Week 4: Toolbox

Keyboard Shortcuts

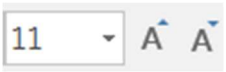
Ctrl+D -- Duplicate a chart

F4 -- Cycle between relative and absolute references

When you are writing a formula, if you have a cell reference selected, such as **D4**, if you press **F4** once you will get the absolute reference **D4**, press it again to get **D$4** (row absolute, column relative), again to get **$D4** (column absolute, row relative), and once more will get you back to the relative reference **D4**.

Ctrl+Shift+> -- Increase the font size of a chart element

This only works on Windows. On Mac you should use the font size tools in the Home tab of the ribbon:



Excel Terminology

COUNTIF and COUNTIFS

The function signatures for the 2 functions are:

COUNTIF(range, criteria)

COUNTIFS(criteria_range1, criteria1, [criteria_range2, criteria2]…)

If you only have 1 criteria that you want to count, these functions are identical. However, you can also use **COUNTIFS** when you have multiple criteria. Other functions that follow this pattern

are **SUMIF/SUMIFS** and **AVERAGEIF/AVERAGEIFS**. We recommend that you always use the **-IFS** versions of these functions.

Criteria Range

This is the range of data that includes the subset which is of interest. For example, the Account Manager range when Connor Betts is the subset of interest.

Relative and Absolute Cell References

A relative cell reference looks like **D4**. This consists of the column letter(s) and row number(s). If you copy this cell reference one column to the right it will change to **E4**. The column letter will increase by 1. Similarly, if you copy it one row down it will change to **D5**. The row number will increase by 1. This is very useful as you can write 1 formula and copy it across or down and have the formula change as you copy it.

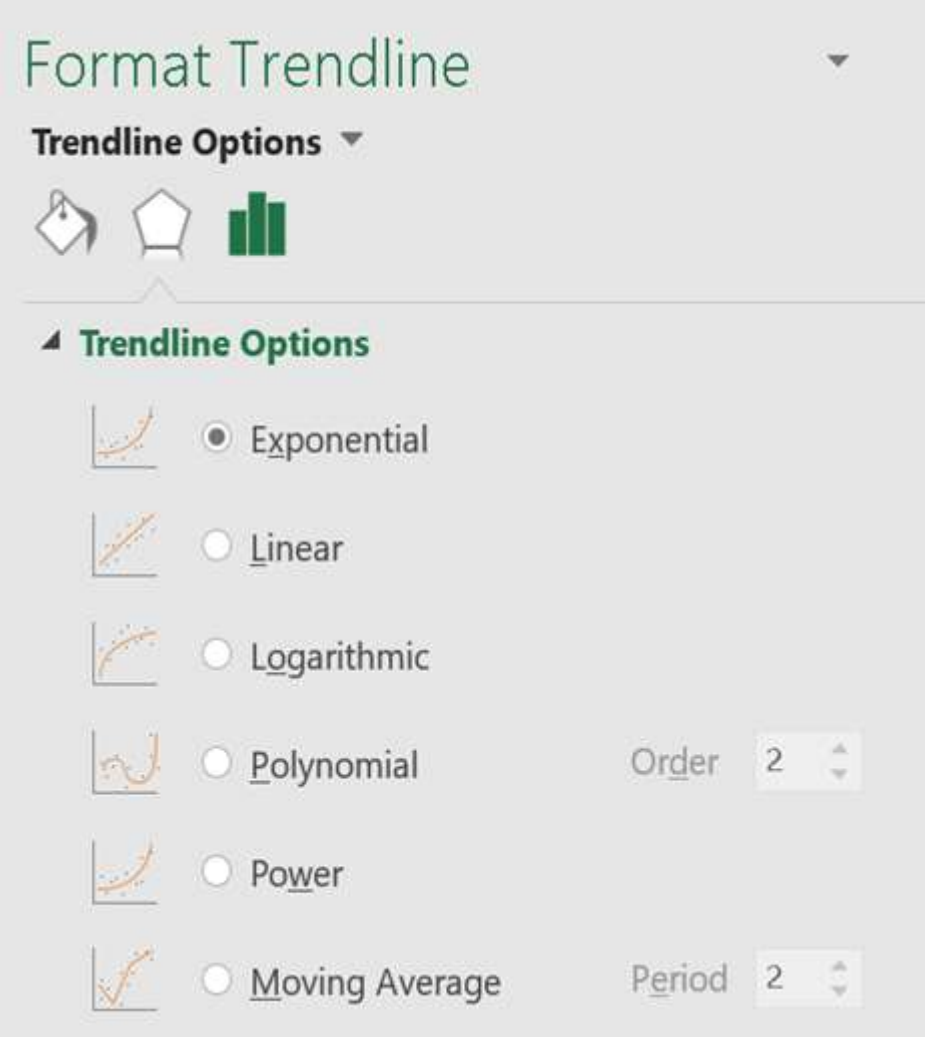
But what happens if you do not want the cell reference to change when you copy the formula? You can change the cell reference to an absolute cell reference by putting dollar signs (**$**) in front of the column letter and row number. So we could change **D4** to **D4**. Now when you copy the formula the cell reference will not change.

You can also have mixed cell references, where either the column or row is “locked” and the other is relative. If you copy **$D4** one column to the right it will not change, but if you copy it one row down it will change to **$D5**. Similarly, **D$4** will not change when copied down rows but will when copied across columns.

https://support.office.com/en-us/article/Switch-between-relative-absolute-and-mixed-references-dfec08cd-ae65-4f56-839e-5f0d8d0baca9?ui=en-US&rs=en-US&ad=US&fromAR=1

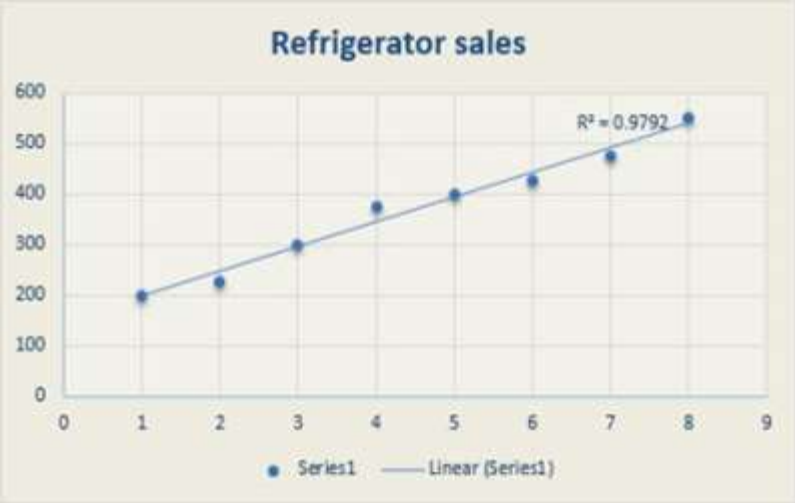
Types of Trendlines

When you add a trendline to a chart it will default to a Linear trendline. However, there are other options:



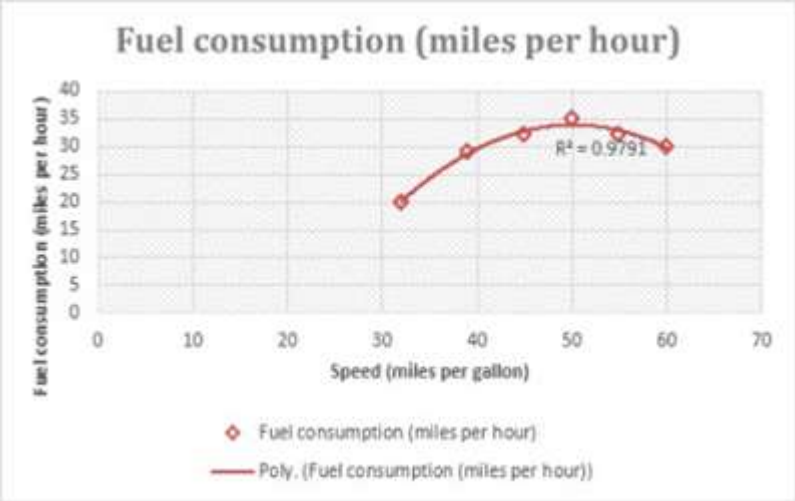
Exponential fits a lot of curved lines. It is ideal when data values rise or fall at constantly increasing rates:

Linear is good for a straight line graph, this shows a constant rate of change:

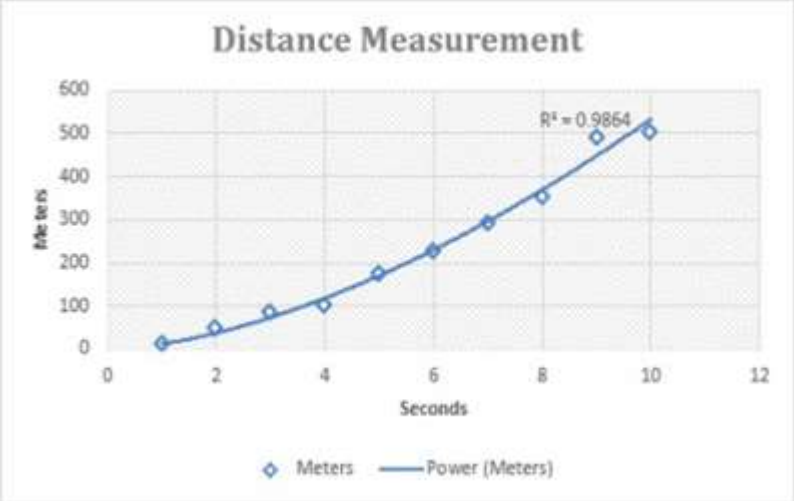


A Logarithmic trendline is useful when the rate of change in the data increases or decreases quickly and then levels out:

Polynomial is good for data that fluctuates, a single peak like this would be an order 2, two peaks would be an order 3, you can go up to order 6.



Power trendlines are good for datasets that compare measurements that increase at a specific rate:

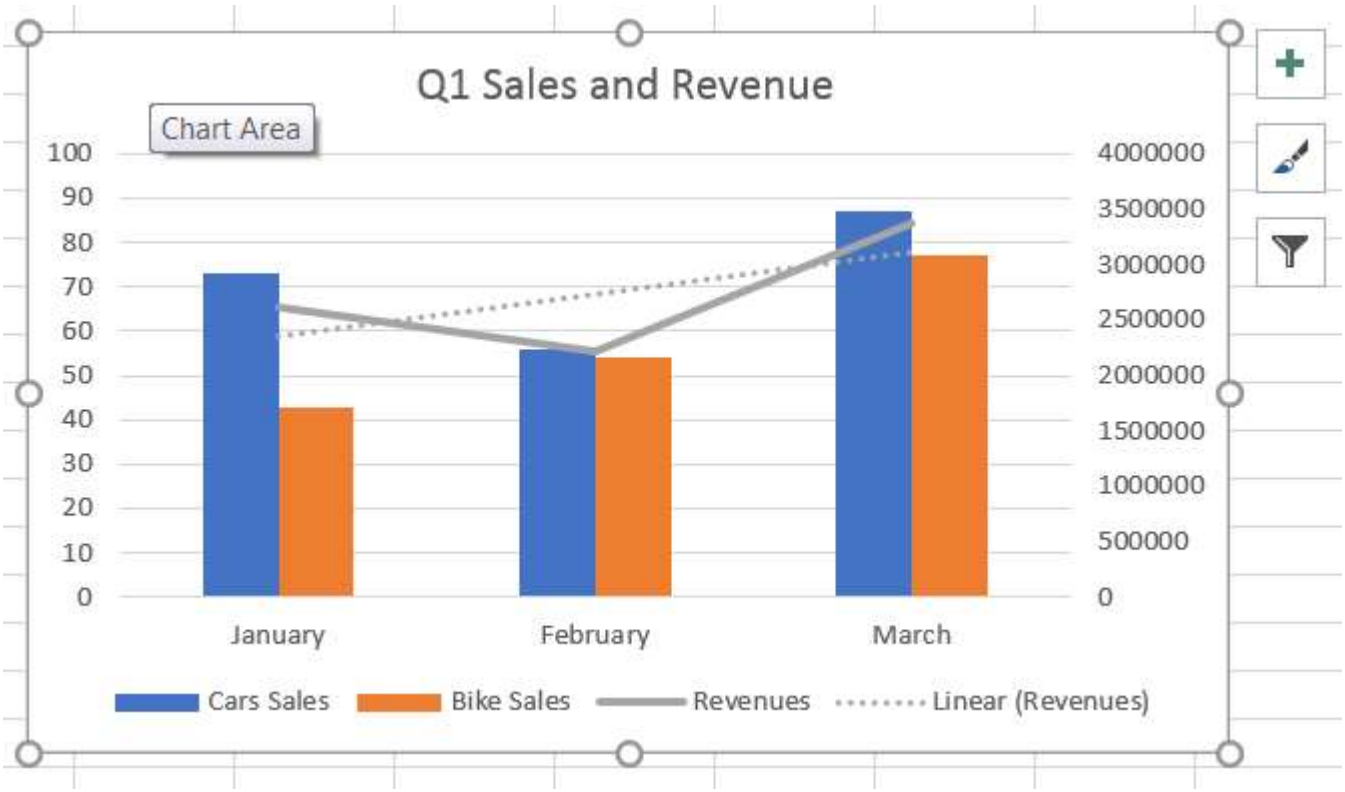


And a moving average is good for evening out fluctuations in the data:

The Elements of a Chart

When you want to drag a chart around a worksheet you might find that you accidentally drag one of the elements within the chart instead. To drag a chart you should put your mouse in the Chart Area. But where is this? The Chart Area is the part of the chart that is not covered by any other elements. If you hover over the chart a tooltip will appear showing you which element you are hovering over.

Some common chart elements are the Chart Area:



Plot Area:

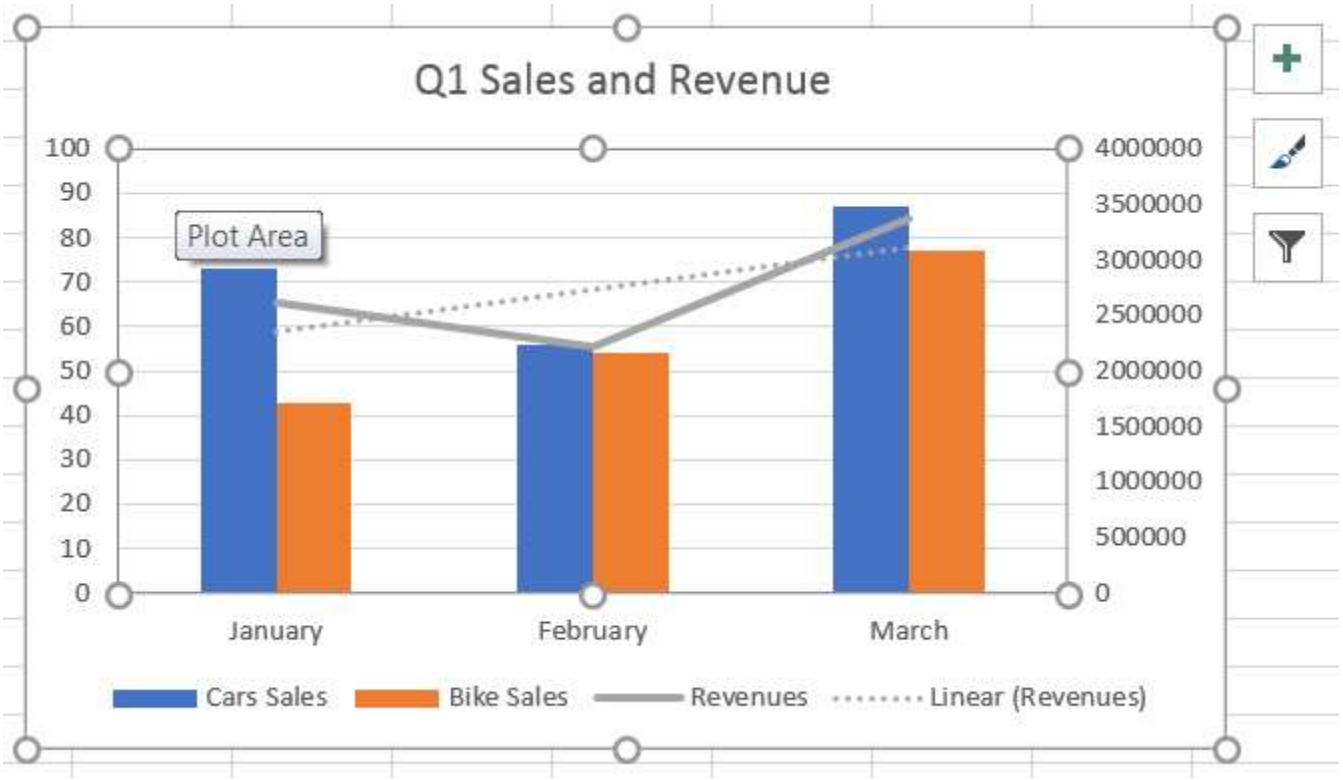
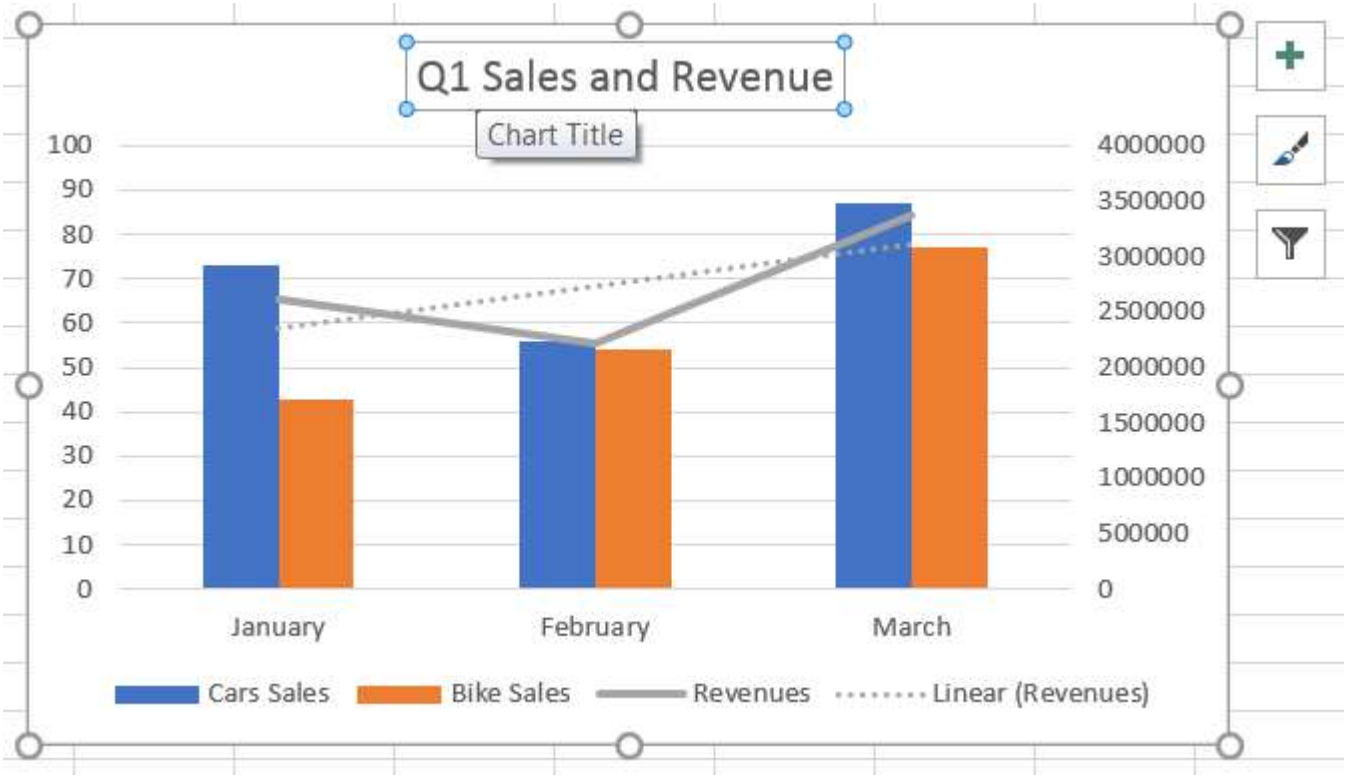
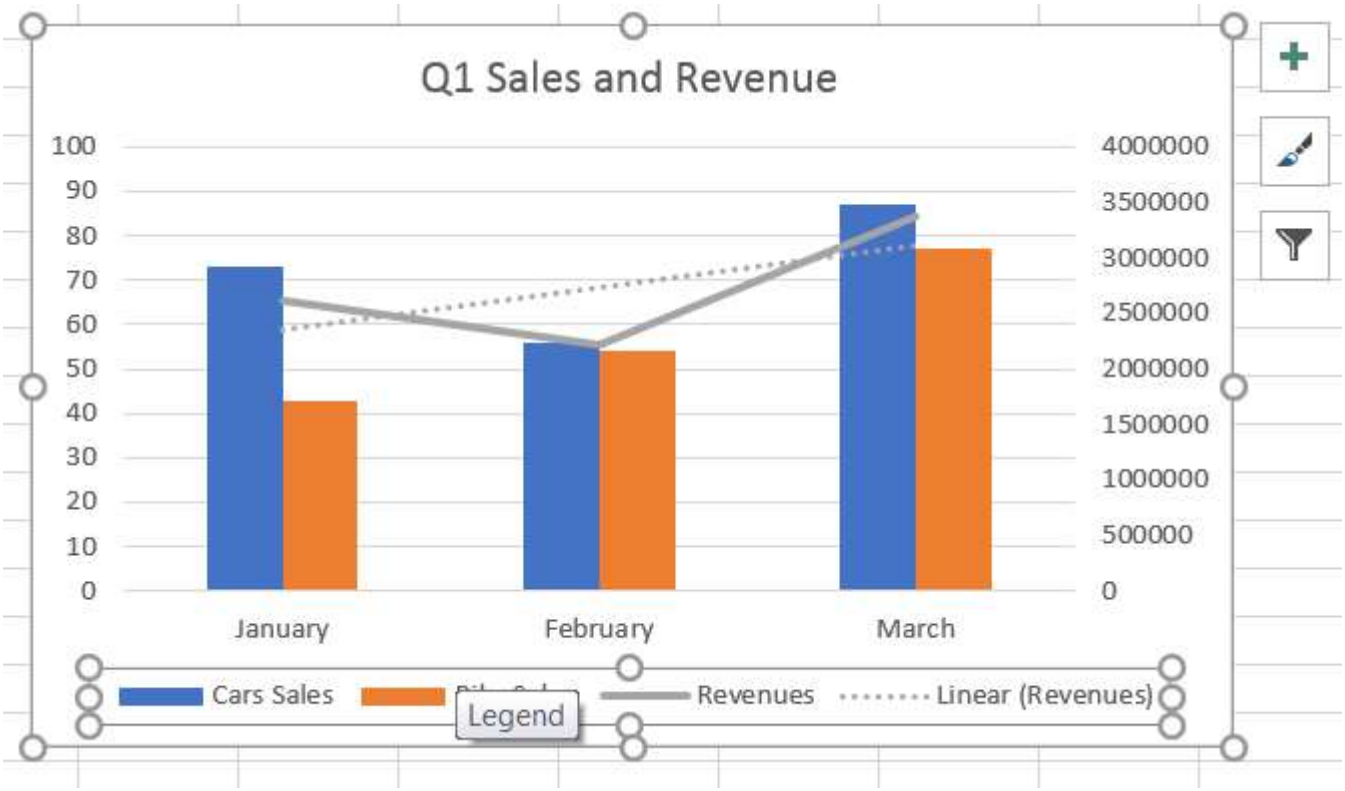


Chart Title:



Legend:



These elements might not appear in the same place as on this chart. You can move these elements around manually or use the Quick Layout tool.

Changing the Scale of a Chart

In the Advanced Charting video, we show how you can change the Axis Bounds of a chart. This has the effect of changing the scale of the chart. You can use this to emphasize a particular feature of the chart or it can mislead the reader into thinking that an effect is more important or dramatic than it actually is. There is no firm rule about this. You should be very careful when presenting any data that you are representing the data faithfully and not just telling the story that you or your audience wants to hear.

Ninja Tip of the Week

Comparison Operators

The criteria in these functions can use different comparisons. The simplest is ***equal to***. You use this when you want to find an exact match between the values in the criteria range and a given value.

For example, **=COUNTIFS(Account_Manager, "Connor Betts")** or **=COUNTIFS(Order_Quantity, 50)**.

Equal to is the comparison operator that Excel will use if you do not specify something else. You can explicitly use the ***equal to*** operator by using, for example, **"=50"**, but you generally do not need to. Notice that you need to use quotation marks when you specify the comparison operator.

The comparison operators for numbers are:

Equal to (=)	=COUNTIFS(Order_Quantity, 50) or =COUNTIFS(Order_Quantity, "=50")
Not equal to (<>)	=COUNTIFS(Order_Quantity, "<>50")
Greater than (>)	=COUNTIFS(Order_Quantity, ">50")
Greater than or equal to (>=)	=COUNTIFS(Order_Quantity, ">=50")
Less than (<)	=COUNTIFS(Order_Quantity, "<50")
Less than or equal to (<=)	=COUNTIFS(Order_Quantity, "<=50")

You can use these comparison operators with dates as well. You should specify the date in your local format, for example **=COUNTIFS(Order_Date,"<2015-01-01")**.

These operators also work when you are comparing text. ***Equal to*** and ***not equal to*** work the way that you would expect. The greater than and less than operators work by comparing the words letter-by-letter. So **"a"<"b"** and **"apple"<"apricot"**. Note that these are case-insensitive: **=COUNTIFS(Product_Container, "Small Box")** and **=COUNTIFS(Product_Container, "small box")** do the same thing.

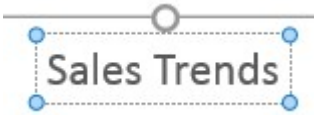
When comparing text there are 2 other operators that you can use: **?** and *****. These are called wildcards and can take the place of a single letter (**?**) or many letters (*****). So ***S?ng*** will match ***Sang***, ***Sing***, ***Song*** and ***Sung*** (as well as nonsense words like ***Sqng***) but it will not match ***Sting***. The asterisk (*****) will match any number of letters. So we could use **=COUNTIFS(Product_Container, "Small *")** and that will count ***Small Box*** and ***Small Pack***.

Using a cell reference in the title of a chart

Just like a regular cell, chart titles can contain fixed values or you can use a formula. However, you can only use very simple formulas that refer to another cell. If you want to use a more complicated formula, you should create that formula in a cell and then reference that cell from the chart title.

Click on the chart title. It is important that the title is only selected, not in edit mode

Notice that the chart title has a solid border around it. If you click inside it to start editing, the border changes to a dashed line



You can press Escape to get out of edit mode.

So we have the title selected. Now, how do we start all formulas? With an '=', so type that, then click on a cell and press Enter to point the chart title to that cell. If you are using the workbook for the Advanced Charting video, use **A37 (Orders by Year and State)** as the cell that contains the title.

On the Mac you will need to select the title, click in the Formula Bar, type '=', then click on the target cell. This also works on Windows, but you have the option not to click on the Formula Bar.