

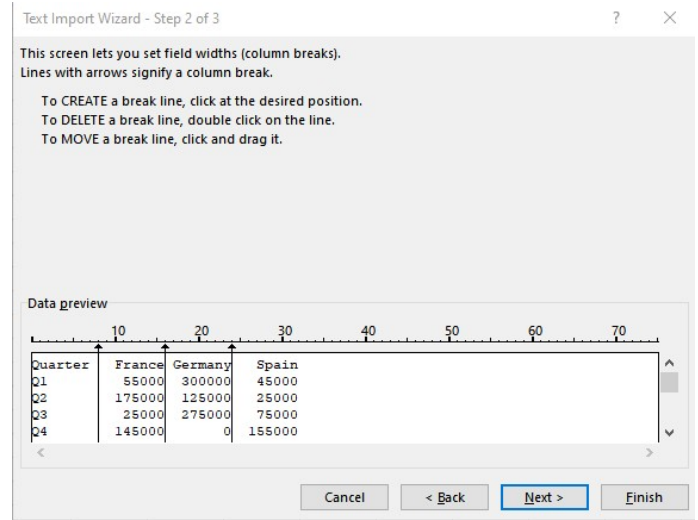
Excel Expert

Session 4 – Data and Displays

Instructor: Don Bremer

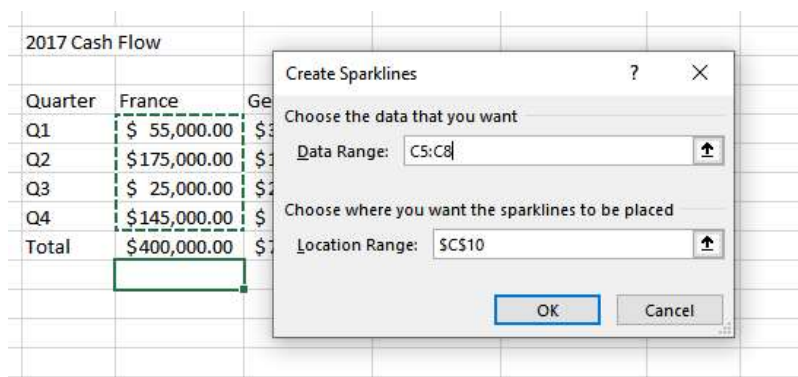
Bringing in fixed width data

1. Open Excel
2. Open the file Cash Flow Summary
3. Make sure to split the columns
4. Add a few rows on top
5. Add a row on the side
6. Add Total Column
7. Add Total Row
8. Title the data and worksheet 2017 Cash Flow
9. Put in Totals
10. Make the digits money



	A	B	C	D	E	F
1						
2		2017 Cash Flow				
3						
4		Quarter	France	Germany	Spain	Total
5		Q1	\$ 55,000.00	\$ 300,000.00	\$ 45,000.00	\$ 400,000.00
6		Q2	\$ 175,000.00	\$ 125,000.00	\$ 25,000.00	\$ 325,000.00
7		Q3	\$ 25,000.00	\$ 275,000.00	\$ 75,000.00	\$ 375,000.00
8		Q4	\$ 145,000.00	\$ -	\$ 155,000.00	\$ 300,000.00
9		Total	\$ 400,000.00	\$ 700,000.00	\$ 300,000.00	\$ 1,400,000.00
10						
11						

You can add sparklines to the totals to see how the company is doing by Quarter or by Country:



You will have to create a new set of sparklines for quarters – but then you can copy all using autofill

Pivot Tables

A PivotTable report is an interactive table that you can use to quickly summarize large amounts of data. You can rotate its rows and columns to see different summaries of the source data, filter the data by displaying different pages, or display the details for areas of interest. You can start a Pivot table by opening the Pivot Table toolbar and clicking on the wizard.

Open Sorting Lists.xls

Independent Variable - a variable (often denoted by x) whose variation does not depend on that of another.

Dependent Variable - a variable (often denoted by y) whose value depends on that of another.

1. Click anywhere in the data
2. Insert->Pivot Table
3. Click OK

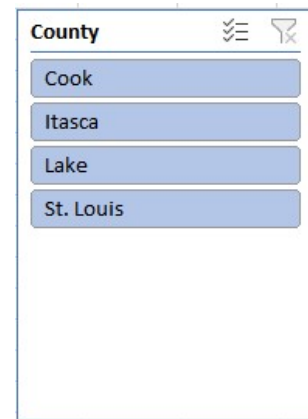
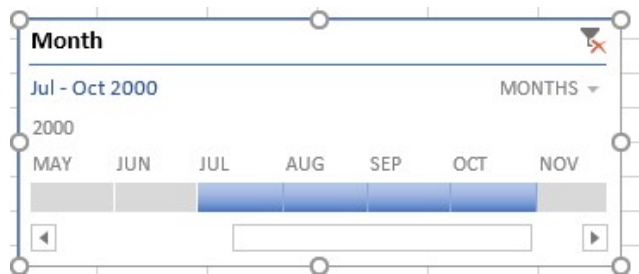
	A	B	C	D	E	F	G
1	Type	(All)					
2							
3	Sum of Quantity	Column Labels					
4	Row Labels	April	May	September	Grand Total		
5	Cook		22000		22000		
6	Itasca	66500	42500		109000		
7	Lake		60000	10600	70600		
8	St. Louis	58500		26500	85000		
9	Grand Total	125000	124500	37100	286600		
10							
11							
12							
13							

Check the data, is it correct? What does this tell you?

Perhaps we should re-arrange the data. Instead of County and Month – try Type and month. Do this just like playing solitaire – drag and drop the fields to the place you want.

Slicers

Applying these kinds of filters to one or two PivotTables is not difficult or time consuming, but if you have to apply the same filter over and over again, the process becomes frustrating and inefficient. To combat this, Excel offers a PivotTable feature called the slicer. A slicer is very similar to a filter field, except that it is independent of any PivotTable. This means that you can apply the same slicer to multiple PivotTables.



Grouping Data together

Most PivotTables have just a few items in the row and column fields, which makes the PivotTable easy to read and analyze. However, it is not unusual to have row or column fields that consist of dozens of items, which makes the PivotTable much more unwieldy. To make a PivotTable with a large number of row or column items easier to work with, you can group the items together. For example, you could group months into quarters, thus reducing the number of items from 12 to 4. Similarly, a PivotTable that lists dozens of countries/regions could group those countries/regions by continent, thus reducing the number of items to four or five, depending on where the countries/regions are located. Finally, if you use a numeric field in the row or column area, you might have hundreds of items, one for each numeric value. You can improve the PivotTable by creating just a few numeric ranges. In Excel, you can group three types of data: numeric, date and time, and text.

Count of Months	Column Labels					
Row Labels	Blue Spruce	Concolor Fir	Frazier Fir	Scotch Pine	White Pine	Grand Total
0-9999	1		2			3
10000-19999	2	3	1	1	1	8
20000-29999	1				1	2
30000-39999					2	2
40000-50000	1					1
Grand Total	5	3	3	1	4	16

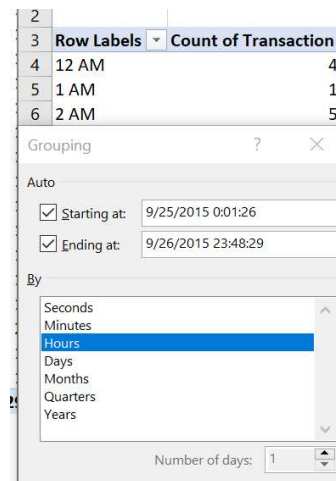
Count of Months	Column Labels					
Row Labels	Blue Spruce	Concolor Fir	Frazier Fir	Scotch Pine	White Pine	Grand Total
0-9999	1		2			3
Apr			1			1
Sep	1		1			2
10000-19999	2	3	1	1	1	8
Apr	1	1		1	1	4
May	1	2	1			4
20000-29999	1				1	2
Apr	1					1
Sep					1	1
30000-39999					2	2
Apr					1	1
May					1	1
40000-50000	1					1
May	1					1
Grand Total	5	3	3	1	4	16

Group Time by Pivot Table

Using the transactions with time worksheet, we can see we have a table of sales data that contains one row for each transaction. The boss wants to see a report that shows how many transactions took place during each hour of the day.

The quickest and easiest solution would be to use the Group feature in a Pivot Table. This solution is also the most limiting because you will only be able to group the times in 1 hour increments.

Row Labels	Count of Transaction
12 AM	4
1 AM	1
2 AM	5
3 AM	1
4 AM	5
5 AM	6



Right-click and group by hours

Reference data in PivotTable

What do you do when you need to include a PivotTable result in a regular worksheet formula? At first, you might be tempted just to include a reference to the appropriate cell in the PivotTable's data area. However, that works only if your PivotTable is static and never changes. In the vast majority of cases, the reference won't remain accurate because the addresses of the PivotTable values change as you pivot, filter, group, and refresh the PivotTable.

Let's use the trees pivot table. We want to find the number of trees purchased by a county during a month.

Sum of Quantity	Months			
County	Apr	May	Sep	Grand Total
Cook		22000		22000
Itasca	66500	42500		109000
Lake		60000	10600	70600
St. Louis	58500		26500	85000
Grand Total	125000	124500	37100	286600

We can set up our equation so that we can put in different values and it will then give us the solution:

	G	H
1	County	Itasca
2	Date	Apr
3	Sales	

The equation in H3 would be:

=GETPIVOTDATA("Quantity",\$A\$6,"Months",H2,"County",H1)

In this case, we would get 66500 trees.

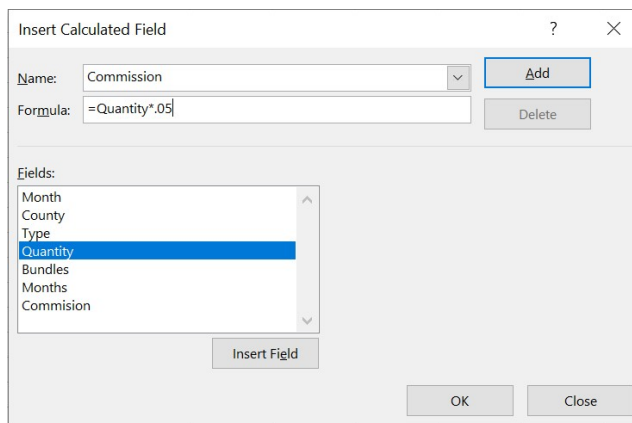
If we changed the county to cook – then we get 0.

Add Calculated fields

By default, Excel uses a Sum function for calculating the data field summaries. Although Sum is the most common summary function used in PivotTables, it's not the only one.

But what if we wanted a field based on a formula? For example, we may get a commission of \$.05 off every tree we sell.

The equation would be: =Quantity * 0.05



And then changing the format to Currency:

Commission	Sum of Quantity	Sum of Commission	Sum of Quantity	Sum of Commission
-	22000	1,100	-	22000
3,325	42500	2,125	-	109000
-	60000	3,000	10600	530
2,925	-	-	26500	70600
6,250	124500	6,225	37100	3,530

Value Field Settings
Source Name: Commission
Custom Name: Sum of Commission
Summarize Values By: Show Values As
Show values as: No Calculation
Base field: Month
Base item:
Number Format
OK
Cancel

Format Cells
Number
Category: General, Number, Currency, Accounting, Date, Time, Percentage, Fraction, Scientific, Text, Special, Custom
Sample: \$3,000
Decimal places: 0
Symbol: \$
Negative numbers: -\$1,234, \$1,234, (\$1,234), (\$1,234)
Currency formats are used for general monetary values. Use Accounting formats to align decimal points in a column.
OK
Cancel

Format Data

This is under the design tab. You can do lots of configurations with this – Totals, Subtotals, etc.

Here is an example of the pivot table with an additional type added to the Rows, and adding a Blank row using the blank Rows button.

Sum of Quantity		Months				Grand Total
County	Type	Apr	May	Jun	Sep	
Cook	Concolor Fir		22000			22000
Cook Total			22000			22000
Itasca	Blue Spruce	22500	42500			65000
	Concolor Fir	13500				13500
	Scotch Pine	15000				15000
	White Pine	15500				15500
Itasca Total		66500	42500			109000
Lake	Blue Spruce		13500		3100	16600
	Frazier Fir		14500		7500	22000
	White Pine		32000			32000
Lake Total			60000		10600	70600
St. Louis	Blue Spruce	15000				15000
	White Pine	37000			26500	63500
St. Louis Total		52000			26500	78500
Carlton	Frazier Fir			0		0
Carlton Total				0		0
Grand Total		118500	124500	0	37100	280100

Drag fields between areas below:

Filters	Columns
	Month
Rows	Values
County	Sum of Quantity
Type	

Pie Charts

These charts represent the parts of a whole. Each 'section' or 'slice of the pie is a data percentage. From biggest to smallest, segments are arranged in a clockwise formation. This way, the pie chart features easy-to-compare subjects presented in a neat, easy-to-understand way.

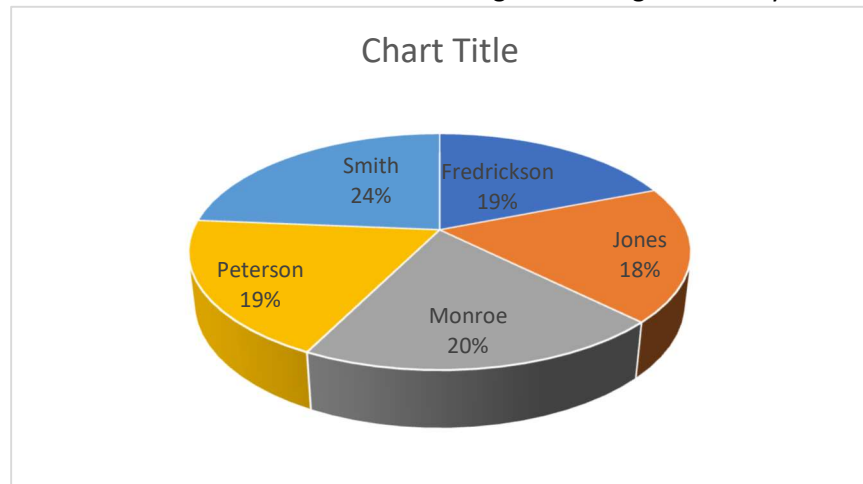
Create your own Pie Chart

- 1.) Open the tab timesheet.
- 2.) Select the names in column B
- 3.) Using your CTRL key, select the gross pay in column E
- 4.) To insert the graph, select insert pie, 2D

Again, not too hard. But, I don't like the color scheme. You can change that using the Gallery's selection on the top of the page.

Also, let's put the series name over the top of the pie pieces to make it easier to read along with their percentages.

OK, again I would call this the minimum acceptable chart. Perhaps we should draw our eyes to Smith since he is getting paid so much more than the rest of us. To do this:



- 1.) Click once on Smith's pie piece. They are now all selected
- 2.) Click again on Smith's pie piece. Now only Smith is selected.
- 3.) Drag Smith's pie piece out
- 4.) Re-color the pie piece to hot pink.

Bar Graphs

The bars' heights are scaled according to their values and the bars can be compared to each other. Bar graphs can be drawn in a 3-dimensional way and compiled for data comparison about the same thing or location. So that more important categories are emphasized, bars in a bar graphs are arranged in order of frequency.

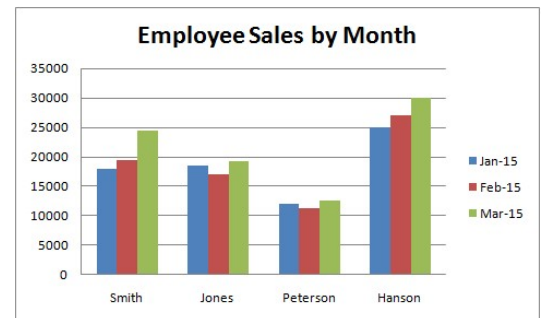


Create your own Bar Graph

In this first exercise, we would like to see the magnitude of sales by date.

- 1.) Open the tab called More Data
- 2.) Select from A2:D6
- 3.) Go to Insert->Insert Column Chart->2D Clustered Column

Boom! We have a chart. That was easy... But, my instructors always said a chart without a title is a graph. Add a chart title by selecting the Chart Layout with a Title on Top. Name the chart "Employee Sales by Month"

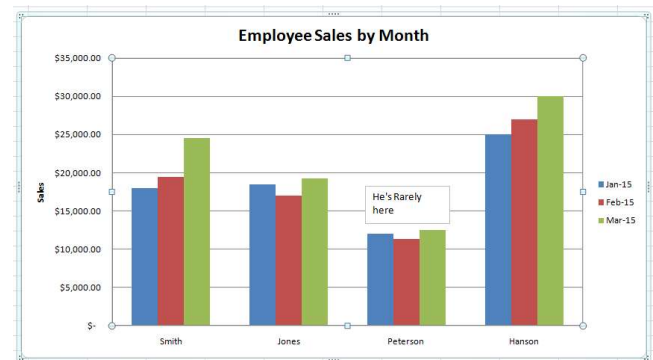


Now, it may be obvious what the y-axis is (money), but perhaps we should label it and use currency.

- 1.) Select the data that makes up the graph
- 2.) Go to the Home tab
- 3.) Select the \$ for money

To add a title on the axis:

- 1.) Select the Chart
- 2.) Select Layout under the Chart
- 3.) Select on Axis Titles
- 4.) Select Vertical
- 5.) Put in "Sales"



Now, this graph is minimal – meaning the minimal we can get away with. Let's make it better. Let's annotate why Peterson's numbers are so low, "He's rarely here"

- 1.) Select the text box under insert
- 2.) Draw out a box to put text
- 3.) Put in the text, "He's Rarely Here"

Line Graphs

Line Graphs are great for showing trends in data. Is the item you are looking at going up or down? Is it staying consistent?

Let's show the stock prices of Apple and Microsoft from Jan 1, 2000 to Jan 1, 2015 (weekly) against the Dow Jones Industrial Average

Open the tab Stocks.

Wow! That's a lot of data. Let's hide everything except the closing data for all items.

- 1.) Select the column that we want to hide (e.g. column B)
- 2.) Right click on the selection giving you a context sensitive menu
- 3.) Select hide

Voilia! Repeat until it looks like this:

Now, to graph, select the date and the Apple close. We will add Microsoft close later in the exercise. Use the CTRL+Shift+Down Arrow to grab everything quickly!

While selected, Insert->Graph->Line 2-D

Wow! That was easy! Let's add Microsoft.

- 1.) Select the chart
- 2.) Go to Chart Tools->Design-> And in the data section, choose Select Data.
- 3.) Click the Add button on the Legend Entries
- 4.) Type Microsoft into the Series name and select the series values

	A	E	N	C
1		Apple	Microsoft	
2	Date	Close	Close	
3	12/29/2014	110.38	46.45	
4	12/22/2014	113.99	47.88	
5	12/15/2014	111.78	47.66	
6	12/8/2014	109.73	46.95	
7	12/1/2014	115	48.42	
8	11/24/2014	118.93	47.81	
9	11/17/2014	116.47	47.98	
10	11/10/2014	114.18	49.58	
11	11/3/2014	109.01	48.68	
12	10/27/2014	108	46.95	
13	10/20/2014	105.22	46.13	
14	10/13/2014	97.67	43.63	
15	10/6/2014	100.73	44.03	
16	9/29/2014	99.62	46.09	
17	9/22/2014	100.75	46.41	

Edit Series

Series name: Microsoft = Microsoft

Series values: =Stock!\$N\$3:\$N\$784 = 1

OK Cancel



Pareto Graph

Many people have heard of this as the “80-20 rule”. That is, that doing 20% of the work can generate 80% of the advantage of doing the entire job. In the idea of quality improvement, we can say that a large majority of the problems (80%) are produced by a few key issues (20%).

Open the File Pareto

- 1.) Sort rows in decreasing order of importance of the causes (i.e., the most important cause first)
- 2.) Sum the numbers together

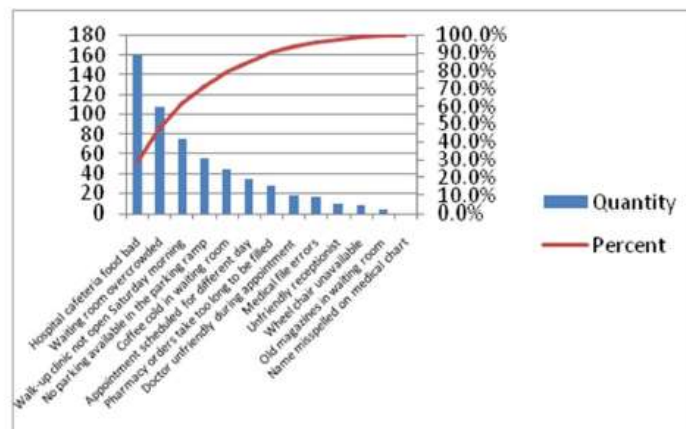
Add a cumulative percentage column to the table

Add a new column to the table and get the percentages of each of the complaints. This is done by taking the quantity of each complaint, dividing it by the total number of complaints, and multiplying by 100.

For example, hospital cafeteria food (bad) has 159 complaints. So $159/557 \times 100 = 28.5\%$

Patient Complaints for the Month	Quantity	Percent
Hospital cafeteria food bad	159	28.5%
Waiting room overcrowded	108	19.4%
Walk-up clinic not open Saturday morning	75	13.5%
No parking available in the parking ramp	56	10.1%
Coffee cold in waiting room	44	7.9%
Appointment scheduled for different day	34	6.1%
Pharmacy orders take too long to be filled	28	5.0%
Doctor unfriendly during appointment	17	3.1%
Medical file errors	16	2.9%
Unfriendly receptionist	9	1.6%
Wheel chair unavailable	8	1.4%
Old magazines in waiting room	3	0.5%
Name misspelled on medical chart	0	0.0%

- 4.) Plot with numbers on the left and cumulative percentages on the secondary y axis.



Save a chart as a template

After you've changed a chart's type and performed other chart-related chores such as applying titles, adding labels, and choosing a layout, you might want to repeat the same settings for another chart. Rather than repeating the procedure to create the second chart, you can make your life easier by saving the original chart as a chart template and then creating the second chart (and any subsequent charts) based on this template. By default, chart templates are stored in the C:\Users\user name\AppData\Roaming\Microsoft\Templates\Charts folder.

To save a chart as a template

1. Right-click the chart's plot area or background, and then click Save as Template.
2. Enter a name for the template, and then click Save.

To create a new chart based on a template

1. Select the range of data you want to chart.
2. On the Insert tab, in the Charts group, click Recommended Charts.
3. Click the All Charts tab, and then click Templates.
4. Click the template you want to use, and then click OK.

To apply a template to a selected chart

1. In the Change Chart Type dialog box, on the All Charts tab, click Templates.
2. Click the template you want to use, and then click OK.

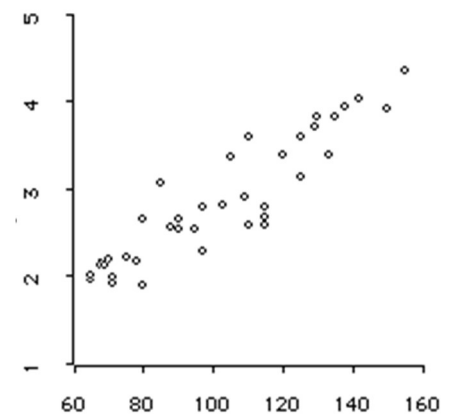
Scatterplot

Scatterplots display paired data using the vertical or the y axis and a horizontal axis or the x axis. The tools for statistics called correlation and regression are then used for showing trends on this type of graph.

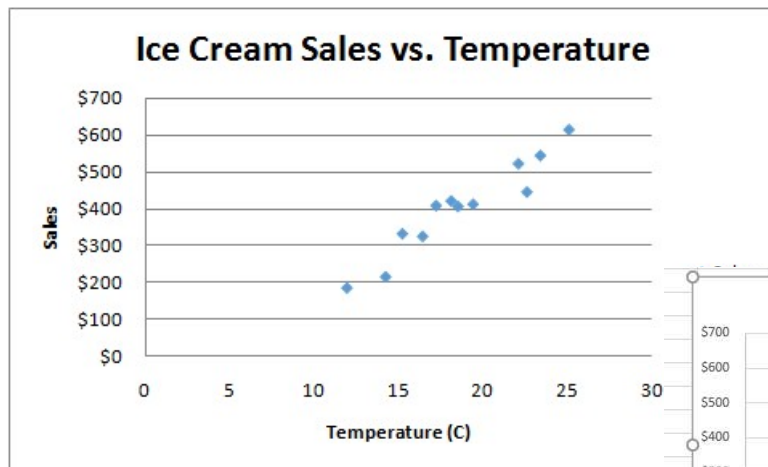
Create your own Scatterplot

Open the file **scatterplot**

1. Select the data from C4:D15
2. Go to Insert->Scatter-> 2D plot
3. Add Titles and Labels
4. Profit!

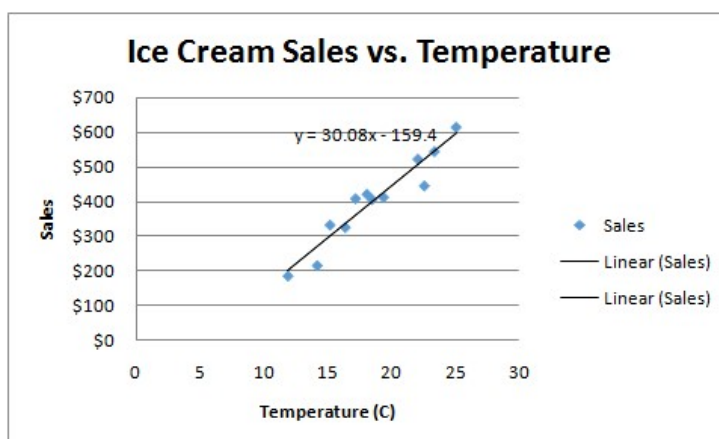
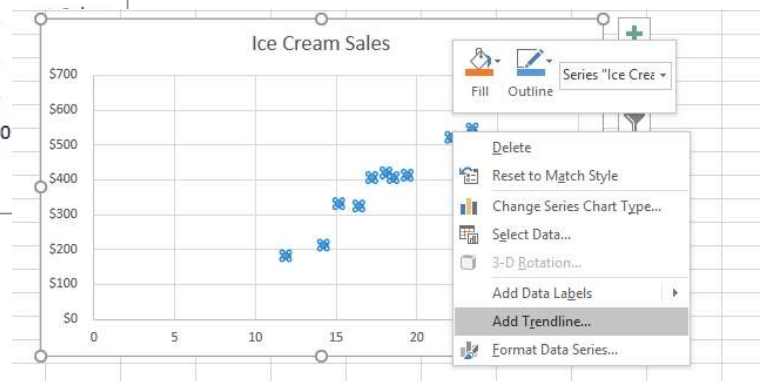


Make sure the x-axis values are on the right of the table. This is default in Excel.



An awesome feature in excel is to get the trendline!

1. Select the chart
2. Select Chart Tools->Layout->Trendline
3. You, as the expert, will have to say what type of trendline the data is representing.
4. I also recommend getting the equation on the chart



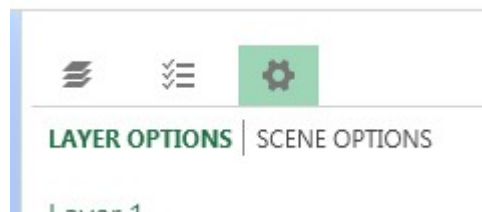
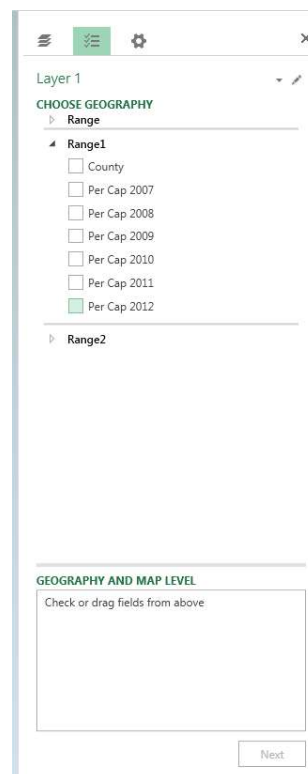
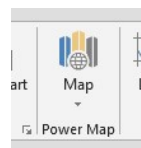
Maps

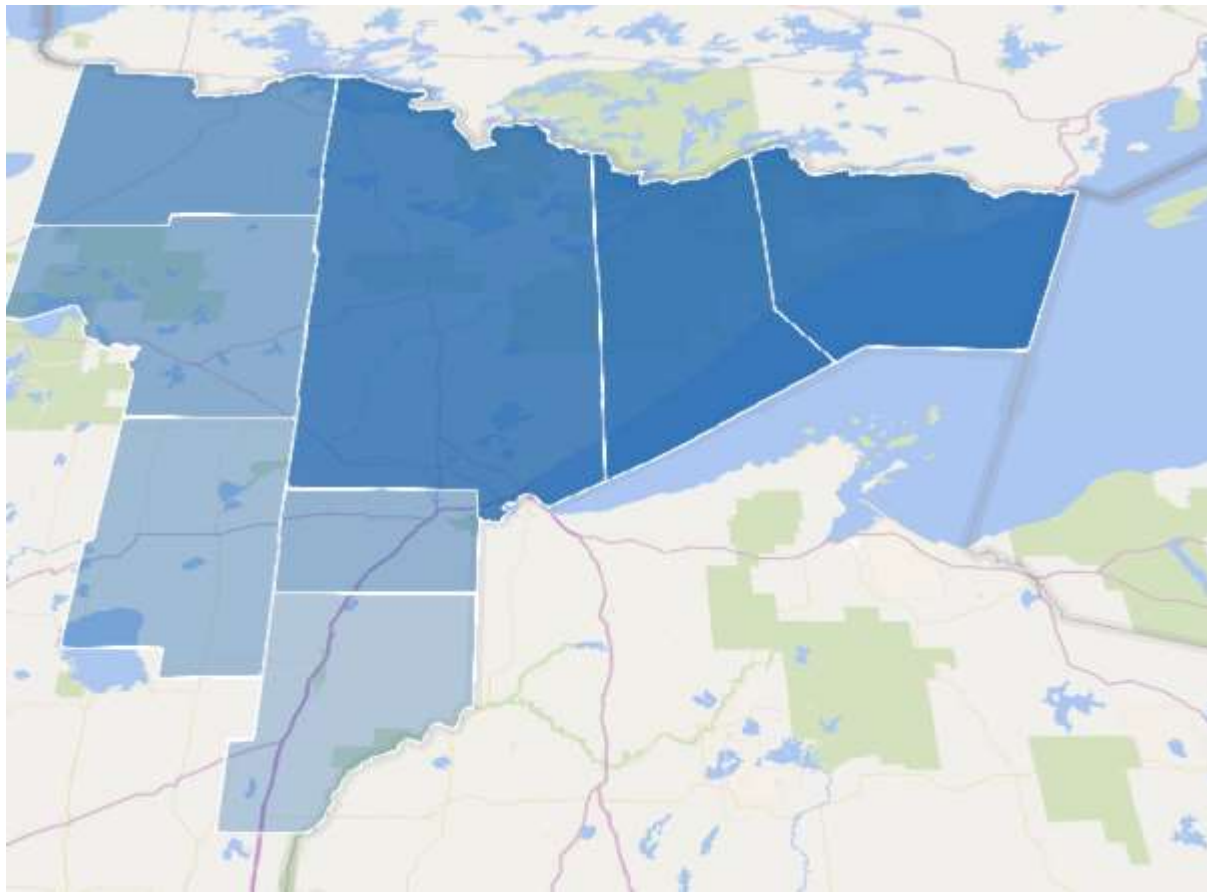
When using Powermap, we have to be very precise in location. The best way for getting precise geographic data is Longitude and Latitude. But, that won't work when we are talking about counties! So, we have to be precise in the counties we are talking about. Did you know there are St. Louis counties in MN and MI? Or Lake counties in MN, IN, IL? So, states are important!

1. Select the data from A1:G9. Notice that the headers of the data were selected.
2. Click Insert->Map->Launch Power Map
3. A new Panel will open saying "Launch Powermap" and at the bottom, there will be a + sign with the label "New Tour"
4. Click "New Tour"
5. A new window opens with the world on it. On the right, a panel shows up that has the headings of our data.
6. Select County
Items appear on the map with County in the Geography and Map Level
7. Click Next
8. Now that the counties are selected, it is time to select the dependent variable to graph. Select Per Cap 2007.
We now have columns of the money on each county. This is great – but not very useful.
9. Above Height on the right, there are different ways to look at the data



- a. Stacked Column
 - b. Clustered Column
 - c. Bubble Graph
 - d. Heat Map
 - e. Visualization by Region—select this
10. Now, each of the counties are colored. They do differ slightly between them, but we may need to increase the amount of contrast. Select the Cog on the top of the panel for Layer Options.
 11. This formatting allows for changes in color and contrast. Change the Color Scale to 25% and zoom in





15 Excel Tips and Tricks

1. CTRL+Y -- Redo
'Nuff Said

2. **Multiple Cells, Same Data**

For some reason, you may have to write the same thing over and over again in cells in a worksheet. That's excruciating. Just click the entire set of cells, either by dragging your cursor, or by holding the Ctrl key as you click each one. Type it on the last cell, then hit Ctrl+Enter—and what you typed goes into each cell selected.

3. **Paste Special with Formulas**

Let's say you've got a huge amount of numbers in decimal format you want to show as percentages. The problem is, that numeral 1 shouldn't be 100%, but that's what Excel gives you if you just click the Percent Style button (or hit Ctrl-Shift-%). You want that 1 to be 1%. So you have to divide it by 100. That's where Paste Special comes in.

First, type 100 in a cell and copy it. Then, select all the numbers you want reformatted, select Paste Special, click the "Divide" radio button, and boom goes the dynamite: you've got numbers converted to percentages. This also works to instantly add, subtract, or multiply numbers, obviously.

4. **Transpose Data from a Row to a Column**

You would use this feature if you want to transpose data to get a better display; however, retyping all data would be the last thing you would need to do if you know how to use the Transpose function in Paste. Here's how: copy the area you want to transpose, move the pointer to another blank location. Go to Home->Paste->Transpose, please note that this function won't activate until you copy the data first.

5. **Save Charts as Templates**

Excel has more types of charts than Jimmy Carter's got teeth and peanuts, but it's almost impossible to find a default chart that is perfect for your presentation. Thankfully, Excel's ability to customize all those graphs is exemplary. But when you have to recreate one? That's a pain. It doesn't have to be. Save your original chart as a template.

Once a chart is perfected, right-click on it. Select Save as Template. Save a file with a CRTX

extension in your default Microsoft Excel Templates folder. Once you do that, applying the template is cake. Select the data you want to chart, go to the Insert tab, click Recommended Charts, and then the All Charts tab, and the Templates folder. In the My Templates box, pick the one to apply, then click OK.

Some elements, like the actual text in the legends and titles, won't translate unless they're part of the data selected. You will get all the font and color selections, embedded graphics, even the series options (like a drop shadow or glow around a chart element).

6. Work With Cells Across Sheets

This one, called 3D Sum, works when you have multiple sheets in a workbook that all have the same basic layout, say quarterly or yearly statements. For example, in cell B3, you always have the dollar amount for the same corresponding week over time.

On a new worksheet in the workbook, go to a cell and type a formula like `=sum('Y1:Y10'!B3)`. That indicates a SUM formula (adding things up) for all the sheets that are titled Y1 to Y10 (so 10 years' worth), and looking at cell B3 in each. The result will be the sum of all 10 years. It's a good way to make a master spreadsheet that refers back to ever-changing data.

7. Hide in Plain Sight

It's easy to hide a row or column—just select the whole thing by clicking the letter or number header, right-click, and select "Hide." (You can unhide by selecting the columns to either side all at once, right-clicking, and selecting "Unhide"). But what if you have just a little section of inconveniently placed data you want to hide, but you still want to be able to work with? Easy. Highlight the cells, right-click, and choose Format Cells. On the Number tab at the top, go to Category and select "Custom." Type three semicolons (;;;) in the Type: field. Click OK. Now the numbers aren't visible, but you can still use them in formulas.

8. Speed up Inputting Complicated Terms with AutoCorrect

If you need to repeat the same value and it is complicated to input, the best way is to use the AutoCorrect function, which will replace your text with the correct text.

9. Status Bar

The status bar is always there but we hardly use it to the full. If you right click on it you can see there hell lot of things which you can check using status bar.

10. Highlight Blank Cells

When you work with large data sheets it's hard to identify the blank cells from it. So the best way is to highlight them by applying a cell color.

Here are the steps to do this.

- First of all, select all the data from the worksheet
- After that, go to Home Tab → Editing → Find & Select → Go To Special.
- click goto special
- From Go To Special dialog box, select Blank and click OK.
- At this point, you have all the blank cell selected and now apply a cell color using font settings.

11. Root of Number

To calculate square root, cube root or any root of a number the best way is to use exponent formula. In exponent formula, you can specify the Nth number for which you want to calculate the root.

=number^(1/n)

For example, if you want to calculate a square root of 625 then the formula will be:

=625^(1/2)