



## Advanced Microsoft Excel 2010

### Agenda:

1. Introduction
2. Complex formulas & cell references
3. Functions
4. Charts
5. Pivot Tables
6. Practice and Questions

*In order to keep computer literacy programs running in the future, we must demonstrate its positive impact on our community. We would be extremely grateful if you would share with us the experiences you have had attending our training sessions and how our program has impacted your life. Please send your responses via e-mail or regular mail. Responses may be used to promote Utica Public Library and Mid York Library System as part of grant reporting.*

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## Introductions

In the Introduction to Excel class we gained a basic familiarity with the layout, modifying spreadsheets, inputting data, and simple formulas. For this class we will build upon this foundation and explore more advanced features such as creating complex formulas, charts, functions, and pivot tables. Excel classes are offered every-other-month, but feel free to make an appointment for one-on-one tutoring with an instructor. We are here to help!

## Review

In order to avoid a lot of headache, it's important to remember what you can do with your mouse pointer in Excel.



This symbol is what your mouse pointer will most often look like. When this symbol is available you can highlight the cells to change the format or enter information.



This four-point arrow cross is available when the mouse pointer is on the perimeter of cells. When this symbol is visible you can move information by clicking and dragging from one cell to another.



This bold, black cross is available when the mouse is placed in the bottom, right corner of cells. When this symbol is visible you can copy the information, including the formula, from one cell to another, by clicking and dragging in the direction you want to go. This is a very useful tool and a big timesaver.

## Formula Procedure Review

1. Click on the cell where you want the formula
2. Start with an equal sign
3. Enter first cell coordinates (either by typing the coordinates or clicking on the cell)
4. Add an operator
5. Enter the second cell coordinates
6. Repeat steps 3 and 4 if necessary
7. Press Enter

**Remember: all formulas in Excel start with an equal sign**

Addition	+	=5+5
Subtraction	-	=5-5
Multiplication	*	=5*5
Division	/	=5/5
Exponents	^	=5^5

**Common mathematical operators in Excel**

### Complex Formulas

In the Introduction to Excel class we created simple formulas. In this class we will explore more advanced equations and functions with absolute and relative cell references.


For complex formulas, try to remember your math teacher’s lesson on the order of operations.

Excel will calculate equations in the following order:

1. Parentheses
2. Exponents
3. Multiplication/Division (whichever comes first)
4. Addition/Subtraction (whichever comes first)

A mnemonic to remember the order of operation is “Please Excuse My Dear Aunt Sally.”

Example:

	A	B	C	D
1	Top of the Muffin Café			
2	Item	Price	Quantity	Total
3	Dark Magic coffee	\$ 5.95	20	\$ 119.00
4	Muffin mix	\$ 0.95	100	\$ 95.00
5	Blueberries	\$ 3.95	20	\$ 79.00
6	Decaf coffee	\$ 5.95	40	\$ 238.00
7	Regular coffee	\$ 5.95	45	\$ 267.75
8	Sugar	\$ 1.95	10	\$ 19.50
9	Honey	\$ 3.95	5	\$ 19.75
10	Tax			
11	Total			

If the sales tax was 7%, to calculate the total tax in cell D10, you would enter the formula:

```
=(D3+D4+D5+D6+D7+D8+D9)*.07
```

The parentheses tell Excel to calculate the sum of the items before multiplying the sales tax for the correct answer of \$58.66.

Wrong way:

```
=D3+D4+D5+D6+D7+D8+D9*.07
```

In the formula without the parentheses, Excel will calculate D9\*.07 first, then add the rest of the cells. The result of this incorrect tax formula is \$819.63.

### Relative Cell References in Formulas

So far, we have only used relative cell references in our formulas. They are probably the type of cell references you will use most often. All cell references are relative by default. In the above café example, the formula =B3\*C3 was used to calculate the total cost of Dark Magic coffee in cell D3. B3 and C3 are relative cell references. What Excel is actually seeing is two cells to the left of D3 multiplied by one cell to the left. Relative cell references allow formulas to be easily copied. Instead of copying B3\*C3, Excel will know to multiply two cells to the left by one cell to the left for each cell down the D column.

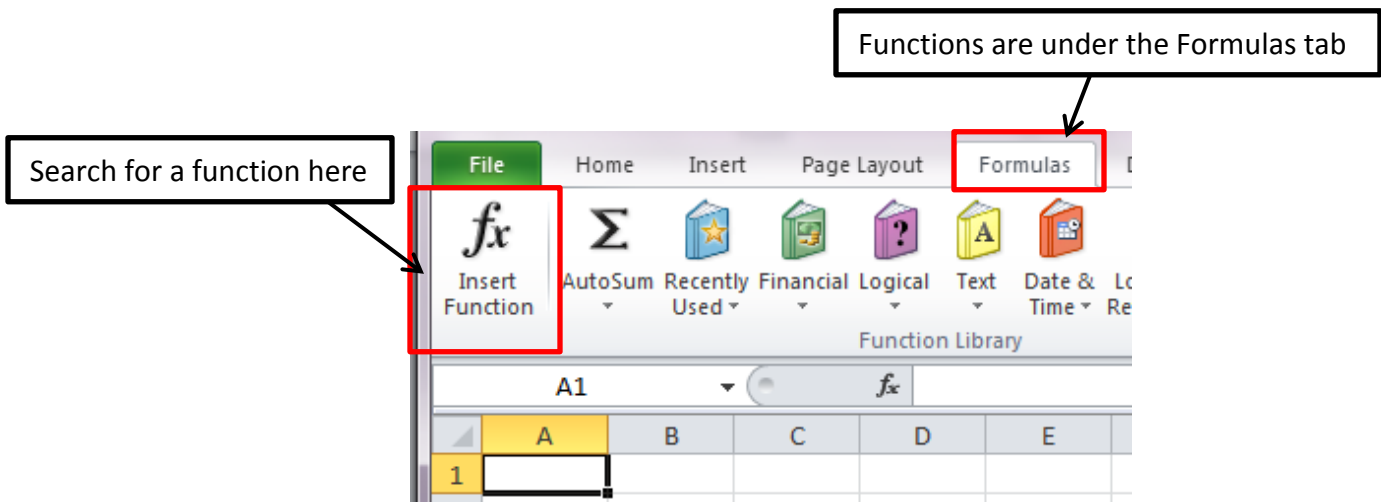
## Absolute Cell References

Absolute cell references in Excel make it so cells in a formula stay constant once copied, not relative to the formula's location. Dollar signs are used to signify an absolute cell reference.

\$A\$3: The column and the row do not change when copied.
\$A3: Column A will not change when copied, but the row number will change relative to the formula's position.
A\$3: Row 3 will not change when copied, but the column can change.

## Functions

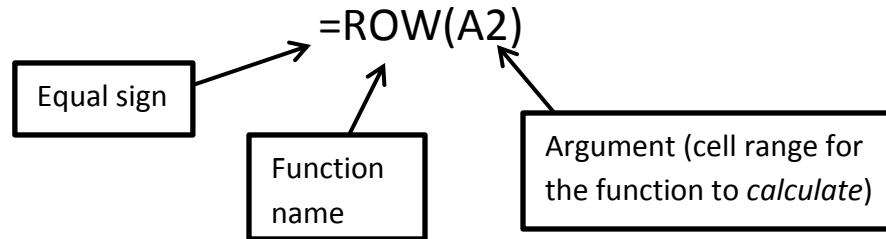
Excel functions are basically pre-designed formulas. In the Introduction to Excel class, we used the AutoSum and AutoAverage feature – which are in fact functions. There many, many other functions available. Excel also has a function library where you can search and find various functions.



## Insert Function Button

The image shows the 'Insert Function' dialog box. A callout box on the left says 'Type a description of what you would like the function to do and press Enter.' with an arrow pointing to the search box containing 'number row in sequence'. Another callout box on the right says 'Excel will provide a list of functions that relate to your description.' with an arrow pointing to the list of functions where 'ROW' is selected. A third callout box on the left says 'Excel's definition of what the function does' with an arrow pointing to the description of the 'ROW(reference)' function: 'Returns the row number of a reference.'

A function has three different parts:



The argument part of the function typically has a cell range to calculate. The beginning cell reference and the end cell reference are separated by a colon. Example:

=AVERAGE(A2:A8)

The above function will find the average of the numbers in cells A2 thru A8 (including the numbers in A2 & A8).

### Tip!

If you want row numbers to appear when printed, the ROW function is a useful tool to quickly number rows. The Row function =ROW(A2) will return the number 2 because it is the row number for that cell. You can copy the function down a column to automatically number rows.

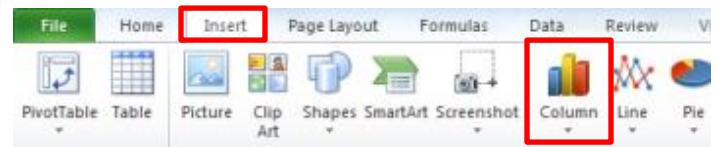
## Charts

Charts are great to visually represent data and allow people to interpret meaning quickly.

### To insert a chart:

1. Highlight the data to be graphed, including the column and row titles.
2. Click on the Insert tab.
3. Select the chart type (column, line, pie, etc.).
4. Select the visual style (2-D, 3-D, etc.).
5. The chart will appear on the worksheet.

	A	B	C	D	E
1	Student name	MS Word Database	Reflective	Midterm	
2	Smith, John	20	18	12	19
3	Fox, Stewart	10	11	0	8
4	Kidman, Carl	14	9	15	16
5	Combs, Neil	18	19	20	0
6					
7					
8					



### Chart Design

Once you create a chart, a new group of tabs will appear: Chart Tools - Design, Layout, and Format. **The chart has to be selected in order for these tabs to be visible.**



## Chart Tools Design Tab



In the Chart Tools Design tab you can:

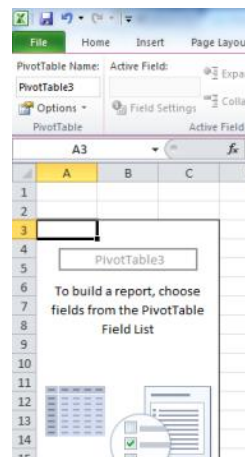
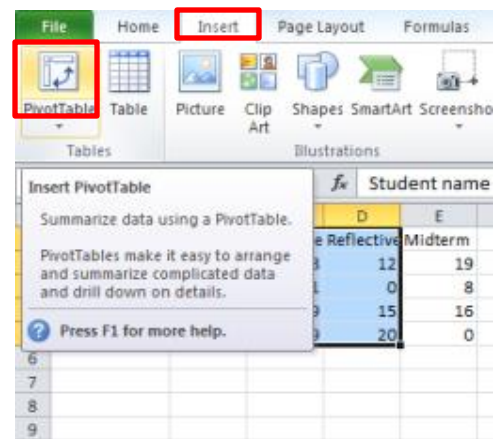
- Change the chart type (see what your data looks like in a pie or line chart instead)
- Switch the Row and Column data on the X axis
- Do quick layout changes (add a title to the x or y axis, add a legend, show more grid lines, etc.)

## Pivot Tables

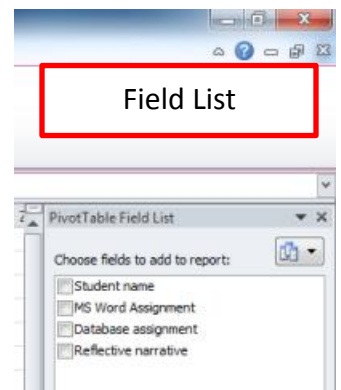
Pivot Tables allow you to focus in on certain parts of your data to make your spreadsheet more manageable. In other words, pivot tables summarize data. Only want to view two of your twenty columns? No problem with pivot tables.

### To create a pivot table:

1. Select the table or cells that you want to be the source of the pivot table's data.
2. Click on the **Insert** tab and select the Pivot Table button
3. A Create Pivot Table box will appear confirming the source spreadsheet of your data. Click OK.
4. A blank Pivot Table will appear on the left and the Field List will appear on the right.
5. Select what information you would like shown in your Pivot Table in the Field List.
6. You can also *Pivot* your data around. What was once organized in columns can be switched to the rows. It allows you to look at your data in a different light.



Blank Pivot Table



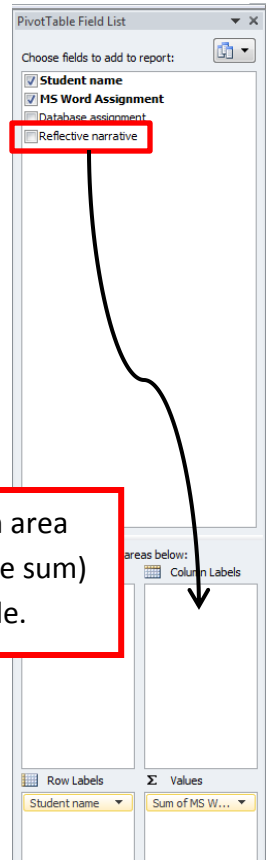
**To Pivot your data:**

Pivoting data, or changing the row and column labels, will help you analyze your data differently.

To change the row or column labels simply click and drag the fields from the Pivot Table Field List to the Row Label, Column Label, or Sum Value Area like pictured to the right. To remove the field, click and drag them out of the field list.

You can also create a chart of your Pivot Table (called a Pivot Chart). Select any cell in your Pivot Table, an Options tab will appear on the ribbon. Click on the Options tab then Pivot Chart. Updating the Pivot Table will automatically update the Pivot Chart.

Click and drag a field into an area (row label, column label, value sum) to change your pivot table.



**Tip!**

If you change any data in the source spreadsheet, the pivot table will NOT automatically update. To update a pivot table, click on the pivot table, and then go to Options – Refresh.

**For free Excel tutorials:**

- Go to the website <http://www.gcflearnfree.org/office>
  - There are videos and step-by-step instructions on Excel versions 2000-2016.

**Excel Keyboard Shortcuts**

Keyboard shortcut	Action
Ctrl + Down or Up Arrow	Moves to the top or bottom cell of the current column
Ctrl + Shift + Down or Up Arrow	Selects all the cells above or below the current cell
F2	Opens the cell for editing in the formula bar
Ctrl + Home	Navigates to cell A1
Ctrl + End	Navigates to the last cell that contains data
Alt + =	AutoSums the cells above the current cell