Excel 2010
Charting Tips and Tricks

By

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Charts

Chart Components

When learning about charts it is important to understand that each part of a chart is a separate thing/object with its own controls and formatting. To modify a chart you will commonly have to change many parts of the chart.

Some parts of a chart can be treated as a group or an individual component. Eg a line chart is a group of data points and these can all be changed at once. Each data point on the line has its own controls and formats.

Pointing the mouse at a part of a chart will display a tooltip with the name of that part. See image on right Chart Title tooltip.

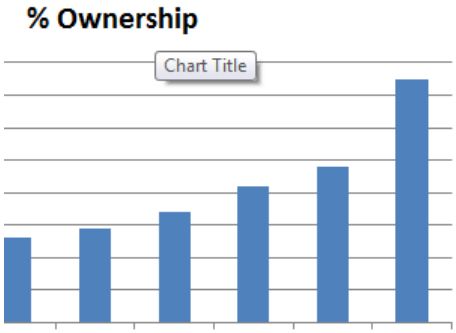


Chart Designs

A well designed chart can convey more information in a glance than minutes spent analysing a series of report tables.

Being visual creatures we can use charts to identify trends and relationships very quickly.

Later in the session we'll review some before and after chart designs that demonstrate some of the tips that we'll cover.

Versions

This session is based on Excel 2010 but most apply to Excel 2007 - the exception is Sparkline charts which are new to Excel 2010. Many of the tips also apply to Excel 2003, but the dialogs are very different as many new options were added to Charts in Excel 2007.

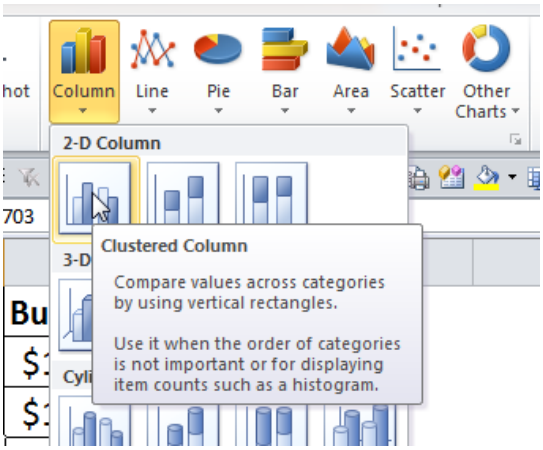
Creating a chart and modifying it.

A table layout is the best structure for your chart data. If your data is spread out then use formula to bring the data together in the table layout. This simplifies the chart creation and maintenance process.

PRACTICE

1. In the Practice sheet click anywhere in the table A1:D7.

2. Click in the Insert tab and click the Column drop down and select a Clustered Column Chart.



3. The chart that is created demonstrates one of the issues you need to address in charting data from existing tables. Charting details and total amounts. This also applies to plotting month and YTD data in the same chart.

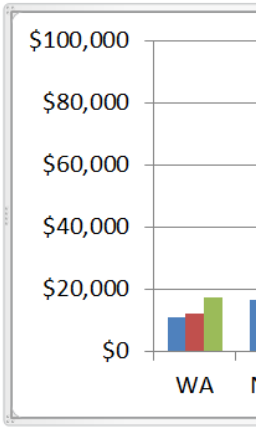
   By including total or YTD values you increase the scale and the detail or month details are harder to compare.

   As a rule you don't plot YTD and Total values on the same chart as month and detail values.

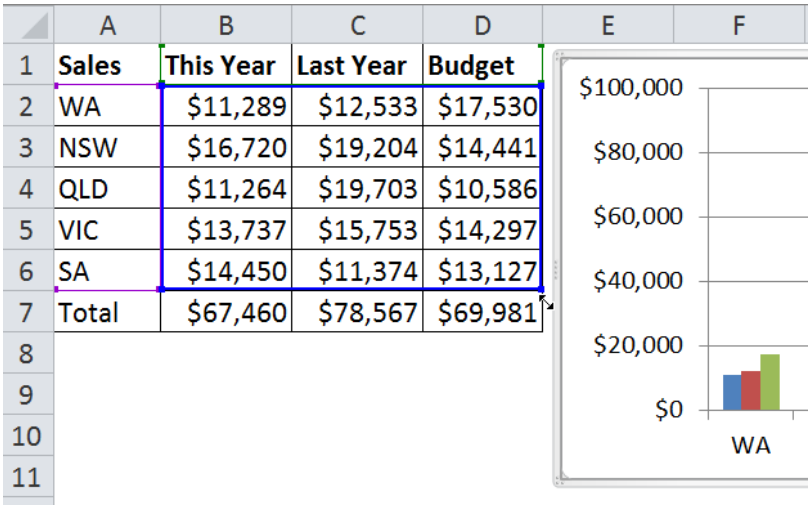
   Note the 3 Ribbon tabs displayed when the chart is selected: Design, Layout and Format.

4. When you select the chart note the colours on the data table. This displays where the data is coming from. It can also be used to amend the data being plotted.

	A	B	C	D
1	**Sales**	**This Year**	**Last Year**	**Budget**
2	WA	$11,289	$12,533	$17,530
3	NSW	$16,720	$19,204	$14,441
4	QLD	$11,264	$19,703	$10,586
5	VIC	$13,737	$15,753	$14,297
6	SA	$14,450	$11,374	$13,127
7	Total	$67,460	$78,567	$69,981
8				
9				
10				
11				
12				



5. Point to the edge of the blue range (note that its gets darker) and click and hold the border of the blue line with the mouse and move it so that is excludes Row 7. See image on next page.



6. This automatically adjusts the scale so that the detail is now displayed better.

7. Hiding a column will hide the values from the chart. Hide Column C and note the difference.

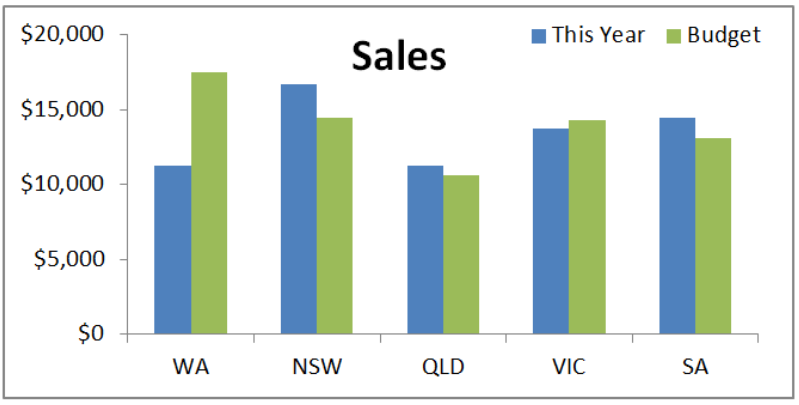
8. You can add a title to the chart and link it to a cell so that it is dynamic.

   With the chart selected click the Layout Ribbon tab and click the Chart Title drop down and choose Centered Overlay Title.

9. With the Title selected click in the Formula Bar and press the equals sign and click cell A1 and press Enter.

10. To remove any component of a chart select it and press the Delete key. Delete the chart Gridlines.

11. Changing the shape of the legend will change how the text is laid out.



12. To create a new chart based on the current chart, drag the chart and then press the Ctrl key and release the mouse. This copies the chart. Then either right click and use Select Data to modify the data range or use the colours on the sheets.

    Create a new chart for the Total figures using the above suggestions.

13. Unhide column C. Right click the red budget data series on the chart. Choose Change Series Chart Type and choose a line chart.

14. Right click the budget Line chart and select Format Data series. Choose Secondary Axis.

    Click the right axis and change the font colour to Red using the Font Color icon on the home Ribbon.

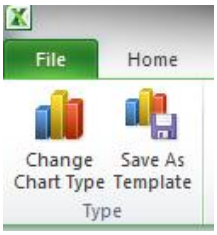
Excel charts are very powerful, but the default chart settings are often not acceptable for presentation. They require editing and formatting to prepare them for presentation. Excel has a Chart Template feature that speeds up this modification process.

Chart Templates

Creating a Chart Template is easy. Once done you can set the Template as the default chart type. To create a Chart Template

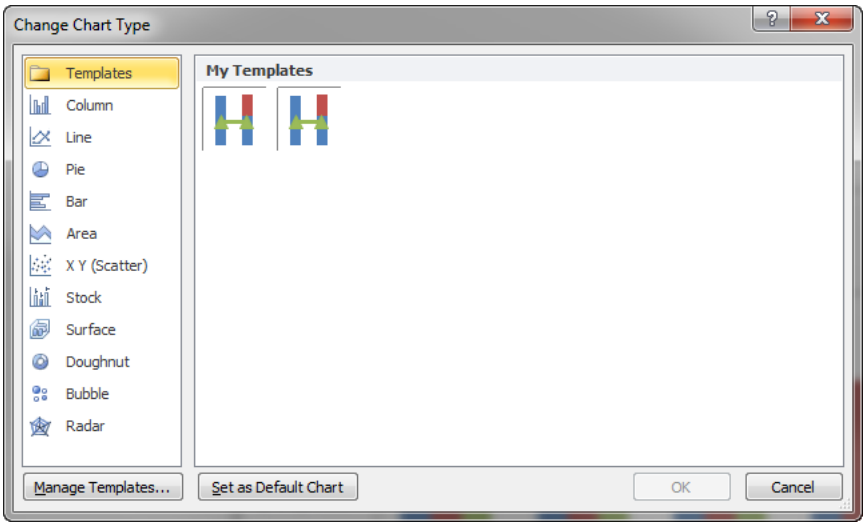
Select a chart that has the structure and format you want to use as the basis for the Template.

1. Click the Design Ribbon Tab and click the Save As Template icon (left side of the Ribbon)



2. Give the Template a name – make it descriptive to make it easier to select in the future. You can overwrite the template if you make changes to it.

To convert an existing chart to a template right click the chart and choose Change Chart Type. Then click Template (top left) and choose the one you need.

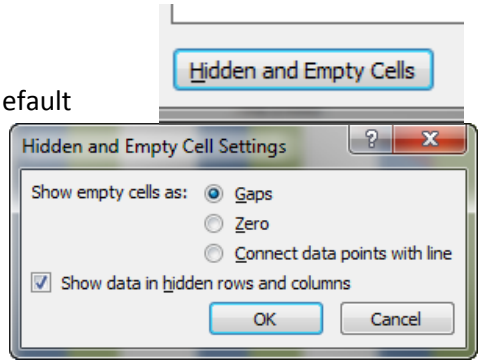


Structural tips

- Use a table layout to hold your chart data, ensure you use relevant labels. Use bold for headings this helps Excel identify them.

- Consider having a separate sheet for your chart data. Bring all the data together into the one sheet.

- If a row or column is hidden it will not display on a chart (default setting), you can use this to display incremental data as the year progresses. Right click the Chart and choose Select Data. Click the Hidden and Empty Cells button and then change options as required.



- Hold the Alt key down whilst moving or re-sizing a chart - this will snap the chart outline to the cell grid - allowing you to perfectly line up or size your charts with the grid.

Quick Formatting tips

- Right-click any chart object to modify it. You can also use the Layout ribbon to select and adjust objects.

- You can use the Fill Colour or the Font Colour tools to quickly change the colour of the selected chart object

- You can use the font size tool to adjust titles, axis and legends

- The F4 key can be used to repeat a format or an action.

- If you have difficulty selecting part of a chart select one part and press the arrow keys to select each part sequentially. The up and down keys select different objects the right and left keys select parts of the object

- Copying a chart and changing the Source Data is an easy way to create similar charts based on different data (If you have the chart Title linked to a cell this will need to be adjusted.)

- You can add data to a Chart by copying the data and clicking on the Chart and pasting

- You can copy a chart and use Paste Special and select Paste format to quickly modify another chart to match the copied one. Warning – this paste may affect the Titles of the chart.

Design suggestions and options

- Avoid 3D charts or 3D effects – they can distort relationships and can literally hide data
- Always start your axis from zero - sometimes Excel doesn't use zero so check your charts when you first create them. Not using zero can distort relationships in bar and column charts. In some cases it is ok to start from a number other than zero for line charts.
- Less is more – rather than adding components to a chart, remove components and see if it impacts the chart's readability
- Keep formatting simple – this is harder now with so many more formatting options
- Use colour for important aspects of the chart. Eg do not use colour on the plot area
- If you have many charts that are comparing the same data types (eg Actual vs Budget) consider having a single legend and have all the charts use the same colour scheme
- Try removing borders to most of the components you'll find it improves the chart
- Delete Chart gridlines
- Turn off sheet gridlines on sheets with Charts (View Ribbon tab Show/Hide section)
- Add labels to the charts if the values are important but don't have too many, consider using a data table
- Use the chart title to describe aspects of the charts if necessary. Make it dynamic by linking it to a cell.
- Sort your data before doing the chart
- Sometimes two or three smaller charts can be better than one large chart
- Pie charts are good for some data but don't use them for too many categories. 5 or less is usually acceptable. Consider using a Bar Chart to show percentages.

Let's examine some examples and see these tips put into practice. The sheets have a hidden chart in the grouping buttons to see before and after.

Dynamic Charts

There are many ways to make a chart dynamic. Some involve using dynamic formula in the chart itself. This tends to be complex and reasonably difficult to follow. To some extent it also hides the source data.

It is better to use tables or formula based reports as the source data for your charts.

Filtered Table based charts

If a row or a column is hidden Excel will not display the value on the chart. We can use data filters to control what is displayed on the chart. (Hiding hidden rows and columns on the chart is an option you can change in Excel 2010)

PRACTICE

1. Open the Table Based sheet.
   The chart's source data is the table defined in A16:B35

2. Applying filters in the Table will vary the chart. Experiment with different filters.

3. Automating the Chart's Title is useful, as is including information in the Title.

   Titles can be linked to cells, which mean you can use Excels text functions to build a dynamic Title.

   When working with filtered tables the SUBTOTAL is invaluable as it is one of only two functions that can calculate based on visible cells. (The other is the AGGREGATE function - new in Excel 2010)

4. In Cell B2 enter the following formula

   =SUBTOTAL(105,Table1[Month])

   The 105 in the function is MIN for visible cells – this formula finds the lowest visible date in the data.

5. In Cell B3 enter the following formula

   =SUBTOTAL(104,Table1[Month])

   The 104 is MAX for visible cells – this formula finds the highest visible date in the data.

6. The SUBTOTAL function can also count how months are visible.

   Enter the following formula in B4

   =SUBTOTAL(103,Table1[Value])

7. Cell A7 creates a Title for the Chart. To link the Title to a cell.
   Click the Title
   Click in the Formula Bar and press =
   Then click the cell A7 and press Enter

   Changing the filter will change the Chart and the Title. Note: not all the filters you apply will work accurately with the automated title.

Rolling 13 month chart

The previous example required changing the filter to change the chart. This next technique is more automated.

We need a 13 month rolling chart based on the latest month data. Columns A:B have a table. We will create a 13 month formula based table that the chart will be based on.

PRACTICE

1. In the Rolling 13 sheet click in Cell D14 and enter the formula to calculate the last date

   =MAX(A:A)

   This assumes no entries below the table and calculates the latest date in the column.

2. To calculate the other months we will use the DATE function. The syntax of the DATE function is

   =DATE(Year,Month,Day)

   There are three functions commonly used with the DATE function YEAR, MONTH and DAY. These extract the measure from a date value. The DATE can be used for many date calculations. See Appendix for other useful DATE function formulas.

3. In cell D13 enter the following formula

   =DATE(YEAR(D14),MONTH(D14)-1,1)

   This calculates the previous month based on the cell below and can be copied up to get a descending sequence of months. MONTH(D14)-1 reduces the month by 1.

4. The last formula is a SUMIF function to extract the value for the month in column D.

   In cell E2 enter

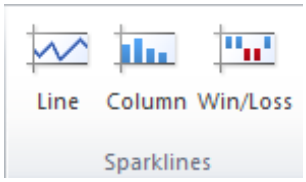
   =SUMIF(A:A,D2,B:B)

   You could have used a VLOOKUP or an INDEX/MATCH but in this case SUMIF is easier. Copy the formula down.

5. Cells G2 and G3 are used to create the Title

Sparkline charts

Sparkline charts are a new feature in Excel 2010. These are small cell-sized charts that are designed for dashboard reports. The chart sits inside a cell and its size changes with the size of the cell both height and width.



To create a Sparkline chart click on the Insert ribbon, there is a new section for Sparklines.

Click on the Sparkline chart you want to use. Excel will then request the range to base the chart on and the cell to put the chart in. You can only chart a single data series on a spark line chart. Being cell based. You can even copy them down.

There are three types of Sparkline charts. A line chart, a column chart and a win loss chart. The first two are useful in many situations. However the win loss chart has limited use. When you have the Sparkline chart selected a Design ribbon is displayed which allows you to change the preferences for the chart.

See the Sparklines sheet in the Chart Examples.xlsx file

You need to be careful in accepting the default settings, as sometimes the column charts do not start at zero and hence the scale between the columns may appear incorrect. The Axis option on the Design Ribbon allows you to modify the default axis setting.

Acknowledgements:

Some of the ideas in this manual are based on the writings of Edward Tufte and Stephen Few. Both authors have written extensively on data visualisation techniques.

Appendix - DATE function examples

The image below shows some useful applications of the DATE function.

	A	B	C	D
1	**Date**	**First day of month**	**Last day of month**	**15th of the Month**
2	23/10/2011	1/10/2011	31/10/2011	15/10/2011
3	Row 2 Formula	=DATE(YEAR(A2),MONTH(A2),1)	=DATE(YEAR(A2),MONTH(A2)+1,0)	=DATE(YEAR(A2),MONTH(A2),15)

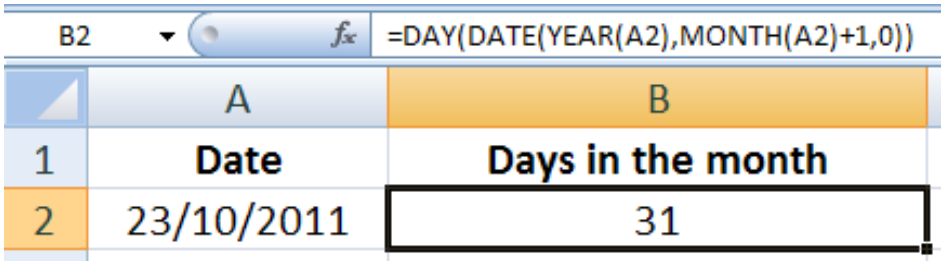
The last day of the month formula shown in cell C2 above is interesting. This technique works by incrementing the month by 1 and then using a zero for the day. Because zero is one less than one, it goes back to the previous day, which is the last day of the previous month. Because you incremented the month by one this gives you the last day of the month.

Formulas to add years and months to a date are shown below.

	A	B	C
1	**Date**	**Add one year to a date**	**Add one month to a date**
2	23/10/2011	23/10/2012	23/11/2011
3	Row 2 formula	=DATE(YEAR(A2)+1,MONTH(A2),DAY(A2))	=DATE(YEAR(A2),MONTH(A2)+1,DAY(A2))

Excel will increment the year as well if the month increment exceeds 12. If you add 13 to a month it will display the next month in the next year.

By slightly modifying the last day of the month formula (first image above - cell C2) you can display the number of days in a month. See image below.



WARNING:

Because there are four different month lengths in our calendar, you need to be careful when adding months or years to dates from the 29th to the 31st of the month. See figure below which shows adding a month to 29/1/11. The date 29/2/11 doesn't exist, so Excel estimates 1/3/11.