Microsoft Excel 2013 Essentials

Introduction

Microsoft Excel is one of the most widely used programs for organizing information and data using spreadsheets. This is due not only to the ease of learning and use of the program, but also to the wide range of customization options that it offers. For this reason, we aim to become proficient at understanding the basics of this program because many users in the labs are using Excel for their schoolwork. With a strong knowledge of the most commonly used elements, we can efficiently help users with a majority of their questions.
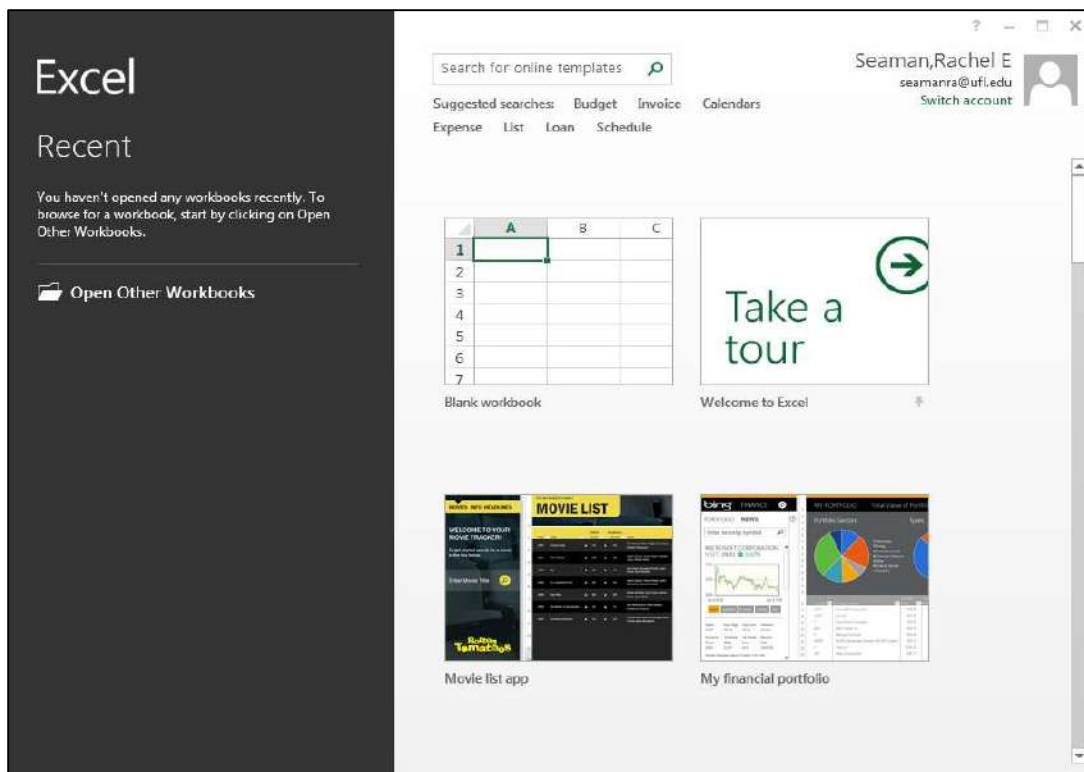
Objectives

1) Become familiar with the basic interface of Excel 2013
2) Learn to create, edit and delete worksheets
3) Format/modify tables (basic and advanced)
4) Use formulas
5) Understanding Referencing
6) Create graphs and charts
7) Use pivot tables and pivot charts

Navigating the Interface

In this section, we will become familiar with the ribbon menu and the Backstage View in Excel 2013. These menus are what you will use to navigate your way to the different tools that we are going to use.
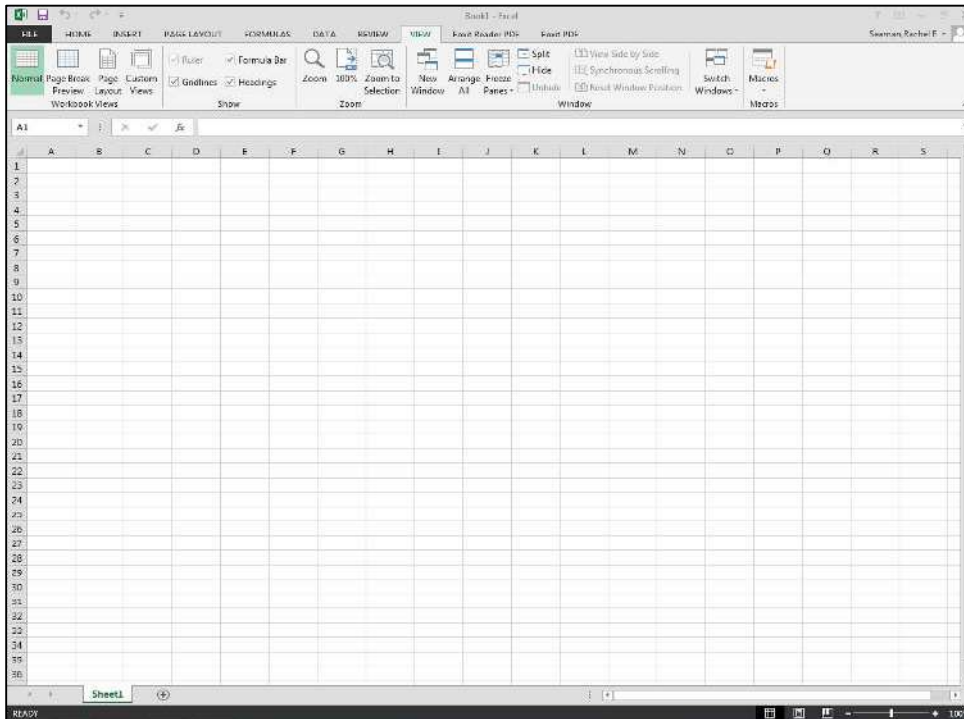
1. First, open Excel 2013 from the start menu.

    The "Recent" window will be the first thing to open. You can open up a new spreadsheet or another spreadsheet you had previously been working on. Your screen will look like this:

For the purposes of this lesson plan, go ahead and click on the "Blank workbook" icon. Then your screen should look like this.

Now we will introduce the features and functions of the ribbon. The ribbon is the long, horizontal strip of menus and buttons at the top of the screen. This is where all of your tools are located that allow you to edit your spreadsheet.

2. Click on the "HOME" tab. This tab contains all of your basic formatting functions that allow you to edit cells and the appearance of the information they contain.

3. Click on the "INSERT" tab. This tab allows you to place objects and images into your spreadsheet to supplement your data

4. Click on the "PAGE LAYOUT" tab. This tab contains all of the tools that allow you to edit the actual page characteristics of the spreadsheet and decide how it will look when it is exported to another format or printed. Here is where you can also decide which information to include for printing.

5. Click on the "FORMULAS" tab. This tab allows you to create, edit and automate formulas in your spreadsheet.

6. Click on the "DATA" tab. This tab allows you to import data from other sources as well as manage the data in your spreadsheet.

7. Click on the "REVIEW" tab. This tab allows you to check your document for errors, and it also contains tools for editing, collaborating and protecting your information.

8. Click on the "VIEW" tab. This tab allows you to change the views not only of the spreadsheet you are currently working on, but also the actual orientation of the program window in case you are working with multiple files.

Now that we have gone over the basic elements of the ribbon, we are going to talk about the File tab and Backstage View. In the file tab you will find some of the options that were available under the Office Button menu in Excel 2010 as well as some new options.

9. Click on the "FILE" tab at the top left corner of the screen.

10. The program will switch to Backstage View, which looks like this:
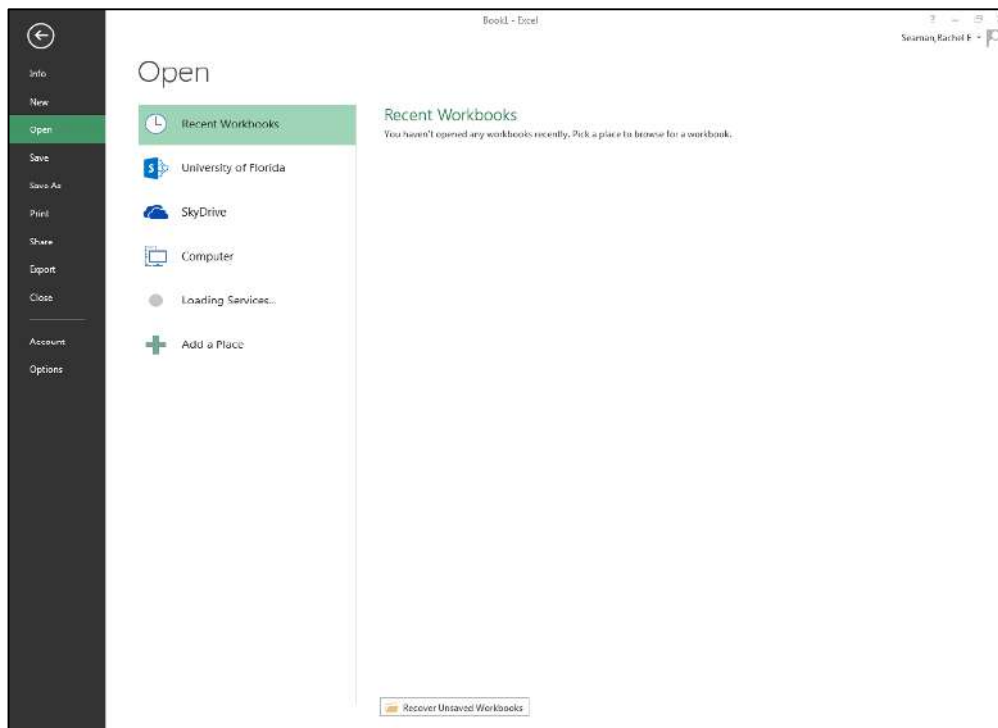

You will notice that there are many different options available to choose from, they might look familiar if you have ever used an earlier version of Excel or another Office program.

- **"Info"** *-* allows you to protect your workbook, inspect your workbook for issues, manage the version of your workbook, edit browser view options if sharing on the web, and look at your workbook's properties.
- **"New"** *-* allows you to create a new workbook, either a blank workbook, a template provided on the computer's software, or an online template.
- **"Open"** *-* will allow you to search for a file that was either recently opened or used, on the UF Team Site, on your SkyDrive, or on the Computer's drive.
- **"Save"** *-* will allow you to save the latest changes made to your workbook in the same location and under the same file name that it was last saved. If this is the first time saving this file, Excel will prompt you to choose a name and a location for your file.
- **"Save As"** *-* allows you not only to be specific about the file name and location, but also presents several other options for saving in different formats.
- **"Print"** *-* will show you a list of printing options as well as a print preview in the same area. This view should be very similar to you if you used Office 2010.
- **"Share"** *-* will give you two options to share your workbook. You can share your document either through SkyDrive or through e-mail as an attachment (PDF or XPS), a link to a shared location, or through Internet fax.
- **"Export"** *-* allows you to either create a PDF or XPS document, or change the file type of the workbook. You can change the workbook's file type to an Excel 97-2003 workbook, an OpenDocument Spreadsheet (for Open Office), an Excel template, a Macro-Enabled workbook, a Binary workbook, a text file (tab delimited, .txt), a CSV file(comma-delimited, .csv), or a formatted text file (space-delimited, .prn).
- To access even more file types, double-click on **"Save as Another File Type"**
- **"Close"** *-* will close your document without closing the program. If you have made changes, it will prompt you to save those changes.
- **"Account"** *-* will show your user information and product information. Underneath "user information" there is the option to change your Office Background & theme.

- **"Options"** - will bring up an entirely new dialog box that looks like this:
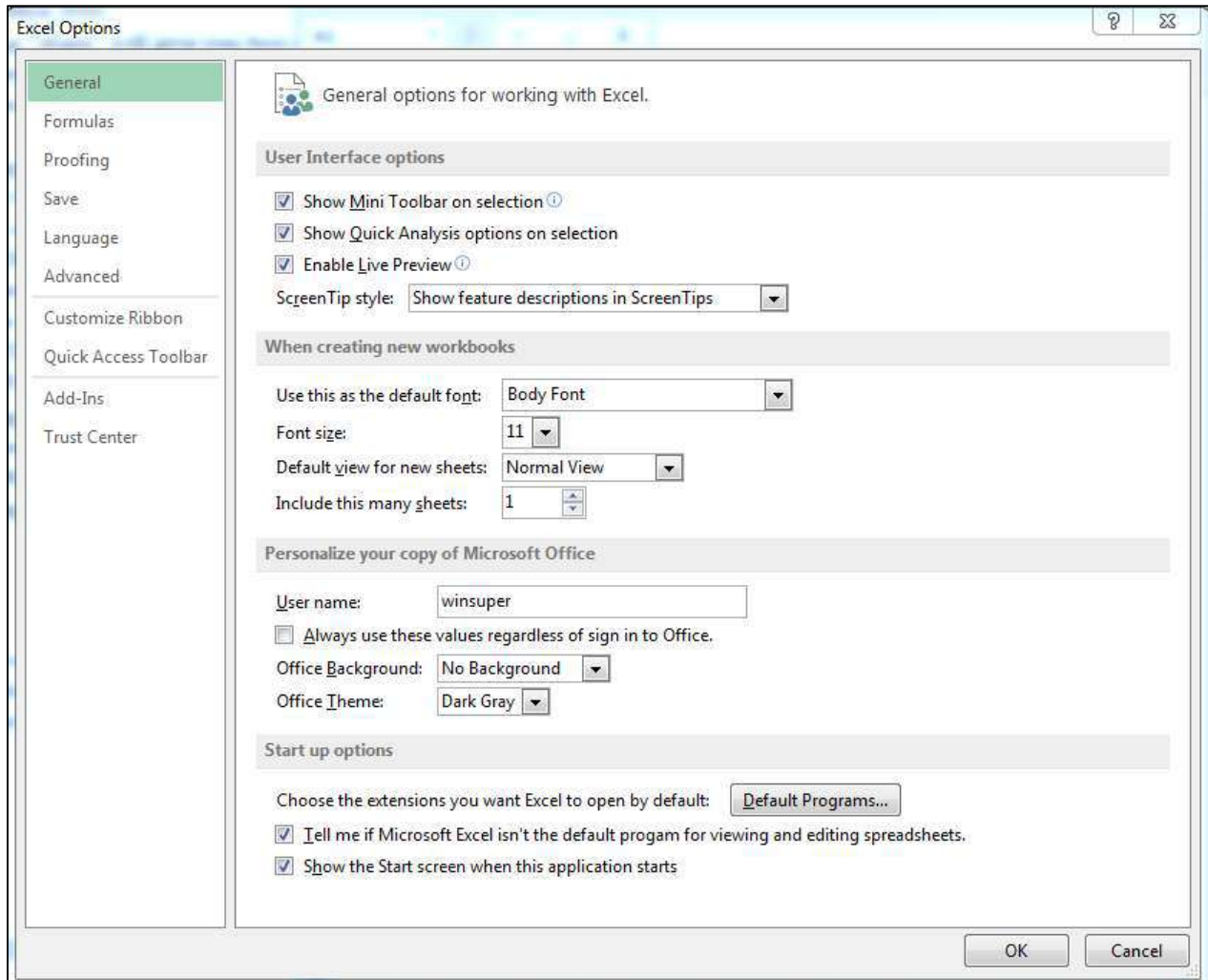
11. Click on the "Options" tab.

This will bring up a new dialog box with the following options:

- **General** – allows you to change the user interface, the default font style, view, and sheet number, as well as customize the username of Microsoft Office, change the background and theme, and alter start-up options.
- **Formulas** – allows you to change calculation options, formula completing/entry options, error notification settings, and error checking rules
- **Proofing** – will allow you to change autocorrect options and extra spelling correction options
- **Save** – you can customize how workbooks are saved, when to save

auto recover information or when to disable it, set a default saving location, and offline editing options.

- **Language –** allows you to set editing, display, and help languages
- **Advanced –** allows you to view and change extra editing options such as automatically inserting a decimal point
- **Customize Ribbon –** this allows you to customize what shows up when you click on one of tabs, such as "INSERT", on the Ribbon
- **Quick Access Toolbar –** allows you to customize what appears on the Quick Access Toolbar (near the Save, Undo, and Redo buttons)
- **Add-Ins –** allows you to view all the Microsoft Office Add-ins, and manage them.
- **Trust Center –** this is where all privacy statements are stored.

Now that we have reviewed the basic interface of Excel 2013, we are going to transition into using the tools on the ribbon and in the office button menu that we are now familiar with to edit our new spreadsheet.

Creating, Deleting, and Modifying Worksheets

Files in Excel are organized into pages called worksheets. A file or "book" can have just one worksheet or it can have multiple, and in this section we are going to learn how to create, rename and delete worksheets. The reason that we might want multiple worksheets in one file is that a user could have many different types of data or several different data sets for one given topic, and he or she could want to keep them all in one place but still separate them into different pages for easy organization. Having the option to create multiple worksheets is a great tool for efficient data organization.

There are a few different ways that you can add, delete, move and rename your worksheets. One way is by right-clicking on the worksheet tabs themselves and selecting an option, and the other way is to use the menus in the "cells" section under the "home" tab.

12. To create a new sheet, click on the button **that looks like a plus-sign** at the bottom of the screen next to your existing worksheets.
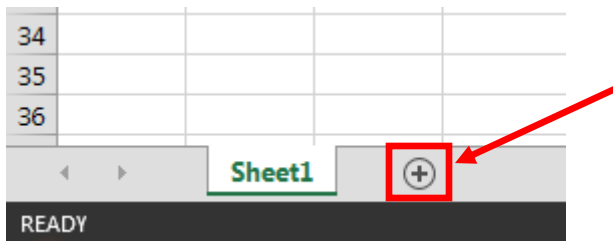

13. To rename an existing sheet, right click on the sheet you want to rename and select "Rename." Now the name of your sheet will turn into an editable field into which you can type a custom name. You can also double-click on the text "Sheet1" to edit the title of the worksheet.

14. To delete a sheet, right click on the sheet you want to delete and select "delete."
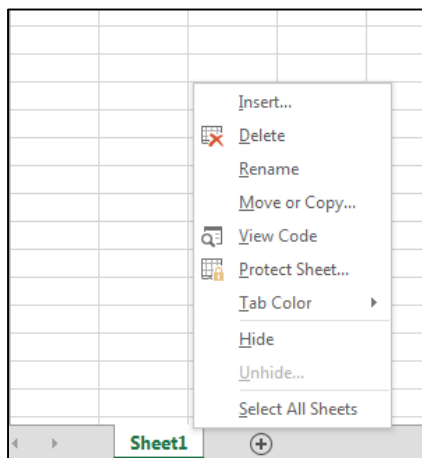
You can also perform these actions in the home tab under the section labeled "cells." Here you have 3 options: insert, delete, and format.
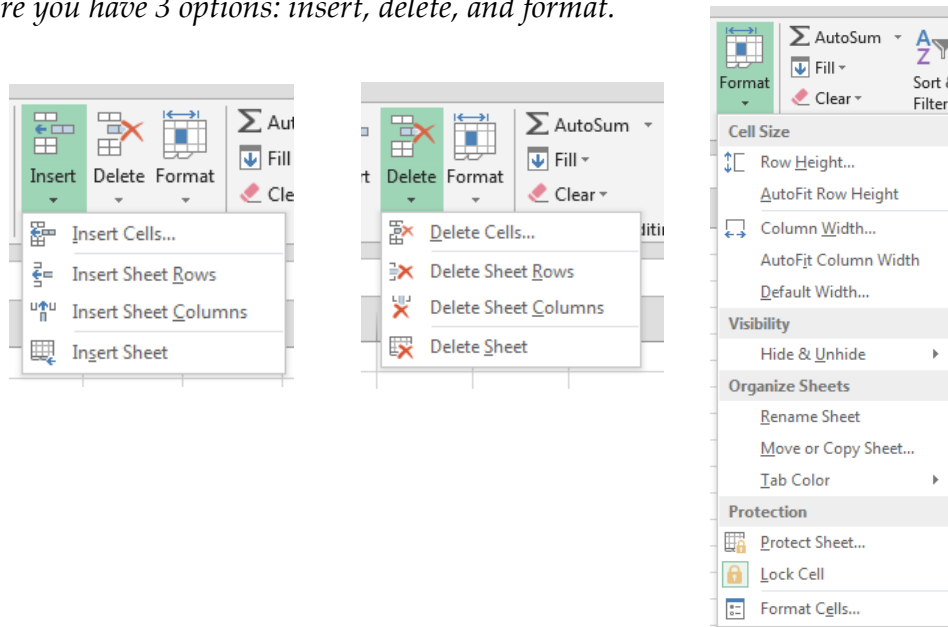
15. Click the Insert button and select "Insert Sheet"

16. Click the Delete button and select "Delete Sheet"

17. Click the Format button and select "Rename Sheet"

Steps 4-6 are a different way of performing the same actions as steps 1-3, which one you choose to use is personal preference.

If you change your mind about the order of your worksheets and decide that you want to place them in a different order, it is easy to change this by simply clicking and dragging the worksheet tabs to the desired position. To do this, click and hold the tab that you would like to move. As you move it horizontally, a small black arrow will appear. The sheet will drop into the spot where the arrow is pointing, so as soon as you see the arrow pointing to where you want the sheet then you can let go of the mouse and it will move into that place.

Now that we have gone over how to create, delete, rename and move sheets, we can transition into actually entering data into the fields and learning how to manipulate that data. In the next section, we will learn to use the basic formatting tools as well as a few of the advanced formatting features.

Formatting Worksheet Data

Now that we are familiar with the interface and how to manipulate multiple sheets, we will move on to formatting data in our spreadsheet. For this exercise, we are going to open up an existing workbook with an unorganized set of data and apply different formatting features to it. The purpose of learning how to do this is to become proficient at helping users be able to organize their data, make it presentable and quickly rearrange it without having to enter it multiple times. Formatting tools save a tremendous amount of time and help us create professional looking results.

18. Open the exercise file from your desktop.

There will be two worksheets titled "exercise 1" and "exercise 2." We will begin by working on "exercise 1." You will be notified when to click on the "exercise 2" worksheet. As you can see, we have a very long list of information that is not easy to read. The columns are too small to display all of the text and it is unclear how the information is organized. In the following steps, we will learn how to organize this information by applying our own criteria as well as make the information more aesthetically appealing. Our first step will be to adjust the width of the columns to match the contents.

19. Select the column to format by clicking the corresponding letter (ex. to select column A, click the letter A at the top of the sheet to highlight the entire column of values)

20. In the "Home" tab, click on "Format" from the "Cells" section. Select "Autofit Column Width" and this will adjust the width of the column to the width of the cell containing the longest amount of text.
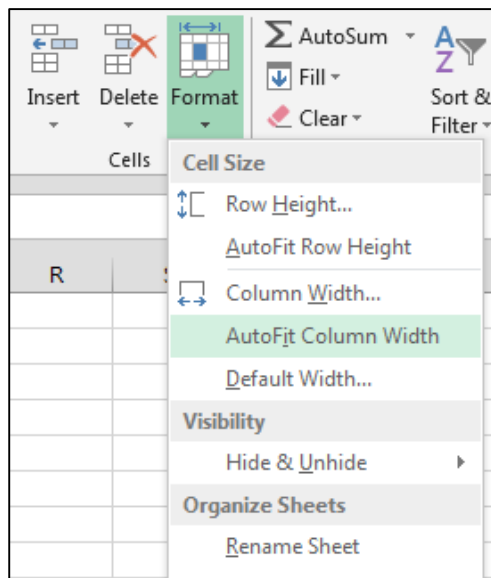
21. Repeat this step for all 4 columns until they are all adjusted.

If you have a large amount of columns and would like to do this procedure to all of them, you can highlight as many columns as you want and double click in the highlighted area when crosshairs are displayed to adjust them all at once. This can save time if your data set is very large.

Now that we have adjusted our columns, it is much easier to read the information in the spreadsheet. However, what if we would like to view the information in a different order, or what if we would like to view only parts of the information at a time? In the following steps, we will learn how to organize our information and view selected sections based on our own criteria.

22. Click on cell A1. There should be a bold dark green border around this cell.

23. Click on "format as table" in the "home" tab.

At this point, your screen will look like this:
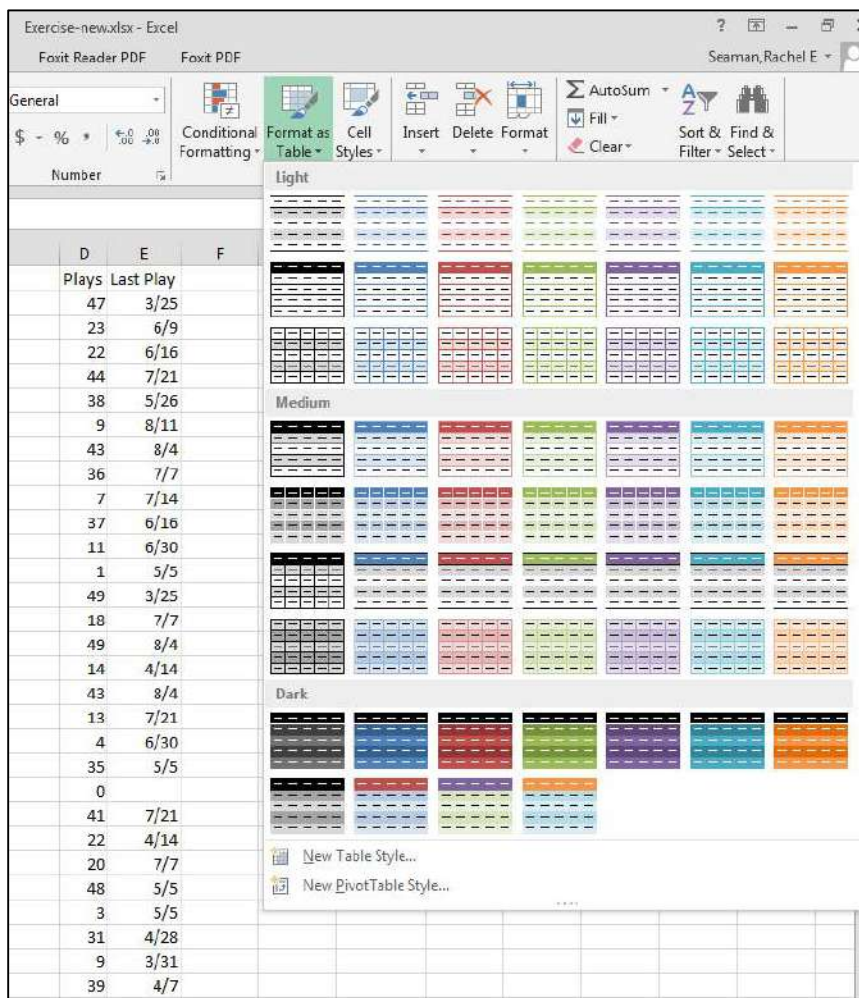
You will have a range of different styles and color schemes to choose from, ranging from light to dark. These are samples of how your information will look once the formatting is applied.

As soon as you pick a template, a dialogue box will appear:

By default, Excel will guess which information you are trying to format. As you can see, it has automatically selected all of our information because it is surrounded by the moving dotted line. If for some reason it guesses incorrectly or if you want to format a different area of information, you can easily click and drag your pointer over the data you would like to use instead. You will also see that there is a check box labeled "My table has headers." When this is checked, Excel will take the first row of information and make it into titles rather than including it into the data set. Our table does have headers, because as you can see each column is labeled according to what is contained below it. For this reason we want to keep the "My table has headers" box checked.

24. Make sure the "My table has headers" box is checked and click OK.

As you can see, Excel has applied the formatting you selected to your data. At this point it is a good idea to check the entire table and make sure your information was formatted correctly.

The next step that we are going to do now that our table is formatted is to filter the information by category in order to be able to read it easier. This is especially helpful for very long lists like the one we have, because we can make it easier to read only certain bits of information. As you can see, after we formatted our data several arrow buttons appeared in the cells on the top row. We will be using these to filter our data.

25. Click on the small arrow button in cell A1.

You should see a menu that looks like this:
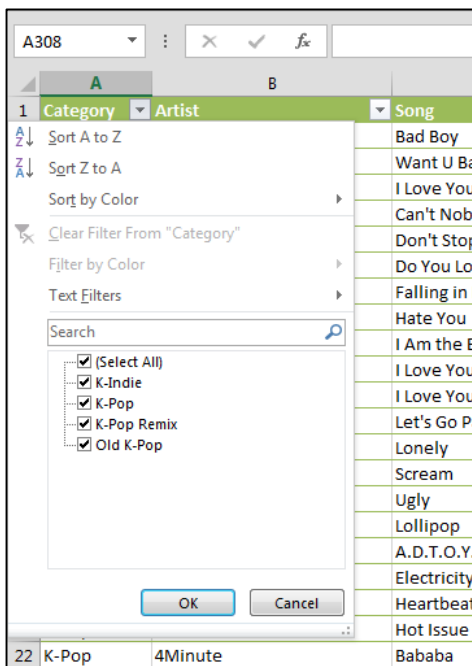
What we have is a list of all of the subcategories under the "category" heading. What this function has done is that it has taken all of the information in this column and reduced it to 4 subcategories, meaning that any cell in this column will only display one of these 4 words. What you can do at this point is decide which information you would like to hide and which you would like to see. This is a very useful tool for filtering large sets of data like the one we have and making it easy to view it in smaller sections.

26. Deselect the "select all" check box.
27. Check only the box that says "K-Indie" and click OK

As you can see, Excel has filtered our data so that all we see is everything that is in the computer category. You will notice however that the other cells did not disappear: they are just hidden. Look at the numbering of the cells and notice that they now start at 1 but skip to 38; therefore, our data has not been renumbered, just reorganized.

	A	B	
1	Category	Artist	Song
38	K-Indie	Achime	02 sir
74	K-Indie	Candy Stripe	Jjak S
75	K-Indie	Cheeze	Mang
110	K-Indie	Gaeko	Rhyth
131	K-Indie	GoGo Star	God
132	K-Indie	Hause Rulez	Whal
136	K-Indie	Humming Urban Stereo	Give
143	K-Indie	Icy Cider	Art P
157	K-Indie	LEDApple	Bad E
158	K-Indie	LEDApple	Time
167	K-Indie	Lee Yu Rim	Call N
168	K-Indie	Lim Kim	All Ri
169	K-Indie	Litter	Breal
178	K-Indie	Nell	Ocea
179	K-Indie	Neon Bunny	Oh M
182	K-Indie	No. 0 & MYK	Away
187	K-Indie	Philtre & Younha	Fade
188	K-Indie	Post Panic	Oute
194	K-Indie	Roll Spike	Whit
222	K-Indie	Smells	Up ar
223	K-Indie	Smells ft. Neon Bunny	Lister
241	K-Indie	Space Cowboy	It's O
242	K-Indie	Sultan of the Disco	Butte
276	K-Indie	The Solutions	Soun
279	K-Indie	TRAX	Oh! N
305	K-Indie	Yozoh	My N
307	K-Indie	Zion T. (feat. Gaecko)	Baba

28. Try this with some of the other columns and see what happens when you select and deselect different categories. When you are done, make sure to choose "select all" under each of the 5 arrow buttons so that all of the information appears again.

If you want to remove the arrow buttons from your table, you can always choose to turn them off. You can do this by clicking the "sort and filter" button under "editing" in the "home tab." Once you do that, simple deselect "filter" and the arrow buttons will disappear. If you'd like to use them again, simply re-select "filter" and they will appear again.
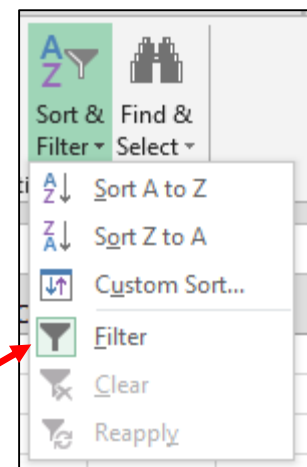
We have already learned basic formatting so next we are going to move on to a few formatting options that are a little more advanced. To organize our data even more, we will explore some conditional formatting that will help us to automate the calculation of our data.

Under the "styles" section in the "home" tab, you will see a button labeled "Conditional Formatting." We are going to use this menu to explore some more ways that we can organize our data.

29. Click on the "Conditional Formatting" button.
    You will see a menu that looks like this:
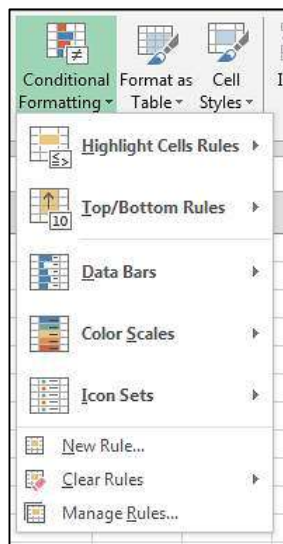
There are several options here for ways that we can highlight our data based on certain criteria. It is important to note that these rules will only apply to cells that have numerical data in them. For example, in our case we have columns A, B, C, and E which have no numerical data in them and row D which has only numbers. If we were to apply conditional formatting to the table, changed would only be made to row D. For this reason, before we apply any formatting we are going to select just that row.
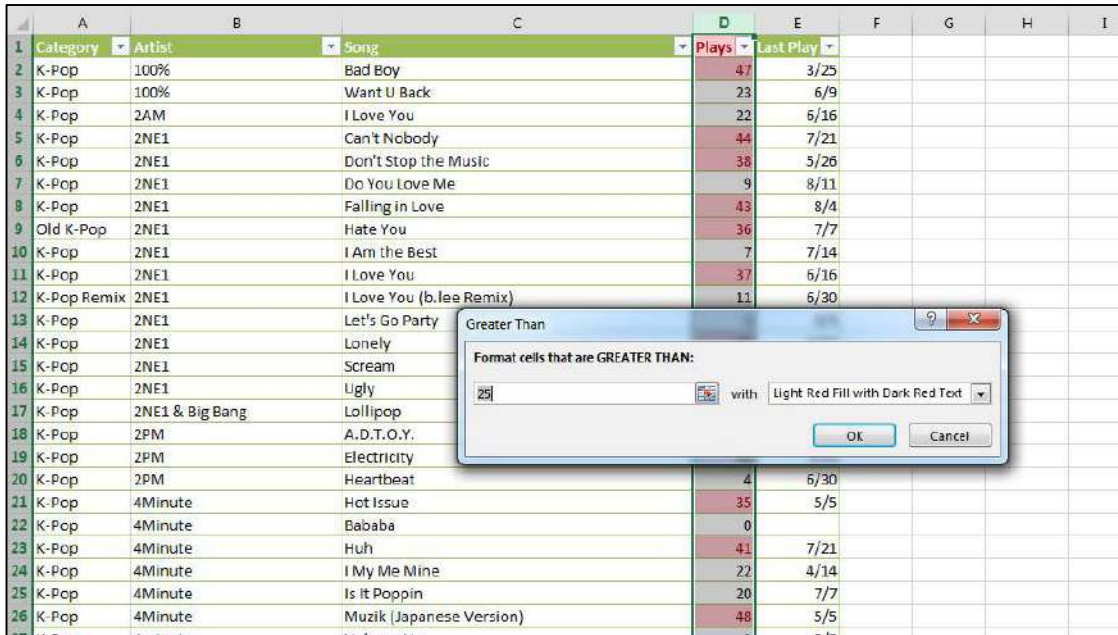
30. Select all of the data in row "D" by dragging your mouse from cell D2 to D307 or by selecting column "D" at the top of the worksheet.
31. Click on the "Conditional Formatting" button.

32. Select "Highlight Cells Rules" and then select "Greater Than."

Your screen should now look like this:

33. In the first field, type 45.

34. In the drop down menu, make sure it says "Yellow Fill with Dark Yellow Text"

35. Click OK

Now, you will notice that every value in column D that is greater than 45 has been formatted to have dark red text with a light red fill color. This is extremely useful if you have a large amount of numerical data and would like to set rules about which ones you would like to stand out. This same idea applies to all of the other options in the "Highlight Cells Rules" menu. We will not take the time to try every single
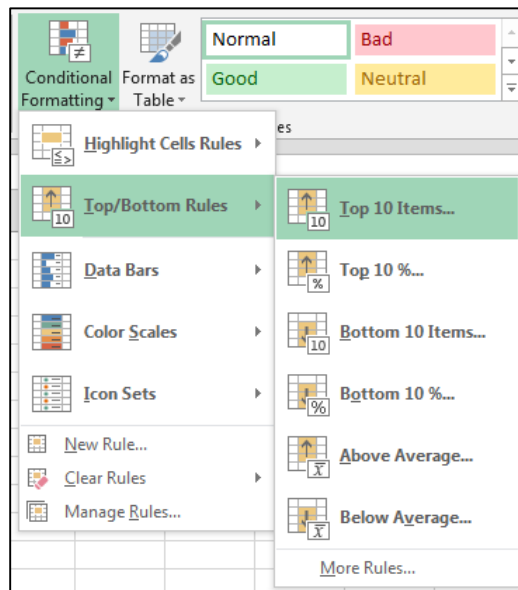
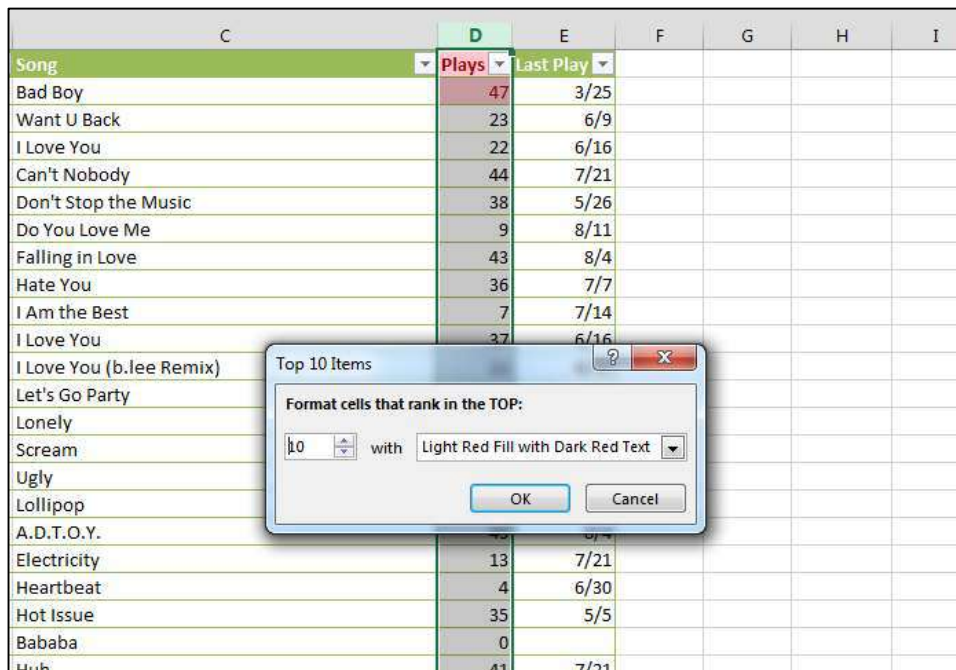*option, but you can see how powerful this function can be for analyzing your data.*

The next menu that we are going to look at is directly under "Highlight Cells Rules" and is called "Top/Bottom Rules."

36. With column D still selected, click on the "Conditional Formatting" button.

37. Select "Top/Bottom Rules" and then select "Top 10 Items."

Your screen should now look like this:

This formatting option will highlight the "top ten" numbers in the column that we have selected, which are going to be the 10 highest numbers in the set. If you would like it to highlight the top five numbers or any other amount of values, you can easily change that by highlighting the number 10 in the first field and changing it to something else. Just like the last exercise that we did, we also need to decide how we want to format the cells. Since we already chose to use a light red fill with dark red text, let's choose "Red Border" instead.

38. Choose "Red Border" from the drop down menu

39. Click OK

Now, you will see that the ten highest values in the column we selected have a red border around them. Similarly, every other option in the "Top/Bottom Rules" menu will follow the same format; however we will not take the time to try every single one.

You also have a few more options in the "Conditional Formatting" menu which are "data bars," "color scales" and "icon sets." These options will apply different colors, styles or icons to your selected data based on their values relative to the whole set. We are going to do a quick exercise to illustrate this idea.
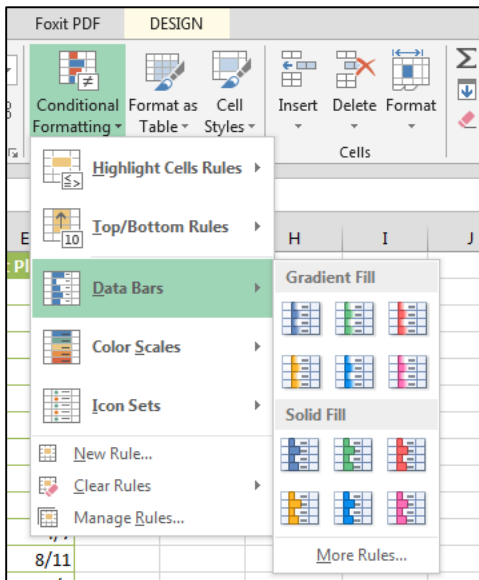
40. Click on the arrow next to Category in column A

41. Deselect all of the boxes except for the one that says "K-Indie"

42. Highlight column D which shows the number of times a song has been played.

43. Click the "Conditional Formatting" button, select "Data Bars" and choose any one of the bar graph icons in that menu.

You will see that colored bars are applied to your data set based on the numerical values in each individual cell.

	A	B	C	D	E
1	Category ⌃	Artist ▾	Song ▾	Plays ▾	Last Play ▾
38	K-Indie	Achime	02 simujigae (Rainbow City)	13	6/23
74	K-Indie	Candy Stripe	Jjak Sarang	46	7/14
75	K-Indie	Cheeze	Mango	12	5/19
110	K-Indie	Gaeko	Rhythm is Life	1	8/11
131	K-Indie	GoGo Star	God of Snowy Fields	1	7/21
132	K-Indie	Hause Rulez	Whale Finder	30	6/30
136	K-Indie	Humming Urban Stereo	Give Me Your Tonight ft. Youme	9	7/21
143	K-Indie	Icy Cider	Art People	26	6/9
157	K-Indie	LEDApple	Bad Boys	46	7/7
158	K-Indie	LEDApple	Time Is Up	27	4/7
167	K-Indie	Lee Yu Rim	Call My Name	44	8/11
168	K-Indie	Lim Kim	All Right	31	7/7
169	K-Indie	Litter	Breakers	36	8/11
178	K-Indie	Nell	Ocean of Light	38	6/23
179	K-Indie	Neon Bunny	Oh My Prince	15	6/23
182	K-Indie	No. 0 & MYK	Away for a Moment	21	6/16
187	K-Indie	Philtre & Younha	Fade	4	6/9
188	K-Indie	Post Panic	Outerspace	49	6/9
194	K-Indie	Roll Spike	White Rabbit	35	6/30
222	K-Indie	Smells	Up and Down	42	6/30
223	K-Indie	Smells ft. Neon Bunny	Listen to Your Heart	43	6/23
241	K-Indie	Space Cowboy	It's Over	11	6/16
242	K-Indie	Sultan of the Disco	Butterfly	49	7/7
276	K-Indie	The Solutions	Sounds of the Universe	14	4/28
279	K-Indie	TRAX	Oh! My Goddess	36	6/2
305	K-Indie	Yozoh	My Name is Yozoh	19	4/14
307	K-Indie	Zion T. (feat. Gaecko)	Babay	14	4/7

We can also arrange this column from low to high or high to low to better demonstrate the trend in number of plays.

44. Click on the arrow next to Plays in column D and select "Sort Largest to Smallest"
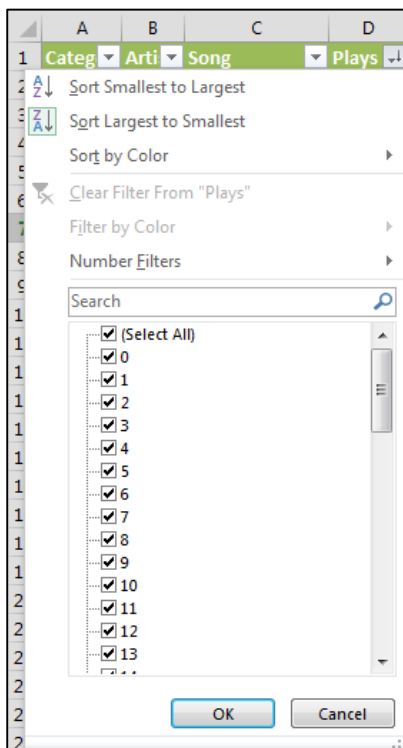
	A	B	C	D	E
1	Category ⟁	Artist ▼	Song ▼	Plays ↓	Last Play ▼
38	K-Indie	Post Panic	Outerspace	49	6/9
74	K-Indie	Sultan of the Disco	Butterfly	49	7/7
75	K-Indie	Candy Stripe	Jjak Sarang	46	7/14
110	K-Indie	LEDApple	Bad Boys	46	7/7
131	K-Indie	Lee Yu Rim	Call My Name	44	8/11
132	K-Indie	Smells ft. Neon Bunny	Listen to Your Heart	43	6/23
136	K-Indie	Smells	Up and Down	42	6/30
143	K-Indie	Nell	Ocean of Light	38	6/23
157	K-Indie	Litter	Breakers	36	8/11
158	K-Indie	TRAX	Oh! My Goddess	36	6/2
167	K-Indie	Roll Spike	White Rabbit	35	6/30
168	K-Indie	Lim Kim	All Right	31	7/7
169	K-Indie	Hause Rulez	Whale Finder	30	6/30
178	K-Indie	LEDApple	Time Is Up	27	4/7
179	K-Indie	Icy Cider	Art People	26	6/9
182	K-Indie	No. 0 & MYK	Away for a Moment	21	6/16
187	K-Indie	Yozoh	My Name is Yozoh	19	4/14
188	K-Indie	Neon Bunny	Oh My Prince	15	6/23
194	K-Indie	The Solutions	Sounds of the Universe	14	4/28
222	K-Indie	Zion T. (feat. Gaecko)	Babay	14	4/7
223	K-Indie	Achime	02 simujigae (Rainbow City)	13	6/23
241	K-Indie	Cheeze	Mango	12	5/19
242	K-Indie	Space Cowboy	It's Over	11	6/16
276	K-Indie	Humming Urban Stereo	Give Me Your Tonight ft. Youme	9	7/21
279	K-Indie	Philtre & Younha	Fade	4	6/9
305	K-Indie	Gaeko	Rhythm is Life	1	8/11
307	K-Indie	GoGo Star	God of Snowy Fields	1	7/21

We will not go into a lot more detail explaining the "Color Scales" and "Icon Sets" options, but both other options work in a similar manner. You can also change the rules about how these tools will format your cells by clicking on "More Rules…" at the bottom of each menu. Take a few minutes to experiment with these options as they apply to your data set.

AT Computer Labs

Slicers and Sparklines

Two important features introduced in Excel 2010 have carried over into Excel 2013: Sparklines and Slicers. Slicers are windowed filtering tools that can help us sort our data. Sparklines are mini charts that can be inserted next to data to easily show the relationship or trend in the data. We will now be investigating how to use Sparklines and Slicers to enhance an Excel worksheet and make data easier to read and synthesize.

1. Click on cell A1 and go to "Insert" and then "Slicer" in the group "Filters".
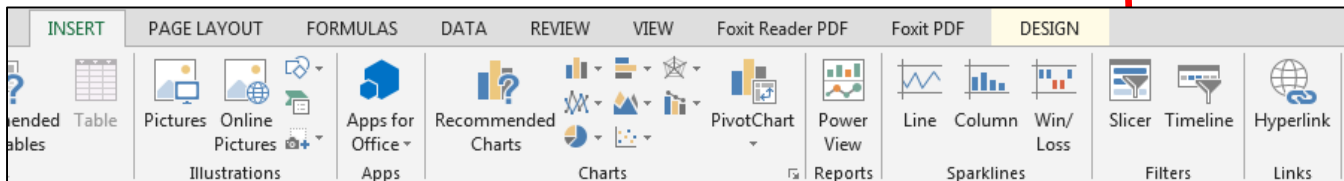
2. Click the checkboxes next to "Category", "Plays" and "Last Play".

You can check all the boxes if needed.

3. Now you should see three slicer windows next to the table.

Category	Artist	Song	Plays	Last Play
K-Pop	100%	Bad Boy	47	3/25
K-Pop	100%	Want U Back	23	6/9
K-Pop	2AM	I Love You	22	6/16
K-Pop	2NE1	Can't Nobody	44	7/21
K-Pop	2NE1	Don't Stop the Music	38	5/26
K-Pop	2NE1	Do You Love Me	9	8/11
K-Pop	2NE1	Falling in Love	43	8/4
Old K-Pop	2NE1	Hate You	36	7/7
K-Pop	2NE1	I Am the Best		7/14
K-Pop	2NE1	I Love You		6/16
K-Pop Remix	2NE1	I Love You (b.lee Remix)		6/30
K-Pop	2NE1	Let's Go Party		
K-Pop	2NE1	Lonely		
K-Pop	2NE1	Scream		
K-Pop	2NE1	Ugly		
K-Pop	2NE1 & Big Bang	Lollipop		
K-Pop	2PM	A.D.T.O.Y.		
K-Pop	2PM	Electricity		
K-Pop	2PM	Heartbeat		
K-Pop	4Minute	Hot Issue		
K-Pop	4Minute	Bababa		
K-Pop	4Minute	Huh		
K-Pop	4Minute	I My Me Mine		
K-Pop	4Minute	Is It Poppin		
K-Pop	4Minute	Muzik (Japanese Version)		
K-Pop	4minute	Volume Up		
K-Pop	4Minute	What's Your Name	31	4/28
K-Pop	4Minute (포미닛)	Goodbye (グッバイ)	9	3/31

Slicers are almost like the windowed versions of the filter drop-downs at the top of the table. You can select more than one category at once and also more than one category across the filters.

Let's say I wanted to know what songs had been played the least amount of times, the longest time ago.
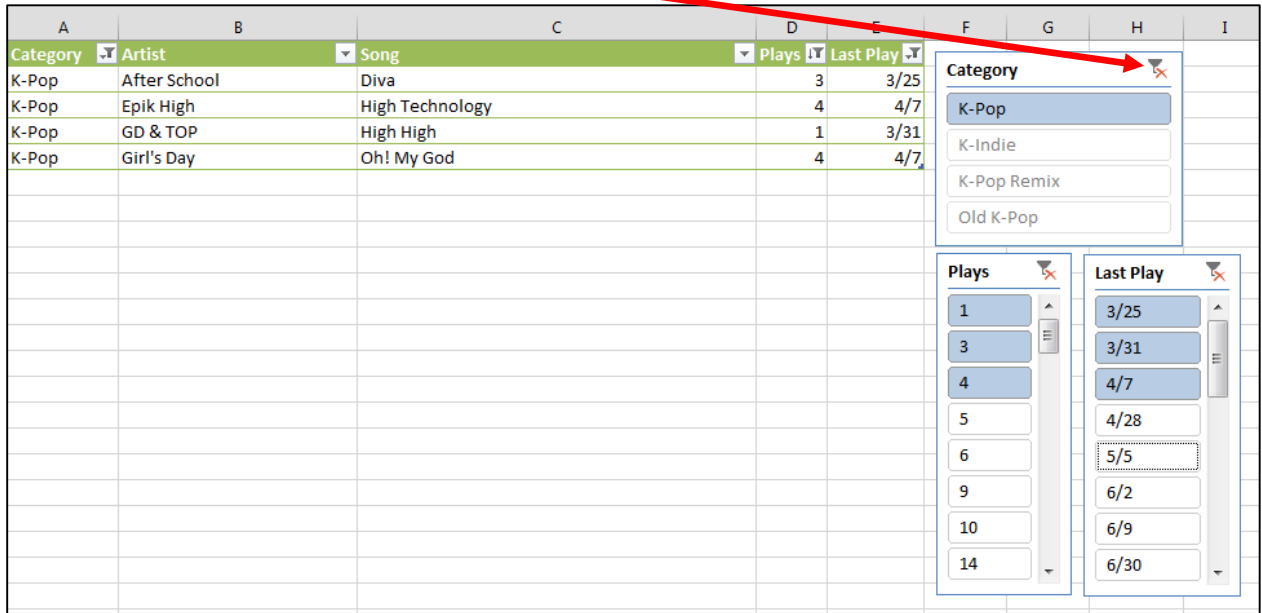
4. Click on the 3/25, 3/31, 4/7, 4/13, and 4/14 dates (or click and drag from 3/25 to 4/14) in the "Last Play" slicer.

5. Then click 1, 3, and 4 in the "Plays" slicer.

6. Finally click only on K-Pop in the "Category" slicer.

You can see that the slicers have allowed me to nicely filter my data so I can see what songs have been played the least, the longest time ago.

To remove the filter simply click on the Filter icon with a red "x" next to it at the top right of the slicer window.

Slicers are useful when you have many, many lines of data that need to be sorted in a specific way several times. Slicers are more easily accessible and visible than the filter drop-downs, but they serve the same purpose.

Now we will move on to inserting Sparklines into our spreadsheet.
For inserting Sparklines, we will need to use the "exercise 2" worksheet.

> *Sparklines are little charts that can be displayed within a single cell to represent your selected data set. Sparklines are useful for spotting trends at a glance. We are going to add some Sparklines to our table of information so we can easily see trends and patterns in our data. We will be previewing each type of Sparkline.*

7. Click on the "exercise 2" tab at the bottom of the worksheet.

> *This worksheet contains fictitious information about the average number of Starbucks drinks consumed each week by AT Staff for each semester during each year from 2001-2012. Numerically you can see the trend but at a glance you would not be able to.*
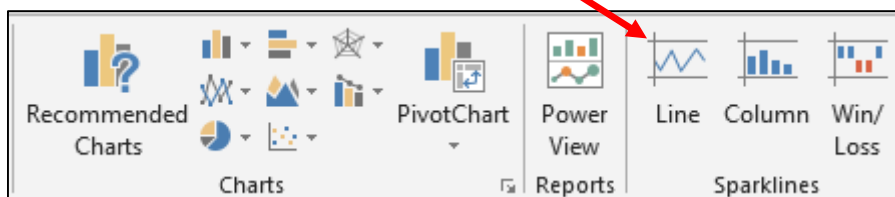
8. Click on the "insert" tab.

> *To the right of the "Charts" & "Reports" groups is the "Sparklines" group. There are three types of Sparkline charts you can insert.*
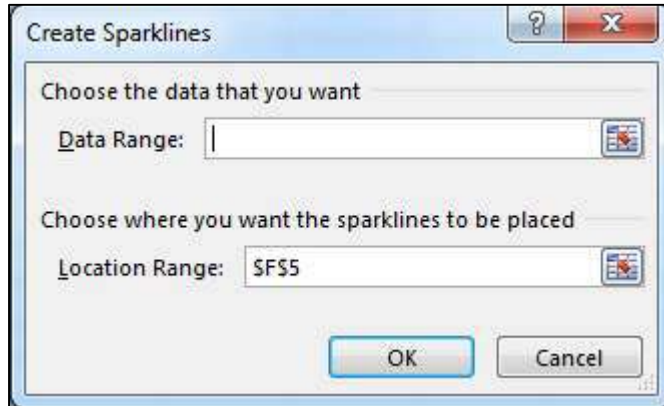
9. Select cell F5.

	A	B	C	D	E	F	G
1							
2	Average Starbucks Drinks Consumed by AT Staff per week						
3	Year			Semesters			
4		Spring	Summer A	Summer B	Fall		Trend
5	2001	21	56	65	89		
6	2002	45	79	84	35		
7	2003	78	65	45	24		

10. Click on the "Line" Sparkline.

This dialogue box will appear:

Notice that the location range coincides with the cell we selected before clicking on the "Line" Sparkline. We will need to highlight a data range for our Sparkline. The range will be from Spring 2001 to Fall 2001.

11. Click inside the "Data Range" text field
12. Highlight cells B5 through E5.

A "Line" Sparkline will appear in cell F5.

Spring	Summer A	Summer B	Fall	Trend
21	56	65	89	
45	79	84	35	
78	65	45	24	

13. Insert "Line" Sparklines for the rest of years, showing plot trends throughout semesters within each academic year. The easiest way would be to click and drag the fill handle from the corner of cell F5 down to F14.

    To click and drag the fill handle, hover your mouse cursor over the bottom right corner of cell F5, which contains the first Sparkline. When the cursor changes to a bold "+," click and drag the values down to F14 and release.

    Notice that once a Sparkline is added to the worksheet, a new tab appears: "Design." This is where we will go to format our newly added Sparklines.

14. Click on the "Design" tab

   *There are several different formatting options available in this tab.*

   a. You can "Edit Data" in the "Sparkline" group if you feel like the data selected is inaccurate.
   b. The "Type" group contains icons for the different Sparkline mini-charts in case you want to change to a different chart type.
   c. The "Show" group allows you to choose whether or not you want to show the specific points in your Sparkline. Options include the high and low points, the first and last points, negative points, and all points (markers).
   d. The "Style" group is where you can choose from a host of premade Sparkline formats. You can also customize your Sparklines by manually changing the Sparkline color and marker colors.

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e. The "Group" group gives you the ability to manipulate the Sparkline axes and group or ungroup Sparkline graphs from each other if there is more than one in a series.
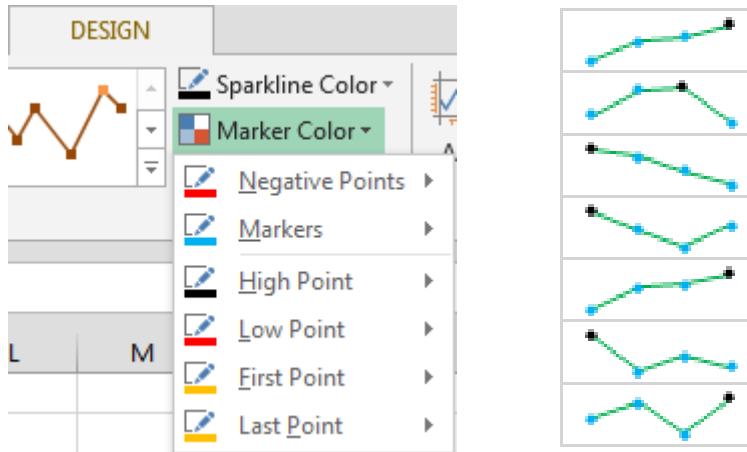
15. Choose a style from the "Style" group

This lesson plan shows "Sparkline Style Colorful #4."
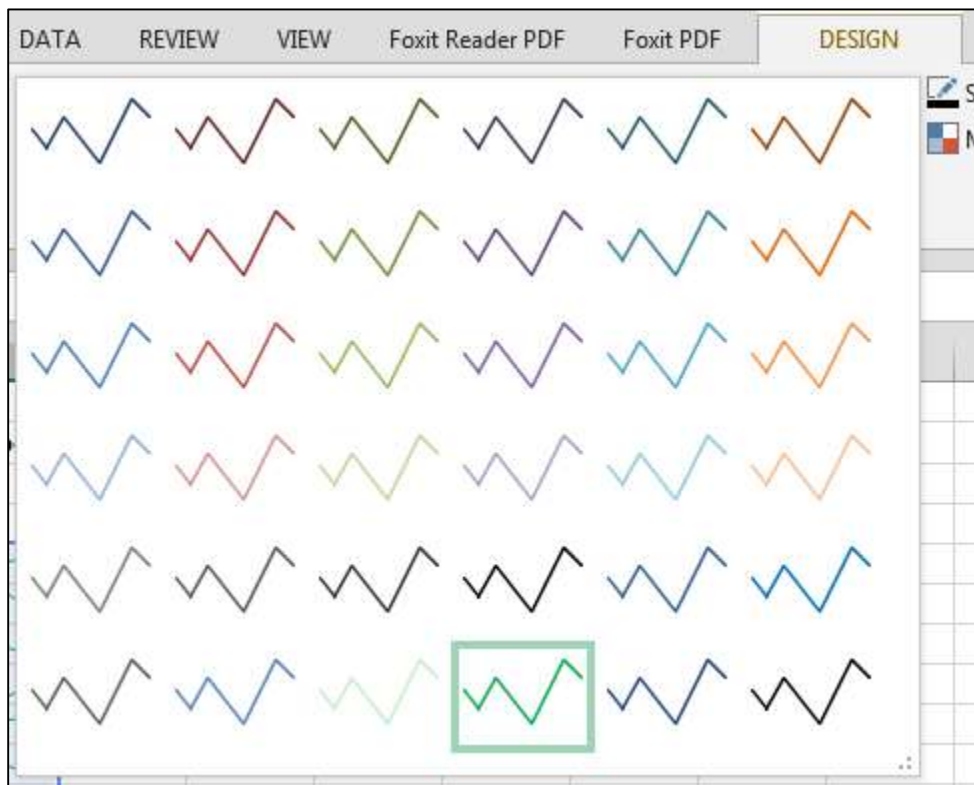
16. Using the "Marker Color" options, reveal the "High Point" and "Markers" and choose a color for each one.

This lesson plan shows "High Point" in black, and "Markers" in a blue color.

We've just previewed one type of Sparkline graph. Let us examine the other two, Column and Win/Loss.

17. Click on cell G5

18. Navigate to the "Insert" tab.

19. Click on the "Column" Sparkline

20. The same "Create Sparklines" dialogue box will appear.

21. Higlight cells B5 through E5 for the data range.

22. Insert "Column" Sparklines for the rest of years, showing plot trends throughout semesters within each academic year. The easiest way would be to click and drag the fill handle from the corner of cell G5 down to G14.

To click and drag the fill handle, hover your mouse cursor over the bottom right corner of cell F5, which contains the first Sparkline. When the cursor changes to a bold "+" click and drag the values down to F14 and release.

Notice that once a Sparkline is added to the worksheet, a new tab appears: "Design." This is where we will go to format our newly added Sparklines.

23. Apply a Style from the "Design" tab and check the box to show "High Point."

This lesson plan shows "Sparkline Style Accent 2 (no dark or light)," which has reddish bars. Your data will look like this now:

Average Starbucks Drinks Consumed by AT Staff per week						
Year	Semesters					Trend
	Spring	Summer A	Summer B	Fall		
2001	21	56	65	89		
2002	45	79	84	35		
2003	78	65	45	24		
2004	89	54	21	62		
2005	28	46	48	58		
2006	81	21	46	30		
2007	33	43	22	47		
2008	11	19	64	35		
2009	48	66	86	52		
2010	20	28	56	41		
2011	55	75	84	41		
2012	28	80	95	50		

Notice how much easier it is to determine highest value. Instead of reading the numbers from left to right to make a decision, we can just check out our Sparklines for the "High Point." The "Line" Sparkline shows trends, whereas the "Column" Sparkline shows value differences.

Let us try the "Win/Loss" Sparkline. This type of Sparkline is best for showing wins and losses, as the name implies. For best results, use positive numbers to signify wins and negative numbers to signify losses.

24. Click on cell H5

25. Navigate to the "Insert" tab.

26. Click on the "Win/Loss" Sparkline

27. The same "Create Sparklines" dialogue box will appear.

28. Higlight cells B5 through E5 for the data range.

29. Insert "Winn/Loss" Sparklines for the rest of years, showing beverage wins and losses (in this case, only wins) throughout semesters within each academic year. The easiest way would be to click and drag the fill handle from the corner of cell H5 down to H14.

To click and drag the fill handle, hover your mouse cursor over the bottom right corner of cell F5, which contains the first Sparkline. When the cursor changes to a bold "+" click and drag the values down to F14 and release.

Notice that once a Sparkline is added to the worksheet, a new tab appears: "Design." This is where we will go to format our newly added Sparklines.

30. Apply a Style from the "Design" tab.

This lesson plan shows "Sparkline Style Colorful #2," which has blue bars on top, and orange bars on the bottom.

Your data should look like this now.

Average Starbucks Drinks Consumed by AT Staff per week							
Year	Semesters					Trend	
	Spring	Summer A	Summer B	Fall			
2001	21	56	65	89			
2002	45	79	84	35			
2003	78	65	45	24			
2004	89	54	21	62			
2005	28	46	48	58			
2006	81	21	46	30			
2007	33	43	22	47			
2008	11	19	64	35			
2009	48	66	86	52			
2010	20	28	56	41			
2011	55	75	84	41			
2012	28	80	95	50			

Formulas

Concept of Formulas and the Formulas Tab

Formulas are equations that perform calculations on values in your worksheet. Using them to work out mass quantities of calculations will save them time, and the users' time. If one wishes to apply the same calculation to a few or a large sum of data, then using the Formulas Tab to choose functions from the library will be helpful.

- Make sure you know that in order for a formula to work, an equal sign must precede the actual equation; failure to do so results in an uncalculated formula.
- Briefly review the order of operations and that Excel follows PEMDAS, which stands for Parenthesis, Exponents, Multiplication, Division, Addition, and Subtraction, from left to right.
- Formulas are not limited to just numbers. Cells or groups of highlighted cells can be integrated into formulas as well.

Let's practice using formulas and the formulas tab.

1. Type this formula into cell B1: 3+1+4, and click off to an empty part of the worksheet.

    Because the formula written down did not contain an '=,' Excel did not recognize this as a needed calculation and therefore left it as 3+1+4.

2. Next, type this formula into cell D1: =3+1+4, and click off to an empty part of the worksheet. Excel completed the calculation for you.
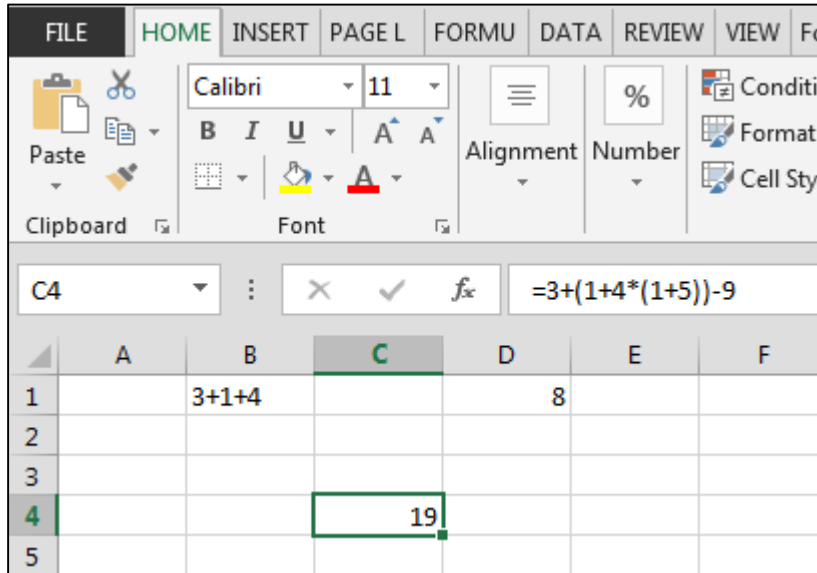
    Since there was a proceeding '=,' Excel received the signal to go through with calculating the equation for you.
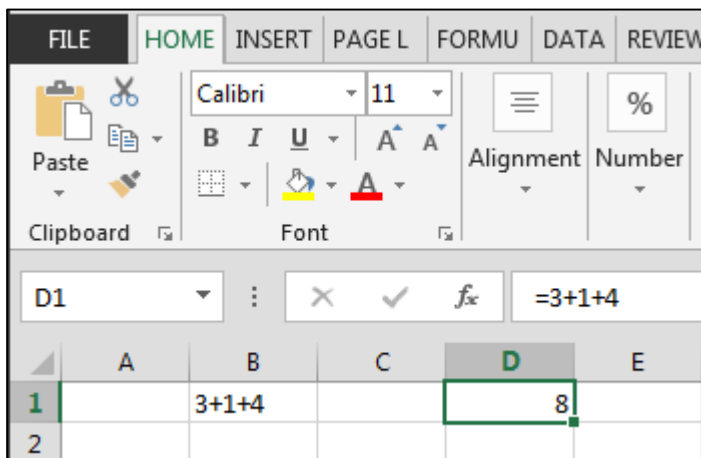
3. To show the use of PEMDAS, type this formula into cell C4: =3+(1+4*(1+5))-9.

   Just as any math equation and any good scientific calculator, Excel follows the PEMDAS sequence when solving equations and carrying out formulas.

4. Finally, to exemplify formulas using cells, add D1 and C4 into cell A7 by using AutoSum and highlighting each cell.

   Instead of having to try and remember cell coordinates of data, and using the plus symbol each time, it's easier to use AutoSum, which can do that for you.

   That was an example using AutoSum, but Excel has a library of other functions, and the Formulas Tab.

5. Type in numbers 1 to 9 in cells A10 through I10.

6. Navigate to the Formulas tab.

There are more formulas in the formula tab. Some are for everyday use, and some are for more specific tasks. For instance, in the Function Library group, there is a subgroup of formulas that can be used to work with finances, trigonometric and math purposes, text purposes, lookup and referencing purposes, etc. There is a large array of various formulas one can use in Excel.
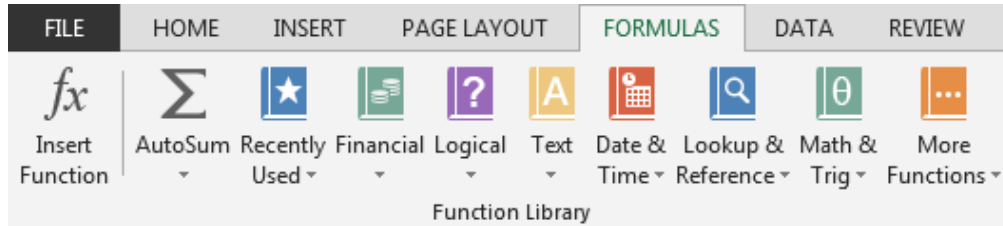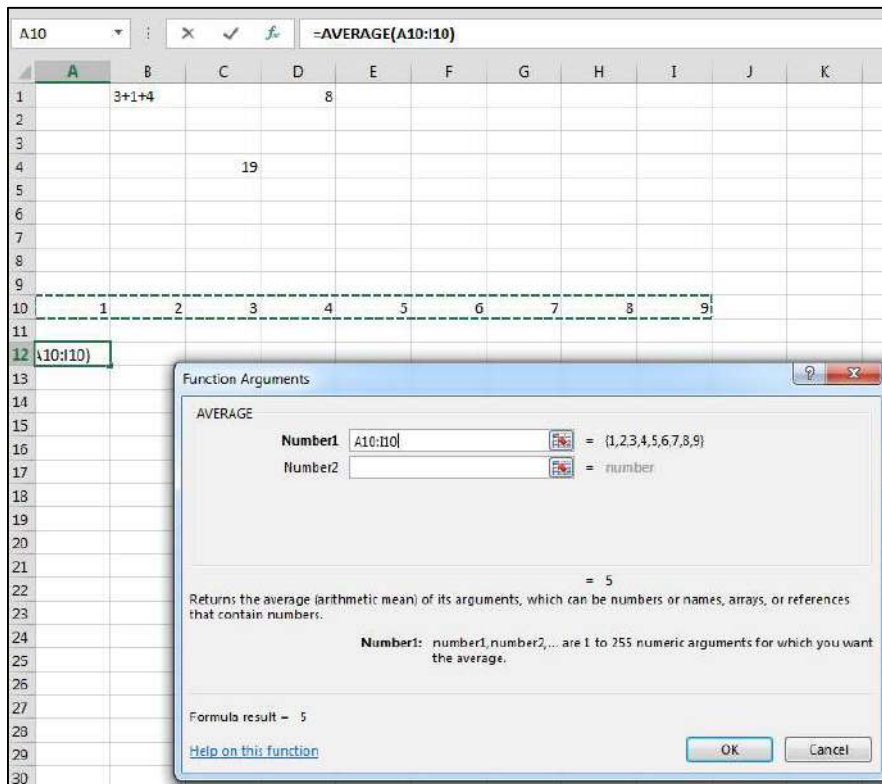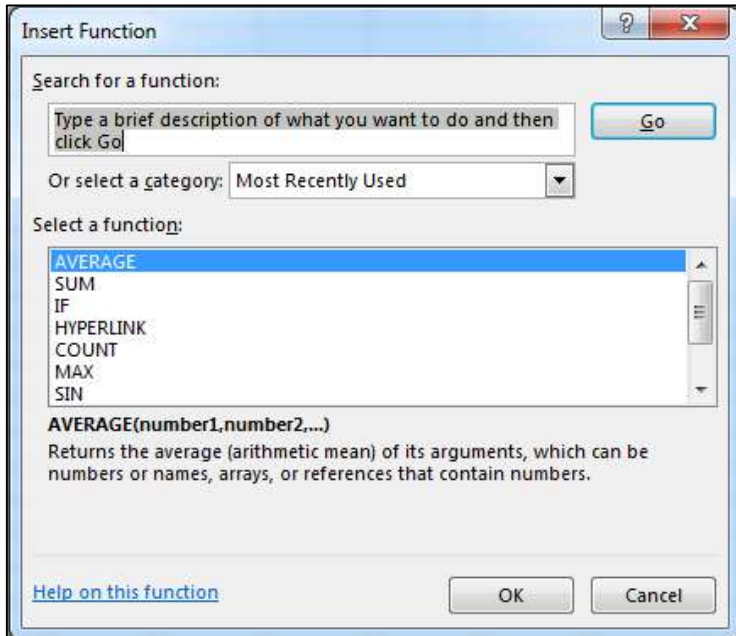

7. Access the formulas Library by clicking on "Insert Function" from the Formulas Tab, or by clicking on the *fx* icon.
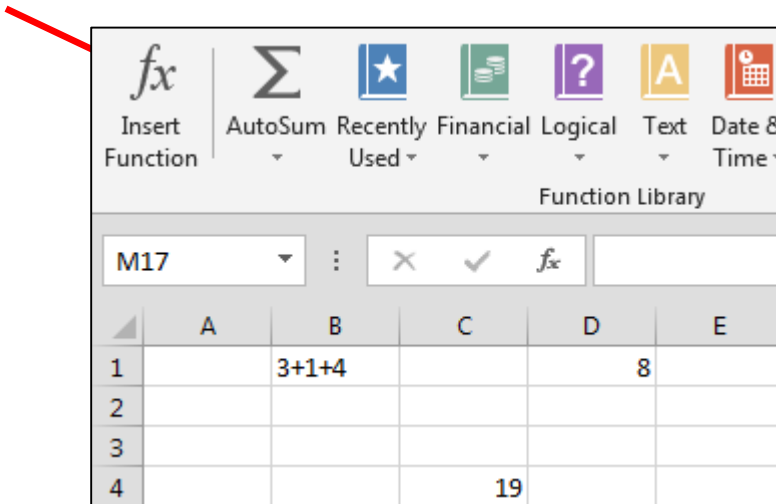
8. Using "AVERAGE" will compute the average of a selection into the cell. Average cells A10 through I10 in cell A12.

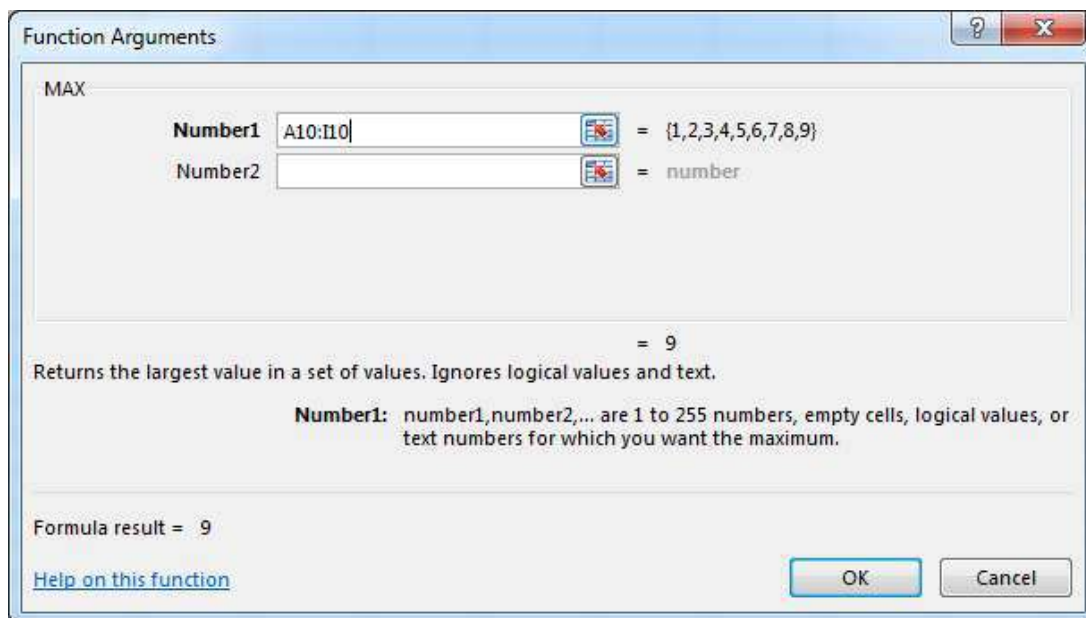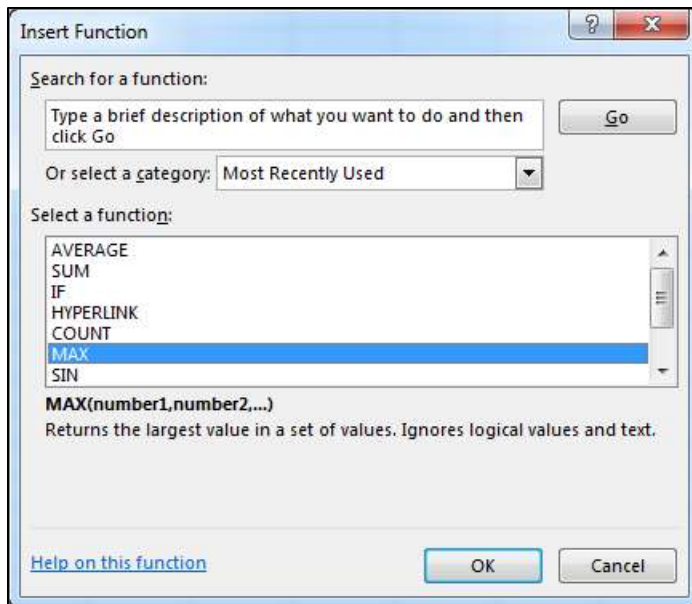*Highlight desired range. Do not forget to close parenthesis.*

9. Click "OK" when you're done.

The average will now be displayed in the cell that you have chosen.

10. Using "MAX" will figure out the maximum value in a selection. MAX cells A10 through I10 in cell C12.

Highlight desired range. Do not forget to close parenthesis.

Referencing

Formulas can also be used in referencing. There are two ways of referencing data in Excel: Relative and Absolute.

Concepts of Referencing

Relative referencing is best shown through examples, which we will be doing shortly. Absolute referencing always references back to the same cell. Absolute referencing "pins" that cell in the calculations. Absolute referencing is identifiable by the use of dollar signs ($), which "pins" either or both components of the cell coordinates (letter, number).

Let's put the concepts of relative and absolute referencing into action to see how they can be useful in easily creating an effective worksheet with multiple formulas and interactions.

1. Open Referencing.xls

2. In cell D4, insert a formula which multiplies price and quantity.

3. Hit "Enter" or click the check mark next to the formula field.

	A	B	C	D	E	F	G
1							
2		Pretend Trader Steve's Shopping Cart					
3	Item	Quantity	Price	Subtotal	With Tax		Tax Rate:
4	Vegan Meatballs	1	2.98	=B4*C4			6.67%
5	Green Tea Mochi	10	3.95				
6	Veggie Chips	3	1.47				
7	Organic Dark Chocolate Bars	6	6.96				
8	Seaweed Snack Packs	12	0.98				
9	Sweet n' Tangy BBQ Sauce	2	4.58				
10	Total						
11							

4. Drag the contents of D4 down to D9.

Notice that while our original formula is B4*C4, it was adjusted when we dragged it down to D9.

This is an example of relative referencing. Notice that the same formula applies to cell D6

through D9 by taking the relative cells and multiplying them. For instance, from B6*C6 to B9*C9

5. In cell E9, insert a formula which totals up all the subtotals. This can be done using AutoSum from the formulas tab and highlighting the desired cells.

6. Next, to calculate Subtotals and the Total with tax rate, insert a formula which multiplies Subtotals and the Total with the tax rate in G5, using the dollar symbol to "pin" the tax rate in the formula. (ie. D5*G5 instead of D5*G5). So for each box you should be entering in the Subtotal plus the Subtotal times the Tax Rate.

Make sure that you are aware of the importance of using the dollar symbol correctly. The dollar symbol is used to pin a data coordinate in the calculations.

An easy way to switch to absolute referencing (using the dollar symbols) and relative referencing (sans dollar symbols) is to press the F4 key.

	A	B	C	D	E	F	G
1							
2		Pretend Trader Steve's Shopping Cart					
3	Item	Quantity	Price	Subtotal	With Tax		Tax Rate:
4	Vegan Meatballs	1	2.98	2.98	=D4+(D4*G4)		6.67%
5	Green Tea Mochi	10	3.95	39.5			
6	Veggie Chips	3	1.47	4.41			
7	Organic Dark Chocolate Bars	6	6.96	41.76			
8	Seaweed Snack Packs	12	0.98	11.76			
9	Sweet n' Tangy BBQ Sauce	2	4.58	9.16			
10	Total			109.57			

Finally, drag the formula down to E10 using the black crosshair to see the Grand Total of your Trader Steve's shopping cart.

	A	B	C	D	E	F	G
1							
2		Pretend Trader Steve's Shopping Cart					
3	Item	Quantity	Price	Subtotal	With Tax		Tax Rate:
4	Vegan Meatballs	1	2.98	2.98	3.178766		6.67%
5	Green Tea Mochi	10	3.95	39.5	42.13465		
6	Veggie Chips	3	1.47	4.41	4.704147		
7	Organic Dark Chocolate Bars	6	6.96	41.76	44.54539		
8	Seaweed Snack Packs	12	0.98	11.76	12.54439		
9	Sweet n' Tangy BBQ Sauce	2	4.58	9.16	9.770972		
10	Total			109.57	116.8783		

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Graphs and Charts

Concepts of Graphs and Charts

An interesting characteristic about charts and graphs is that they can display information in a much more meaningful and visual way. They can take a bland or mundane looking list and completely turn it into visually eye catching presentation. In addition, they convert plain data in a table to charts or graphs, and you can format them by using either Format as Table in Styles, or the Design Tab that appears for charts and graphs.

We will now go over how to format charts and graphs to display our information in a captivating and informative fashion.

1. Open Classes & Students.xlsx

   This worksheet is a tally of how many students fall asleep on average (rounded to the nearest integer) during each class. It is shown in plain data, but what if this had to be presented to the professors of each class? It would need to be more eye-catching.

2. Click on any cell within the table of data.

   Clicking on a cell within the table of data identifies the table as the source of information.
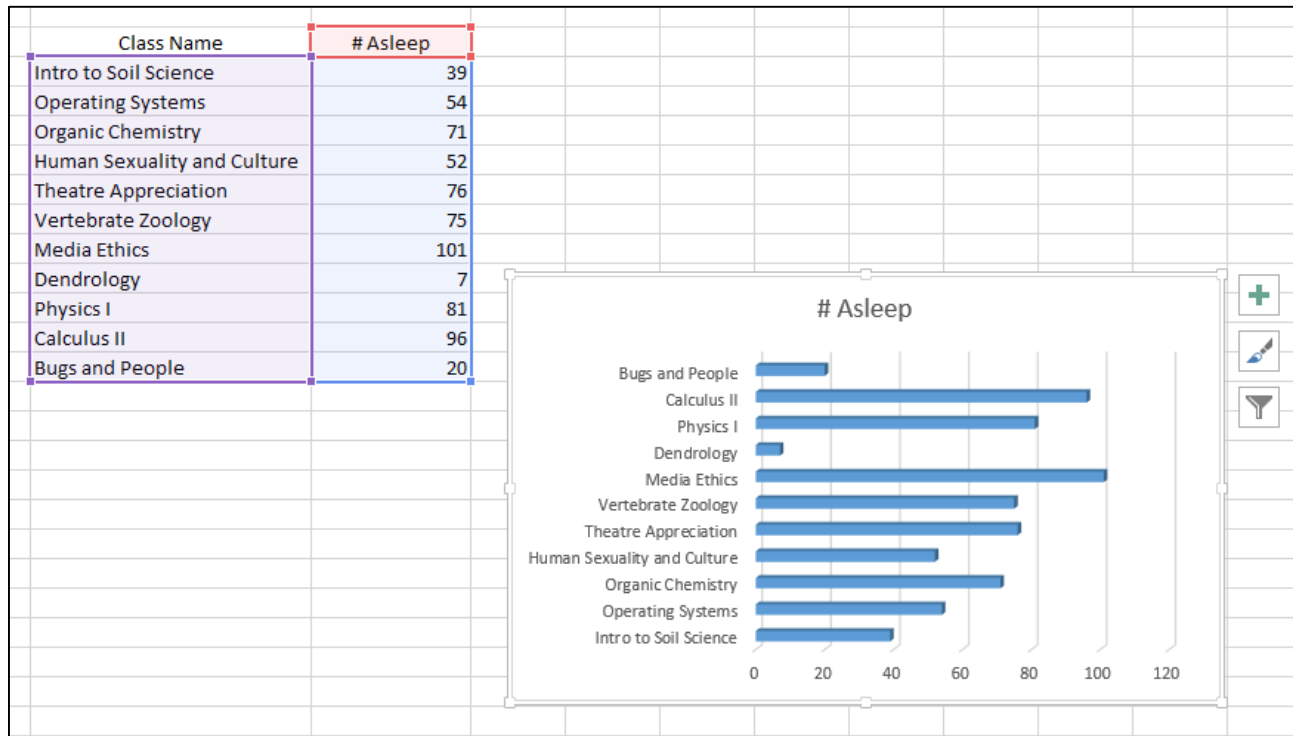
3. Navigate to the Insert Tab

4. You will see a group of Icons above the Charts label that look like this:
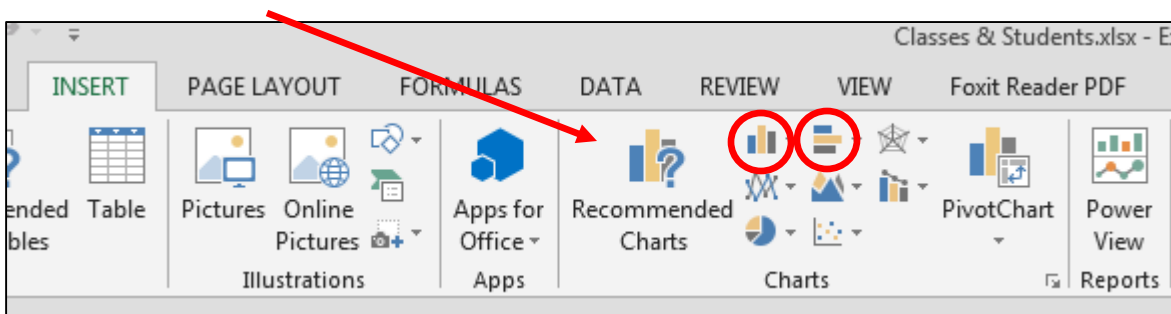
   You can use any of the designs offered in either the Column Chart or Bar Chart options (The first two from the top left, moving to the right) to organize this data.

In this example I am using the 3-D Cluster Bar Chart.

5. Change the title of the graph by clicking on "# Asleep" so that a box appears around it. Then double-click and replace that text with "Students Asleep in Class"

Next, we will take a look at how to format these charts to our liking. In Excel 2010, we had Design, Layout, and Format tabs to help us alter our tables to our liking. In Excel 2013, Design and Format tabs were retained but all but one of the Layout features were moved to options linked to the table itself.
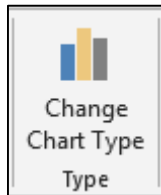

We will first go over the Design and Format tabs before moving onto the Layout features linked directly to the table.
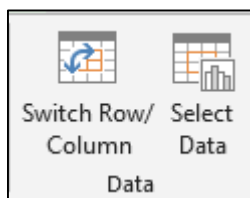
6. Select the chart, and then navigate to the Design Tab.

The Design tab has several options.

- You can change the Chart type here if you feel the current type is unfitting.

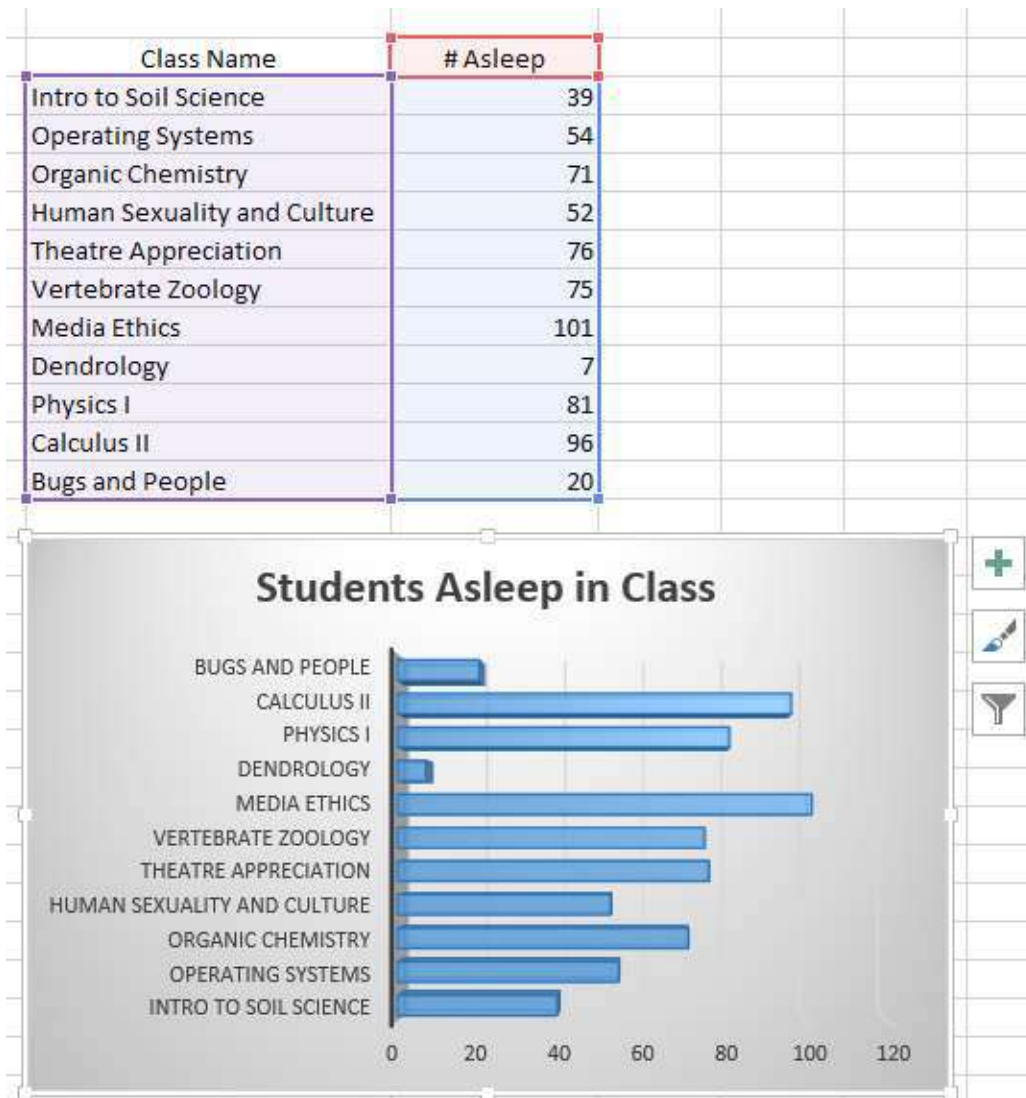- You can switch your rows and columns (x and y axis data).

7. Choose a Style from the Styles Group.

Clicking to open the drop down will show you more styles offered by Excel. You will notice the number of Styles available is much less in 2013 than it was in 2010. Hovering over each will let you know which design number it is. The example below shows Style 3, which has 3-D blue bars and a gray gradient background with dark gray text.

| Class Name	# Asleep
Intro to Soil Science	39
Operating Systems	54
Organic Chemistry	71
Human Sexuality and Culture	52
Theatre Appreciation	76
Vertebrate Zoology	75
Media Ethics	101
Dendrology	7
Physics I	81
Calculus II	96
Bugs and People	20

Students Asleep in Class

8. Now let's navigate to the Format tab.

- This tab has not changed much from Excel 2010 to Excel 2013.
- You can change the basic table appearance and text appearance within the table as well as add shadows, insert shapes, and resize the cart.

Now that we have covered the Design and Format tabs we can move on to Layout options offered next to the table.

If you click on the chart you will see three icons pop-up on the top right-hand side of the table that look like this:
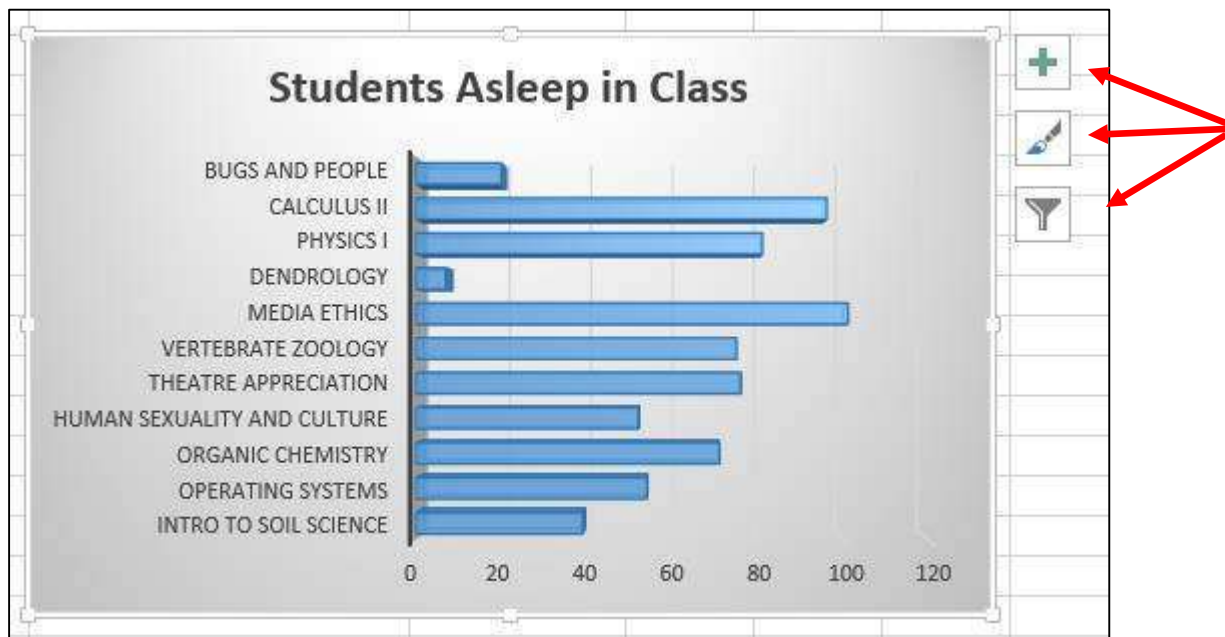
9. Hover over the first icon (which looks like a plus-sign) and a pop-up tells you that this allows you to add/remove and edit chart elements.

All options listed are very similar to the options listed in the former "Layout" tab. However, in 2013 all options are much more interactive and accessible. Let's go through each option.

10. Click on the plus sign and a menu with checkboxes will appear to the right.

Notice that right now only Axes, Chart Title, and Gridlines are checked. Let's explore the Axes option.

11. Click on the arrow that appears when you hover over the Axes option. If you click on the label Axes and not on the arrows all of your Axes will disappear off of your chart.

*Your screen should now look like this:*
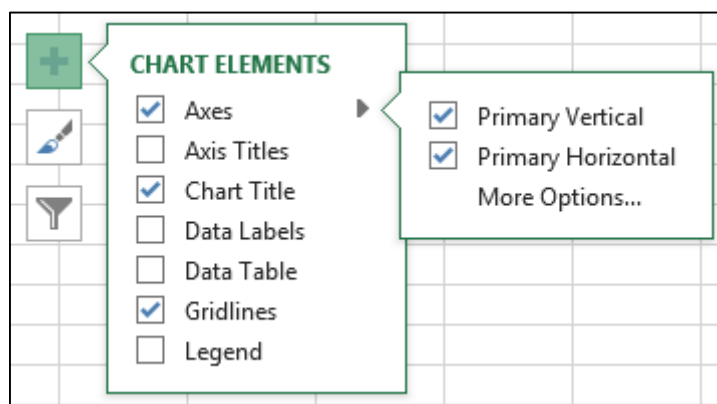
There are two options listed, one is for showing the Primary Vertical Axis and one for the Primary Horizontal. However, if you wanted to edit the size, color, bounds, or labels of the Axis you would have to either click on "More Options" at the bottom of the list OR double-click on either of the axes on the chart.

12. Either click on "More Options" at the bottom of the list or double-click on either of the axes on the chart.

    Either of these methods will bring up a side-bar that looks like this:

    This side-bar is incredibly important to formatting our chart. You can format in depth any section of the chart by clicking the drop down next to "Axis Options" right underneath "Format Axis" and clicking on any of the areas listed.
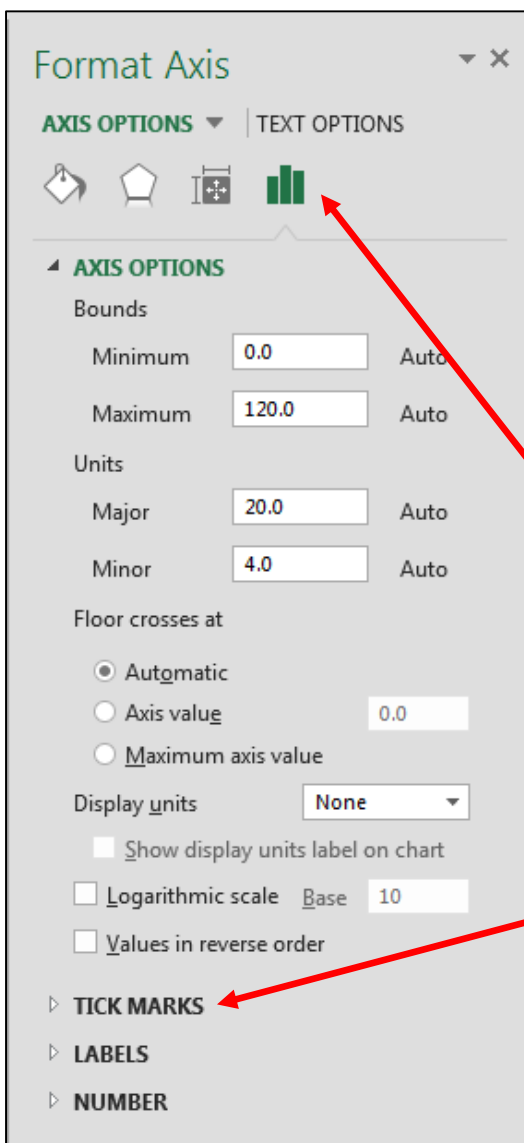
Notice that there are four icons near the top of the side-bar. This allows you to change not only the options listed but also size of the axis, color, and other effects. Remember that the vertical axis has different options than the horizontal axis.

- Let's change some things about the horizontal axis of our chart.
- You can do this either by double-clicking on the horizontal axis or click on "More Options" in the Axes menu and making sure the horizontal axis is the axis that is selected.
- Click on the "Axis Options" icon (the one that looks like a column chart).
  - *Notice that our options change depending on which axis is selected.*
- Navigate to "Tick Marks" and click on it to bring down options regarding Tick Marks.
- Click the drop-down next to "Major Type" and select "Outside"
- Select "Outside" for "Minor Type" as well.
  - *This allows our data to be more easily compared and read*

The next icon that appears when we click on our chart looks like a paintbrush.

Here you can edit the style or color of your chart without going back into the Design tab. There are separate submenus for Style and Color.

You might notice that your list of color options is more limited than it was in Excel 2010.

However, you can easily change the color of your data bars by double-clicking on all the data bars at once

13. Double-click on all of the data bars at once.

When you do this a side-bar will appear just like when we edited our Axes. If you click on the "Fill & Line" Icon this menu will appear.
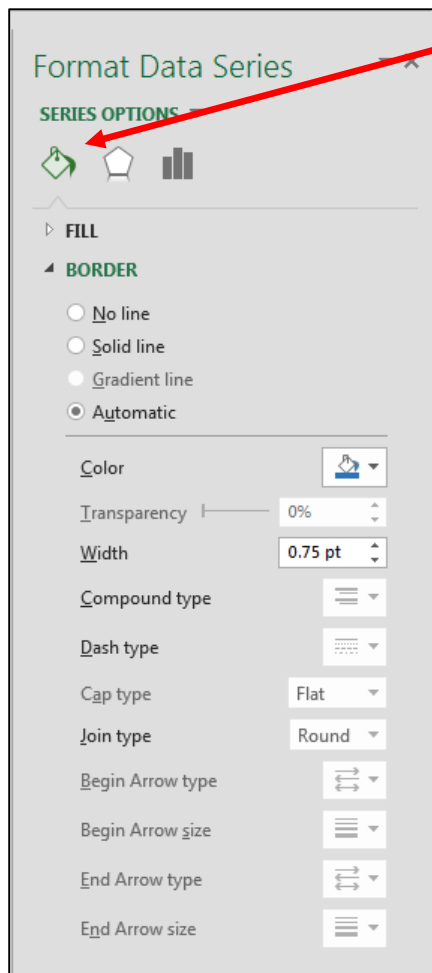
Make sure that you click on "Fill" to change the fill color of the data bars.

You may change your data bars to any color, or change each data bar to a different color.

I went ahead and changed some bars to different colors and other bars to other colors. This makes the chart easier to read as classes are now more differentiable.

Now that our table is more visually appealing and easier to read, let's go a step further and create a pie chart to better visualize the percentage of students falling asleep in each class.

To do this we need to know how many students are in each class.

14. Insert these values into Column D next to the number of students asleep.

263
64
97
291
230
293
169
282
270
145
255

Now let's do some math to figure out the percentage of people asleep in each class.

15. Go to cell E5 and enter in this formula: "=C5/D5".

16. Use the fill handle to use this formula for each class.

17. To form percentages you must divide the portion of people asleep by the entire class size and multiply by 100. Excel 2013 has eliminated the last step in our formula making and we can turn all of our decimals into percentages by clicking one button.

18. If you go to the Number option under the Home tab you will notice an icon that looks like a percent sign. With all your new decimal data selected, click the percent button.
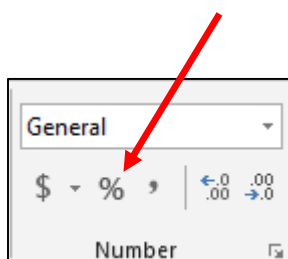
19. Now you should have a column of percentages.

Class Name	# Asleep		
Intro to Soil Science	39	263	15%
Operating Systems	54	64	84%
Organic Chemistry	71	97	73%
Human Sexuality and Culture	52	291	18%
Theatre Appreciation	76	230	33%
Vertebrate Zoology	75	293	26%
Media Ethics	101	169	60%
Dendrology	7	282	2%
Physics I	81	270	30%
Calculus II	96	145	66%
Bugs and People	20	255	8%

20. Select your percentages and while holding down the Ctrl key select the class names.

Class Name	# Asleep		
Intro to Soil Science	39	263	15%
Operating Systems	54	64	84%
Organic Chemistry	71	97	73%
Human Sexuality and Culture	52	291	18%
Theatre Appreciation	76	230	33%
Vertebrate Zoology	75	293	26%
Media Ethics	101	169	60%
Dendrology	7	282	2%
Physics I	81	270	30%
Calculus II	96	145	66%
Bugs and People	20	255	8%

21. Then go to Insert at the top and click on the Pie Chart icon, selecting the 3-D chart.
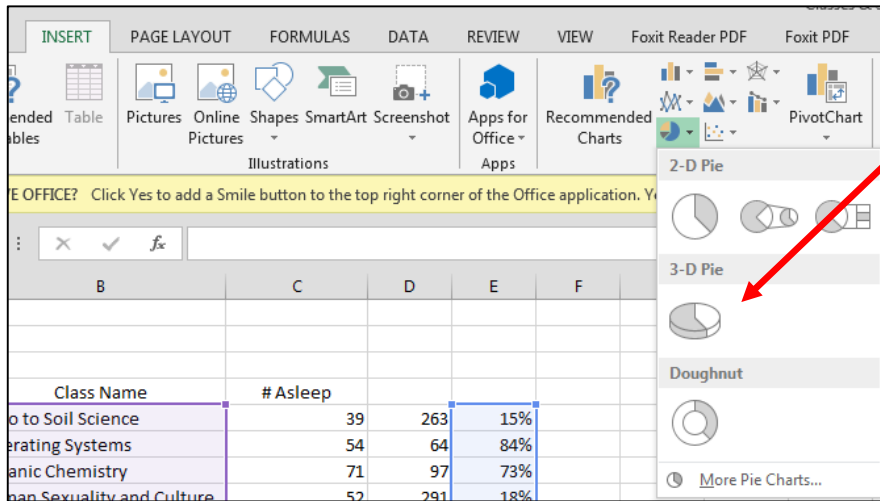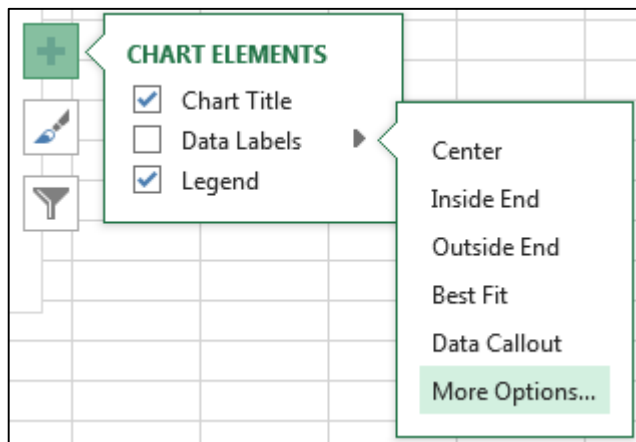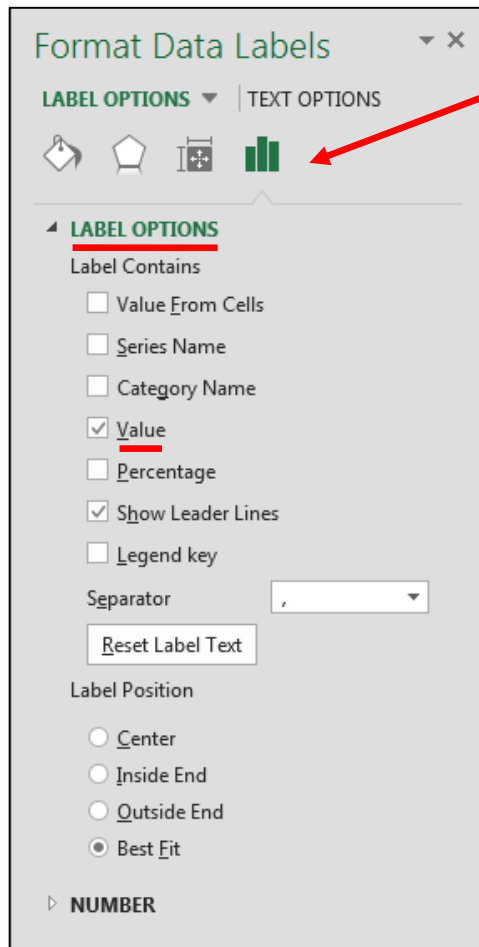

- Choose Style 8 from the Design menu.
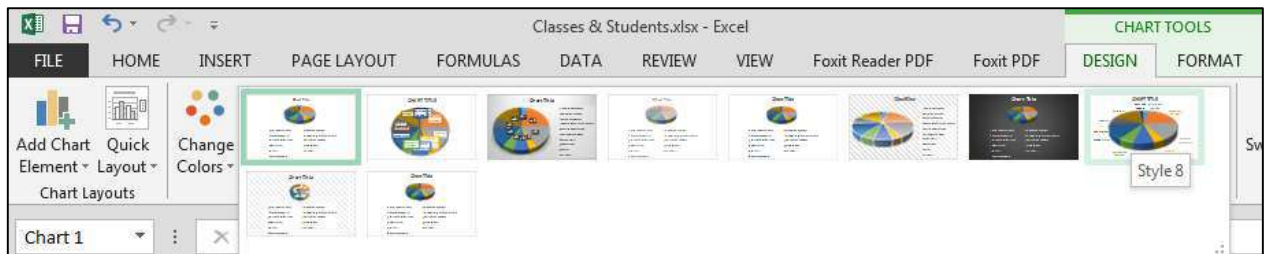
22. Click on the Chart and then on the plus sign icon next to the chart.

- Check the Legend option
- Click on the arrow next to Data Labels to and then "More Options"

23. Make sure you click on the "Label Options" icon (looks like a column chart)

- Make sure that the Label Options section is expanded
- Deselect "Category Name" and then select "Value"

24. Double-click on the Chart Title and re-name the Chart "Percentage of Students Asleep"

You should now see that even though Media Ethics had the largest number of students asleep in class, it is Operating Systems that has the largest proportion of students asleep.

25. To explode that portion of the pie, click to select only that piece and drag it away from the whole pie.

Pivot Tables and Charts

Concepts of Pivot Tables and Pivot Charts

Pivot Tables and Pivot Charts are other time saving features of Excel. They are useful when trying to organize an expansive list of data arranged in a columnar fashion, or vertically atop one another. "Pivot" comes from the way users of Excel are given the power to switch data to and from the X and Y axes. In other words, they can pivot information.

Let's explore Pivot Tables.

26. Open "Pivoting.xlsx"

27. Click a cell within the table to identify the data collection

28. Click on the Insert Tab and click on PivotTable in the Tables grouping.
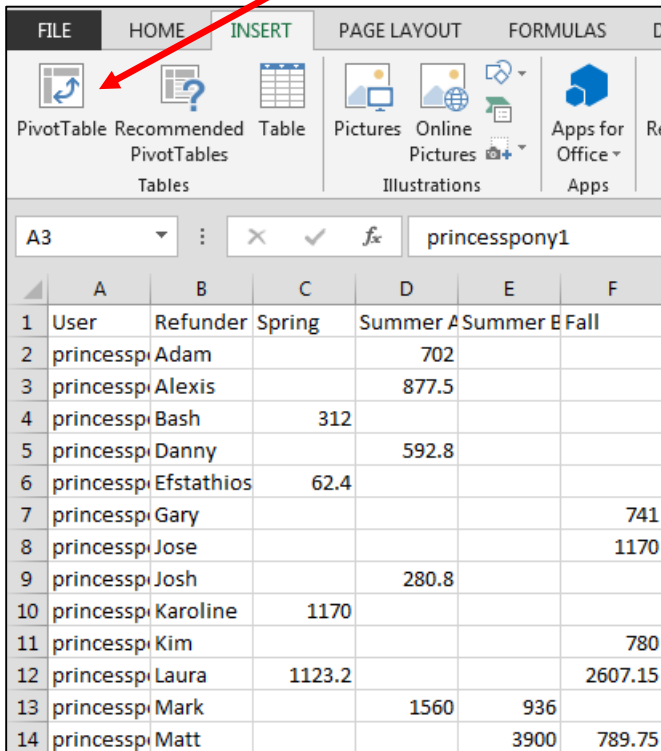
29. The following box will appear. Click OK.

You have the option of choosing whether or not you want the PivotTable to show in the same worksheet you have open, or open in a new worksheet on its own. For this lesson, I will choose New Worksheet.

30. Excel should lead you to the new worksheet automatically. Rename the new worksheet Pivot Table.

31. To the right side, there is a side-bar titled 'PivotTable Fields'. Check the 'fields' desired and migrate them into the areas shown at the bottom: Filters, Columns, Rows, and Values.

This is in fact, where the idea of Pivot Tables and Charts comes from. You get to choose the fields you want to add, and you get choose which areas to place them in. Fiddle around with the PivotTable Field List.

	A	B	C	D		E	F
1	Refunder	(All)				PivotTable Fields	▼ ✕
2							
3	Row Labels ▼	Count of Spring	Count of Summer A	Count of Summer B		Choose fields to add to report:	⚙ ▼
4	gator_lover	3	5	8			
5	happy_user	4	1	3		☑ User	
6	marsupials	1	2	5		☑ Refunder	
7	plotter_user	3	3	5		☑ Spring	
8	princesspony1	4	5	2		☑ Summer A	
9	queenof_France	1	1	1		☑ Summer B	
10	Royal_Rumble	7	6	6		☐ Fall	
11	Grand Total	23	23	30		MORE TABLES...	
12							
13							
14							
15							
16							
17						Drag fields between areas below:	
18							
19						▼ FILTERS	▥ COLUMNS
20						Refunder ▼	Σ Values ▼
21							
22							
23							
24							
25							
26							
27						≡ ROWS	Σ VALUES
28						User ▼	Count of Spring ▼
29							Count of Sum... ▼
30							Count of Sum... ▼
31							
32							
33							
34							
35						☐ Defer Layout Update	UPDATE
36							

Now, the PivotTable is completed. See how easy it was to control your data. We will go over constructing PivotCharts now.

We can create a PivotChart using the first worksheet, so let's navigate to the first worksheet.

32. Make sure you are on the first worksheet titled Tables Charts Graphs.xlsx Then, click on a cell within the table to identify the data collection.

33. Click on the Insert Tab and click on PivotChart in the Charts grouping and select PivotChart.
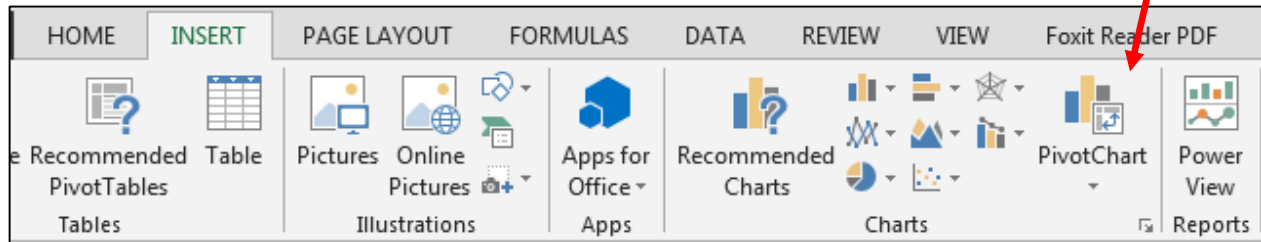

34. A dialog box similar to the one that appeared when we created PivotTables will appear. Click OK.

You have the option of choosing whether or not you want the PivotChart to show in the same worksheet you have open, or open in a new worksheet on its own. For this lesson, I will choose New Worksheet.

35. Excel should lead you to the new worksheet automatically. Rename the new worksheet Pivot Chart.

36. If you click in the area where there is a Pivot Chart placeholder the side-bar will display "Pivot Chart Fields". If you click on the Pivot Table placeholder on the spreadsheet the side-bar will display "Pivot Table Fields".

This should look familiar. It is the same box on the right side, with the same fields and areas. Again, they can choose which fields they want viewable, and the area they go in.
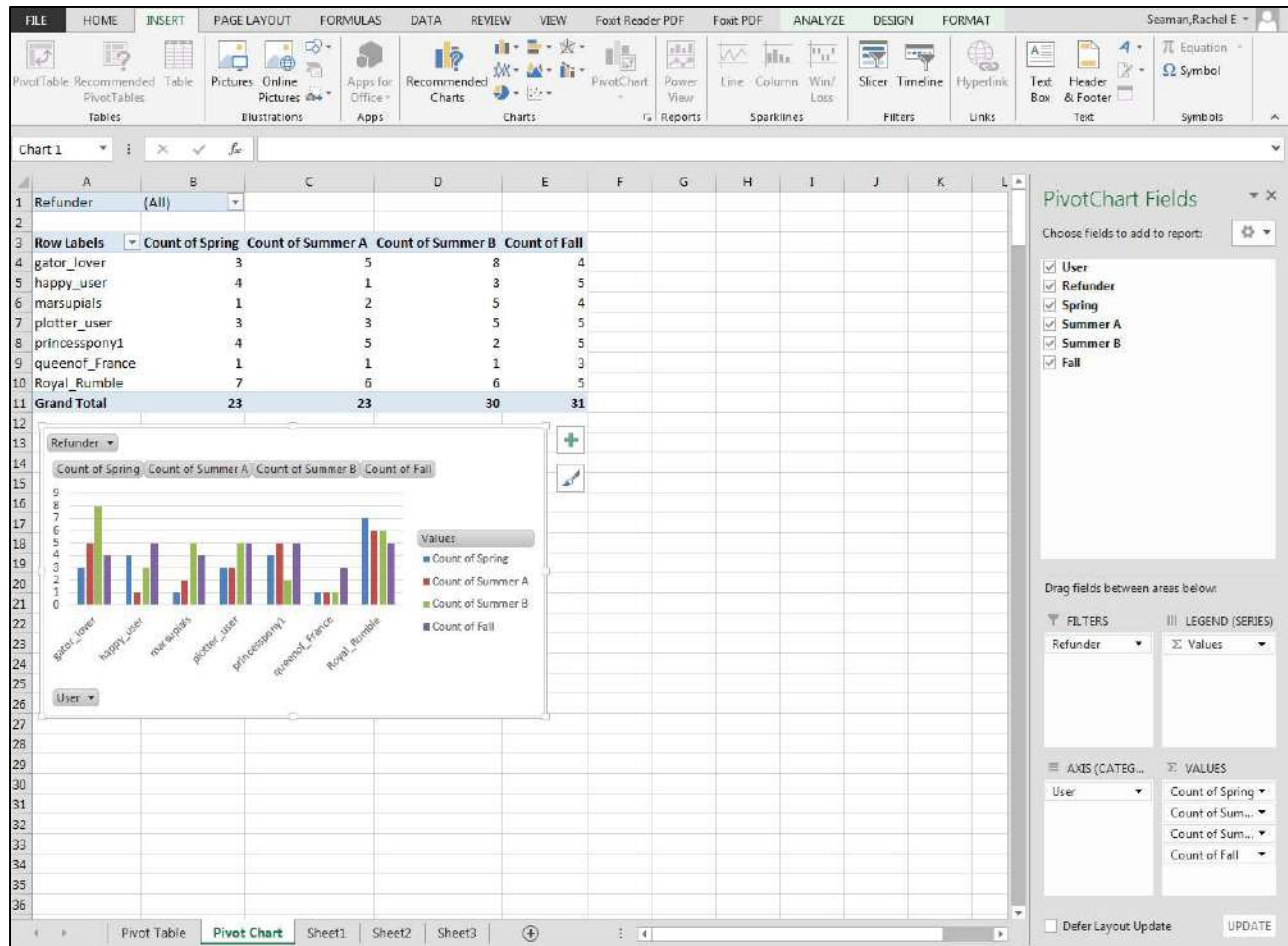

Notice something different about choosing PivotChart instead of PivotTable? Choosing PivotChart makes both the table and the chart for you at the same time. Notice how the table and charts shift as you move from fields from area to area.

Let us explore with filtering. We can narrow down to specific information with filters. Any fields from the field list that is located in the "Filter" box will show up above the Pivot Chart as a filter menu. To filter, we can click to open the drop down menu to narrow our data.

Let us set the filter so that our table only shows data from a specific Refunder.
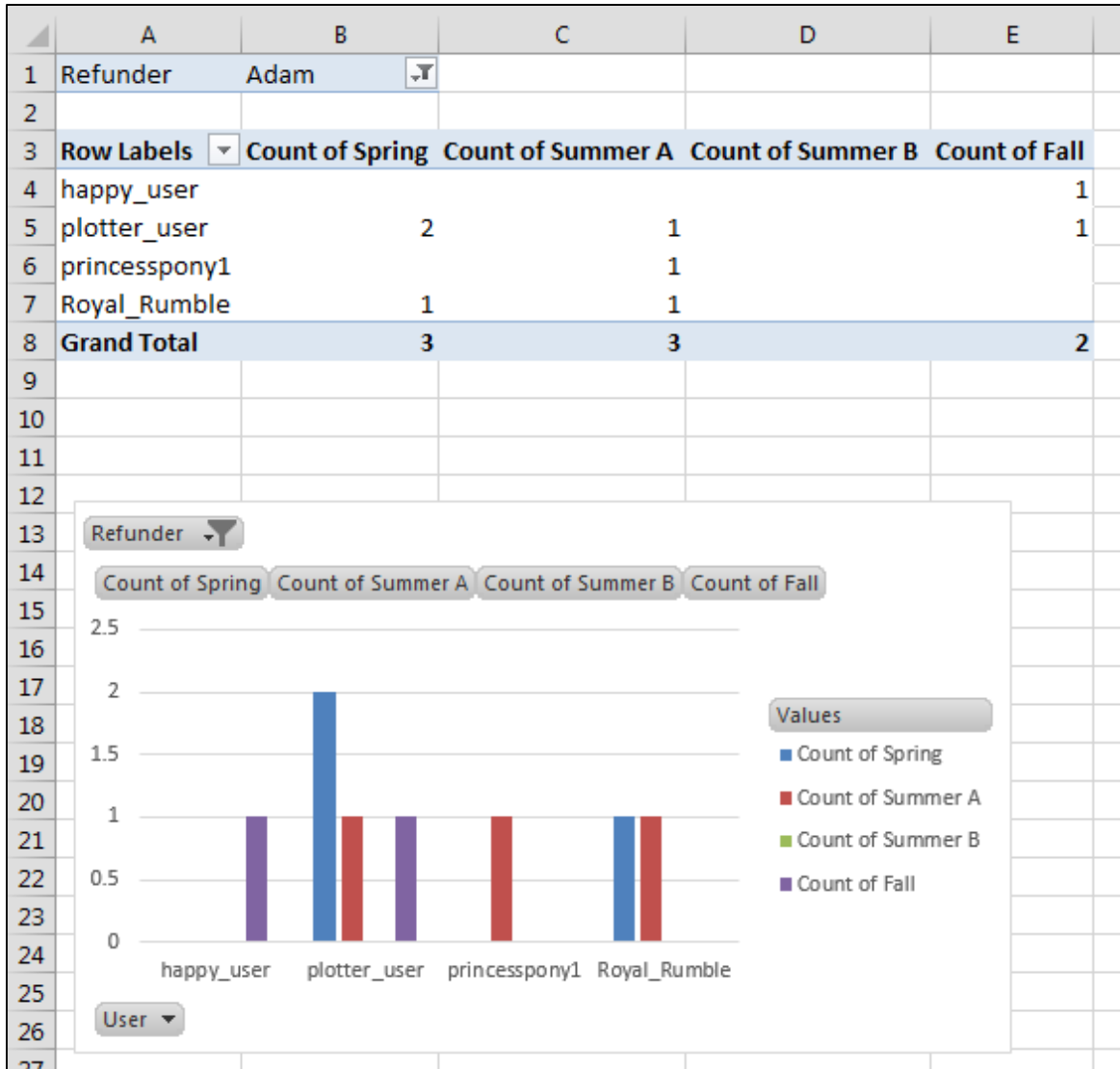
37. Click to open the drop down menu, and click on "Adam" from the list and click "OK."
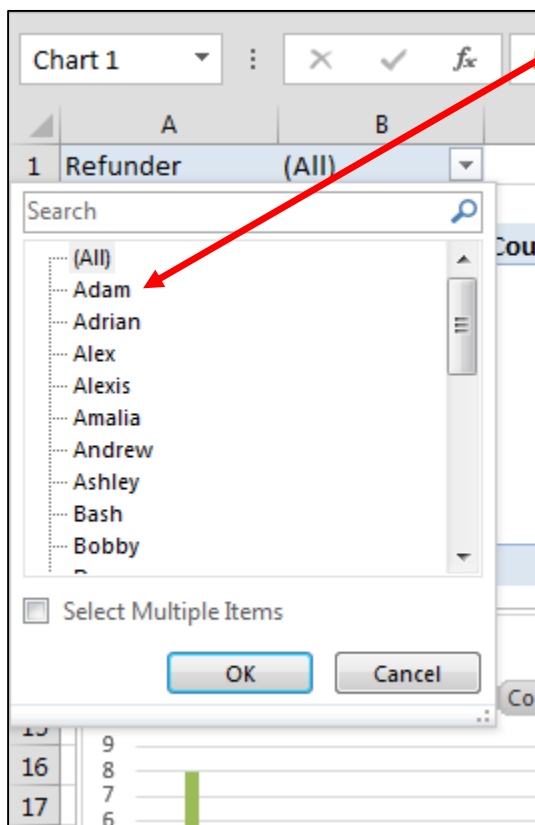
Now, the table and chart should only display semester counts for Adam only. Also, notice that filter above the table shows us that the Refunder we are filtering for is Adam.

	A	B	C	D	E
1	Refunder	Adam ⊤			
2					
3	Row Labels ▾	Count of Spring	Count of Summer A	Count of Summer B	Count of Fall
4	happy_user				1
5	plotter_user	2	1		1
6	princesspony1		1		
7	Royal_Rumble	1	1		
8	**Grand Total**	**3**	**3**		**2**
9					
10					
11					
12					

Let us now display semester counts for more than one person: Adam and Andrew.

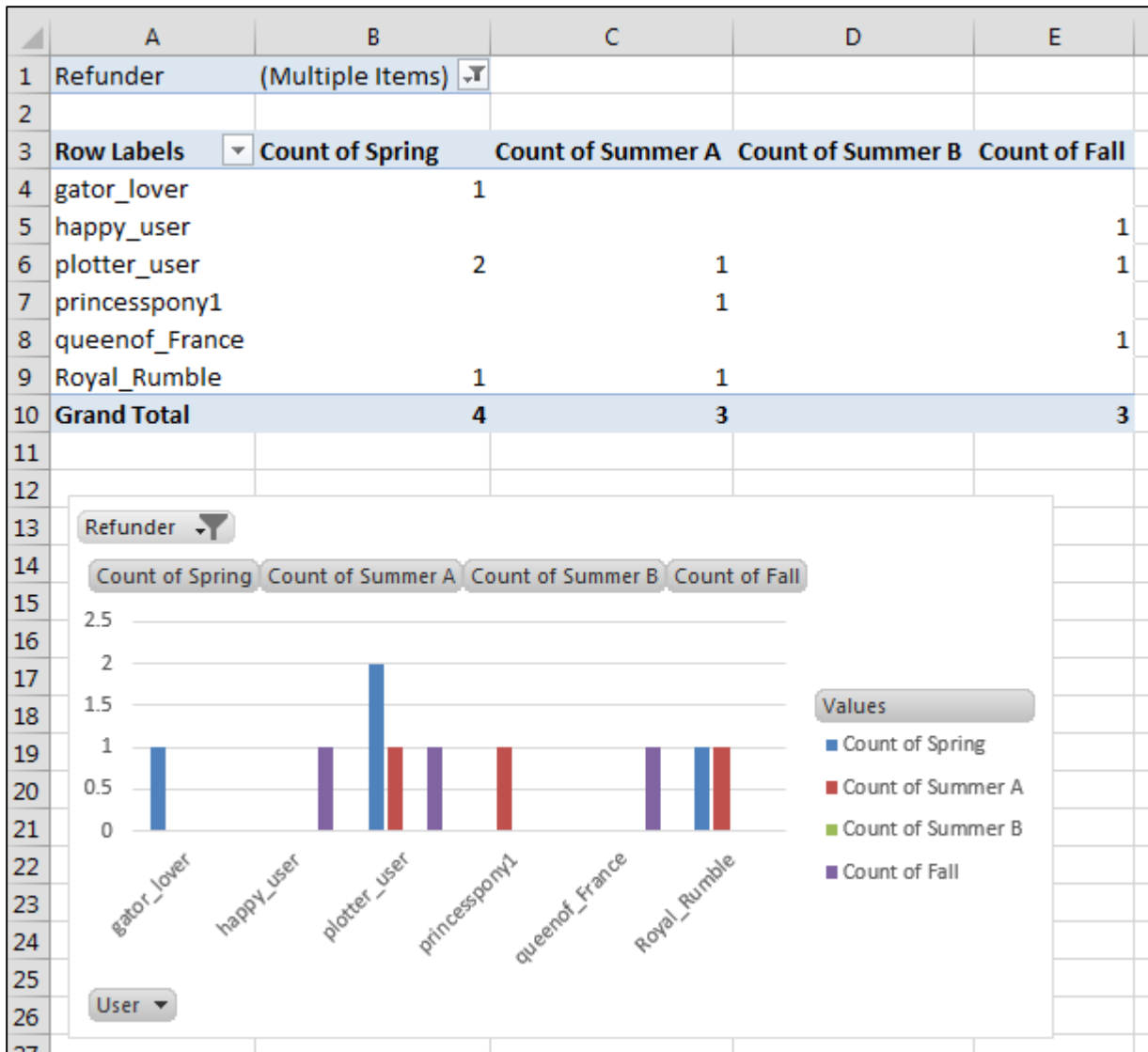38. Click to open the drop down menu and check the box for "Select Multiple Items."

Check boxes will appear next to the names in the list now.

39. Check the boxes for both Adam and Andrew and click "OK"
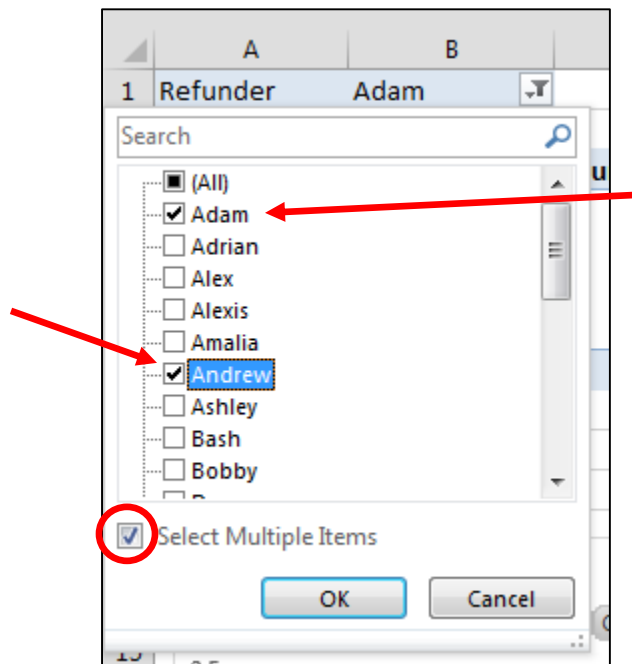
The table should now display data on Adam and Andrew. However, notice that the filter above the table no longer shows us the name of whom we're filtering for.

Since we selected more than one item in the list, it shows us "(Multiple Items)." In case we needed a reminder of the filters we set, seeing "(Multiple Items)" would not be helpful. To see what we checked off, we need to click on the "Filter" icon to open the drop down list.

In this case, Slicers would be a useful tool to see which Refunders were being looked at while still filtering the Pivot Chart and Pivot Table.

Conclusion

In this lesson, we have gone over many important topics in Microsoft Excel 2013 that will aid you in helping users in the labs. We have learned how to navigate the program, manipulate sheets, as well as create and modify tables, graphs and charts. In addition to that we have learned how to use formulas, explored the concepts of relative and absolute referencing, and lastly we learned to take our data and use it to create Pivot Tables and Pivot Charts. Now having the basic understanding of this program and being able to perform some of the most common functions will greatly improve your ability to provide good customer service to users in the labs.

Excel Activity

Sample Product Reports

- Format table
    - Make sure there is adequate spacing
    - Apply filters to headers
- Apply two different types of conditional formatting
- Subtotal Sales column
- Apply filter for Beverages for Quarter 1 only
    - Create Pie Chart that effectively shows the type of beverage and total sales

Sample Customer Reports

- Format table
    - Make sure there is adequate spacing
    - Insert Column Sparklines (Hint: Use relative referencing)
- Subtotal each sales column
    - Use relative referencing
    - Create a Grand Total
- Create a Pivot Table and Pivot Chart
    - Include Slicers
    - Make sure it is understandable