

## How to Create a Frequency Table and Histogram in Excel

A **histogram** (or frequency distribution) is a type of graph that allows you to get a visual picture of your spread of data. While **histograms** are relatively easy to draw by hand, you'll get a more professional result in Excel.

**Before you begin, you must first determine your groups (how many will you have and what will be the range for each)**

### Grouped Frequency Distribution

We just saw in that example how we can group frequencies. This is very useful when the scores have many different values

#### Example: Leaves

Alex measured the lengths of leaves on the oak tree, and got these values (to the nearest cm):  
9,16,13,7,8,4,18,10,17,18,9,12,5,9,9,16,1,8,17,1,10,5,9,11,15,6,14,9,1,12,5,16,4,16,8,15,14,17

Trying to work out the groups takes some practice, but here is a guide:

To get started, put the numbers **in order**, then find the **smallest** and **largest** values in your data, and calculate the **range** (range = largest - smallest).

#### Example: Leaves (continued)

In order the lengths are:

1,1,1,4,4,5,5,6,7,8,8,8,9,9,9,9,9,10,10,11,12,12,13,14,14,15,15,16,16,16,16,17,17,17,18,18

The smallest value (the "minimum") is 1 cm

The largest value (the "maximum") is 18 cm

The range is  $18 - 1 = 17$  cm

#### Size of Each Group

Now calculate an approximate group size, by dividing the **range** by how many groups you would like.

Then round that group size **up** to some **simple value** (like 2 instead of 1.83 or **5** instead of 4.26).

#### Example: Leaves (continued)

Let us say we want about 5 groups.

Divide the range by 5:

$$\rightarrow 17/5 = 3.4$$

Then round that up to **4**

#### Start Value

Pick a starting value that is less than or equal to the smallest value. Try to make it a multiple of the group size if you can.

In our case a start value of **0** makes the most sense

#### Groups

Now calculate the list of groups. (You must continue up to or past the largest value)

#### Example: Leaves (continued)

Starting at 0 and with a group size of 4 we get: **0, 4, 8, 12, 16**

Write down the groups, include the end value of each group (must be less than the next group):

Length (cm)	Frequency
0-3	
4-7	
8-11	
12-15	
16-19	

The last group goes to 19, which is greater than the largest value, so that is good.

(Note: If you don't like the groups, then go back and change the group size or starting value and try again.)

## NOW TO EXCEL>>>

**Step 1:** Enter your data into a single column. For example, you might have a list of scores.

**Step 2:** Sort Data by highlighting all the numerical data, right clicking it and clicking sort, sort smallest to largest.

**Step 3:** Enter the rest of the maximum data values into the next column (The highest number from each group you made).

**Step 4:** Click on the "Data" tab and then choose "Data Analysis." If you don't have the Data Analysis button, you need to add the ToolPak (it only takes a few seconds). See this [how to on how to load the Microsoft Excel Data Analysis ToolPak](#) for instructions.

**Step 5:** Click on "Histogram" and then click on "OK."

**Step 6:** Click on the cell icon to the right of "Input Data."

**Step 7:** Click on the first value in the column of data. Highlight all data in the list of data.

**Step 8:** Click on the cell icon to the left of "Bin Range."

**Step 9:** Click on the values in the column where input your first and last bin values (those are the maximum data values from step 3).

**Step 10:** Click on "Chart Output", click in that cell so that it is clear and then click on a cell to the right of the data you've already entered.

**Step 12:** Click on "labels"

**Step 13:** Click "OK"

**Step 14:** The frequency table and histogram should pop up. Click on a bar on the histogram and then right click it. Choose "format data series". Drag the "gap width" button over so it is at 0%, meaning there is no gap between the bars, then click "Close."

CONGRATULATIONS! YOU'VE JUST MADE A FREQUENCY TABLE AND HISTOGRAM IN EXCEL! =)