EXCEL

FORMULAS, FUNCTIONS, AND OTHER USEFUL FEATURES

OVERVIEW

- Excel is a spreadsheet, a grid made from columns and rows. It is a software program that can make number manipulation easy and somewhat painless.

- The nice thing about using a computer and spreadsheet is that you can experiment with numbers without having to RE-DO all the calculations.

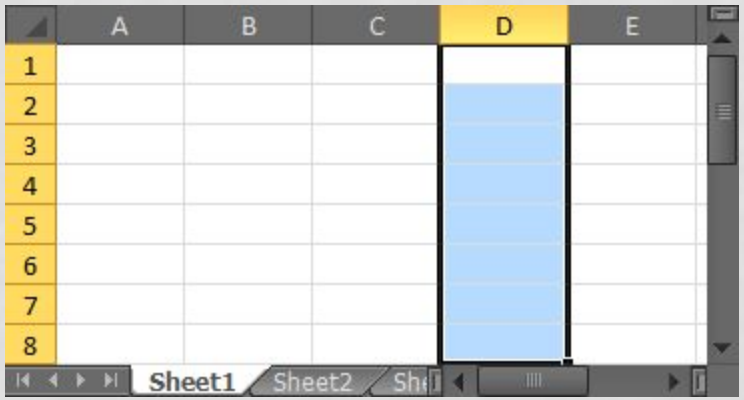
BASICS OF A SPREADSHEET

- Spreadsheets are made up of
  - Columns
  - Rows
  - and their intersections are called cells

WHAT IS A COLUMN ?

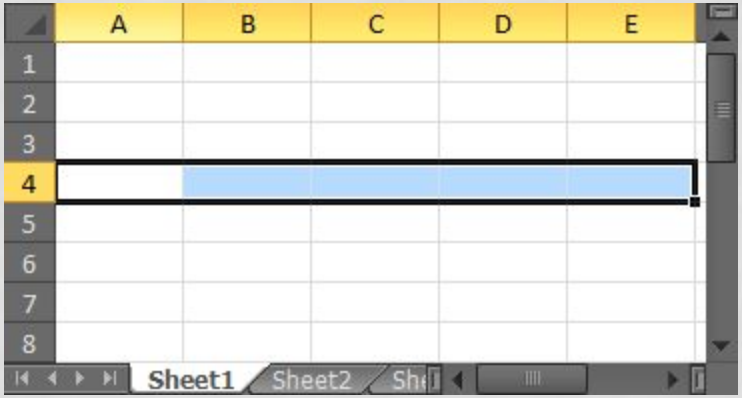
- In a spreadsheet the **COLUMN** is defined as the vertical space that is going up and down the window. **Letters** are used to designate each **COLUMN'S** location.

- **COLUMN** labeled **D** is highlighted.



WHAT IS A ROW?

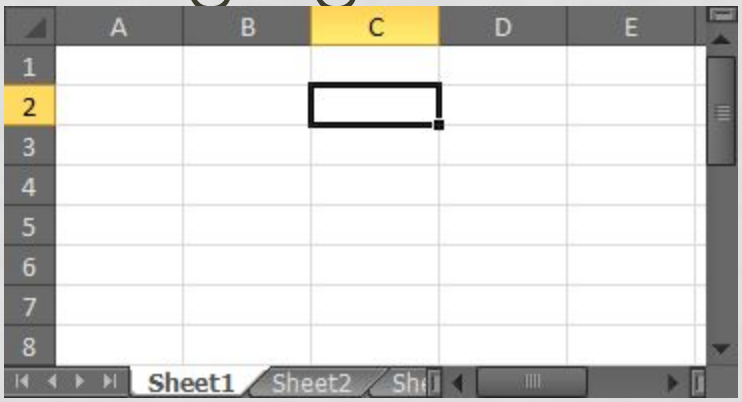
- In a spreadsheet the **ROW** is defined as the horizontal space that is going across the window. **Numbers** are used to designate each **ROW'S** location.
- **ROW** labeled **4** is highlighted.



WHAT IS A CELL ?

- A **CELL** is the space where a row and column intersect. Each **CELL** is assigned a name according to its **COLUMN letter** and **ROW number**.

- In the above diagram the **CELL** labeled **C2** is highlighted.



TYPES OF DATA

- In each cell there may be the following data types:
  - Labels -- (text with no numerical value)
  - Number data (constant values)
  - Formulas (mathematical equation used to calculate)

Data Types	Examples	Descriptions
LABEL	Name or Wage or Days	anything that is just text
CONSTANT	5 or 3.75 or -7.4	any number
FORMULA	=5+3 or = 8*5+3	math equation

LABELS

- **Labels** are text entries
  - Labels help identify what we are talking about
  - Labels do not have a value associated with them
  - Sometimes called 'headers'

	A	B	C	D	E	F	G	H
1	First Name	Last Name	Company Name	Address 1	City	State	Zip	Phone
2	Sharon	Aguilar	Maury Delicatessen	10370 Walnut	Tulsa	Minnesota	79113	(552) 586-1179
3	Meredith	Alvarado	Bannister Housekeeping	7583 Balsam	Hempstead	California	63792	(369) 509-9323
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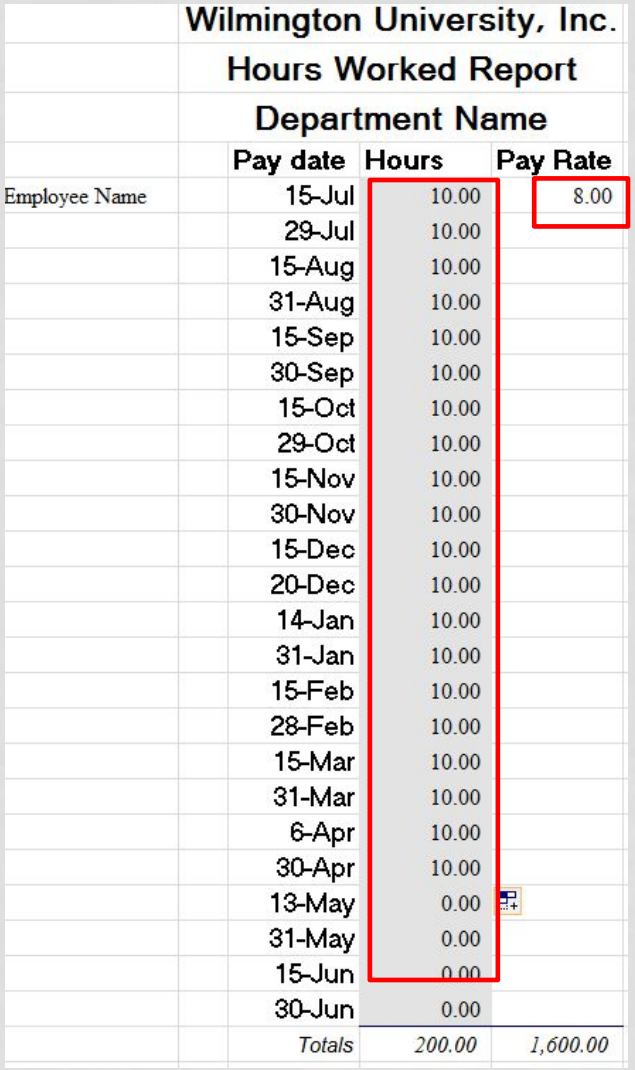
14	Cassie	Walton	Dewey Welcome Wagon	6200 Hackberry	Phoenix	Virginia	46424	(287) 977-0607

CONSTANTS

- **Constants** are FIXED number data
- Constants may refer to dollars, percentages, or number of items (in this case number of hours worked within a certain pay period).



	Wilmington University, Inc.		
	Hours Worked Report		
	Department Name		
	Pay date	Hours	Pay Rate
Employee Name	15-Jul	10.00	8.00
	29-Jul	10.00	
	15-Aug	10.00	
	31-Aug	10.00	
	15-Sep	10.00	
	30-Sep	10.00	
	15-Oct	10.00	
	29-Oct	10.00	
	15-Nov	10.00	
	30-Nov	10.00	
	15-Dec	10.00	
	20-Dec	10.00	
	14-Jan	10.00	
	31-Jan	10.00	
	15-Feb	10.00	
	28-Feb	10.00	
	15-Mar	10.00	
	31-Mar	10.00	
	6-Apr	10.00	
	30-Apr	10.00	
	13-May	0.00	
	31-May	0.00	
	15-Jun	0.00	
	30-Jun	0.00	
	Totals	*200.00*	*1,600.00*

FORMULAS

- **Formulas** are math equations that CALCULATE a value to be displayed.
- DO NOT type in the numbers; type in the equation.
- It is BEST to **Reference** as much data as possible as opposed to typing data into equations. That way when OTHER information changes, we **DO-NOT have to change the equations or type in information again**.

	Wilmington University, Inc.		
	Hours Worked Report		
	Department Name		
	Pay date	Hours	Pay Rate
Employee Name	15-Jul	10.00	8.00
	29-Jul	10.00	
	15-Aug	10.00	
	31-Aug	10.00	
	15-Sep	10.00	
	30-Sep	10.00	
	15-Oct	10.00	
	29-Oct	10.00	
	15-Nov	10.00	
	30-Nov	10.00	
	15-Dec	10.00	
	20-Dec	10.00	
	14-Jan	10.00	
	31-Jan	10.00	
	15-Feb	10.00	
	28-Feb	10.00	
	15-Mar	10.00	
	31-Mar	10.00	
	6-Apr	10.00	
	30-Apr	10.00	
	13-May	0.00	
	31-May	0.00	
	15-Jun	0.00	
	30-Jun	0.00	
	Totals	*200.00*	*1,600.00*

BASIC FORMULAS & FUNCTIONS

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BASIC MATH FUNCTIONS

- Math functions built into them. Of the most basic operations are the standard multiply, divide, add and subtract.

	A	B	C	D	E	F
1	**5**	**5**	**Operation**	Symbol	Reference Data	Answer
2			**Multiply**	*	= A1 * B1	25
3			**Divide**	/	= A1 / B1	1
4			**Add**	+	=A1+B1	10
5			**Subtract**	-	= A1-B1	0

SUM FUNCTION

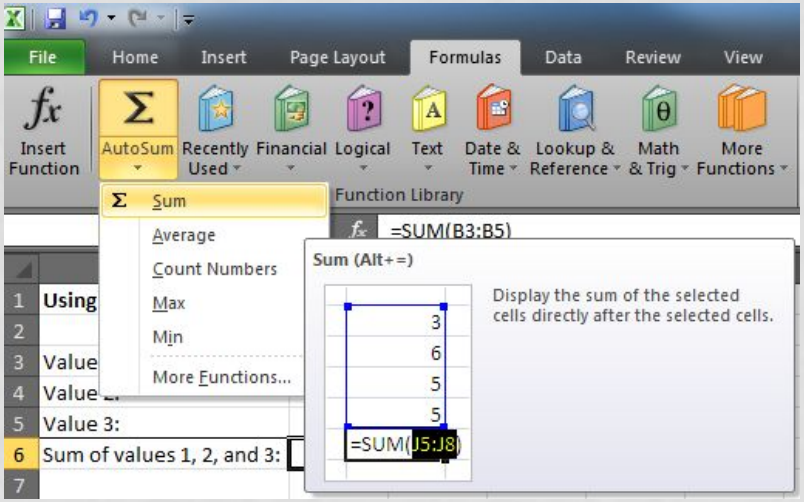
Definition:

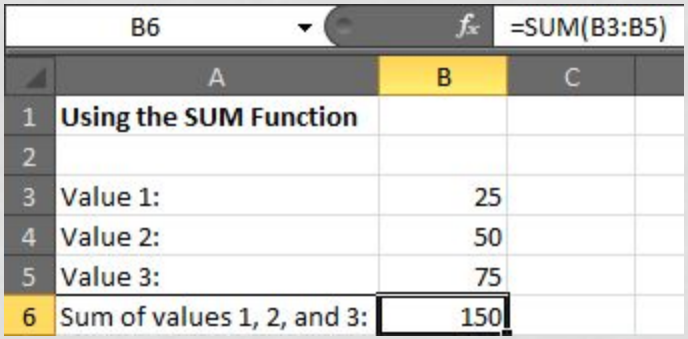
- Probably the most popular function in any spreadsheet is the SUM function. The Sum function takes all of the values in each of the specified cells and totals their values.
- The syntax is: =SUM(first value, second value, etc)

Tips:

- Blank cells will return a value of zero to be added to the total.
- Text cells can not be added to a number and will produce an error.

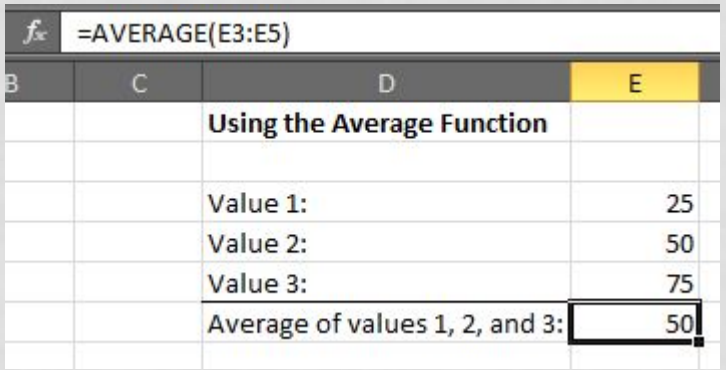
SUM FUNCTION





AVERAGE FUNCTION

- The average function finds the average of the specified data. (Simplifies adding all of the indicated cells together and dividing by the total number of cells.)



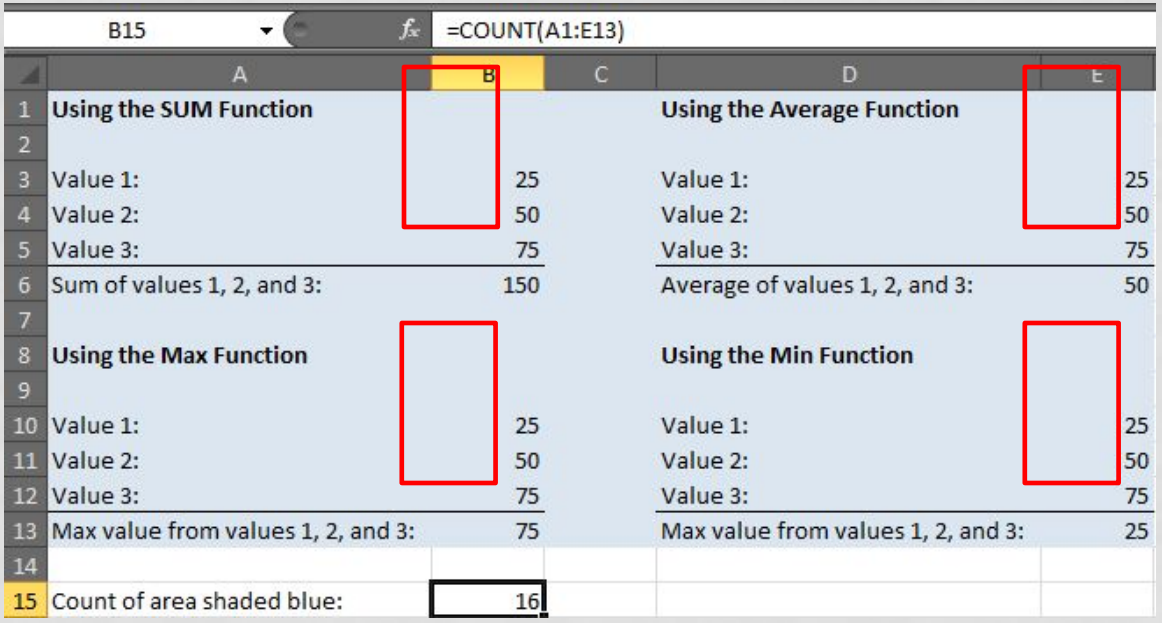
MAX & MIN FUNCTIONS

- The **Max** function will return the largest (max) value in the selected range of cells. The **Min** function will display the smallest value in a selected set of cells.

8	**Using the Max Function**			**Using the Min Function**	
9					
10	Value 1:	25		Value 1:	25
11	Value 2:	50		Value 2:	50
12	Value 3:	75		Value 3:	75
13	Max value from values 1, 2, and 3:	75		Max value from values 1, 2, and 3:	25

COUNT FUNCTION

- The **Count** function will return the number of entries (actually counts each cell that contains NUMBER DATA) in the selected range of cells.
- Remember: cell that are blank or contain text will not be counted.



	A	B	C	D	E
1	**Using the SUM Function**			**Using the Average Function**	
2					
3	Value 1:	25		Value 1:	25
4	Value 2:	50		Value 2:	50
5	Value 3:	75		Value 3:	75
6	Sum of values 1, 2, and 3:	150		Average of values 1, 2, and 3:	50
7					
8	**Using the Max Function**			**Using the Min Function**	
9					
10	Value 1:	25		Value 1:	25
11	Value 2:	50		Value 2:	50
12	Value 3:	75		Value 3:	75
13	Max value from values 1, 2, and 3:	75		Max value from values 1, 2, and 3:	25
14					
15	Count of area shaded blue:	16			

IF FUNCTION

Definition:

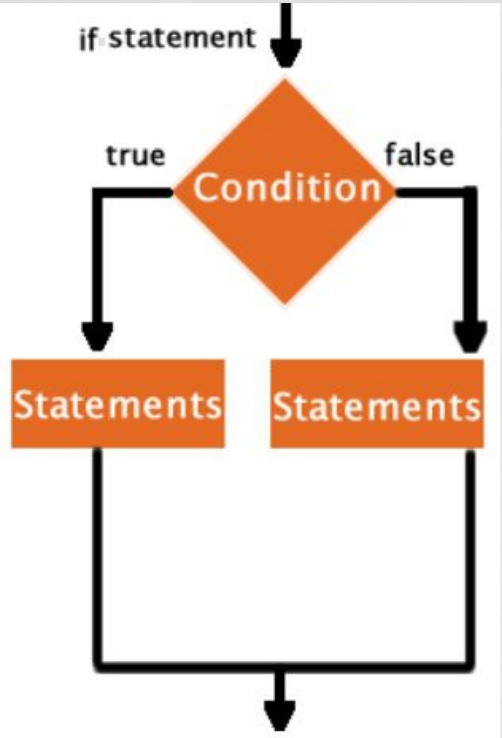
- The IF function will check the logical condition of a statement and return one value if true and a different value if false.
- The syntax is:
  =IF (condition, value-if-true, value-if-false)

Tips:

- Until you are used to writing them, test them out on multiple cells.
- There are multiple ways to write an IF statement to get the same result

IF FUNCTION

- IF Functions are like programing - they provide multiple answers based on certain conditions.



DATA TOOLS

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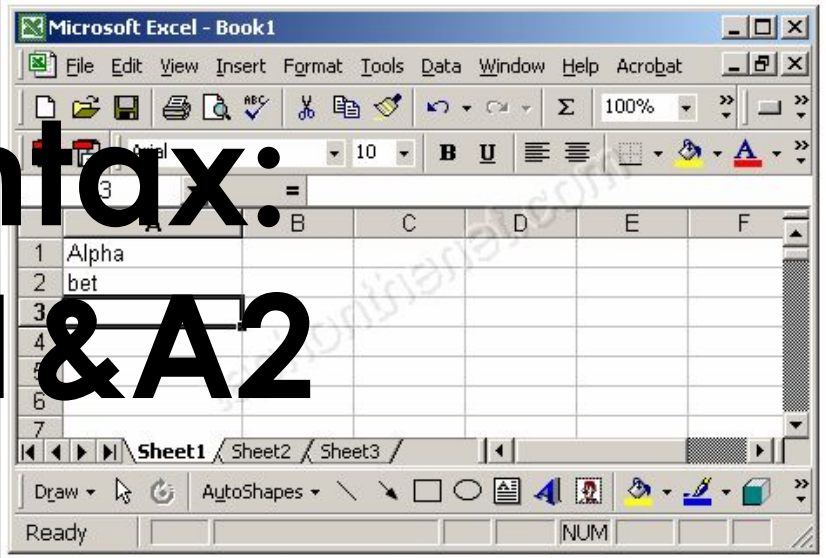
CONCATENATE FUNCTION

- **Concatenate function** - join several strings into one text string
  - **Note:** The concatenate function does not automatically leave a blank space between words or other data.

Syntax:

=A1&A2

Let's take a look at an example to see how you would use the **CONCATENATE** function in a worksheet:

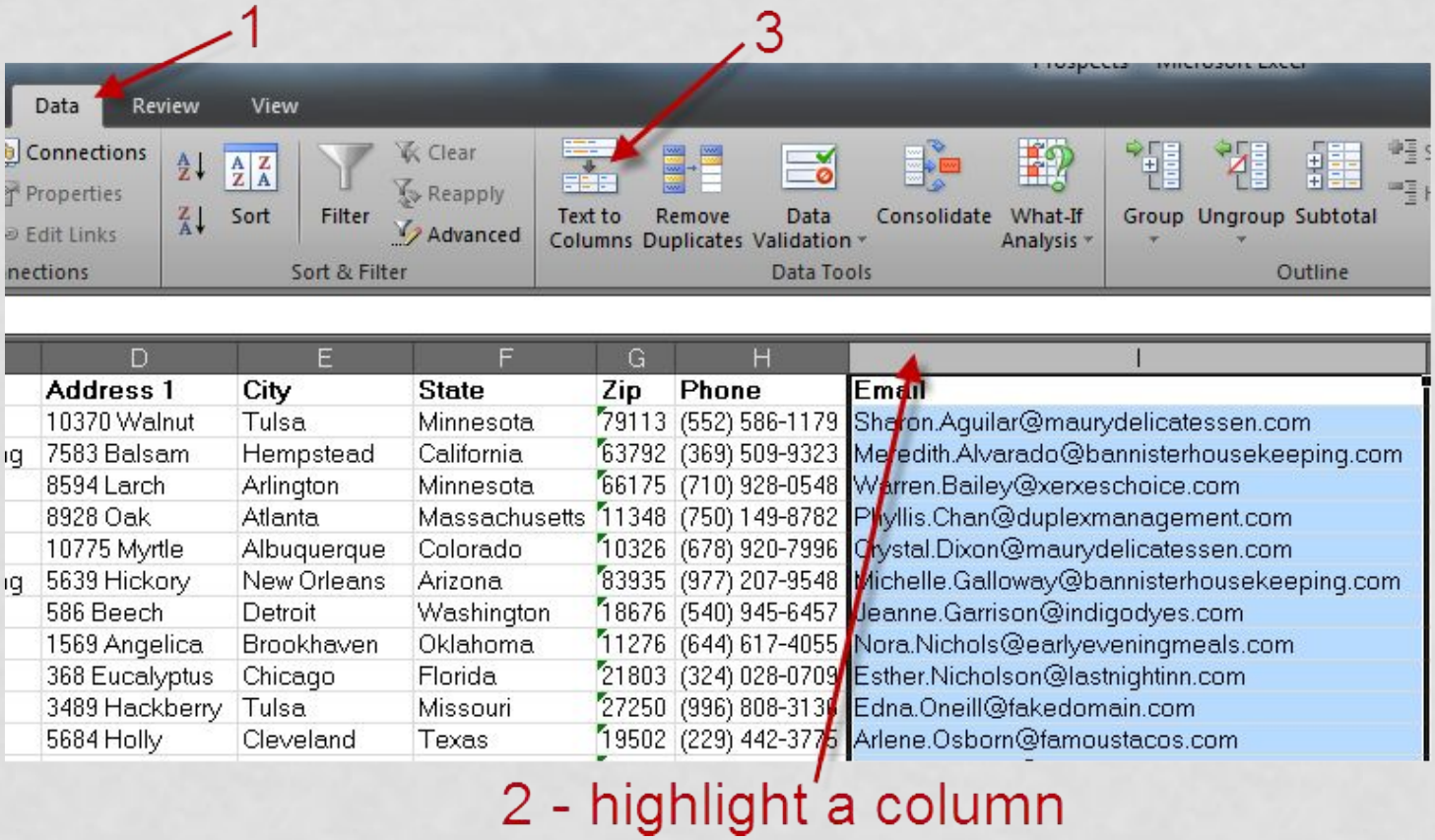


Based on the Excel spreadsheet above, the **CONCATENATE** function would return the following:

=CONCATENATE(A1, A2)	would return "Alphabet"
=CONCATENATE("Tech on the ", "Net")	would return "Tech on the Net"
=CONCATENATE(A1, "bet soup")	would return "Alphabet soup"

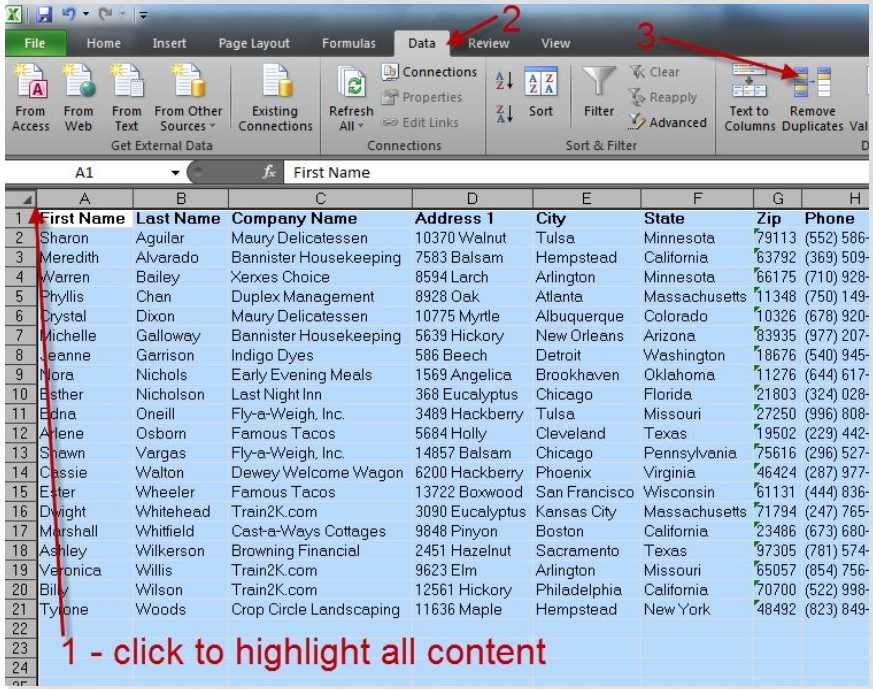
TEXT TO COLUMNS

- **Text to Columns** – delineate via special characters or fixed width



REMOVING DUPLICATE VALUES

- **Removing duplicate values** – check for and delete specific cells with duplicate values



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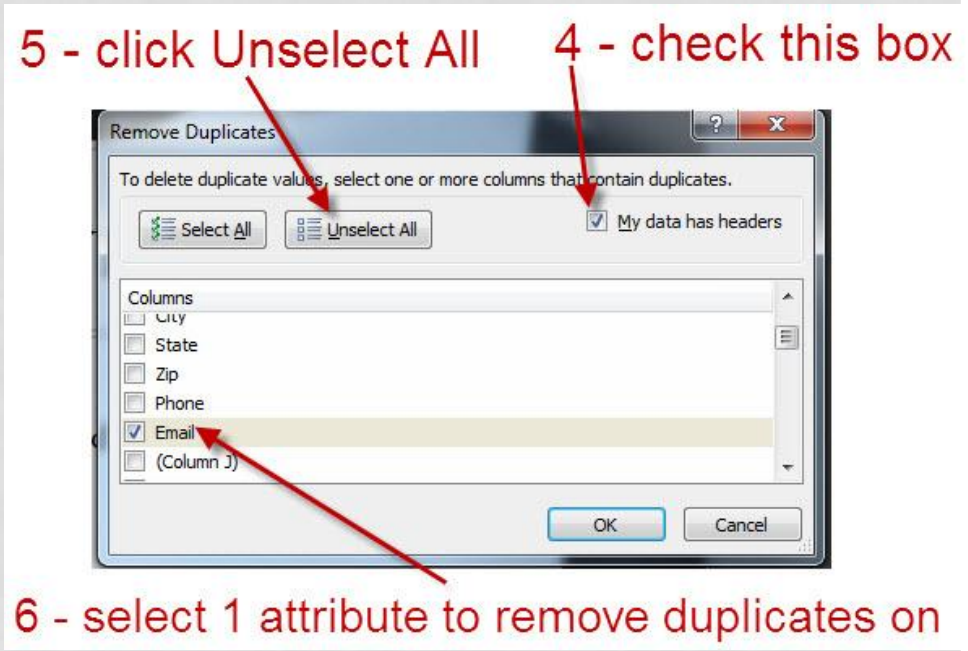
18	Ashley	Wilkerson	Browning Financial	2451 Hazelnut	Sacramento	Texas	97305	(781) 574-
19	Veronica	Willis	Train2K.com	9623 Elm	Arlington	Missouri	65057	(854) 756-
20	Billy	Wilson	Train2K.com	12561 Hickory	Philadelphia	California	70700	(522) 998-
21	Tyrone	Woods	Crop Circle Landscaping	11636 Maple	Hempstead	New York	48492	(823) 849-



USEFUL FEATURES

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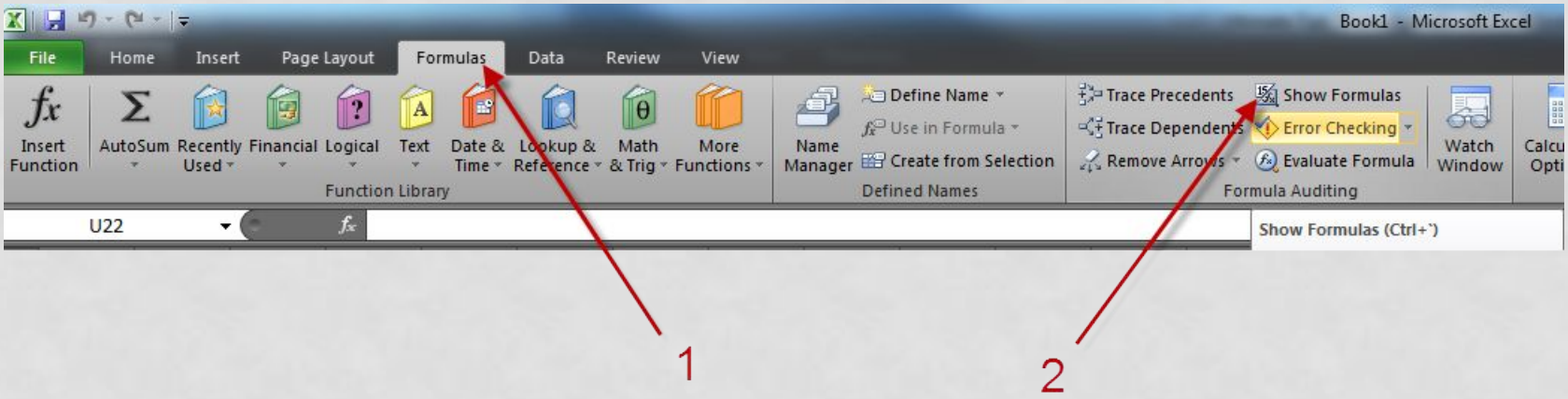
INSTANTLY REVEAL FORMULAS AND GENERAL NUMBER FORMAT OF ALL CELLS

- Show all formulas and the general number format of cells
- Saves you time because you don't have to move the cell pointer to check each formula one-by-one.

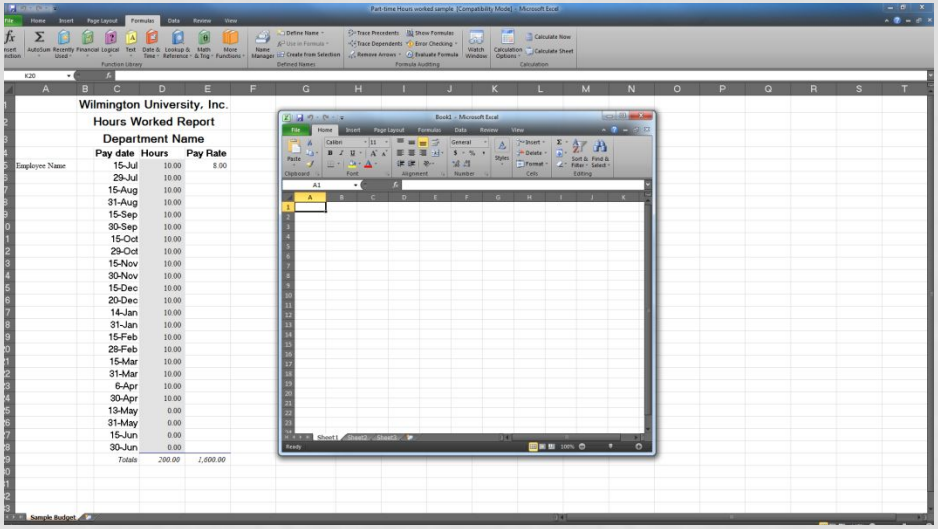


KEYBOARD SHORT CUT TO INSTANTLY REVEAL FORMULAS

- To do this, just press the Ctrl key and the tilde key at the same time. The tilde is the squiggly line that is directly above the tab key in the upper left corner of your keyboard. To change your worksheet back to the normal view, just press the Ctrl and tilde keys again.

COMPARING 2 OR MORE EXCEL SPREADSHEETS SIMULTANEOUSLY

- You can open two instances of Excel INSTEAD of multiple files on top of each other in the same Excel application.
- To do this, simply open Excel by double clicking the icon on your desktop and open the first Excel file you want to use. Minimize this window and move it to the right screen. Then go back to the desktop, double click the Excel icon once more, another **separate** Excel window will open.



SORTING

- Arranging data so it's easy to analyze
- You can sort the data alphabetically, from highest to lowest, or by a number of additional criteria (such as cell color)

FILTERS

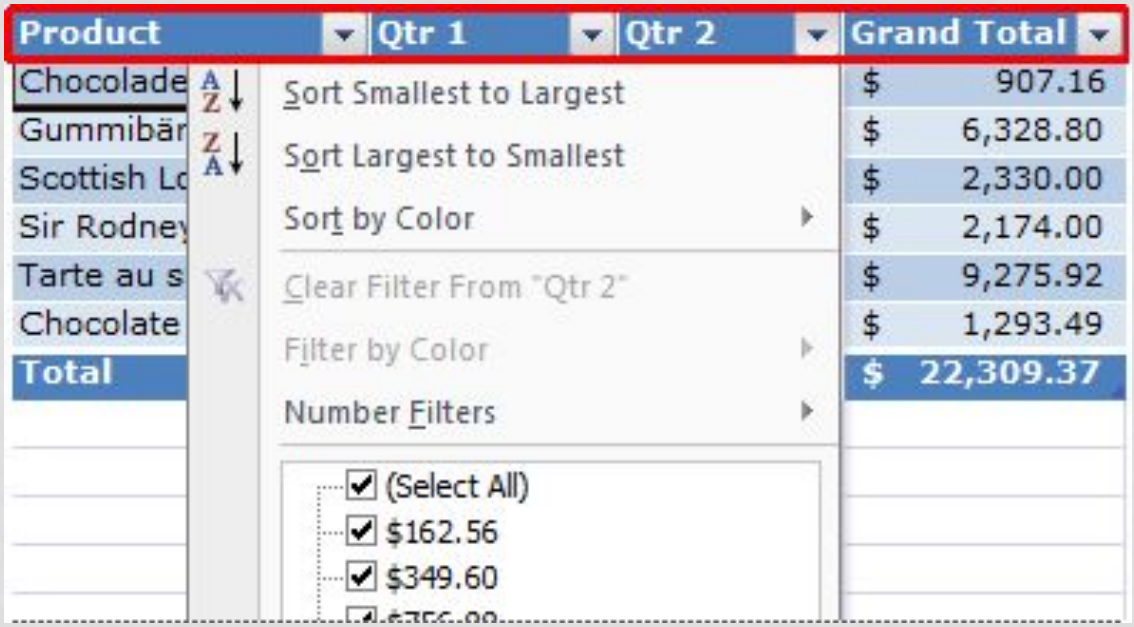
- The **Filter is a** quick and easy way to find and work with a subset of data in a range of cells.

TABLES

- To make managing and analyzing a group of related data easier, you can turn a range of cells into a Microsoft Office Excel table (previously known as an Excel list). A table typically contains related data in a series of worksheet rows and columns that have been formatted as a table. By using the table features, you can then manage the data in the table rows and columns independently from the data in other rows and columns on the worksheet.

ELEMENTS OF AN EXCEL TABLE

- **Header row** By default, a table has a header row. Every table column has filtering enabled in the header row so that you can filter or sort your table data quickly.



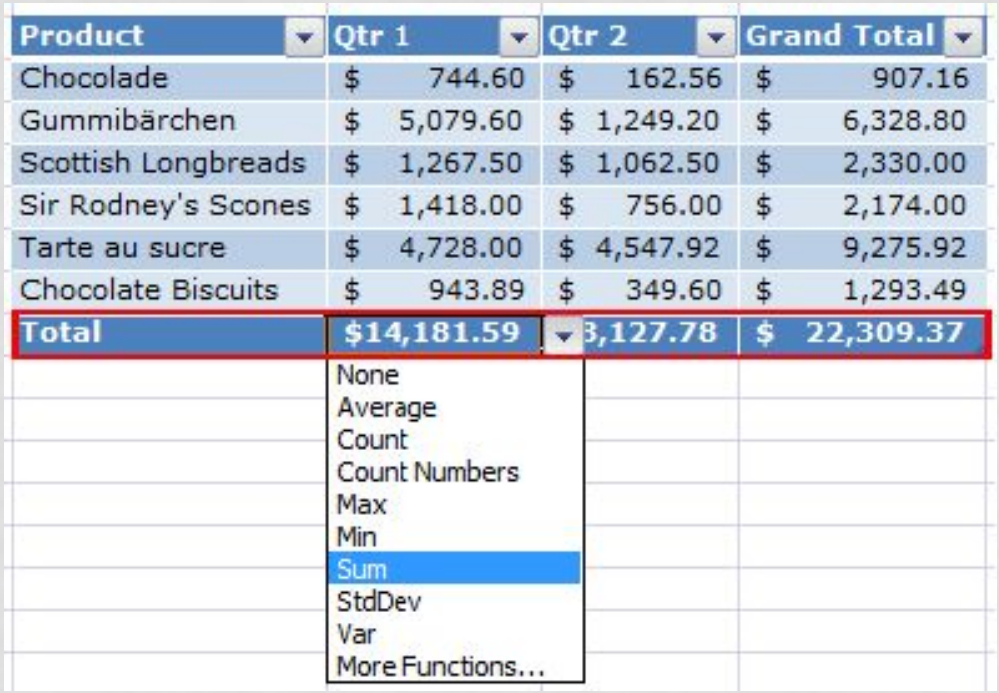
ELEMENTS OF AN EXCEL TABLE

- **Banded rows** By default, alternate shading or banding has been applied to the rows in a table to better distinguish the data.

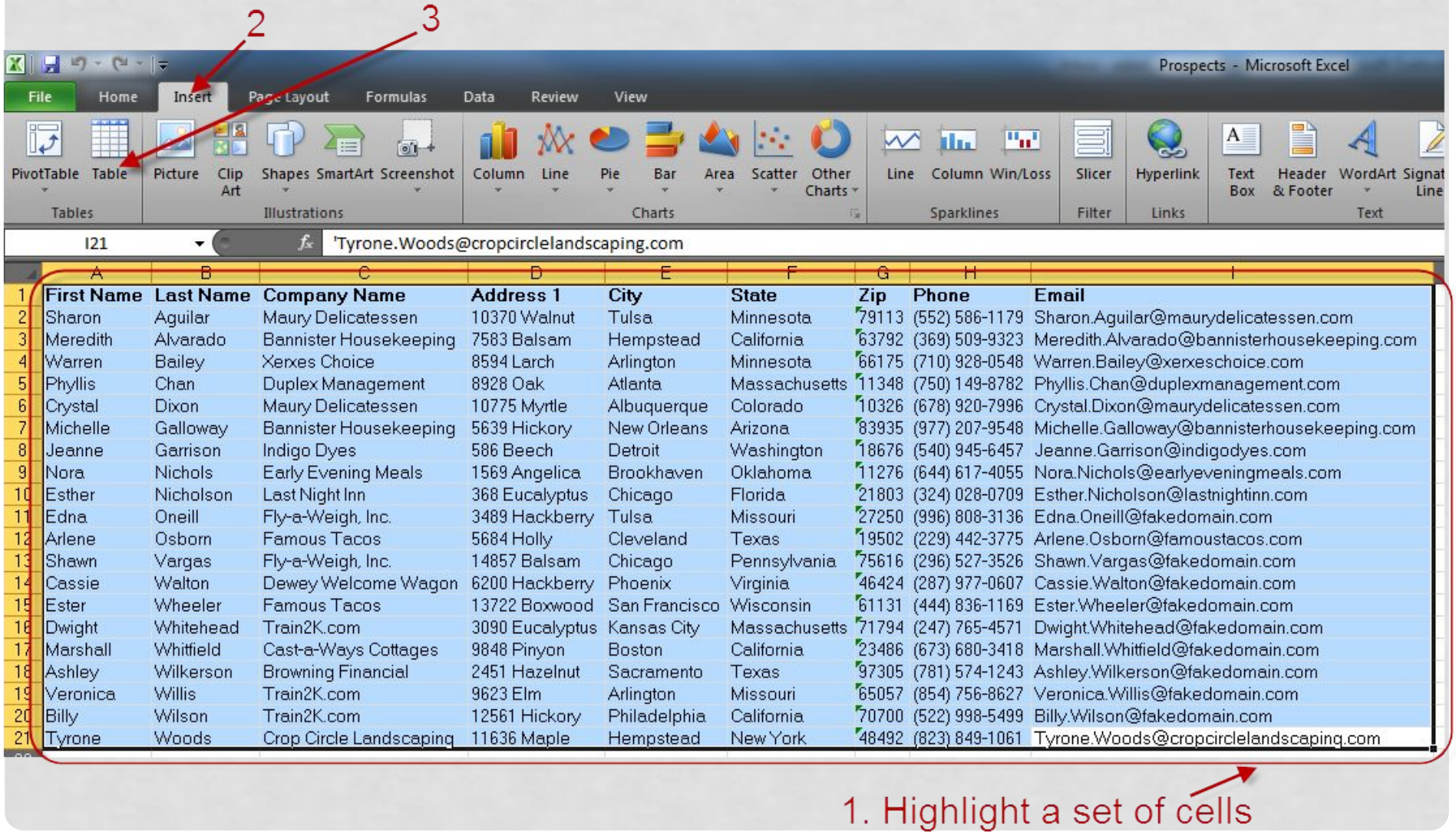
Product	Qtr 1	Qtr 2	Grand Total
Chocolade	$ 744.60	$ 162.56	$ 907.16
Gummibärchen	$ 5,079.60	$ 1,249.20	$ 6,328.80
Scottish Longbreads	$ 1,267.50	$ 1,062.50	$ 2,330.00
Sir Rodney's Scones	$ 1,418.00	$ 756.00	$ 2,174.00
Tarte au sucre	$ 4,728.00	$ 4,547.92	$ 9,275.92
Chocolate Biscuts	$ 943.89	$ 349.60	$ 1,293.49
Total	$14,181.59	$8,127.78	$ 22,309.37

ELEMENTS OF AN EXCEL TABLE

- **Total row** You can add a total row to your table that provides access to summary functions (such as the AVERAGE, COUNT, or SUM function). A drop-down list appears in each total row cell so that you can quickly calculate the totals that you want.



CREATING A TABLE



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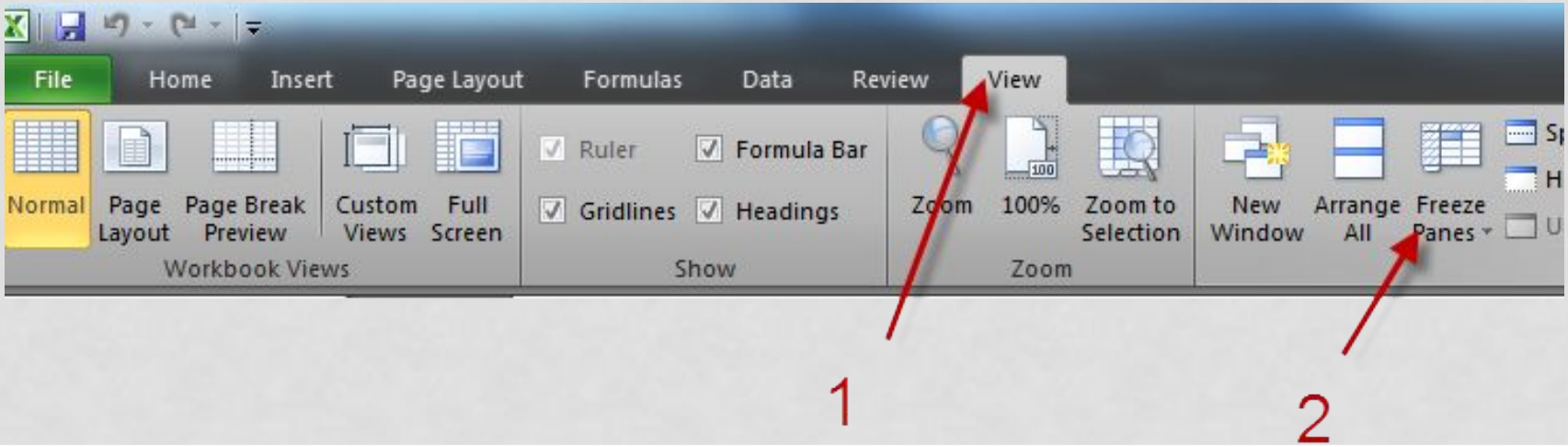
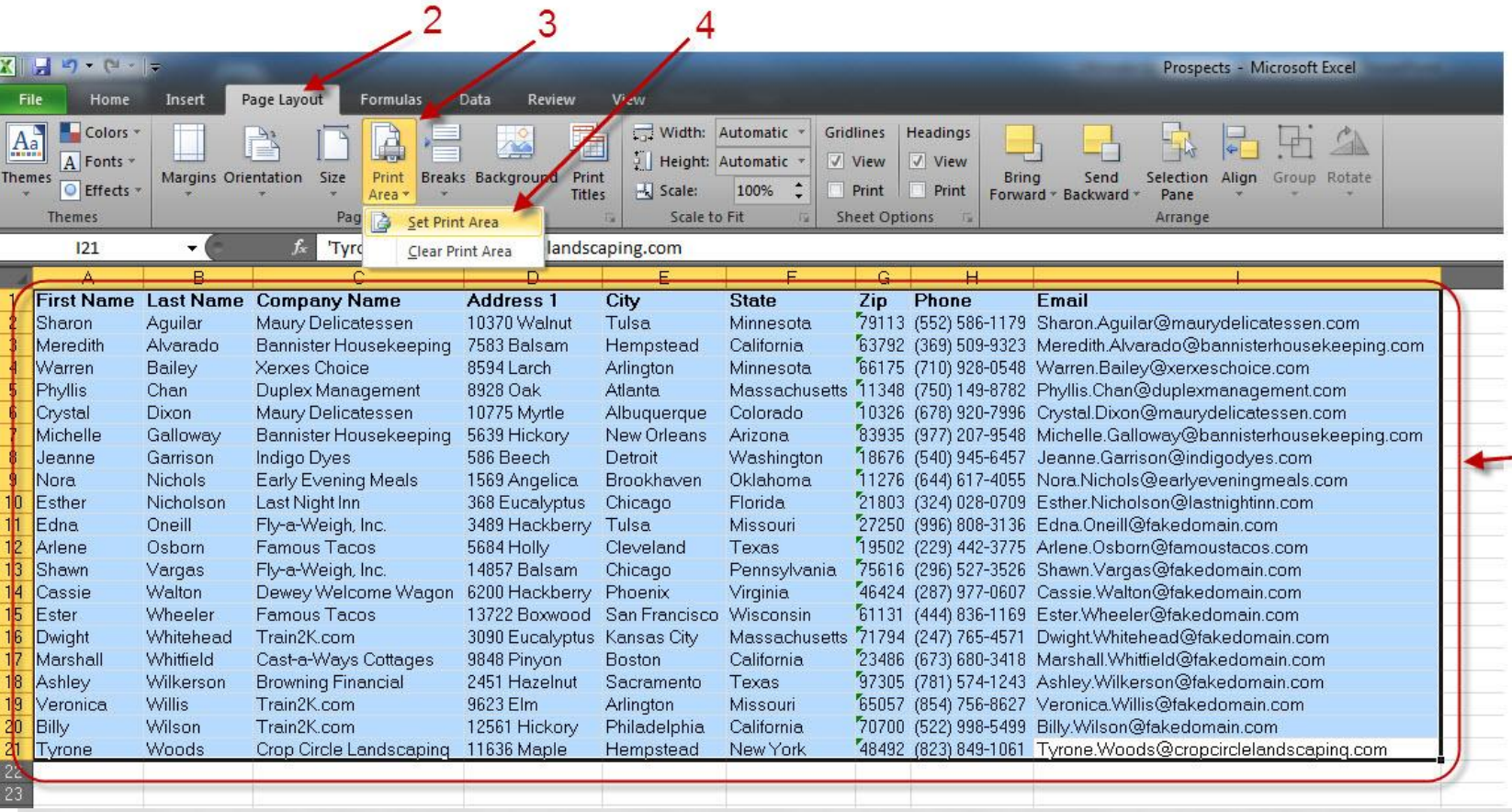
21	Tyrone	Woods	Crop Circle Landscaping	11636 Maple	Hempstead	New York	48492	(823) 849-1061	Tyrone.Woods@cropcirclelandscaping.com

FREEZE HEADERS

- To freeze a row in your worksheet, highlight the row where you wish all rows before the highlighted row to be frozen or locked, go to **Window>Freeze Panes** and you will see a line appear across your worksheet. Everything above the line is frozen and will remain in view when you scroll down your worksheet.

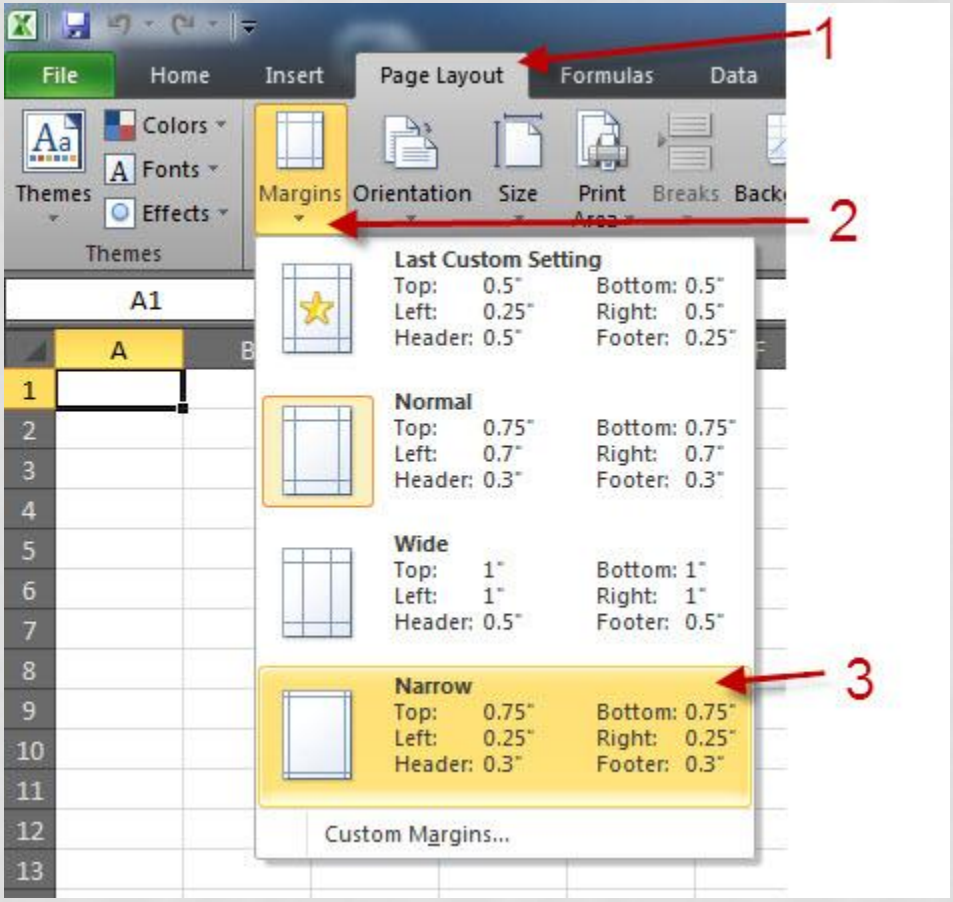


SET PRINT AREA

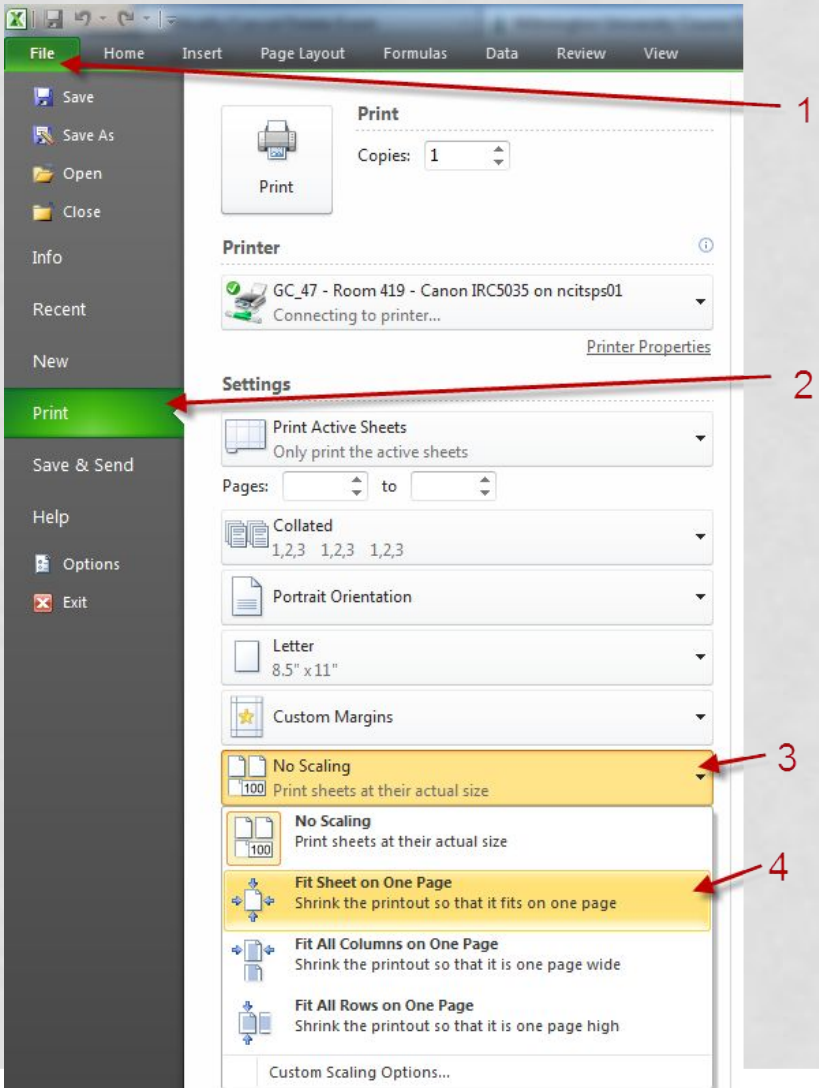


	First Name	Last Name	Company Name	Address 1	City	State	Zip	Phone	Email
2	Sharon	Aguilar	Maury Delicatessen	10370 Walnut	Tulsa	Minnesota	79113	(552) 586-1179	Sharon.Aguilar@maurydelicatessen.com
3	Meredith	Alvarado	Bannister Housekeeping	7583 Balsam	Hempstead	California	63792	(369) 509-9323	Meredith.Alvarado@bannisterhousekeeping.com
4	Warren	Bailey	Xerxes Choice	8594 Larch	Arlington	Minnesota	66175	(710) 928-0548	Warren.Bailey@xerxeschoice.com
5	Phyllis	Chan	Duplex Management	8928 Oak	Atlanta	Massachusetts	11348	(750) 149-8782	Phyllis.Chan@duplexmanagement.com
6	Crystal	Dixon	Maury Delicatessen	10775 Myrtle	Albuquerque	Colorado	10326	(678) 920-7996	Crystal.Dixon@maurydelicatessen.com
7	Michelle	Galloway	Bannister Housekeeping	5639 Hickory	New Orleans	Arizona	83935	(977) 207-9548	Michelle.Galloway@bannisterhousekeeping.com
8	Jeanne	Garrison	Indigo Dyes	586 Beech	Detroit	Washington	18676	(540) 945-6457	Jeanne.Garrison@indigodyes.com
9	Nora	Nichols	Early Evening Meals	1569 Angelica	Brookhaven	Oklahoma	11276	(644) 617-4055	Nora.Nichols@earlyeveningmeals.com
10	Esther	Nicholson	Last Night Inn	368 Eucalyptus	Chicago	Florida	21803	(324) 028-0709	Esther.Nicholson@lastnightinn.com
11	Edna	Oneill	Fly-a-Weigh, Inc.	3489 Hackberry	Tulsa	Missouri	27250	(996) 808-3136	Edna.Oneill@fakedomain.com
12	Arlene	Osborn	Famous Tacos	5684 Holly	Cleveland	Texas	19502	(229) 442-3775	Arlene.Osborn@famoustacos.com
13	Shawn	Vargas	Fly-a-Weigh, Inc.	14857 Balsam	Chicago	Pennsylvania	75616	(296) 527-3526	Shawn.Vargas@fakedomain.com
14	Cassie	Walton	Dewey Welcome Wagon	6200 Hackberry	Phoenix	Virginia	46424	(287) 977-0607	Cassie.Walton@fakedomain.com
15	Ester	Wheeler	Famous Tacos	13722 Boxwood	San Francisco	Wisconsin	61131	(444) 836-1169	Ester.Wheeler@fakedomain.com
16	Dwight	Whitehead	Train2K.com	3090 Eucalyptus	Kansas City	Massachusetts	71794	(247) 765-4571	Dwight.Whitehead@fakedomain.com
17	Marshall	Whitfield	Cast-a-Ways Cottages	9848 Pinyon	Boston	California	23486	(673) 680-3418	Marshall.Whitfield@fakedomain.com
18	Ashley	Wilkerson	Browning Financial	2451 Hazelnut	Sacramento	Texas	97305	(781) 574-1243	Ashley.Wilkerson@fakedomain.com
19	Veronica	Willis	Train2K.com	9623 Elm	Arlington	Missouri	65057	(854) 756-8627	Veronica.Willis@fakedomain.com
20	Billy	Wilson	Train2K.com	12561 Hickory	Philadelphia	California	70700	(522) 998-5499	Billy.Wilson@fakedomain.com
21	Tyrone	Woods	Crop Circle Landscaping	11636 Maple	Hempstead	New York	48492	(823) 849-1061	Tyrone.Woods@cropcirclelandscaping.com

NARROW MARGINS

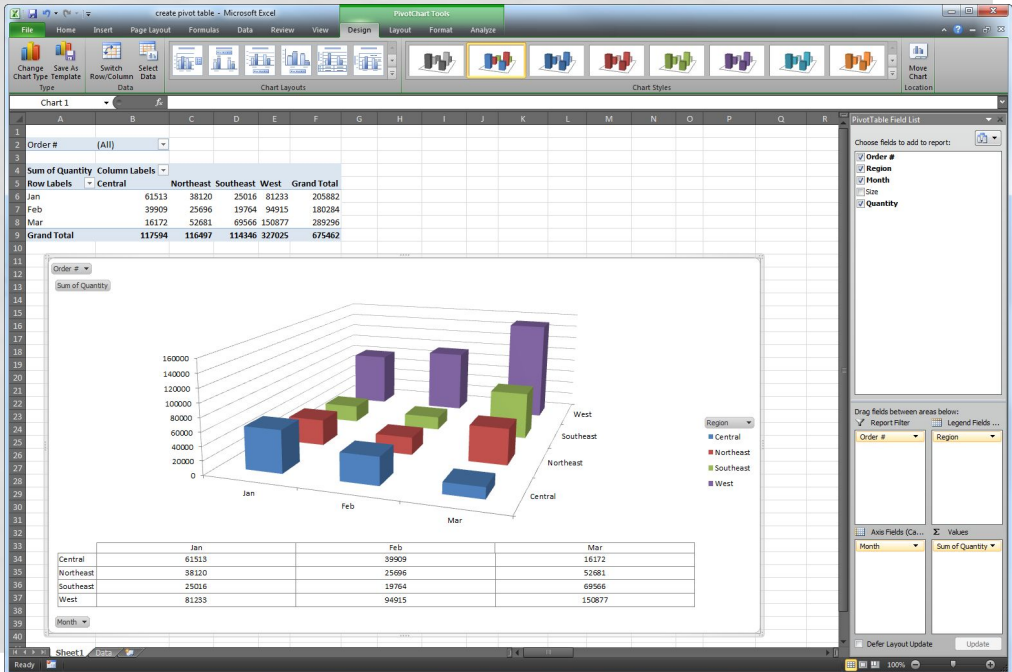


SHRINK TO FIT



PIVOT TABLE

- A Pivot table lets your arrange, sort, and filter a set of data on the fly so you can **analyze** it from different perspectives with minimum effort.
  - Start with a data list with a few columns
  - Make sure each of the rows have a value of each one of the columns



EXCEL CELL REFERENCES WORTH REMEMBERING

- In Excel formulas, you can refer to other cells either relatively or absolutely. When you copy and paste a formula in Excel, how you create the references within the formula tells Excel what to change in the formula it pastes. The formula can either change the references relative to the cell where you're pasting it (relative reference), or it can always refer to a specific cell. You can also mix relative and absolute references so that, when you move or copy a formula, the row changes but the column does not, or vice versa.
- Preceding the row and/or column designators with a dollar sign ($) specifies an absolute reference in Excel.

Example	Comment
=A1	Complete relative reference
=$A1	The column is absolute; the row is relative
=A$1	The column is relative; the row is absolute
=A1	Complete absolute reference

Referencing a range of cells….

- In other worksheets: **worksheet!A1:D4**
- In other workbook: **c:\my documents\[test.xls]Sheet1!A2:A5**
- Across several worksheets: **sheet1:sheet5!A12**