

Using Charts in Excel

Excel offers a number of charts, each typically best at representing a particular type of data. Picking the right chart for the data is the most important part of using charts, with proper formatting and labeling a close second.



Column Column charts are used to compare values from different categories, such as sales from different departments in a store.



Line Line charts are used to show changes over time. An example would be the population size of squirrels over time.



Pie Pie charts are used to show portions making up a whole value. An example would be the percentage of each citation style (MLA, APA, Chicago, etc.) used in all papers.



Bar Bar charts are similar to column charts, and can often be used just according to personal preference. Bar charts are better than column charts in some circumstances for labeling.

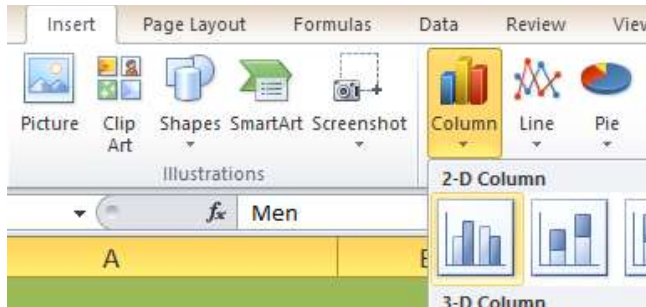


Scatter Scatter plots are used to compare pairs of data that is not in linear order. An example would be showing the eruption durations & wait times of the Old Faithful geyser.

Here is a screenshot tutorial of creating and adjusting a **column** chart in Excel 2010. For these examples, we're comparing median incomes of Men vs. Women sorted by education levels. Here's the sample data, with the parts you want in the chart selected:

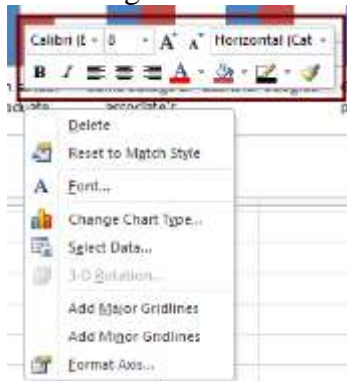
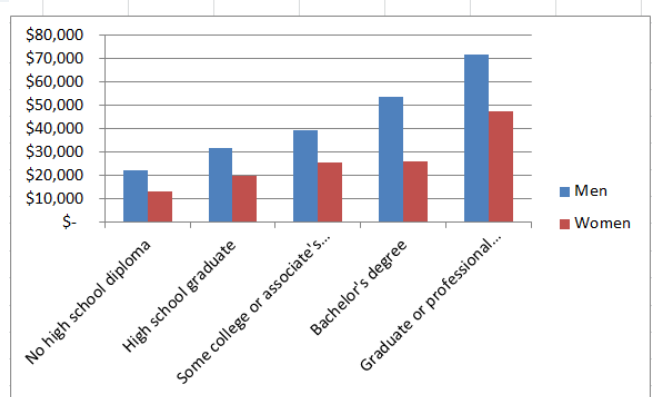
	A	B	C
1			
2	Median Income by Education Level		
3	Education Level	Men	Women
4	No high school diploma	\$ 22,138	\$ 13,076
5	High school graduate	\$ 31,683	\$ 20,179
6	Some college or associate's degree	\$ 39,601	\$ 25,736
7	Bachelor's degree	\$ 53,693	\$ 26,250
8	Graduate or professional degree	\$ 71,918	\$ 47,319

Now with the data selected, click the **'Insert'** tab on the Excel menu bar, then click on the **'Column'** drop-down menu. This displays a variety of styles for column charts, all functionally the same, simply different appearances. For now we'll use the plain old first 2D option.



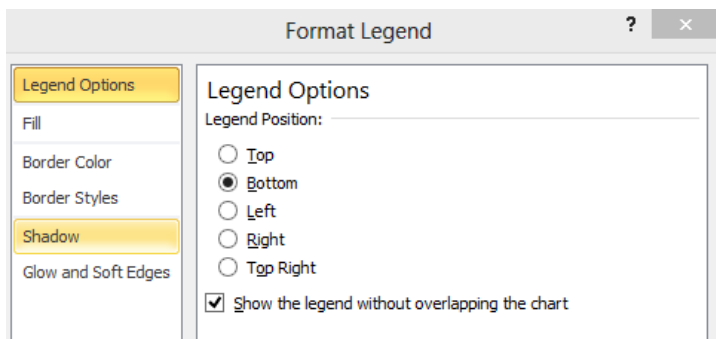
Doing this gives us the following basic chart: While a perfectly functional chart, the layout and appearance aren't that great, so we'll modify it quickly to improve it.

The first thing to change is the data labels on the bottom axis. They are too large and some don't even display fully because of it. To change the formatting of the label text, right-click somewhere on or around that text to see something like the following:

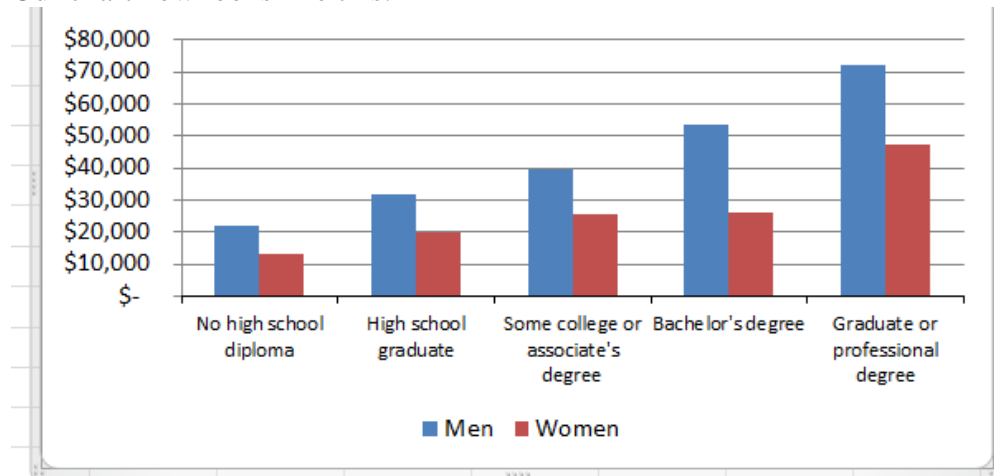


The right-click menu that appears isn't very relevant right now, but the highlighted text control box is. In this shot we've already reduced the font size of the text from 10 to 8, easily improving the readability of the labels and overall look of the chart. You can customize the labels in any way you could customize any text in word, including using WordArt styles, but be careful not to make them hard to read. Usually bolding and changing the font or font-size is all you should need to do.

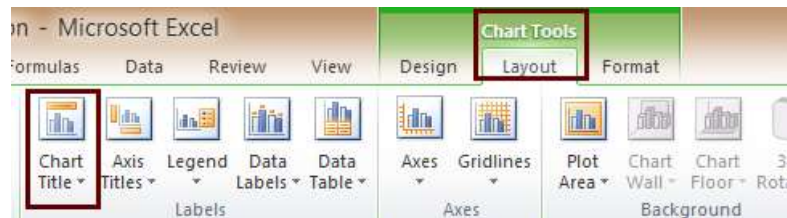
The next step to improve the chart is to move the **Legend** around to reduce the excess white space on the side. To do this, right-click on the legend, and click 'Format Legend'. In the menu that opens, click which part of the chart you want the legend to appear in (we'll use bottom for now).



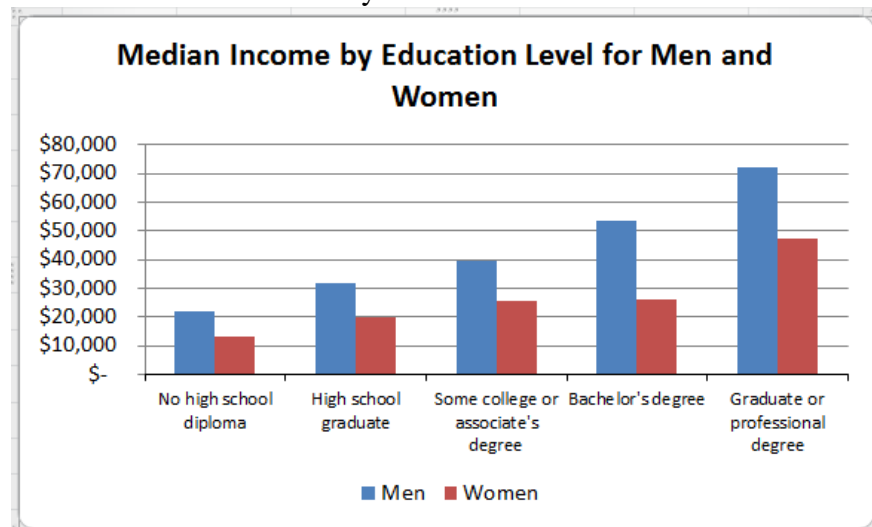
Our chart now looks like this:



Quite a bit better, but still missing a key feature. For any chart type, you are almost always going to want a chart title. Generally, only omit the title if your instructor or boss tells you not to use one. If your chart doesn't have a title space ready to be filled, you can add one by selecting the chart (left-click anywhere on the chart, including the border), then clicking on the 'Layout' tab of the 'Chart Tools' part of the Excel menu bar, then clicking on the 'Chart Title' drop-down menu.



Finally, click on 'Above Chart' to add a title text box above the chart data. Click in this new text box to edit the title appropriately, making sure it's descriptive. As with the data labels, make sure the title is easy to read and doesn't overpower the rest of the chart. There are a lot of other options to customize chart appearances, this only covered the basics. Each chart type can largely be customized the same way and with the same rules.



Customizing Line Charts

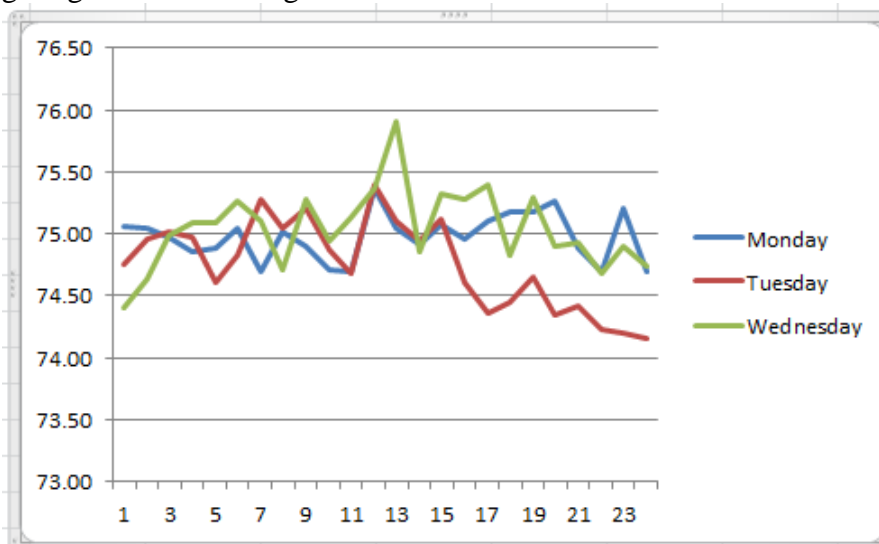
Line charts are typically used to show trends over time, or some other kind of transitional measurement. They are usually a little busier looking than bar charts, and can be modified in a number of ways.

To start with, make sure your data is entered in columns. Multiple data sets each get their own column. The timeline or whatever the X axis is going to be should be in an unlabeled column for the easiest creation of the chart. Here's the sample data for this example:

The left column is 'hours'. However, if we put a column label at the top, Excel will treat it as data and the initial chart will be a mess, so we will add the axis labels ourselves in the chart.

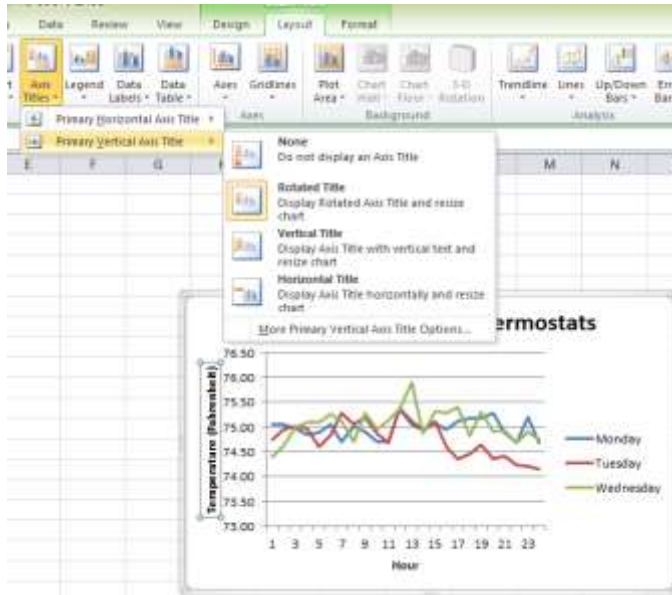
To create a line chart, the process is almost identical to creating a bar chart. Select all the relevant columns, including the column headers and the X axis values, in this case Monday/Tuesday/Wednesday and 1-24, respectively. Then on the Excel toolbar, go to **Insert**, then click **Line Chart**, then click your desired style. We'll just use the first option, giving us the following chart:

	Recorded mean of 4 thermostats		
	Monday	Tuesday	Wednesday
1	75.06	74.75	74.40
2	75.05	74.95	74.63
3	74.97	75.02	74.99
4	74.85	74.97	75.09
5	74.89	74.61	75.09
6	75.05	74.83	75.26
7	74.70	75.28	75.11
8	75.01	75.05	74.71
9	74.90	75.20	75.28
10	74.71	74.87	74.94
11	74.70	74.68	75.13
12	75.36	75.39	75.36
13	75.05	75.11	75.90
14	74.92	74.94	74.86
15	75.07	75.12	75.32
16	74.96	74.61	75.28
17	75.11	74.36	75.40
18	75.18	74.45	74.83
19	75.18	74.65	75.29
20	75.27	74.35	74.90
21	74.89	74.41	74.93
22	74.69	74.23	74.68
23	75.20	74.20	74.90
24	74.69	74.15	74.74



This is some pretty basic, standard data, so the chart is fairly straightforward. We won't need to modify this chart much to get it up to speed, but the options we'll use can be applied more expansively to more complicated data.

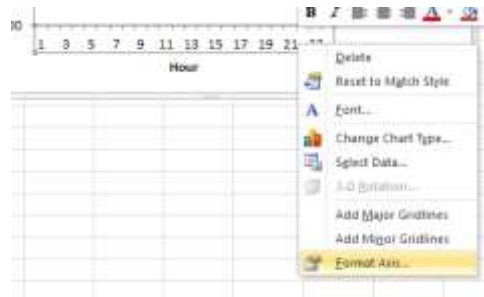
One of the first things to change is to add titles to the X/Y axis, to let the viewer know what those numbers represent. To do this, make sure the chart is selected, and go to **Layout->Axis Titles**. Highlight the axis title you want to add or change. **Horizontal Axis Title** is the title for the X-axis, or Hours in this case, **Vertical Axis Title** is for the Y-axis, or temperature here.



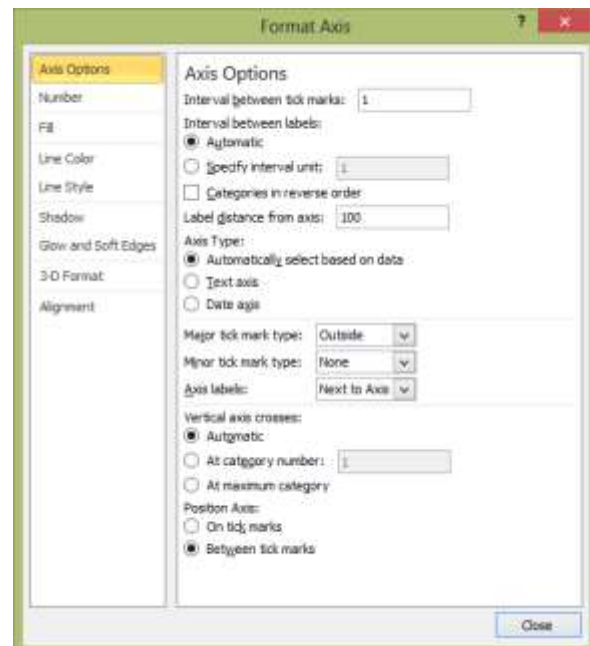
In this picture, we've already added a chart title, and a title to each axis. The **Vertical Axis Title** has a few variations in appearance, in most cases **Rotated Title** is probably fine.

After adding the titles, a lot of charts will be in good shape. We will go through a few options that are useful for different data sets.

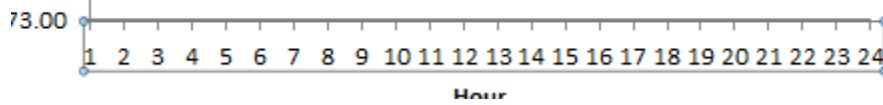
A common thing to change would be the value display on the horizontal axis. In our example, it's showing number labels for every other mark. In some cases, you'll want to display more or less numbers. These can be formatted by clicking on the horizontal numbers, then right-clicking and selecting **Format Axis**.



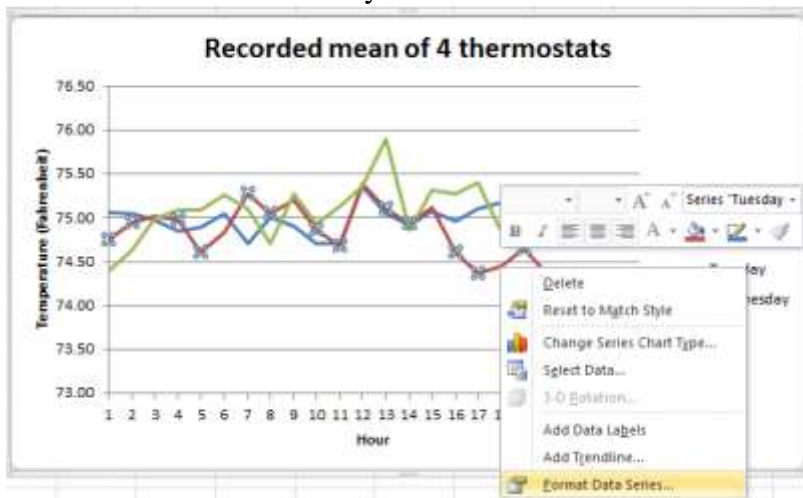
The menu that pops up allows for a great deal of visual options for the axis. Excel charts will automatically change the value labels displayed as the chart is resized. This usually fits in the value labels in an appealing way, but if you want to manually override the automatic settings, the setting to change is **Interval between labels**. If you change it from **Automatic** to **Specify interval unit**, this allows for you to set how many intervals are between each label on the axis. 1 means that every tick on the axis will have a label, 2 means every other tick will, and so on. The chart we made here is displaying an interval unit of 2. Manually changing it to 1 in this case makes the numbers almost impossible to read, because of the sizing. There are some ways to resolve this, for example, when you right-click on the axis bar, a text toolbar also appears, which lets you change the font size. In addition, under the **Format Axis** menu, the **Alignment** settings allow you to rotate the labels, which can allow for a more efficient use of space.



Here is the label with the chart resized to be larger slightly, and the **Position Axis** set to **On tick marks**:



In addition to the labels, there are lots of ways of changing the chart layout and appearance in the big Excel toolbar with the chart selected. However, you can also click on a data line in the chart and format them individually:



This brings up a menu similar to that of the **Format Axis** menu, with options applying to the data set/line. For most users, this won't be used often.

One last formatting option to go over is **Gridlines**.

These can make charts with many data points or covering a long period of time easier to read, but are not always required. The lines going horizontally by default in the chart are **Primary Horizontal Gridlines**, which can be disabled if desired, or you can add **Minor Gridlines**, and you can add vertical gridlines as well. All of these are changed in the Excel toolbar, under **Layout->Gridlines**. This picture shows the addition of vertical **Major Gridlines**:

