Microsoft Excel 2007

Excel is Microsoft's Spreadsheet program. Spreadsheets are often used as a method of displaying and manipulating groups of data in an effective manner. It was originally created for accounting.

Excel is useful when you have a very large set of data and need to perform the same operation on each Series / Set of it. It is well-suited to tasks such as sorting, alphabetizing, and performing more complex mathematical functions on data such as adding 2 columns together.

Things to Note – Data Types and Formulas

Entering Data

Data does not have to start at Cell A1. Data can be placed wherever you like as long as your data is in a solid block of adjacent cells. When you print, you can select a specific set of cells so that empty cells are not printed.

Data Types

There are several different types of data that can be entered into a cell.
Some common **Data Types** are:

- Text
- Numbers
- Dates
- Currency

Each of these can be formatted to suit the requirements of your data. For instance, you can alter the number of decimal places for a Number, or the way a date is written out or abbreviated with a Date.

Most Data is entered by typing Data into a cell or group of cells, then defining a Data Type and Format for the cells. If you have a large block of cells with the same Data Type and Format, you can select them all at once and set the Data Type and Format for all of them.

Formulas

These are entered using the Formula Bar at the top of the Excel window (underneath the Tool Ribbon). Formulas allow you to manipulate other data.

When you select an empty cell and type a Formula into the Formula Bar, that cell will contain the result of the Formula. For instance, it might contain the result of 2 other cells added together.

NOTE 1 - In Excel, Formulas follow a specific syntax that is not the same as mathematical notation. It is therefore sometimes difficult to create a formula that behaves as you want it to.

NOTE 2 - If the **Formula Bar** is not visible, turn it on by going under
**View Tab** >> **Show/Hide** >> **Formula Bar**

Different versions of Excel and different installations on computers may have all kinds of shortcuts added, or even removed. For consistency's sake, this tutorial uses the **Ribbon Tabs** to explain how to complete most tasks.

MS EXCEL 2007 - New Interface

When you open Excel 2007, you will notice that it looks quite different from Excel 2000 and Excel 2003. The same tools are all there, but they are arranged very differently and new features have been added.

If you are already familiar with Excel 2000 or 2003, it may take you a while to adjust to this new arrangement of tools. This tutorial uses Excel 2007 and you can use it as a quick reference guide for most of the common tools.

## Arrangement of Tools in Excel 2007
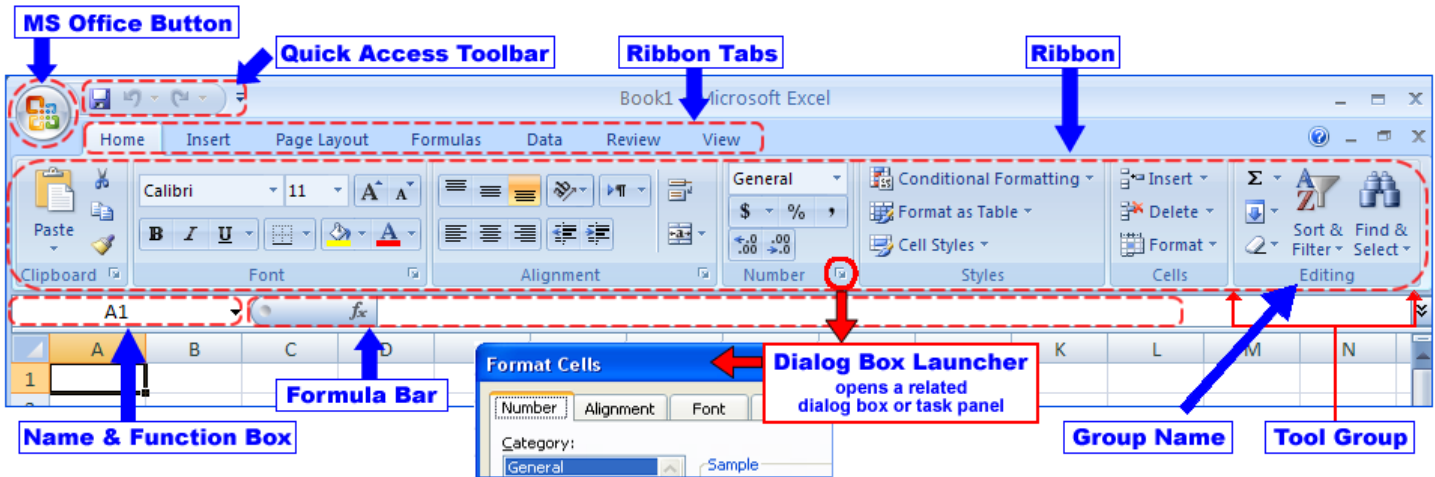
MS OFFICE BUTTON contains the main **File Functions**:
- New, Open, Save, Save as, Print, Print Preview, etc.

QUICK ACCESS TOOLBAR contains shortcuts to **Save, Undo, and Repeat**

RIBBON TABS - Each **Ribbon Tab** displays a **Ribbon** that provides a set of **Tool Groups.** The **Ribbon Tab and the Tool Groups** correspond to the **Menu and Toolbar** in previous versions of Excel.

- **Tool Groups** - Each **Tool Group's** name is shown at the bottom of the Group
  - **Example** - **Home Tab**
  - Both the **Clipboard** and **Font Tool Groups** display their names at the bottom of their Group (see image at right)
- **To Change Tool Groups** click on the appropriate **Ribbon Tab** in the **Ribbon**
  - **Examples**
    - **Home Tab - Tool Groups** for ClipBoard, Font, Alignment, and Cell Formatting
    - **Insert Tab - Tool Groups** for inserting Images, Charts, and Text Boxes
- **Dialog Box Launch Arrow**
  - Some **Tool Groups** have a **small arrow in the bottom right-hand corner**
  - Clicking on this arrow will open a **Dialog Box** which offers more options and settings related to that **Tool Group**
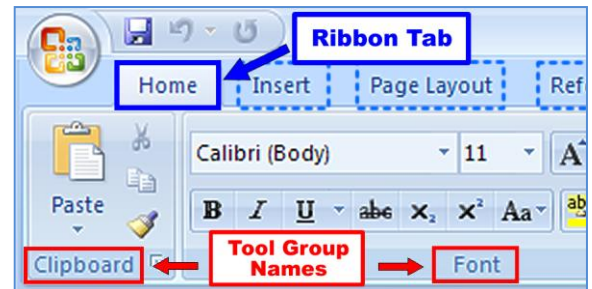
In Excel 2007, tools with similar uses are organized so that they are usually found within the same Tool Group or at least within one Ribbon. If you do not find a tool in the Ribbon you think it should be in, try exploring the other Ribbon Tabs.

In this tutorial, we will not use the control keys as these function differently on different computers. For the sake of consistency, all instructions in this tutorial refer to the **Ribbon Tabs** and **Tool Groups** in each **Ribbon**.

Getting Started

Start a new Workbook	**MS Office Button** >> **New** When you open Excel for the first time, a new, blank Workbook appears. If you are already in Excel and want a new Workbook • Click on **MS Office Button** and choose **New** **NOTE:** In Excel, a **Workbook** is the basic document • Each **Workbook** contains several **Sheets** on which different sets of Data can be entered • The Sheets are listed at the **bottom of the Excel window** • Sheets can be given individual names • Click on the name of a each sheet to switch between them
Open an existing Workbook	**MS Office Button** >> **Open** • Browse to an Excel Workbook document and Open it
Open a file from a different version or format	Excel 2007 will automatically convert a document from a compatible version of Excel • Your document will open in **Compatibility Mode** • This will prevent you from using certain tools in Office 2007 which are not compatible with Office 2000 or 2003 • When you finish editing a document, be **VERY CAREFUL** to save any converted documents in their original format • Please read the **Important Notes** below regarding saving in Office 2007!

IMPORTANT NOTES: Saving Documents in Excel 2007

1. In the Computing Facilities, files on the **Desktop** are **NOT SAVED** when you log off.
   • **ALWAYS** use **MS Office Button** >> **Save As...** to save your file to a storage device or server
   • You can also save a file to the Desktop and then email it to yourself as an attachment

2. If you are **NOT** running Office 2007 at home and you save a document as Excel 2007 **(*.xlsx)**, **YOU WILL NOT BE ABLE TO OPEN IT AT HOME!** (see step 3 below)

3. If you have **Office 2000 or 2003** or you use a **Mac** at home or in the Computing Facilities
   • You will have to save your document as an older version
   • Go to **MS Office Button** >> **Save As**
     o At the bottom, there is a bar that asks you to **"Save as Type:"**
     o **Choose Excel 97-2003 Workbook (*.xls)**
   • **DO NOT CHOOSE** "Excel Workbook (*.xlsx)" - that is the 2007 format.

4. If you are using a PC at home running **Office 2000 or 2003**
   • You can download the **MS Office 2007 to Office 2003 Compatibility Pack** from Microsoft's website
     o http://www.microsoft.com/downloads/
     o Under **New Downloads**, choose "**Microsoft Office Compatibility Pack for Word...**"
   • Even with the Compatibility Pack, you might **lose data / formatting** when you save as an older version
   • There is no Compatibility Pack available for **Mac** yet.

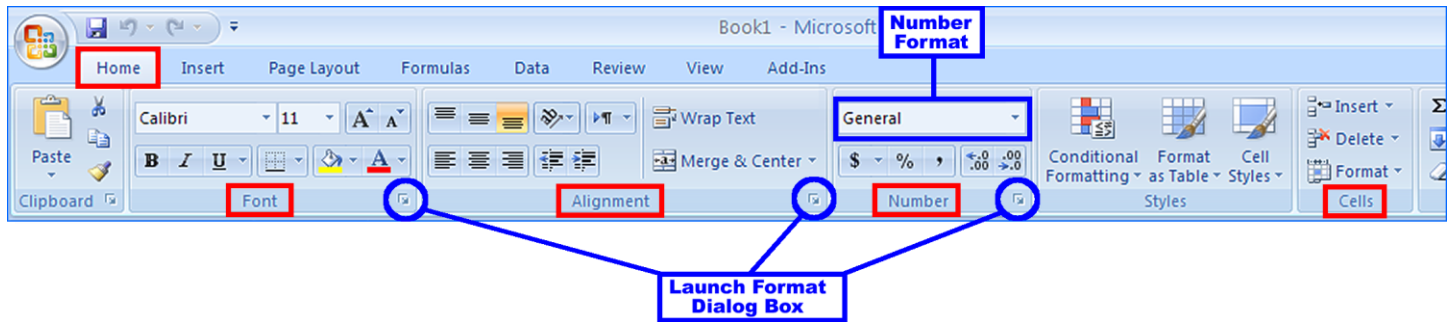|	
Save the current Workbook OR Save the Workbook as a different name, version, or format	**MS Office Button** >> **Save or Save As...** • Please read the **Important Notes** above regarding saving in Office 2007! • In the bars at the bottom of the **Save As... Window** • Give your document a new name in **"File Name:"** • Select the version and format from **"Save as type:"**

Format Cells Dialog Box - (has not changed from Word 2000, 2003)

- Allows you to change several properties of a Cell within one Dialog Box.
  - o **Type of Data**
  - o **Alignment/Position** of Data in a Cell
  - o **Font** of the Data
  - o Cell **Borders and Fill**

- Offers more options than the **Tool Groups** in the Ribbon

- It is especially useful for altering **Cell Borders**

- To Open or Launch the **Format Cells Box**
  - o **Select** the cells you wish to format
  - o Click on the **Dialog Box Launcher** arrow at the right bottom corner of the **Font**, **Alignment**, or **Number Groups**

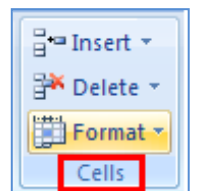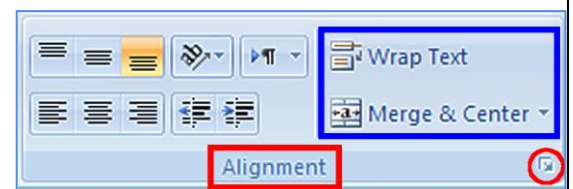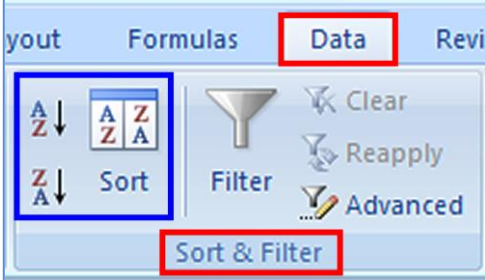|	

Format the **Borders** of Cells	**Home Tab** >> **Launch Format Dialog Box** (small arrow at bottom right of Groups)
	
	Select the Cell(s) you wish to format
	- Click on the **Dialog Box Launcher** arrow at the right bottom corner of the
	- **Font**, **Alignment**, or **Number Groups**
	- This will launch the **Format Cells Dialog Box**
	- Click on the **Border Tab** at the top of this Box
	  1. Choose a **Style** of Line
	  2. Choose a **Colour** for the Line
	  3. Choose which **Border Lines** you want to see around the Cell(s)
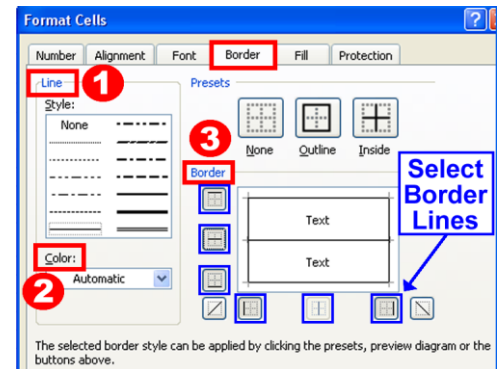
Format the Column **Width** or **Row Height** of Cells	**Home Tab** >> **Cells Group** >> **Format** **Select** the Cell(s) for which you want to change the **Row Height** or **Column Width** - Click on the **Format** button in the **Cells Group** - Choose to adjust the **Column Width** or **Row Height** **OR** - Select **Autofit** to adjust the Cell to the size of the Data
Move a cell(s)	- **Select** the Cell(s) you want to move - Position the mouse over a border of the selection - The cursor will change from a **thick white plus sign** into **thin crossed arrows** - **Click-drag** the cells to their destination.
Merge Cells Combine several Cells into 1 **NOTE**: This process **ONLY** retains Data from the **top left Cell**	**Home Tab >> Alignment Group >> Merge & Center** **Select** the Cell(s) to be Merged - Click on the **Merge & Center Tool** - Select **Merge Cells** from the pull-down menu **OR** - Launch the **Format Dialog Box** using the arrow at the bottom right corner of the **Alignment Group** - Check the **Merge Cells** box under **Text Control.**

| Automatically fill Data Cells	Excel can automatically continue a list if you provide the first 2 or 3 items in it. This is very useful for basic sequences such as: • Days of the week • List of numbers **Input data** into a Cell or across two consecutive cells to get an incremental list • **Select** the cell(s) • Position the mouse in **bottom right corner** of the selection • The pointer will change to a thin black cross • **Click-drag downwards or to the right across the neighbouring empty cells** to apply the Auto-fill to all desired cells
Sorting Data	**Data Tab >> Sort & Filter Group >> Sort** **Select** the Data in a Row or Column • Click on the **Sort** button to open the **Sort** window **Home Tab** >> **Editing** >> **Sort & Filter** For simple Sorting, use the Sort & Filter Tool in the Editing Group of the Home Tab

Formulas - The Formula Bar & Functions

Formulas are entered in the **Formula Bar** under the Ribbon.

Formulas are composed of one or more **Functions.**

Formulas:
• Require an equals sign to begin **'='**
• Follow the rules of **BEDMAS** (see below)
• Will be checked for **Notation** errors, **not Logic** errors
• Rely on column/row numbering (A1, Z39)
• Are most easily tackled by using the online help feature
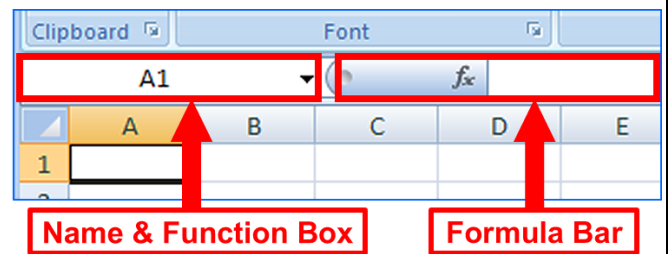
To begin a Formula:

Select the Cell where you want the result to appear
• This Cell does not have to be adjacent to the Data used by the Formula

1. **Type an equals sign '='** into either
   o The **Formula Bar**
   o The Cell where you want the Result to appear

2. Choose a **Function** from the **Function List** to the left of the **Formula Bar**
   o This list contains commonly used Functions such as Add or Sum
   o For more functions, choose More Functions...
   o The **Insert Function Dialog Box** will open

3. The **Result** of the Function will appear in the Cell you chose in Step 1

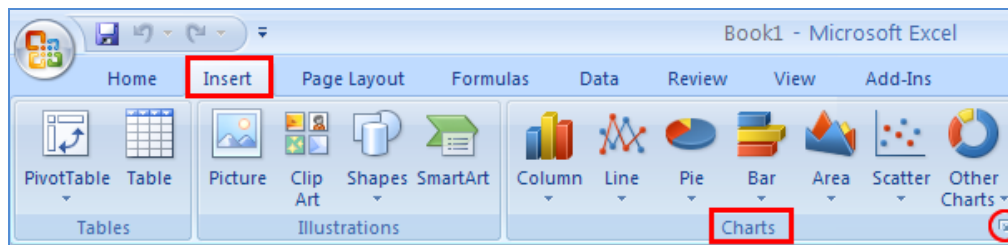|	
Functions & Operators for Formulas	Operations follow the order of **BEDMAS**: • **B**rackets, **E**xponents, **D**ivide, **M**ultiply, **A**dd, **S**ubtract **Formula Notation** for common mathematical functions Addition: **+** Multiplication: ***** Subtraction: **-** Brackets: **( )** Division: **** Range: **...** [i.e. A1...A70]
AutoSum Automatically Sum your Data	**Home Tab** >> **Editing Group** >> **AutoSum** Excel can automatically, quickly, **Add** a row or column of numbers for you: • **Select** the Cells you want to sum • Include an **empty Cell** as the last Cell in the selection • This is where your summation result will be entered • Click on the **AutoSum Tool** in the **Editing Group** • Choose **Sum** from the list Several other **commonly used Functions** are available here such as: • **Average, Count, Min, Max** To automatically apply the same Function to a Set of Cells • Follow instructions to **Automatically Fill Data Cells** on page 6 above

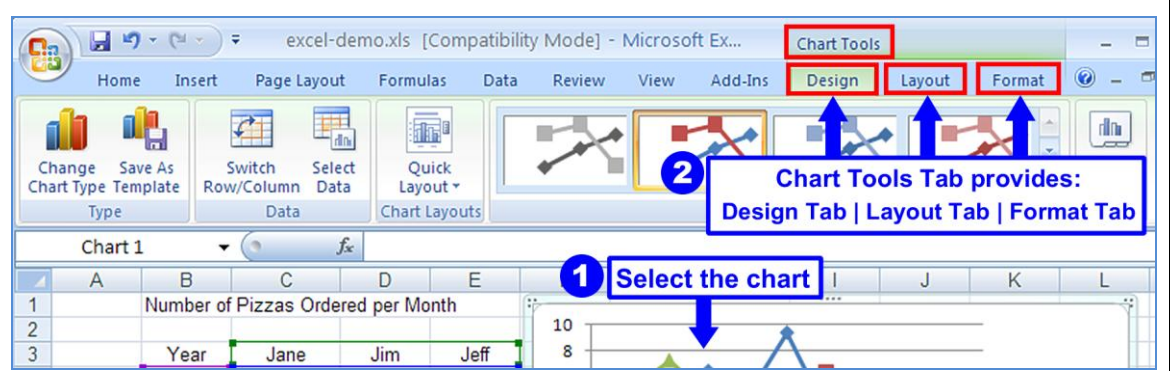# Creating and Formatting Charts

Inserting a Chart from Data	**Insert Tab** >> **Charts Group**
	
	• Select a set of Data
	    o The Data should all be adjacent and arranged in Columns
	    o The **leftmost Column** is **Data for the X-Axis**
	    o Each other Column represents a different **Series of Data** or Set of Y-Values
	• Choose a **Chart Type** (Column, Pie, Scatter, etc.) from the **Charts Group**
	• Or click on **Dialog Box Launcher** arrow at the right bottom corner of **Chart Group** to launch **Insert Chart** window
	• Select the type of chart you want
	
	Choose the type of Chart you want.
	• **XY (Scatter)** is one of the more popular Chart Types for representing data because it allows you to **alter both the X-axis and the Y-axis**
	• There are several other types of charts and each has different options for laying out data. See which one works best for your data set
	
	NOTE :
	Excel 2007 has removed the **Chart Wizard.** You must use the **Chart Tools Ribbon Tabs** to format and alter the appearance and Data of your Chart. See instructions below.

|	
Chart Tools Tab: • **Design Tab** • **Layout Tab** • **Format Tab** You need to use **Chart Tools Tabs** to Format any part of the Chart	
	1. To Format a Chart, always **Select the Chart** first by clicking on it. 2. **Chart Tools Tab** appears providing the **Design Tab**, **Layout Tab** and **Format Tab** for Formatting the selected Chart
Creating a Chart Step 1 Choose / Change a Chart Design	**Chart Tools - Design Tab** >> **Type Group** >> **Change Chart Type** • Click on **Change Chart Type** Tool to change the type of chart **Choose the type of Chart you want.** • **XY (Scatter)** is one of the more popular Chart Types for representing data because it allows you to **alter both the X-axis and the Y-axis** • There are several other types of charts and each has different options for laying out data. See which one works best for your data set

Creating a Chart - Steps 2 - 4

Edit the Data Range, Choose a Location, Add Labels
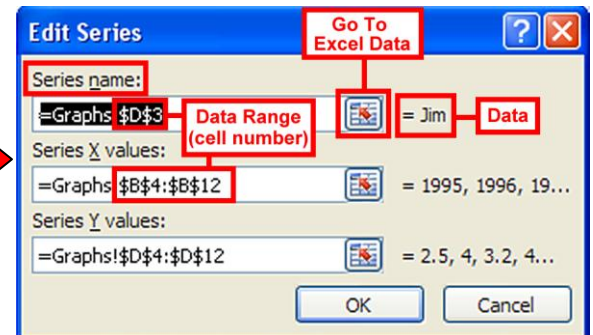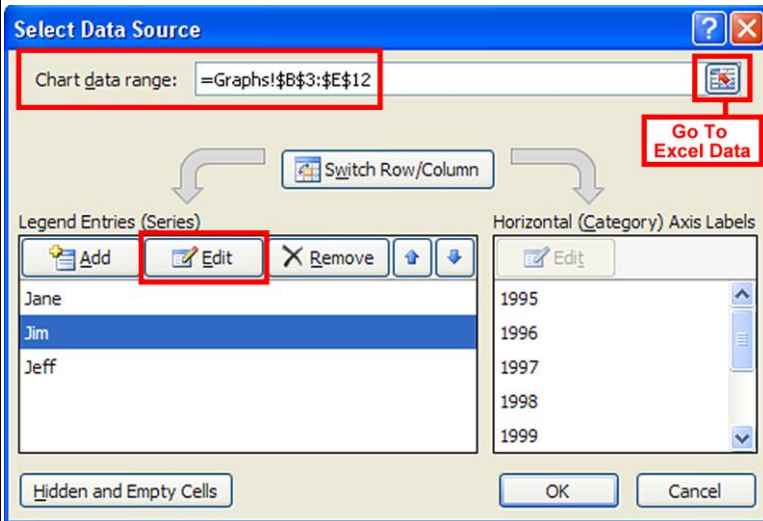
Creating a Chart
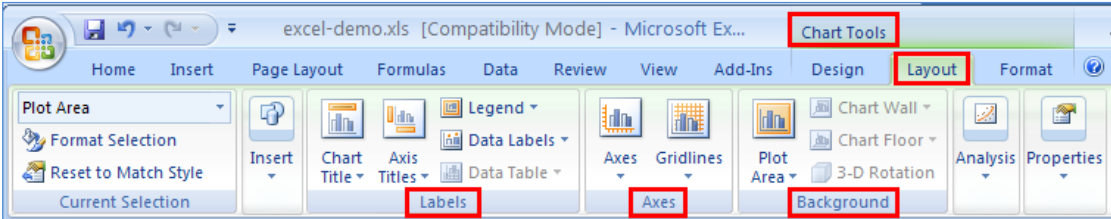 	
Step 2
Data Range
• Choose a Data Range
• Add or Delete a Series
 	
Series - a single Column of Data
	Chart Tools - Design Tab >> **Data Group** >> **Select Data**
	
	NOTE: You only need to use the **Select Data Tool** if the Chart is **NOT** displaying the correct Data for each Series.
	
	• Click on **Select Data** button to change the **Data Range of each Series** of the Chart
	• The **Select Data Source** window will appear
	• Select a Data Series in the box on the left (Ex. "Jim")
	• Click on **Edit** button to change the Data in the Series
	   o The **Edit Series** window will appear
	   o To choose Data straight off the Excel Sheet, click on the **Graph Symbol** next to the **Series Name, X-Values, or Y-Values**

Creating a Chart **Step 3** **Chart Location**	**Chart Tools - Design Tab** >> **Location Group** >> **Move Chart** • The **Move Chart Tool** is located on the far right of the Chart Tools Design Tab • Choose whether you want the Chart to appear as an object on the **same sheet** as your data (more common) or on **its own sheet**

Creating a Chart
 	
Step 4
Labels
• Chart Titles
• Axis Titles
• Gridlines
• Legend Position
• Background
	Chart Tools - Layout Tab >> **Labels, Axes, & Background Groups**
	
	Labels Group:
	• **Chart Title / Axis Titles Tools**
	   o Add, remove and position the titles of the chart and axis
	   o To change the Font for a Title, highlight the text and go to the **Font Group** in the **Home Tab**
	• **Legend Tool**
	   o Add, remove and position the **Chart Legend**
	   o The Legend assigns a separate colour to each Data Series
	• **Data Labels Tool**
	   o **Data Labels** are the X or Y values for each Data Point in a Series
	   o They will appear next to each Data Point Marker in a Series Line
	   o Add, remove and position the **Data Labels**
	• **Data Table Tool**
	   o Add the Data Table to the chart
	
	Axes Group:
	• **Axes Tool** - Change the formatting and layout of each axis
	• **Gridlines Tool** - Turn Major and Minor Gridlines on or off
	
	Background Group: Edit the Background color and style of the chart.
	
	There are **more options** for all of these Groups.
	• Choose **"More options"** when you click on a Tool
	• A Format Dialog Box will open for that Tool
	• As you select each option, the **Chart Preview** will change. If you are unsure of what an option will do to your Chart, try clicking on it. You can always turn it off again.

Stretching the Chart	If the **Axis Labels** are positioned too close together, or the Chart is not the shape you want it to be, you can stretch the chart. • Click in the blank background of the Chart near the Title. You should see a box appear around the entire Chart. • Click and drag the "handles" of the box to make the Chart bigger

Formatting Elements of a Chart
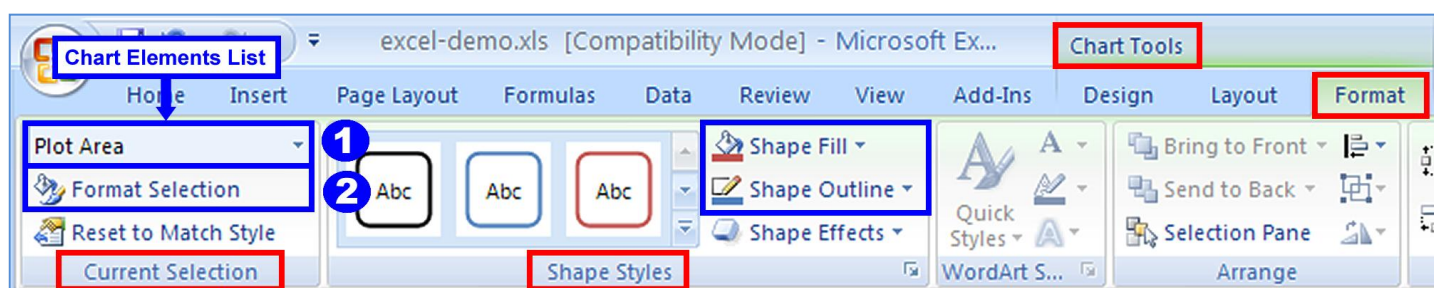
There are **two methods** you can use to **Format** any part of your Chart
Format the
- Font, Colour, Shape, Fill, Outline or Style
of the
- Chart Area (background of whole chart), X or Y Axes, Legend, Plot Area, Gridlines, Titles, Data Series Lines, or Plot Points

① **Chart Elements List**

Method 1
- **Right-click** on that specific part of the Chart and choose **Format ____ ...**

Method 2
Chart Tools - Format Tab >> **Current Selection Group**
1. Click on the **Chart Elements List**.
   o A pull-down menu will list all the elements of your Chart
   o Select the part of the chart that you want to format
2. Click on the **Format Selection** button
   o A **Format Dialog Box** will appear for that element of the chart
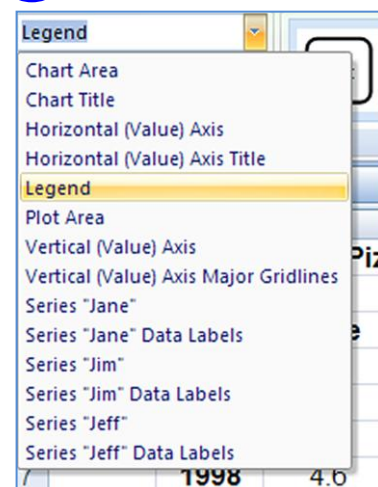
Some parts in the chart (i.e. Lines and Plot Points) are easier to select by Method 2 than by right-clicking.

Note: In the sections below, we mainly use the **Right-click** Method to select an area of the chart.

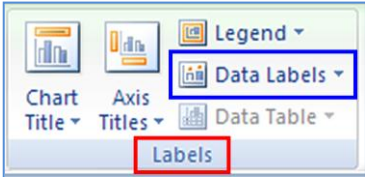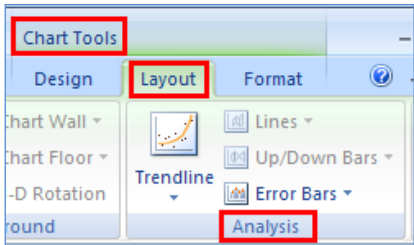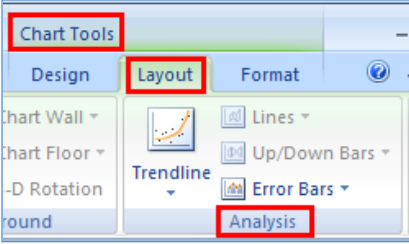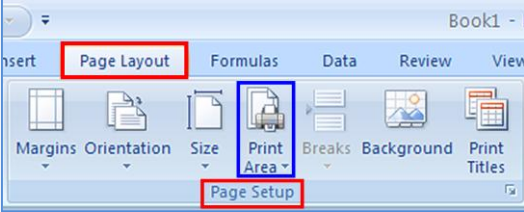|	

Formatting Axes
Change the Pattern, Scale, Font, Number Type, and Angle of the X and Y Axes.
 	
Of these, the most important is the **Scale** of the Axes.
	Right-click on the X or Y axis in your Chart and choose **Format Axis...**
	- The **Format Axis Dialog Box** will open
	
	Set the Axis options:
	- **Axis Options** - **These greatly affect how your data is displayed!**
	  When the Chart is created, the major values (tick marks) of the axes are set automatically, but you might want them to be very different.
	  Axis Options allows you to set:
	  o **Minimum and Maximum** value for each axis
	  o **Major Unit** - The increment between major values (tick marks) on the axis
	  o **Minor Unit** - The increment between minor values (smaller tick marks) on the axis
	  o To change any of these options, click on the **Fixed**, not Auto setting
	- **Number** - Change the **Type of Data** for the axis values (date, time, text...)
	- **Fill, Line Colour, Line Style** - Change the background color, Axis colour, or Axis Line style for the X or Y axis
	- **Alignment** - Change the direction of the text for the Axis Values

Formatting a Series of Data Change the appearance of a Data Series Line and its Markers	**Right-click** on the **Series Line** and choose **Format Data Series...** • The **Format Data Series** Dialog Box will open **Set the Data Series options:** • **Series Options** - decide whether to place a series on a Primary or Secondary Axis • **Marker Options and Fill** - Change the Marker Shape, Colour, and Size • **Marker Line Color & Style** - Change the Color and Style of the Marker Outline • **Line Color & Line Style** - Change the Colour and Style of the Series Line
Display and Format Data Labels Show the Data Values **Data Labels** The X or Y values can be displayed next to each Data Marker in a Series Line	**Chart Tools - Layout Tab** >> **Labels Groups** >> **Data Labels** **To create Data Labels**: • **Select** a Series Line • Click on the **Data Labels Tool** in the **Labels Group** • Choose a position for the Data Labels **relative to their Marker** **To show the Format Data Labels Dialog Box:** • **Right-click** on a **Series Line** that has **Data Labels** and choose **Format Data Labels...** • The **Format Data Labels** Dialog Box will open **Set the Data Labels options:** • **Label Options** - Choose which X or Y Value you want the Label to display and where you want the Label to be positioned **relative to the Series Markers** • **Number** - Change the **Type of Data** for the axis values (date, time, text...) • **Fill, Border Colour, Border Style** - Change the appearance of the Data Label • **Alignment** - Change the direction of the text in the Data Label

Charts - Error Bars and Trendlines

Adding Error Bars to a Series of Data
 	
Error Bar
A small line extending from each Data Marker that represents the potential error of your data.
	Chart Tools - Layout Tab >> **Analysis Group** >> **Error Bars**
	
	To create Error Bars:
	• **Select** a Series Line
	• Click on the **Error Bars Tool** in the **Analysis Group**
	• Select the **Type of Error Bars** you want
	   o Standard, Percentage, or Standard Deviation
	• **Horizontal and Vertical Error Bars** will appear on all the Data Markers in that Series Line
	• To **Delete** Horizontal or Vertical Error Bars, select one or the other and hit the Delete Key
	
	To show the Format Error Bars Dialog Box:
	• Select the **Error Bars** for a Series Line that has them
	• **Right-click** on an Error Bar and choose **Format Error Bars...**
	• The **Format Error Bars** Dialog Box will open
	
	Set the Error Bars options:
	• **Vertical / Horizontal Error Bars**
	   o Show the Plus, Minus, or Both Error Bars
	   o **Amount of Error** - Fixed, Percentage, Standard Deviation, Standard Error
	• **Line Colour, Style** - Change the appearance of the Error Bars

Creating Trend Lines and their Equations
 	
Trendline
The line that best represents the average of your data points.
 	
Excel can **provide an equation** for the Trendline
	Chart Tools - Layout Tab >> **Analysis Group** >> **Trendline**
	
	To create a Trendline:
	• **Select** a Series Line
	• Click on the **Trendline Tool** in the **Analysis Group**
	• Select the type of Trendline you want
	   o Linear, Exponential, Linear Forecast
	• A Trend Line will appear on your Chart and be added to the Legend
	
	To show the Format Trend Line Dialog Box:
	• Select a Trend Line and **Right-click** on it (or use the **Chart Elements List**)
	• Choose **Format Trendline...** and the **Format Trendline** Dialog Box will open
	
	Set the Trendline options:
	• **Trendline Options**
	   o **Type** - Exponential, Linear, Logarithmic, Polynomial, Power,
	   o **Name** - Change the Name of the Trendline in the Legend
	   o Check **Display Equation on Chart** to show the Equation of the Trendline
	      • **This is one of the most useful features of Excel!**
	• **Line Color, Style** - Change the appearance of the Trendline

Printing

Set the **Print Area** of a spreadsheet	**Page Layout Tab** >> **Page Setup Group** >> **Print Area** To print ONLY selected data • **Select** an area of Data in the Data Sheet you want to print • Click on the **Print Area Tool** in the **Page Setup Group** • Choose **Set Print Area** **MS Office Button >> Print** • Click on OK to print the Print Area
Preview the print-out	**MS Office Button >> Print** • Place the mouse over **Print** to see more options • Choose **Preview** from the list in the right side of the MS Office Box **NOTE:** You may find that you need to set the **Page Orientation** to **Landscape** (Horizontal) to make your Data Sheet fit properly. Printing that spans several pages is available for larger spreadsheets.

• This tutorial covers the basic features of Excel. This handout is intended to be a general reference tool.
• If you require **further assistance**, please ask **Staff at any of the Computing Facilities** (Clearihue, BEC, or HSD) for assistance with any other aspects of Excel.
• Formula tutorials can also be found in Excel's Help or online.

Thank you for attending tutorial series.