Creating an Excel XY (Scatter) Plot

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EXCEL REVIEW
2001-2002

What is an XY or Scatter Plot?

An XY or scatter plot either shows the relationships among the numeric values in several data series *or* plots two groups of numbers as a single series of XY coordinates. It can show uneven intervals or clusters of data and is commonly used for scientific data.

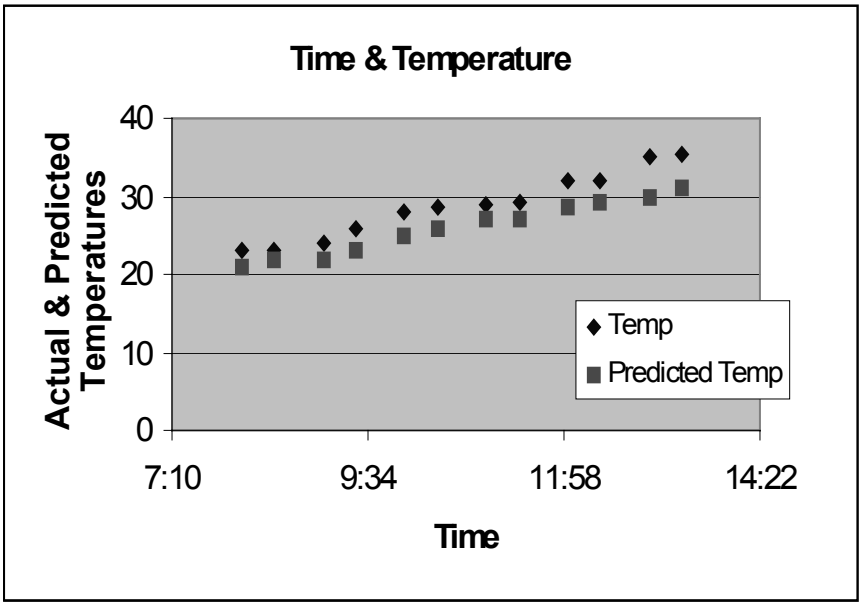
Example of an XY Scatter Plot

The data and plot below are an example of an using an XY or scatter plot to show relationships among several data series. This example shows the relationship between time and two temperature values. Time is the **X** value on the horizontal axis. There are two data series for the **Y** values: Actual temperatures and predicted temperatures.

Time	Temperature	Predicted Temperature
8:01	23	21
8:25	23	22
9:01	24	22
9:25	26	23
10:01	28	25
10:25	28.5	26
11:01	29	27
11:25	29.3	27
12:01	32	28.5
12:25	32	29.2
13:01	35	30
13:25	35.5	31

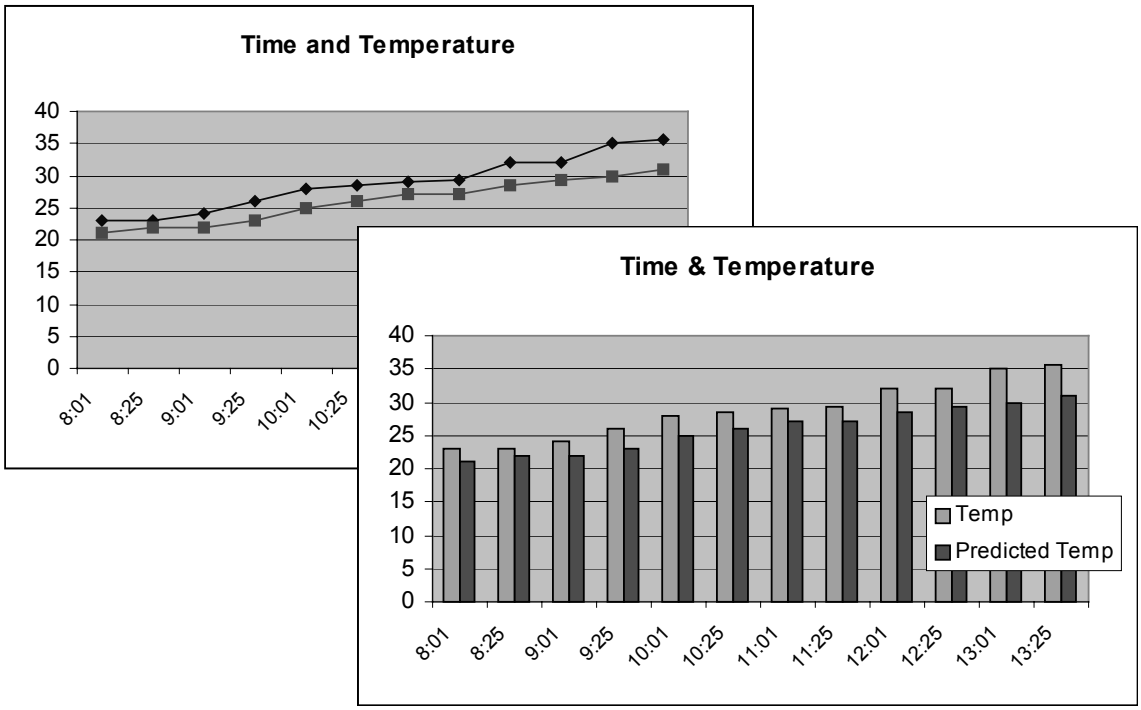
When you arrange the data for a scatter plot, place x values in one row or column and then enter corresponding y values in the adjacent rows or columns.

In the data shown at left, for example, values with the label "Time" are the x-axis values. The "Temp" and "Predicted Temp" values are Y values.



What Happens If You Select the Wrong Chart Type for Your Data

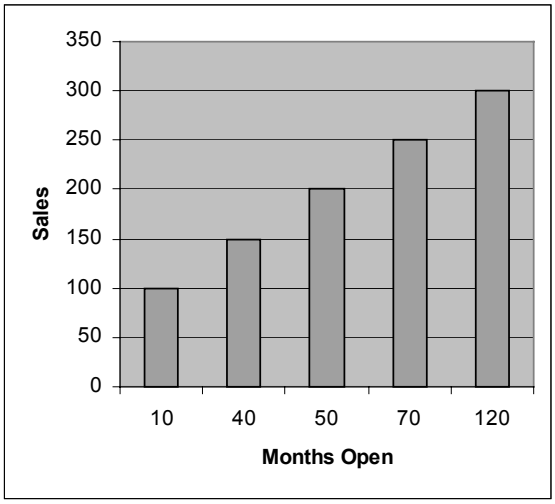
Excel offers many different chart types and in many cases you can substitute one type for another with no loss of meaning. However, the XY scatter plot is a unique type of plot because of the way it treats data. You might select a chart type other than the XY scatter plot for the time and temperature data above. For example, the plots below show the time and temperature data plotted as a line chart and as a column chart. Both produce a chart that *appears* to be meaningful for the time and temperature data but that's because this data happens to include time intervals as the X axis.



There are many data sets, however, where choosing just any chart type will *not* produce a meaningful chart. For example, the next data set we'll consider is one of this type. Let's view the data set and see how *not* to plot the data with a line or column chart type. Then we'll see how to make a meaningful plot of the data with an XY scatter plot.

Months Open	Sales ($ thousands)
10	100
40	150
50	200
70	250
120	300

At left we have data from five retail stores. For each store, we have information about how long the store has been open and its average monthly sales. The task is to create a chart that shows the relationship between length of time open and sales.



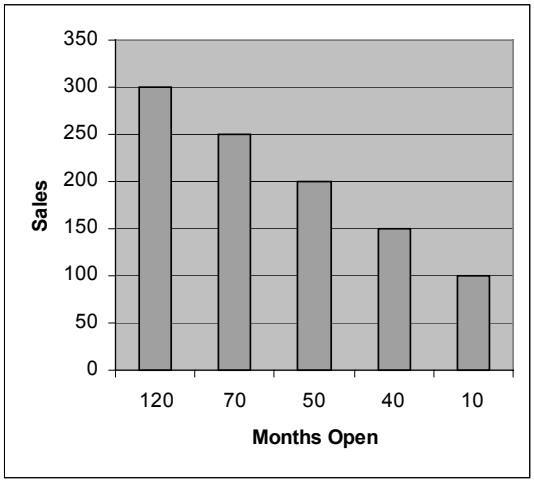
At left is a column chart of the data.

You can see that the scale on the X axis doesn't make sense; the intervals are not equal and shouldn't be.

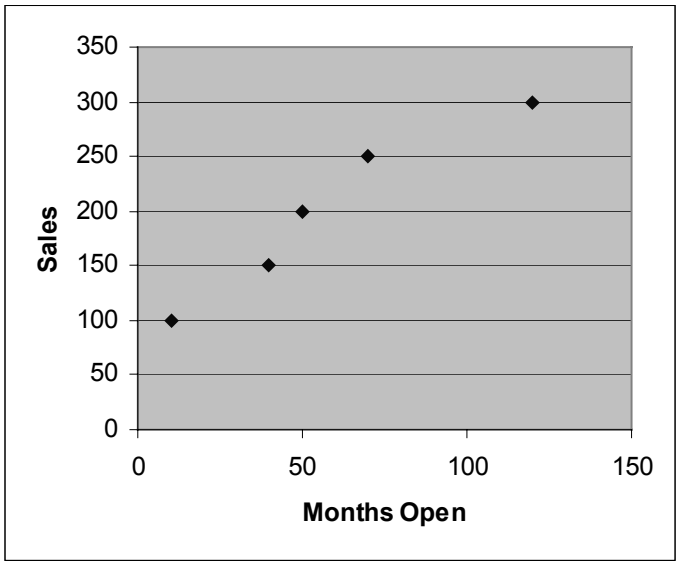
Just glancing at the column chart graph above, you do, at least, get the idea that the relationship is positive, which makes sense. But if you just reverse the order of the data so that the longest-open store is listed first and so on, then you get a graph where at first glance it looks like the relationship is negative! That arrangement would look like the data and chart below.

Months Open	Sales ($ thousands)
120	300
70	250
50	200
40	150
10	100

Data in reverse order.



Reverse data order column chart.



The way to chart this data to get a meaningful result is with the XY scatter plot, as shown at left.

In summary, data suitable for chart types *other than* the XY scatter plot:

- Data that changes over time and that compares items. For example, sales by year or by quarter. For data like this you might use a column or a line chart.
- Comparisons among items, with less emphasis on time. For example, sales by region. Try a bar chart for this kind of data.
- A comparison of each item to the whole. For example, which bicycle brands contribute to total sales. Use a pie chart for this kind of data.

Consider using an XY scatter plot when you have:

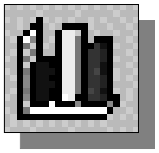
- Data that you want to plot as one series of XY coordinates.
- Data for which you want to see the relationships among numeric values in several data series.
- Data that's in uneven intervals, or clusters.

How to Create a Scatter Plot

In this example we plot two series values in a scatter plot as a single group of **XY** coordinates. To create this scatter plot first arrange the data to plot in rows or columns. In this example, the data is arranged in rows.

X	5000	10000	15000	20000	25000	30000
Y	200000	400000	600000	800000	1000000	1200000

Highlight the data values by dragging over them with the mouse (no need to select the "x" and "y" headers here) and click the ChartWizard button from the standard toolbar. The Chart Wizard opens with **Step 1**.



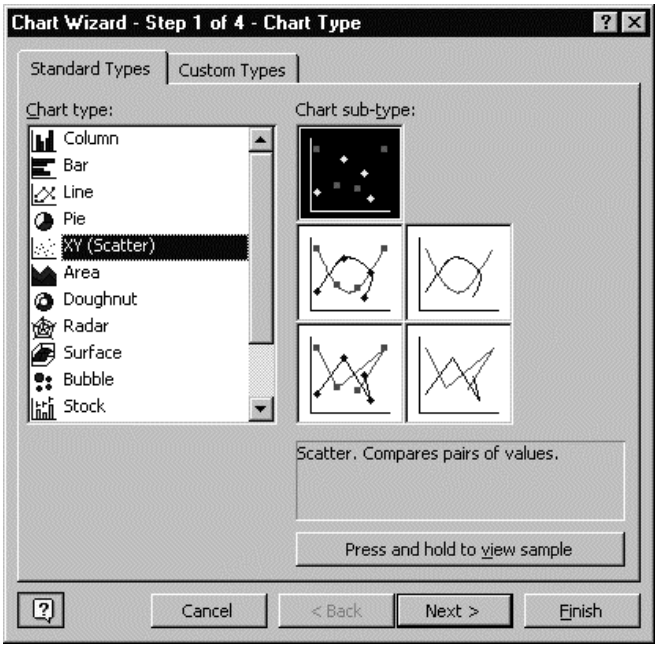
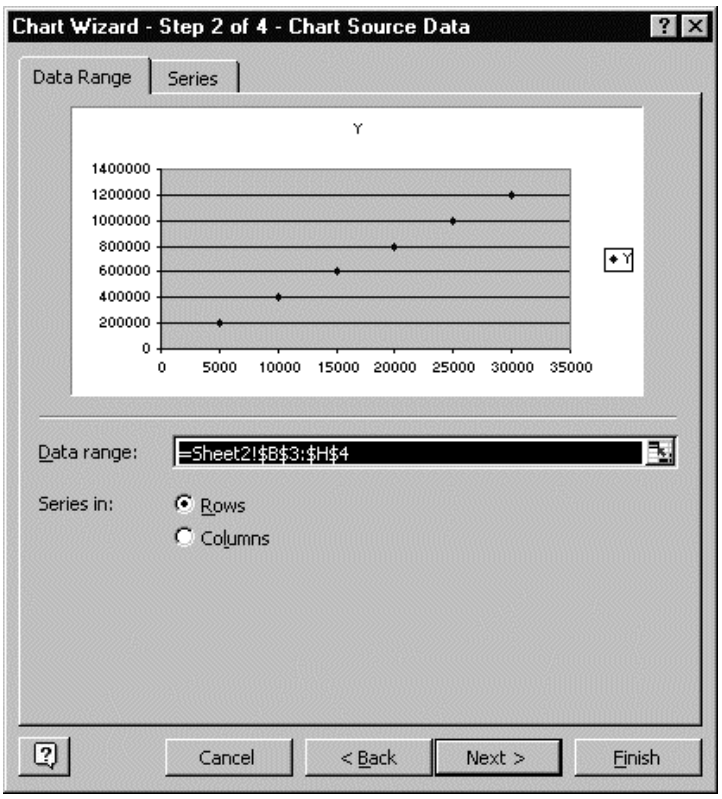


Chart Wizard's **Step 1** lets you select a chart type and sub-type.

Select the **XY (Scatter)** option on the *Standard Types* tab.

Select from any of the chart sub-types. Note that when you select a chart type, Excel displays a short description of the chart.

Click *Next* to continue.

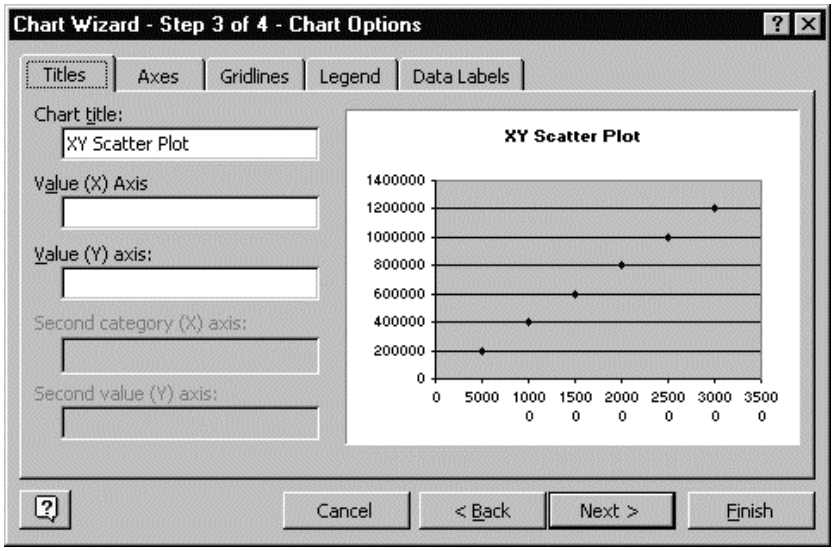


Step 2 asks you to identify the data you want to chart. If you selected the data range *before* starting the Chart Wizard, the correct range will already be filled into the "Data range" text box.

Indicate whether your data series are arranged in rows or columns. The thumbnail sketch of your XY plot will vary depending on what you select here and helping you to make the correct choice.

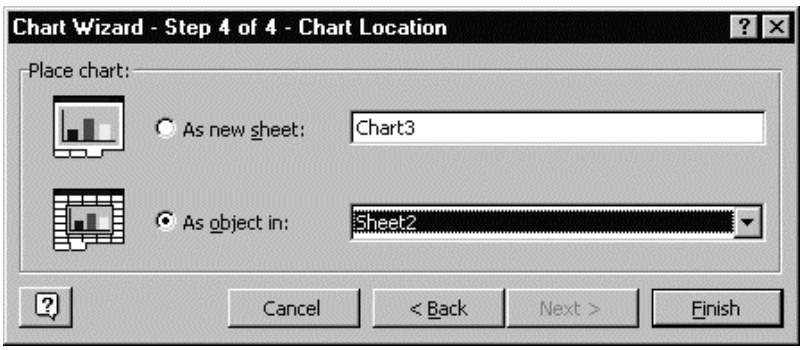
Click *Next*.

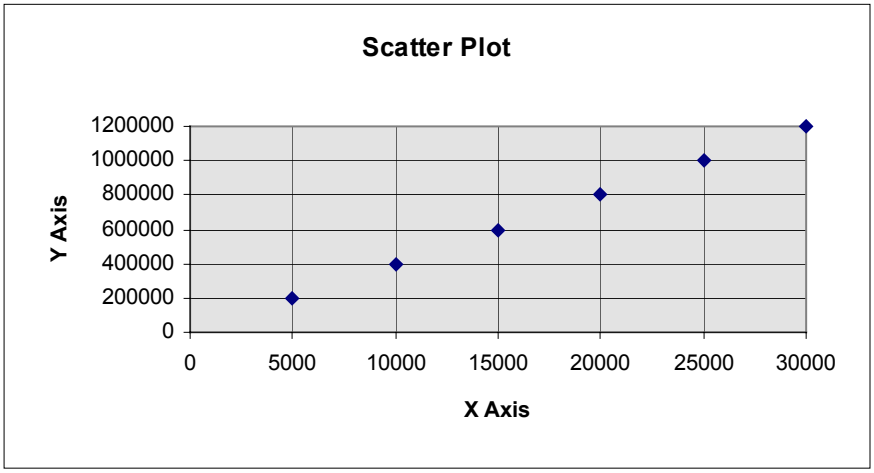
Step 3 displays a 5-tab dialog box that lets you customize your plot. The changes you make on any of the tabs are reflected in the thumbnail sketch.



When you're finished customizing click *Next* to continue.

Step 4 gives you a choice of where the Chart Wizard will create your plot. If you select "As object in:", the Chart Wizard puts your chart in the middle of the current spreadsheet. (However, once it's there you can move and size it as you like.) Click *Finish* to complete the XY plot and have it display on your spreadsheet.





Manipulating the XY Scatter Plot

To move it: Click once to select the chart. Put the mouse pointer (an arrow) inside the chart and hold down the left-hand mouse button. The arrow pointer turns into a four-headed arrow. Drag the chart to a new location.

To size it: Click once to select the chart. Put the mouse pointer on a selection marker (a filled box) in any corner of the chart and drag in or out with the mouse to reduce or increase the chart size.

To edit it: Click any element of the chart to select it. Then right-click with the mouse to see a pop-up menu of edit options.

End