together in a row.

The leaves are to the right.

A vertical line separates the stem from the leaves.

For example, here is a set of data about the number of text messages sent by students in a class on a particular day:

42, 53, 21, 7, 22, 22, 9, 18, 45, 61, 33, 55, 47, 49, 62

The plot looks like this:

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

The first row shows that there is a 7 (07) and a 9 (09) in the set of data. The row starting with 2 shows that there is a 21 and two 22s in the data.

What Is a Stem-and-Leaf Plot? (continued)

Notice that the numbers are in order from least to greatest within each row and overall.

If there had been a number like 103 in this set of data, the stem would have been 10 and the leaf 3.

If there are no numbers in a category, most people still write the stem but don't include any leaves; other people simply leave out the unused stems. Both ways are acceptable.

There are variations of stem-and-leaf plots where, for example, the stems or the leaves have two digits or decimals represented, but we are not dealing with these yet.

A stem-and-leaf plot looks a bit like a horizontal bar graph, where the numbers are written in place of the bars. Notice that the leaves are lined up to make it work like a bar graph.

When Is a Stem-and-Leaf Plot Useful?

Stem-and-leaf plots are useful when you want to look at numbers organized in groups. They are most appropriate when there are not too many data values or too few data values. Stem-and-leaf plots are often used when there are 15 to 20 pieces of data.

Although these graphs are not used a lot in the media, mathematicians do sometimes use them because they work like bar graphs. The advantage is you can still see all of the actual values in the data. On a bar graph, for example, you might see that there are three numbers in the 20s, but you will not know whether they're in the low 20s or the high 20s; with a stem-and-leaf plot, you can see the exact data values.

Definitions

bar graph: a type of graph that uses horizontal or vertical bars to display discrete categories

place value: the placement of the digit in the numeral that tells its value in the numeral; for example, the place value of the digit 5 in 358 is tens, so the digit 5 has a value of 5 tens, or 50

stem-and-leaf plot: a data display where numbers are placed in order and organized based on place value: the left digits are placed at the left to form the stems, and the right digits are placed at the right to form the leaves; every piece of data is included