

Microsoft Office Basics

- The *first* **Chapter 1** in the Excel textbook by Grauer.
- Material is largely common to Excel, Word, Powerpoint, Access.
- Key knowledge and skills:
 - Files and folders
 - Backstage view
 - Home tab tasks
 - Insert tab tasks
 - Page Layout tab tasks
- You probably know this material already. Review the first Chapter 1 in Grauer to be sure.

Why Use a Spreadsheet?

Many things that can be done with a pencil, a pad of paper, and a calculator can be done much faster, far more accurately and conveniently using a spreadsheet

The biggest advantage of using spreadsheet is that every time a user makes changes, the spreadsheet **automatically** recalculates all the other related values

Nowadays, spreadsheets also allow easy creation of charts and offer useful statistical and mathematical functions

The best known commercial spreadsheet application is Microsoft's **Excel®**, but there are also free, open-source applications with similar functionality and even compatibility, notably OpenOffice.org™'s **Calc**, and **Gnumeric** from the long-running GNU project.

In this course we use **Excel** because of its popularity, its widespread availability, and its broad range of features.

What can Excel do?

- Excel allows you to **easily solve** many data analysis problems.
- Excel provides features that allow you to:
 - Import, export, store, process and sort data
 - Display data **graphically**
 - Analyse data **statistically**
 - Solve **optimisation** problems
 - Find **relationships** between data sets (fit algebraic equations through data sets)

Material from Grauer Excel Chapter 1

Objectives

- Plan for effective workbook and worksheet design
- Explore the Excel Window
- Enter and edit cell data
- Use AutoFill
- Display cell formulae
- Manage worksheets

Objectives (continued)

- Manage columns and rows
- Select, move, copy and paste
- Apply alignment and font options
- Apply number formats
- Select page setup options
- Print a workbook

Planning Structure of Worksheets

- Articulate the purpose of the worksheet
- Decide what input values are needed
 - An **input area** is a range of cells containing values
- Decide what outputs are needed
 - An **output area** is a range of cells containing results
- Figure out which rows and columns to put the inputs and outputs in

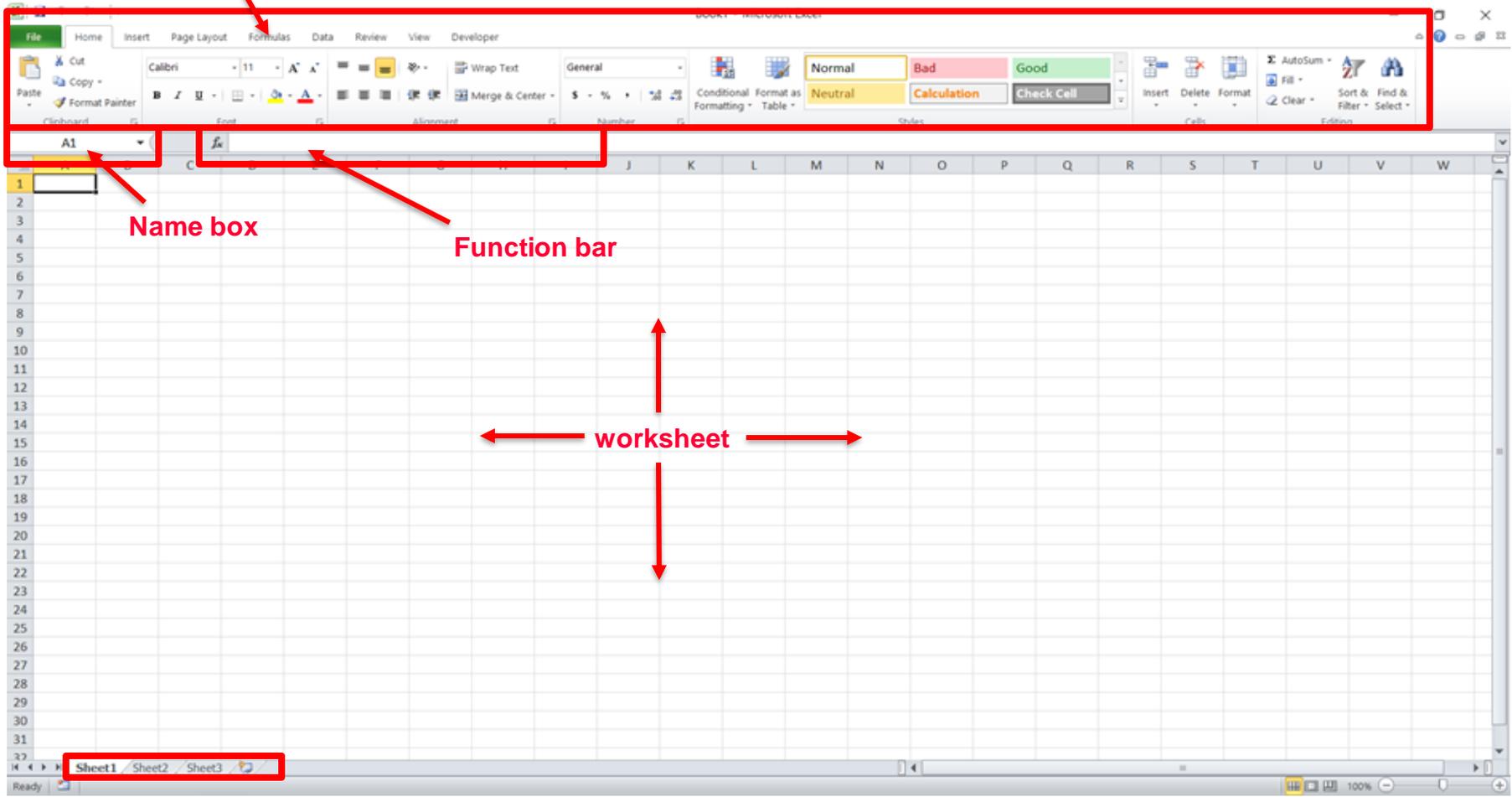
	A	B	C	D
1	Product	Uni cost	Quantity	Cost
2	Pencil	\$ 2	3	\$ 6
3	Eraser	\$ 5	3	\$ 15
4	Chair	\$ 20	2	\$ 40
5				
6	Total			\$ 61

Planning Structure of Worksheets

- Enter the labels, values, and formulae
- Format the numerical values (\$, % etc.)
- Format the descriptive titles and labels
- Document the worksheet
- Save the completed workbook

Interface

Ribbon



Name box

Function bar

worksheet

Worksheets and Workbooks

- A **worksheet** is a spreadsheet that contains formulae, values, text, and visual aids
 - Choose good names for your worksheets
 - Can copy or move worksheets
- A **workbook** is a file containing one or more related worksheets

Spreadsheet Structure

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H
1	Student		Test1	Test2	Final	Average	Total	Grade
2								
3	John		75	87	92	84.66667	87.10	
4	Mary		85	95	77	85.66667	84.00	
5	Susie		100	85	81	88.66667	86.00	
6	Paul		94	62	76	77.33333	75.40	
7	Kirsten		64	98	83	81.66667	83.70	
8								
9	Class Average							
10								
11	Weightings		0.2	0.3	0.5			
12								
13								

Annotations in the image:

- Current Cell:** B2 (circled in red)
- Columns:** A through H (indicated by a red dashed line and box)
- Rows:** 1 through 13 (indicated by a red dashed line and box)
- Cell - D5:** The cell containing the value 85 (circled in red)

A spreadsheet is divided into rows and columns*

In Excel, rows are labeled as integers starting from 1; column labels are from A to Z, AA to AZ, BA to BZ, etc..

The intersection of a row and column forms a **cell**. Each cell has a unique **cell reference**. For example, the cell at the intersection of column C and row 5 is called C5

* 1 million+ rows and 16000+ columns in Excel 2007/2010

Navigating Worksheets

Keystroke	Used To
↑	Move up one cell in the same column.
↓	Move down one cell in the same column.
←	Move left one cell in the same row.
→	Move right one cell in the same row.
Tab	Move right one cell in the same row.
Home	Move the active cell to column A of the current row.
Ctrl+Home	Make cell A1 the active cell.
Ctrl+End	Make the rightmost, lowermost active cell of the worksheet the active cell.

Entering and Editing Cell Data

- Excel supports text, values, dates, and formula results

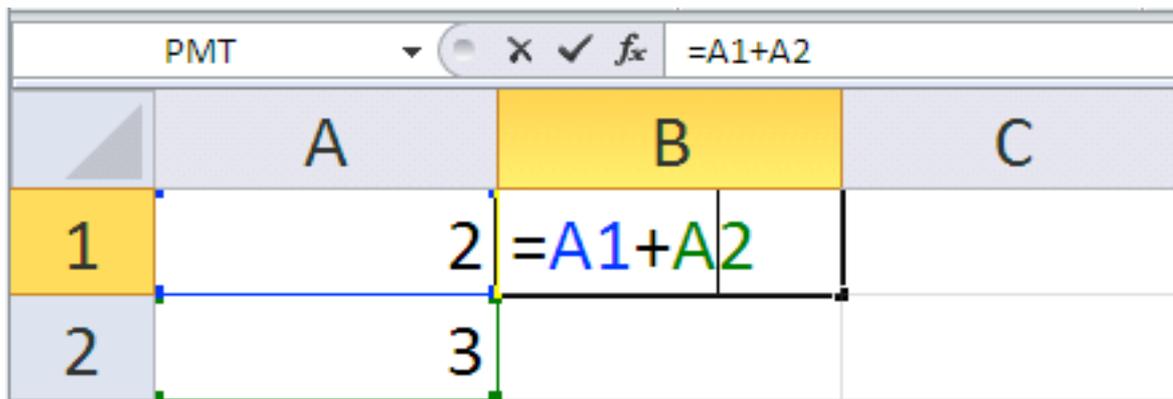
	A	B	C	D	E	F
1						
2						
3	Text	Date	Value	Value	Formula Results	
4	↓	↓	↓	↓	↓	
5	Computer	9/1/2012	400	0.5	600	
6	Computer					
7						
8						

Editing Cell Content

Select Cell	Double-click Cell	Select Cell
1. Click in the Formula Bar.	1. Make edits directly in the cell.	1. Press F2.
2. Make changes in the Formula Bar.	2. Press Enter.	2. Make changes in the cell.
3. Click Enter on the left side of the Formula Bar.		3. Press Enter.

Entering formulae

- **Formulae** are combinations of cell addresses, math operators, values and/or functions
- A formula begins with the equal sign =
 - Examples:
=A1+A2
=C2*5
- Type in the cell or in the formula bar



Using Semi-Selection to Create a Formula

- **Semi-selection** uses the mouse pointer to build a formula containing cell references or ranges
- This technique is also called **pointing**
- To build a formula to add the numbers in cells A1 and A2:
 - Click cell where you will build the formula
 - Type an = sign
 - Click cell A1
 - Type a + sign
 - Click cell A2
 - Press *Enter*

Mathematical Symbols

Operation	Common Symbol	Symbol in Excel
Addition	+	+
Subtraction	-	-
Multiplication	×	*
Division	÷	/
Exponentiation	^ or superscript	^

Order of Precedence

- **Order of precedence** (operations) controls the sequence in which math operators are computed
 - Parentheses
 - Exponentiation
 - Multiplication and Division
 - Addition and Subtraction

Order of Precedence

	A	B	C	D
1	10			
2	5			
3	2			
4	4			
5				
6	Result	Formula	Explanation	
7	20	=A1+A2*A3	5 x 2 = 10. The product 10 is then added to 10 stored in cell A1.	
8	30	=(A1+A2)*A3	10 + 5 = 15. The sum of 15 is then multiplied by 2 stored in cell A3.	
9	24	=A1+A2*A3+A4	5 x 2 = 10. 10 + 10 + 4 = 24.	
10	90	=(A1+A2)*(A3+A4)	10 + 5 = 15; 2+4 = 6. 15 x 6 = 90.	
11	10	=A1/A2+A3*A4	10 / 5 = 2; 2 x 4 = 8; 2 + 8 = 10.	
12	5.71429	=A1/(A2+A3)*A4	5 + 2 = 7. 10 / 7 = 1.428571429. 1.42857149 * 4 = 5.714285714	

Cell References in Formulae

- It is best to use cell addresses in formulae versus actual data
 - If cell A1 contains value 5 and you need to add B1 to this value, use `=A1+B1` versus `=5+B1`
- If the data changes, Excel will recalculate the result
- Apply this rule intelligently: you only use `=A1+B1` rather than `=5+B1` if you *want* the result to update if A1 changes!

Using Auto Fill

- **Auto Fill** enables you to copy the contents of a cell or cell range or to continue a series using the fill handle
 - Example: Month names Jan, Feb, Mar form a series
- The **fill handle** is the small black square in the bottom right corner of a cell

	A	B
1	2	5
2	3	
3	4	

	A	B
1	2	5
2	3	7
3	4	

	B
1	5
2	7

Displaying Cell Formulae

- The result of a formula appears in a cell and the formula itself appears in the Formula bar
- Press the **Ctrl+`** key combination to display formulae in the worksheet
- This key combination acts as a toggle so can be used again to turn off the effect

	A	B
1	2	5
2	3	7
3	4	

	A	B
1	2	=A1+A2
2	3	=A2+A3
3	4	



<http://www.computerhope.com>

Displaying Cell Formulae

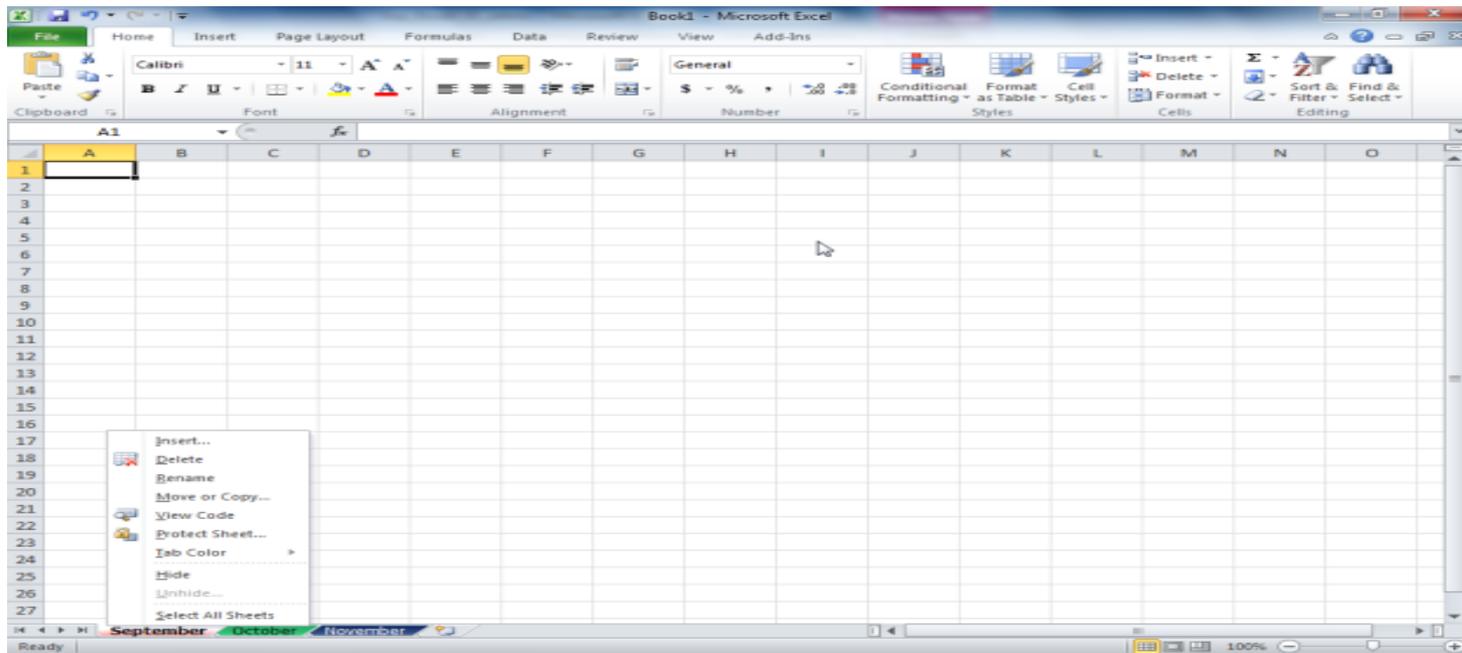
The image shows two windows from Microsoft Excel. The top window displays a spreadsheet with data for 'OK Office Systems'. The bottom window, titled 'OK Office Systems Formulas', shows the same data but with the formulas used to calculate the values in the 'Percent Off', 'Sale Price', 'Profit Amount', and 'Profit Margin' columns.

	A	B	C	D	E	F	G	H	I	J	K
4	Product	Cost	Markup Rate	Retail Price	Percent Off	Sale Price	Profit Amount	Profit Margin			
5	Electronics										
6	Computer System	\$ 475.50	50.00%	\$ 713.25	15%	\$ 606.26	\$130.76	21.57%			
7	28" Monitor	\$ 195.00	83.50%	\$ 357.83	10%	\$ 322.04	\$127.04	39.45%			
8	Color Laser Printer	\$ 457.70	75.50%	\$ 803.26	20%	\$ 642.61	\$184.91	28.77%			
9	Furniture										
10	Desk Chair	\$ 75.00	100.00%	\$ 150.00	25%	\$ 112.50	\$ 37.50	33.33%			
11	Solid Oak Computer Desk	\$ 700.00	185.70%	\$ 1,999.90	30%	\$ 1,399.93	\$699.93	50.00%			

	A	B	C	D	E	F	G	H
4	Product	Cost	Markup Rate	Retail Price	Percent Off	Sale Price	Profit Amount	Profit Margin
5	Electronics							
6	Computer System	475.5	0.5	=B6*(1+C6)	0.15	=D6-D6*E6	=F6-B6	=(F6-B6)/F6
7	28" Monitor	195	0.835	=B7*(1+C7)	0.1	=D7-D7*E7	=F7-B7	=(F7-B7)/F7
8	Color Laser Printer	457.7	0.755	=B8*(1+C8)	0.2	=D8-D8*E8	=F8-B8	=(F8-B8)/F8
9	Furniture							
10	Desk Chair	75	1	=B10*(1+C10)	0.25	=D10-D10*E10	=F10-B10	=(F10-B10)/F10
11	Solid Oak Computer Desk	700	1.857	=B11*(1+C11)	0.3	=D11-D11*E11	=F11-B11	=(F11-B11)/F11

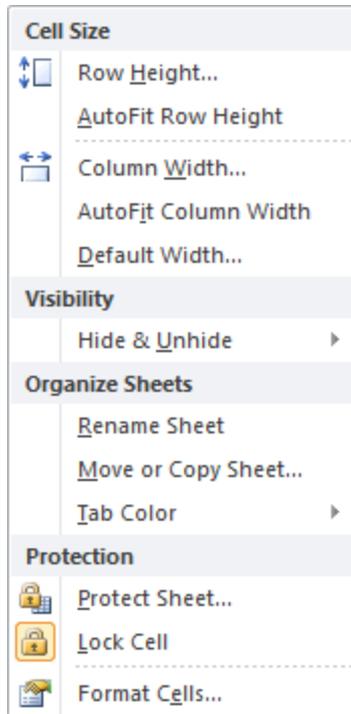
Managing Worksheets

- Creating a multiple-worksheet workbook requires planning and maintenance



Organizing Worksheets

- The **Format Menu** (in the Cells group of the Home tab) presents sheet commands (among others):

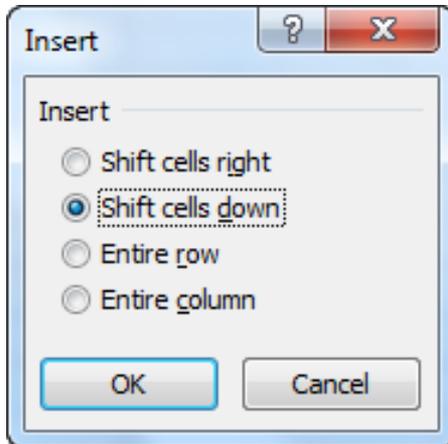


Moving or Copying Worksheets

- **Moving** a worksheet changes its order among sheet tabs
- **Copying** a worksheet makes a duplicate sheet at the new location

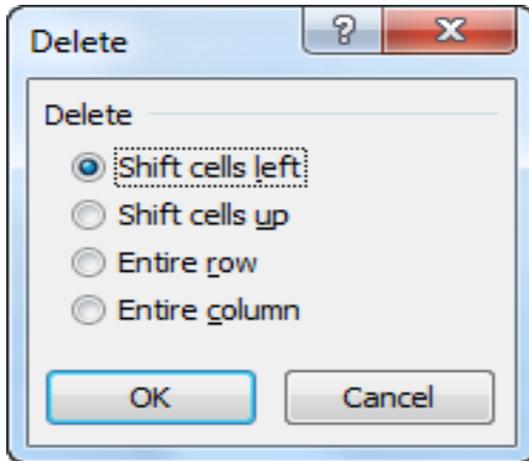
Inserting Rows and Columns

- The **Insert** command offers several techniques to insert rows, columns, and cells



Deleting Rows and Columns

- The **Delete** command offers several techniques to remove rows, columns, and cells



Adjusting Column Width

- **Double click** column border, or
- **Drag** column border, or
- Use Home tab – Cells group – Format button

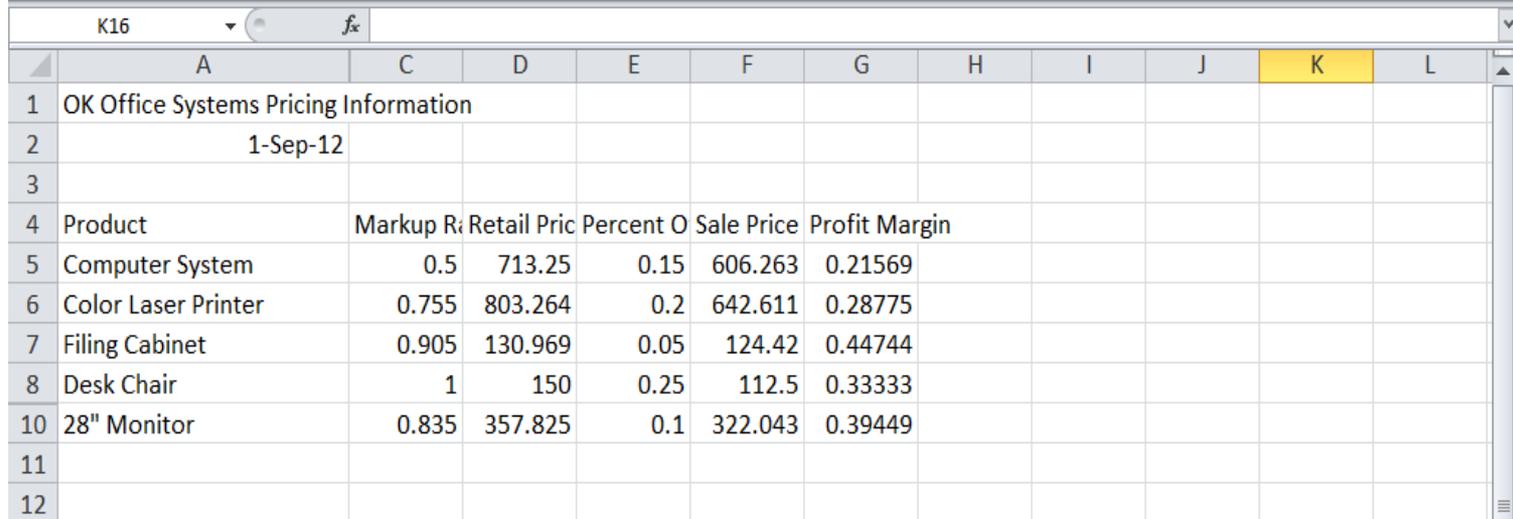
	A	B	C	D	E	F	G	H
1	OK Office Systems Pricing Information							
2	1-Sep-12							
3								
4	Product	Cost	Markup R	Retail Pric	Percent O	Sale Price	Profit Margin	
5	Computer	475.5	0.5	713.25	0.15	606.2625	0.215686	
6	Color Lase	457.7	0.755	803.2635	0.2	642.6108	0.287749	
7	Filing Cab	68.75	0.905	130.9688	0.05	124.4203	0.447437	
8	Desk Chai	75	1	150	0.25	112.5	0.333333	
9	Solid Oak	700	1.857	1999.9	0.3	1399.93	0.499975	
10	28" Monit	195	0.835	357.825	0.1	322.0425	0.39449	
11								
12								

Adjusting Row Height

- Drag the row boundary
- Select Row Height from Home tab / Cells group / Format button
- Using ALT+Enter to create multiple lines may require a row height adjustment
- The row height is automatically adjusted when you change the content

Hiding Columns and Rows

- **Hiding** a column or row prevents it from displaying and printing
 - Select column(s) or row(s) and use Home/Cells/Format
- **Unhiding** a column or row returns it to view
 - Select columns/rows either side; use Home/Cells/Format



	A	C	D	E	F	G	H	I	J	K	L
1	OK Office Systems Pricing Information										
2	1-Sep-12										
3											
4	Product	Markup R	Retail Pric	Percent O	Sale Price	Profit Margin					
5	Computer System	0.5	713.25	0.15	606.263	0.21569					
6	Color Laser Printer	0.755	803.264	0.2	642.611	0.28775					
7	Filing Cabinet	0.905	130.969	0.05	124.42	0.44744					
8	Desk Chair	1	150	0.25	112.5	0.33333					
10	28" Monitor	0.835	357.825	0.1	322.043	0.39449					
11											
12											

Copy and Paste Commands

The **copy** command duplicates the contents of a cell, or range of cells

The **paste** command copies the contents to the destination cell, or range of cells. However, a formula is **not copied exactly**, but is **adjusted** as it is copied, depending on the destination cell.

For example, if the formula in cell C9 is copied to D9, it is adjusted so that the cells referenced in the new formula are updated automatically – it computes the average of the Test2 values

	A	B	C	D	E	F	G	H
1	Student		Test1	Test2	Final	Average	Total	Grade
2								
3	John		75	87	92	84.66667	87.10	
4	Mary		85	95	77	85.66667	84.00	
5	Susie		100	85	81	88.66667	86.00	
6	Paul		94	62	76	77.33333	75.40	
7	Kirsten		64	98	83	81.66667	83.70	
8								
9			83.6	85.4				
10								
11	Weightings		0.2	0.3	0.5			
12								

Original Formula
AVERAGE(C3:C7)

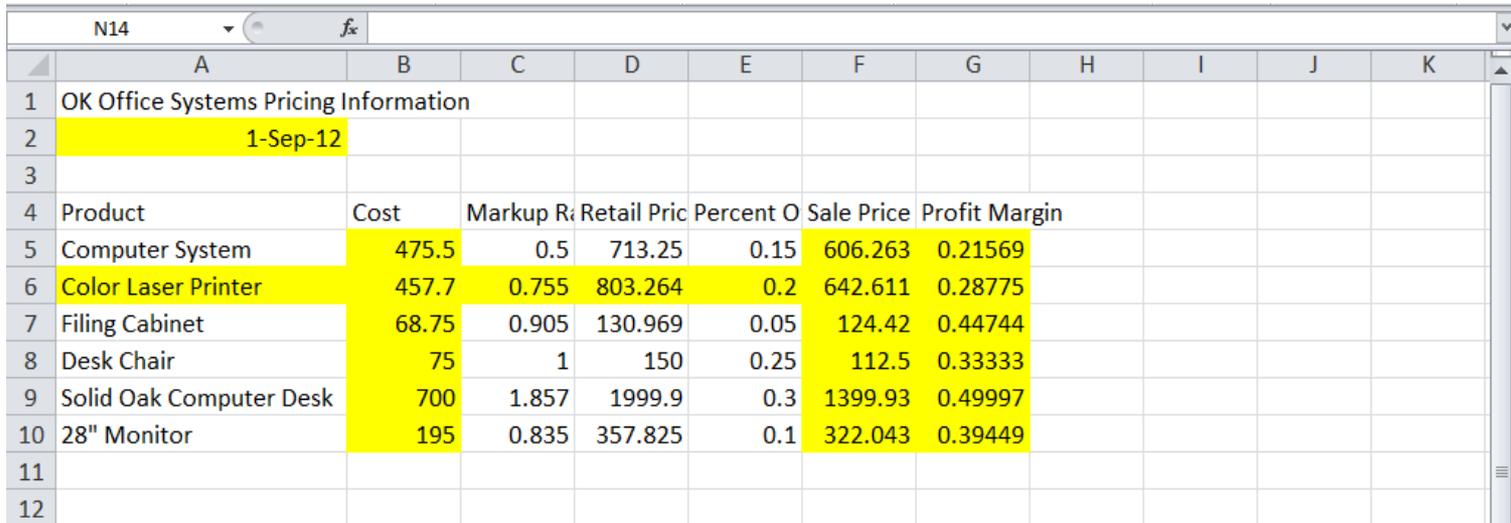
Copied Formula
AVERAGE(D3:D7)

Same principle applies to

- inserting rows, cols
- deleting rows, cols
- filling down or right

Selecting a Cell Range

- A **range** is a rectangular group of cells
- A **nonadjacent range** contains a group of ranges that are not next to each other



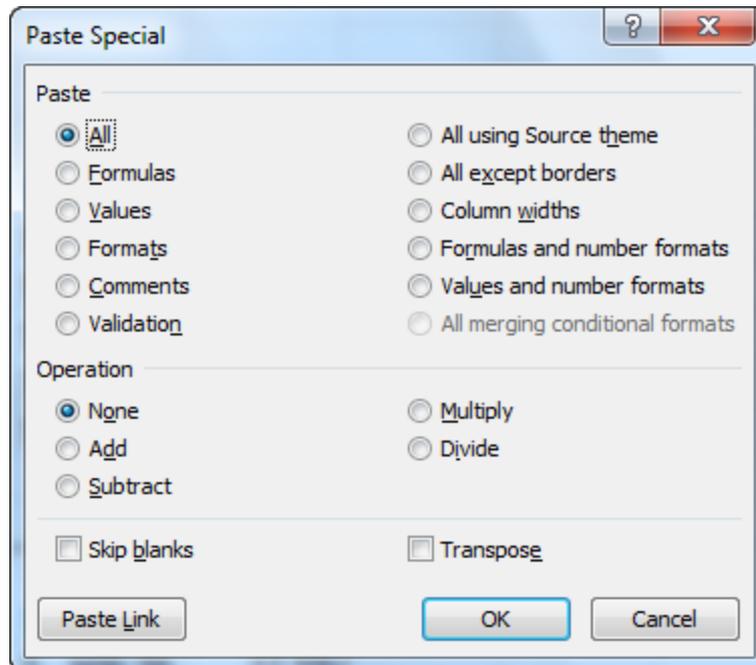
	A	B	C	D	E	F	G	H	I	J	K
1	OK Office Systems Pricing Information										
2	1-Sep-12										
3											
4	Product	Cost	Markup R	Retail Pric	Percent O	Sale Price	Profit Margin				
5	Computer System	475.5	0.5	713.25	0.15	606.263	0.21569				
6	Color Laser Printer	457.7	0.755	803.264	0.2	642.611	0.28775				
7	Filing Cabinet	68.75	0.905	130.969	0.05	124.42	0.44744				
8	Desk Chair	75	1	150	0.25	112.5	0.33333				
9	Solid Oak Computer Desk	700	1.857	1999.9	0.3	1399.93	0.49997				
10	28" Monitor	195	0.835	357.825	0.1	322.043	0.39449				
11											
12											

Moving/Copying a Range

- **Moving/copying** a range preserves text and values, but cell addresses in formulae will be altered in the pasted location
 - **Move** a range by cutting it and pasting to the upper left corner of the destination
 - **Copy** a range by copying it and pasting to the upper left corner of the destination

Using Paste Special

- The **Paste Special** command is used to paste data from the clipboard using a different format



Formatting

- **Formatting** accentuates and draws attention to meaningful portions of a worksheet

The screenshot displays a Microsoft Excel spreadsheet titled "OK Office Systems Pricing Information" for "1-Sep-12". The spreadsheet is organized into columns for Product, Cost, Markup Rate, Retail Price, Percent Off, Sale Price, Profit Amount, and Profit Margin. The data is categorized into Electronics and Furniture. The table is formatted with bold headers, background shading for categories, and a border around the Percent Off and Sale Price columns.

	Product	Cost	Markup Rate	Retail Price	Percent Off	Sale Price	Profit Amount	Profit Margin
5	Electronics							
6	Computer System	\$ 475.50	50.00%	\$ 713.25	15%	\$ 606.26	\$ 130.76	21.57%
7	28" Monitor	\$ 195.00	83.50%	\$ 357.83	10%	\$ 322.04	\$ 127.04	39.45%
8	Color Laser Printer	\$ 457.70	75.50%	\$ 803.26	20%	\$ 642.61	\$ 184.91	28.77%
9	Furniture							
10	Desk Chair	\$ 75.00	100.00%	\$ 150.00	25%	\$ 112.50	\$ 37.50	33.33%
11	Solid Oak Computer Desk	\$ 700.00	185.70%	\$ 1,999.90	30%	\$ 1,399.93	\$ 699.93	50.00%

Formatting Cells

The appearance of a cell can be changed by altering fonts, borders, color patterns and number formatting, including indents

Note that changing the format of a number affects the way the number is displayed but **does not change its value**

Some of the number formats available in Excel are:

- **General format**

 - a number is displayed the way it was originally entered
for example, 247 or 247.58 or 2257.42E+10 (i.e. 2257.42×10^{10})

- **Number format**

 - 125.345 or 10,200.45 or 10200.45 or 135.50 or 1.355e+2 etc
(default alignment is right-justified, can use right-indent too)

- **Date format**

 - May 2, 2011 or 2/5/2011 or 2-May-11 , etc

- **Percentage format**

 - 23% or 23.56% or 175%

- **Text format**

 - Even a numeric value is displayed as a text string, left-justified

Numeric Formats

Format Style	Display
General	A number as it was originally entered.
Number	A number with or without the 1,000 separator
Currency	A number with the 1,000 separator and with an optional dollar sign to the immediate left.
Accounting	A number with the 1,000 separator and with an optional dollar sign at the left cell border.
Date	The date in different ways, such as March 14, 2012 or 3/14/12.
Time	The time in different ways, such as 10:50 PM or 22:50 (24-hour time).

Numeric Formats (continued)

Format Style	Display
Percentage	A value as it would be multiplied by 100 with the percent sign. Number of decimal places can be adjusted
Fraction	A number as a fraction; appropriate when there is no exact decimal equivalent.
Scientific	A number as a decimal fraction followed by a whole number exponent of 10.
Text	The data left-aligned; is useful for numerical values that have leading zeros and should be treated as text.
Special	A number with editing characters, such as hyphens.
Custom	Predefined customized number formats or special symbols to create your own format.

Numeric Formats (continued)

	A	B	C
1	General	1234.56	
2	Number	1234.56	
3	Currency	\$1,234.56	
4	Accounting	\$ 1,234.56	
5	Comma	1,234.56	
6	Percent	12.34%	
7	Short Date	3/1/2012	
8	Long Date	Thursday, March 01, 2012	

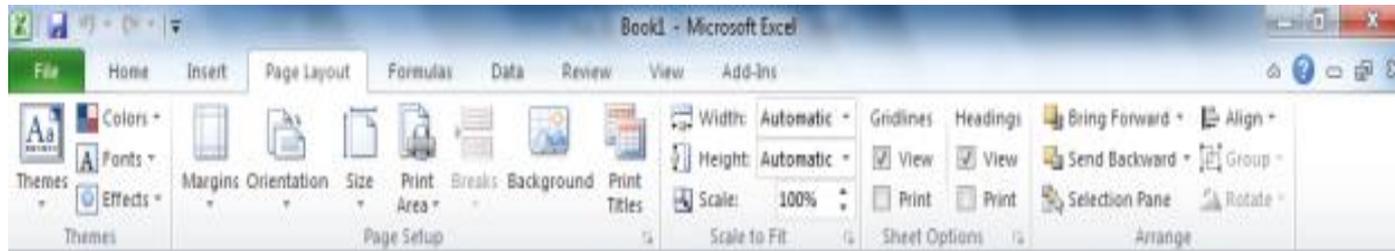
Note that changing the format of a number affects the way the number is displayed but *does not change its value*. In our example, two decimal places are shown, but many more may be actually recorded.

Sample Completed Worksheet

	A	B	C	D	E	F	G	H
1	OK Office Systems Pricing Information							
2	1-Sep-12							
3								
4	Product	Cost	Markup Rate	Retail Price	Percent Off	Sale Price	Profit Amount	Profit Margin
5	Electronics							
6	Computer System	\$475.50	50.00%	\$ 713.25	15%	\$ 606.26	\$130.76	21.57%
7	28" Monitor	\$195.00	83.50%	\$ 357.83	10%	\$ 322.04	\$127.04	39.45%
8	Color Laser Printer	\$457.70	75.50%	\$ 803.26	20%	\$ 642.61	\$184.91	28.77%
9	Furniture							
10	Desk Chair	\$ 75.00	100.00%	\$ 150.00	25%	\$ 112.50	\$ 37.50	33.33%
11	Solid Oak Computer Desk	\$700.00	185.70%	\$1,999.90	30%	\$1,399.93	\$699.93	50.00%
12								

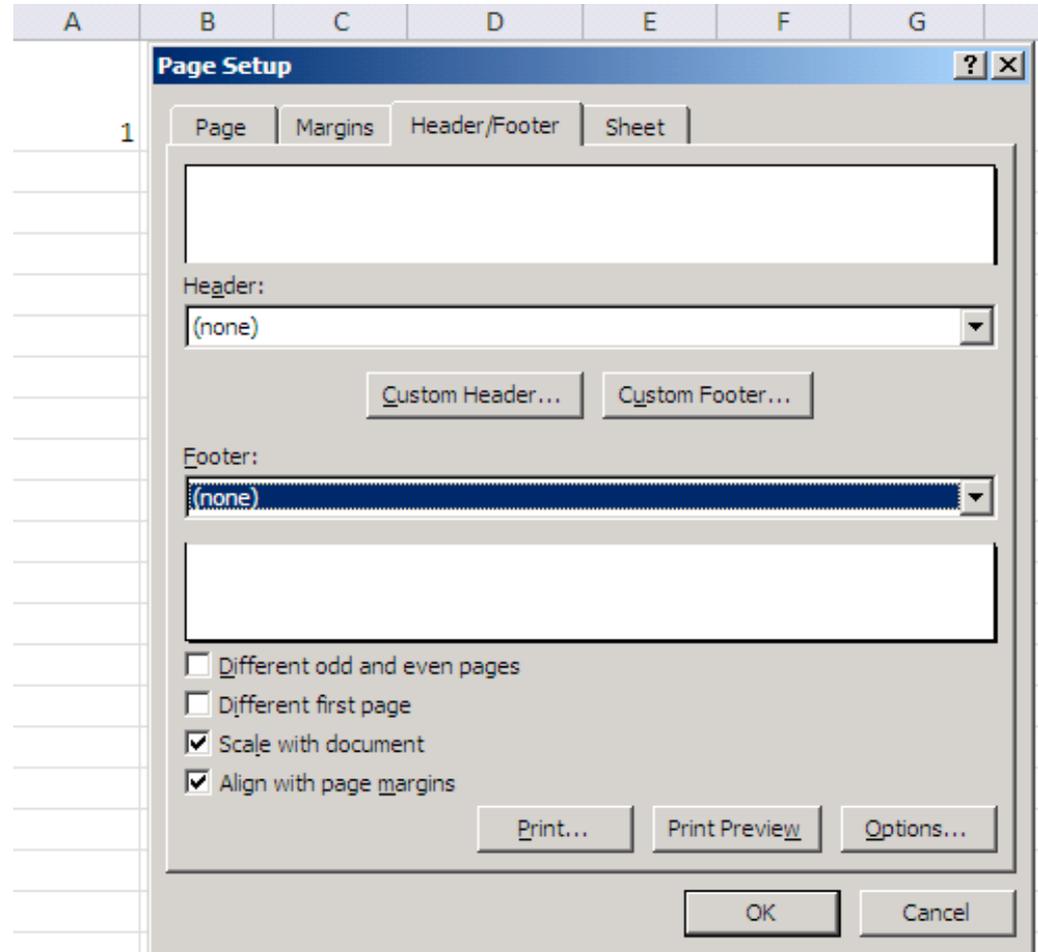
Using Page Setup

- The **Page Setup Dialog Box Launcher** contains many common print-related options



Headers and Footers

- A **header** is content appearing at the top of each printed page
- A **footer** is content appearing at the bottom of each printed page
- Go Page Layout tab - Page Setup group - click arrow bottom right – Header/Footer tab to set them up.



Summary

- In this lecture, you have learned to enter cell data and create simple formulae with mathematical operators.
- You can now manage a worksheet by manipulating rows, columns, and cells.
- You have learned basic formatting techniques to add visual appeal to text and numbers. Don't overdo this!

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