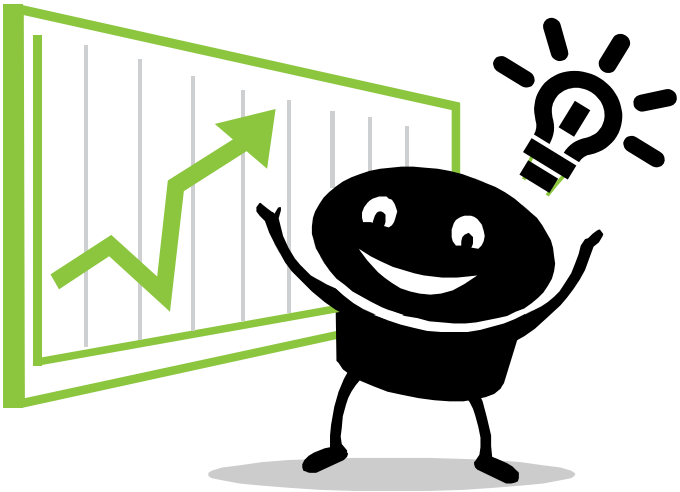
Training on Data Analysis
And
Production of Feedback Materials



Revised

Health System Strengthening for HIV/AIDS Services Project

in collaboration with

University of Dar es Salaam Computing Centre

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Message from M&E advisor, HIV/AIDS Services Project

The Ministry of Health and Social Welfare (MOHSW), with its support from The Japan International Cooperation Agency (JICA), has commenced a four-year project entitled "Health Systems Strengthening for HIV and AIDS Services Project" since October 2010. One of the components of the project is to strengthen the HIV and AIDS Monitoring and Evaluation (M&E) system through modeling exercises in Dodoma and Pwani regions.

M&E system of the project is composed of the data feedback and data utilization. Data have to be returned to the data source with an interpretation after being analyzed and visualized in order for the people who collect the data to understand the situation of their community. The findings of the data analysis are expected to be utilized to improve the health services by the health management teams.

Although the concept is quite unique and challenging to all of you, we hope that the knowledge and skills acquired through this training will be applied to your routine work once you return to your field.

Eventually that all the efforts will come together to improve the health services in your community.

September 2012

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Epidemiologist/ M&E Advisor
Health Systems Strengthening for HIV and AIDS Services Project

Course Description

The course is made particularly to strengthen the capacity of data analysis and data feedback at Regional Health Management Teams and Council Health Management Teams by use of MS Excel 2010. Among a number of HIV/ AIDS related indicators, Score Card Indicators selected by National AIDS Control Programme will be applied as data. Throughout the course, participants will be guided to the process to analyze and visualize their data timely and accurately.

Course Objectives

At the end of the course, students should be able to

1) Maintain IT equipment properly

2) Comprehend the basic MS Excel functions

3) Acquire the skills of making tables and charts through MS Excel

4) Acquire the skills of statistical data analysis through MS Excel

5) Analyze data by use of Score Card Indicators

6) Produce data feedback materials for health facilities by use of Score Card indicators

Lesson Plan of Computer Course Programme – Data analysis and Production of feedback materials

Tutor: DAUDI MLAULE AND JUMA HANZURUNI for Basic & Intermediate

Objectives: The students will be introduced to concepts of Information Technology and be able to start, use, shutdown and maintain the computer properly, be able to work in spreadsheets, formatting and laying out data and carry out statistical and mathematical calculations to a level matching to their needs and abilities, and be able to make feedback material based on above mention skills and knowledge

Day	Topic	Teacher Activity	Learner Activity	Resources
Day1	PC general instruction & MS Excel basic function	**1.PC General instruction and Proper Maintenance** Information Technology concepts. Hardware Management to Improve System performance. Introduction to Computer and its parts including Keyboard and Mouse, how they work and maintain them. Starting, restarting, hibernating, standby and shutting down the computer, adjustment. Folder & file management (creating, copying , renaming, moving, erasing, restoring and search). Data storage & backup (HD, external HD, USB memory flash etc.). Managing User Accounts. Creating, Changing account type, setting and removing passwords, Erasing accounts. Definition and Application of AntiVirus. **2.Introduction to spreadsheet program (MS Excel ver. 2010/ Windows 7) "What is MS Excel? "** **<Managing Workbook>** Creating, Saving, copying, renaming, moving, erasing workbooks. **<Managing Worksheet>** Creating/inserting, copying, renaming, moving, erasing worksheets and tab color worksheets. Screen structure (title-bar, menu-bar, row number, column number, scroll-bar, clip board, status-bar, formula bar, cell and active cell, mouse pointer, name box, question box, worksheet-tab, minimize button, maximize and restore down button, close button, help button etc.) Navigating menu using a mouse and keyboard. Entering, Copying, Cutting, Pasting the data and maintaining them on the worksheet using clip board and short-cut key. Inserting rows and columns, Adding borders and filling color, Formatting cells and Conditional formatting, if functions and lookup formulas.	Exercises on PC General instruction and Proper Maintenance Exercises on Managing Workbook Exercises on Managing Worksheet Exercises and Tests on basic operation of PC and MS Excel	Physical parts of computer (e.g.HDD, RAM, CPU, Case, and Motherboard etc.) Whiteboard Digital Projector Practical exercises Color Printer & printing paper
Day2	Database, basic formula and statics value, tabulation and table	**1.Introduction to making "MS Excel Database" and its basic theory. " What is Excel database? "** **2.Introduction to basic formulas (addition, subtraction, division, multiplication, exponentiation, sum, count)** **3.Introduction to basic statics values (Mean, Standard error, Median, Mode, Rage, Maximum, Minimum, Standard deviation)** **4.Introduction to tabulation using MS Excel** **5.Introduction to making tables in MS Excel and its basic theory. "What is table ? "**	Exercise on how to make a database Exercises on how to work with basic formula and tabulation Exercise on creating Excel table by formatting borders and shading and deleting a table Exercise on formatting and printing a table Exercises and Tests on creating a table using tabulating data	Whiteboard How-to manual on Excel Interactive whiteboard Digital Projector Additional exercises on covered items Pictorial handout on menus and their meanings
Day3	Data analysis and graph/chart	**1.Introduction to graphing data and its basic theory. "What is graph/chart ? "** Types of graph/chart and concept of each graph/chart e.g. Columns, Bar, XY and others **2.Introduction to Data Analysis using MS Excel. "What is data analysis ? "** Analyzing data in MS Excel and explaining what they mean. **3.Introduction to Correlation Coefficient, Scatter chart and Regression formula and Hypothesis testing e.g. t-test and z-test, Once comfortable carry out additional tasks supplied by the tutor**	Exercise on selecting and creating suitable graph/chart based on purpose Exercise on formatting and printing graph/chart Exercises on how to work with Correlation Coefficient, Scatter chart and Regression formula and Hypothesis testing Exercises and Tests on creating graph/chart and how to work with Correlation Coefficient, Scatter chart and Regression formula and Hypothesis testing	Color Printer & printing paper
Day4	Data analysis, graph/chart and feedback material	**1.Introduction to making presentation format in MS Excel** Organizing table, graph/chart and description in A4 paper, printing them out as feedback materials **2.Facilitation for producing feedback materials**	Exercises on producing feedback materials Production of feedback materials using own SCI data	
Day5	Production of feedback materials	**1.Facilitation for producing feedback materials** **2.Suggestion with encouragements on the presented materials**	Production of feedback materials using own SCI data Presentation of produced feedback materials Suggestion with encouragements on the presented materials	

TIME TABLE

Day	Start	End	Activity/Topic	Responsible Person
Day 1	8:00	8:30	Participants arriving and registration	All
pc general instruction & MS Excel basic function	8:30	9:00	Opening Remarks, logistics, Self-Introduction, Training schedule	UCC Arusha Branch Manager, NACP/JICA representative
			JICA HIV/AIDS M&E activities and Purpose of the training, Today's target and schedule	NACP/JICA representative
	9:00	10:30	PC General instruction and Proper Maintenance	Daudi Mlaule and Juma Hanzuruni
			Introduction to Computer and its parts including Keyboard and Mouse, how they work and maintain them	
			Starting, restarting, hibernating, standby and shutting down the computer, adjustment), Folder & file management (create, copying , renaming, moving, erasing, restoring and search), Data storage & backup (HD, external HD, USB memory flash), Desktop management (Taskbar setting, Screen Wallpaper, Screen Saver, Clock adjustment)	
			Optimizing computer performance by Disk defragmentation, error checking and cleanup	
	10:30	11:00	**Tea Break**	All
	11:00	13:00	Managing User Accounts	Daudi Mlaule and Juma Hanzuruni
			Creating, Changing account type, setting and removing passwords, Erasing accounts. Definition and Application of AntiVirus	Students/Participants
	13:00	14:00	**Lunch Break**	All
	14:00	15:30	Introduction to spreadsheet program (MS Excel ver. 2010) "What is Excel? "	Daudi Mlaule and Juma Hanzuruni
			Worksheet and Workbook, Screen structure (title-bar, menu-bar, row number, column number, scroll-bar, clip board, status-bar, formula bar, cell and active cell, mouse pointer, name box, question box, worksheet-tab, minimize button, maximize and restore down button, close button, help button etc.), Navigating menu using a mouse and keyboard	
			Creating, Saving, copying, renaming, moving, erasing workbooks	
			Entering, Copying, Cutting, Pasting the data and maintain them on the worksheet using clip board and short-cut key	
			Inserting rows and column, Adding borders and filling color, Formatting cell and Conditional formatting, if functions and lookup formula.	
			Creating/inserting, copying, renaming, moving, erasing worksheets and tab color worksheets	
	15:30	16:00	**Evening Tea**	All
	16:00	17:00	Exercises and Tests on basic operation of PC and MS Excel	Students/Participants
	17:00	18:00	Free to use Computer Lab/Class for any Private reading	Students/Participants
Day 2	8:00	9:00	Recap for day 1 and Today's target and schedule	Daudi Mlaule and Juma Hanzuruni
database, basic formula and statics value, tabulation and table	9:00	10:30	Introduction to making a "MS Excel Database" and its basic theory. " What is Excel database? "	Daudi Mlaule and Juma Hanzuruni
			Exercise on how to make a database	Students/Participants
			Introduction to basic formula (addition, subtraction, division, multiplication, exponentiation, sum, count)	Daudi Mlaule and Juma Hanzuruni
			Introduction to basic statics values (Mean, Standard error, Median, Mode, Rage, Maximum, Minimum, Standard deviation)	do
			Introduction to tabulation using MS Excel	do
			Exercises on how to work with basic formula and tabulation	Students/Participants
	10:30	11:00	**Tea Break**	All
	11:00	13:00	Introduction to making tables in MS Excel and its basic theory. "What is table ? "	Daudi Mlaule and Juma Hanzuruni
			Exercise on creating Excel table by formatting borders and shading and deleting a table	Students/Participants
	13:00	14:00	**Lunch Break**	All
	14:00	15:30	Exercise on formatting and printing a table	Students/Participants
	15:30	16:00	**Evening Tea**	All
	16:00	17:00	Exercises and Tests on creating a table using tabulating data	Students/Participants
	17:00	18:00	Free to use Computer Lab/Class for any Private reading	Students/Participants

Day	Start	End	Activity/Topic	Responsible Person
Day 3	8:00	9:00	Recap for day 2 and Today's target and schedule	Daudi Mlaule and Juma Hanzuruni
data analysis and graph/chart	9:00	10:30	Introduction to graphing data and its basic theory. "What is graph/chart ? "	Daudi Mlaule and Juma Hanzuruni
			Types of graph/chart and concept of each graph/chart	do
			Exercise on selecting and creating suitable graph/chart based on purpose	Students/Participants
	10:30	11:00	**Tea Break**	All
	11:00	13:00	Exercise on formatting and printing graph/chart	Students/Participants
			Introduction to data analysis using MS Excel. "What is data analysis ? "	Daudi Mlaule and Juma Hanzuruni
	13:00	14:00	**Lunch Break**	All
	14:00	15:30	Introduction to Correlation Coefficient, Scatter chart and Regression formula and Hypothesis testing	Daudi Mlaule and Juma Hanzuruni
			Exercises on how to work with Correlation Coefficient, Scatter chart and Regression formula and Hypothesis testing	Students/Participants
	15:30	16:00	**Evening Tea**	All
	16:00	17:00	Exercises and Tests on creating graph/chart and how to work with Correlation Coefficient, Scatter chart and Regression formula and Hypothesis testing	Students/Participants
	17:00	18:00	Free to use Computer Lab/Class for any Private reading	Students/Participants
Day 4	8:00	9:00	Recap for day 3 and Today's target and schedule	Daudi Mlaule and Juma Hanzuruni
data analysis, graph/chart and feedback material	9:00	10:00	What is data feedback ?	NACP/JICA representative
	10:00	10:30	How to produce feedback materials using MS Excel	Daudi Mlaule and Juma Hanzuruni
	10:30	11:00	**Tea Break**	All
	11:00	13:00	Exercises on produce feedback materials	Students/Participants
	13:00	14:00	**Lunch Break**	All
	14:00	15:30	Exercises on producing feedback materials (Continued….)	Students/Participants
	15:30	16:00	**Evening Tea**	All
	16:00	17:00	Produce feedback materials using own SCI data	Students/Participants
	17:00	18:00	Free to use Computer Lab/Class for any Private reading	Students/Participants
Day 5	8:00	8:30	Recap for day 4 and Today's target and schedule	Daudi Mlaule and Juma Hanzuruni
establish feedback materials	8:30	9:30	Produce feedback materials using own SCI data (Continued….)	Students/Participants
	9:30	10:30	Presentation of produced materials	Students/Participants
	10:30	11:00	**Tea Break**	All
	11:00	11:30	Suggestion with encouragements on the presented materials	Daudi Mlaule and Juma Hanzuruni
	11:30	13:00	Final Examinations	Students/Participants
	13:00	14:00	**Lunch Break**	All
	14:00	15:30	Discuss the way of data feedback.	Students/Participants
			The way forward of the project activities	NACP/JICA representative
	15:30	16:00	Evaluation of the training	Students/Participants
	16:00	16:30	Course Summary	Daudi Mlaule and Juma Hanzuruni
	16:30	17:00	**Evening Tea**	All
	17:00	18:00	Getting Final examination results and Certificate *for all participants and for who passed the examination	Students/Participants and facilitator
			Closing	All

Abbreviations & Terminology

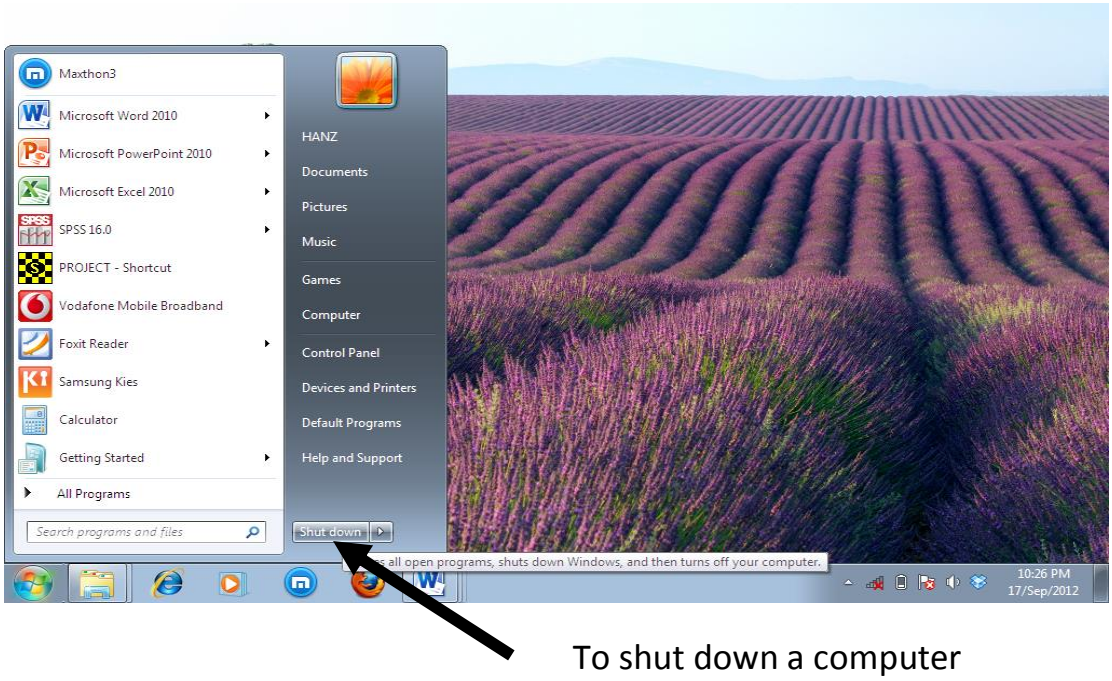
ITEM	MEANING
ADSL	Asymmetric Digital Subscriber Line
Bit	1 or 0 level of storage is called a bit
BPS	Bits Per Second
Byte	A measurement of storage capacity
CBT	Computer Based Training
CD	Compact Disk
CD-R	Compact Disk - Recordable
CD-ROM	Compact Disk - Read Only Memory
CPU	Central Processing Unit
DAT	Digital Audio Tape
DOS	Disk Operating System
DSL	Digital Subscriber Lines
DVD	Digital Versatile Disk
FTP	File Transfer Protocol
G Byte	Gigabyte. A gigabyte consists of 1024 M Bytes
G Hz	Measurement of computer speed. Gigahertz
GUI	Graphical User Interface
Hz	Hertz (this is a measurement of frequency (i.e. speed).
IS	Information Systems
ISDN	Integrated Services Digital Network
IT	Information Technology
K Byte	Kilo byte. A kilobyte (KB) consists of 1024 bytes.
LAN	Local Area Network
M Byte	Megabyte. A megabyte (MB) is one million bytes
MHz	Million Hertz
PC	Personal Computer
PSTN	Public Switched Telephone Network
RAM	Random Access Memory
ROM	Read Only Memory
ROM-BIOS	Read Only Memory - Basic Input Output System
RSI	Repetitive Strain Injury
T Byte	Terabyte. A terabyte (TB) is one million M Bytes
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
VDU	Visual Display Unit
WAN	Wide Area Network
WWW	World Wide Web

Using Computer

Starting the Computer

- Ensure that all cables are plugged securely into the rear of the machine.
- Make sure that there is no disk inserted in the CD/DVD drive.
- Locate the power switch and turn the computer on.
- After a few seconds, you should see something on screen. If not ensure that the monitor is switched on.

SHUTTING DOWN THE COMPUTER



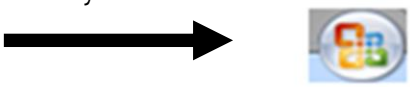
To shut down a computer

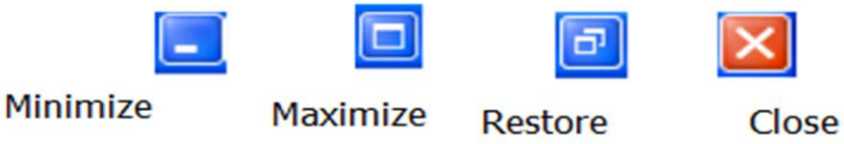
- Click "Start" button
- Click "Shut down"

SAVING A FILE TO DISK

- When you use a Microsoft application, such as Word, PowerPoint or Excel, then by default the files that you save will be saved in a folder called "Documents"

PARTS OF THE WINDOW

- Make sure that you can identify:
  - Office Button 
  - Quick Access Toolbar 
  - Title Bar 
  - WINDOW CONTROL BUTTONS

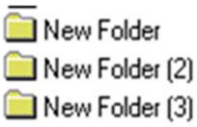


Files and folders

DEFINING A FILE AND A FOLDER

- File:
  - Is electronic information stored in a computer
- Types of files
  - Program files: All files used to run the system
  - User files: Stored in Application software e.g. Ms Excel.
- Folder:
  - Is a virtual space in the storage drive to store files and/or other folders.
  - Is a collection of files stored in the same location in a drive.

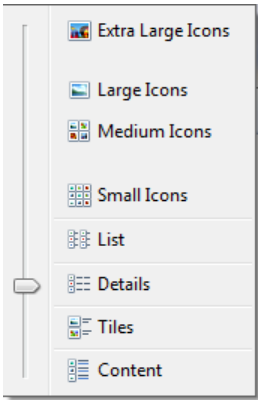
CREATING A FOLDER AND A FURTHER SUB-FOLDER



- Open the Windows Explorer
- Then click on the portion of the folder tree you would like to create a subordinate folder.
- Under the title bar click "New Folder"
- Write the folder name and press Enter key

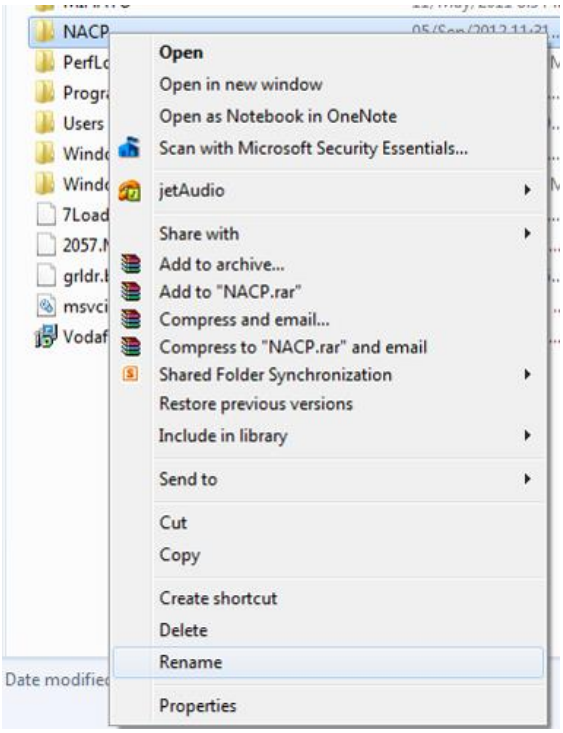
VIEWING CONTENTS IN DIFFERENT STYLES

- The appearance of the Explorer contents window may be customized to display file and folder objects in eight different views
- Select the desired view
- Right-click the file or folder to be renamed.
- From the drop-down menu, select the "Rename" command
- Enter new name and press Enter key to confirm the change.



Selecting Files or Folders

SELECTING FILES or FOLDERS



- To select adjacent files/folders; select in combination with "shift key"
- To select non-adjacent files/folders; select in combination with the "control key"
- Copying files or folders between folders and between drives

  Use either "Copy and Paste" or use "Drag and Drop" technique
- To copy (Within a drive)

  Drag and drop a file or folder while keeping the control (CTRL) key pressed

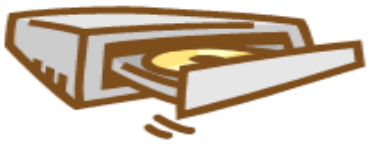
MOVING FILES

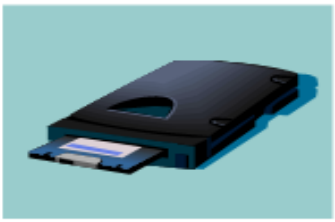
- Use either "Cut and Paste" / Use "drag and drop" techniques
- To Move (within a drive)

  Drag and drop file or folder

Importance of Backing Up Your Data Files

- Backup your data
- Store off-site
- Backup regularly
- Protect yourself from computer break down, theft or fire

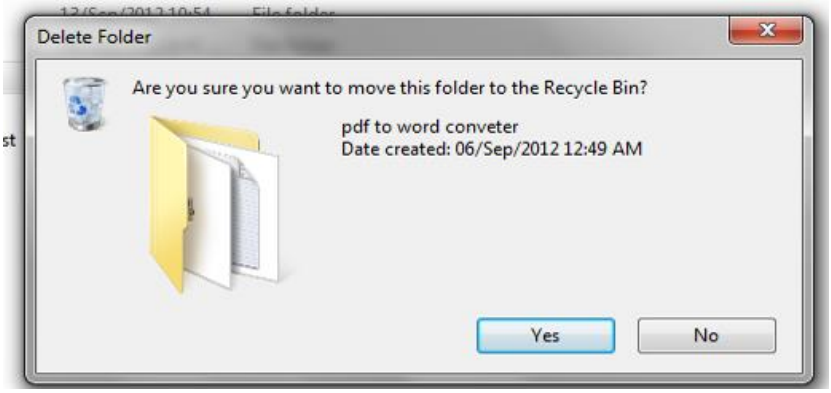




Deleting Files and Folders to the Recycle Bin

- Deleted files are first moved to the Recycle Bin rather than deleted immediately.
- If you accidentally delete a file, you can undelete it

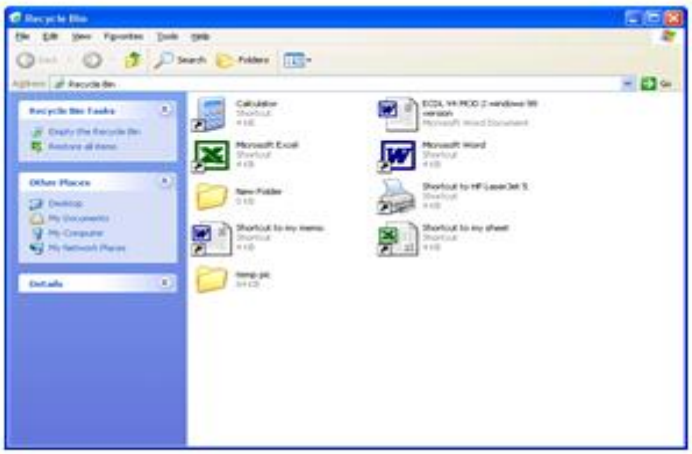
Recycle Bin



Restoring Files and Folders From the Recycle Bin

- Files contained within the Recycle Bin can be 'undeleted'

Recycle Bin



Security Issues

Computer logon user name (ID) and password.
Passwords:
If your computer has a password that prevents other users from accessing it then do NOT give this password to anybody else. Do not write the password on a card and prop this up next to the monitor and above all do not attempt to hide your access passwords on the underside of your desk (this is the first place most criminals would look if trying to break into your system). Make sure you do not forget your passwords; in many cases, data cannot be recovered once the password is lost.

User IDs and passwords:
A User ID is normally used to logon to a computer, or computer network. It uniquely identifies you to the network. In addition you use a password that is only known to you. The password guarantees that no one can access the network and impersonate you (in theory). Once you have logged on (i.e. connected) to the rest of your computer network, you will have been assigned access rights to the network. Your network administrator will have defined these access rights. The idea of access rights is that you only have the ability to connect to, or share, devices that you have authority to use. In other words, the network administrators often have access rights to just about every computer, printer, modem etc. on the network. You on the other hand may have access rights to print to only certain, specified printers and you may be able to access only certain data held on the network.

Passwords:
Your password is the only thing that will prevent someone else logging into a computer using your user ID and impersonating you. It is important to choose a password that cannot be easily guessed by other people. Ideally a password should be at least 8 characters long & contain a mixture of words and numbers. It is also recommended that you change your password regularly; some computer systems will require you to change your password periodically. Never share your password with others
These are procedures to create an account. Click **"Start/Windows"** logo then click **"Control Panel"**. Within this choose **"User Accounts"**. Then click "Manage another account", a panel will open for you to see different present accounts. Click **"Create new Account"**, give it a name, decide whether is to be "Standard" or "Administrator" user, then click **"Create Account"**
To set a password do the following; Double-click that newly made account, then click **"Create a password"**. Write your desired password and repeat it to confirm at an area given. Password hint is an optional and may help you to remember your password. Password Hint is visible even to other computer users. Then click **"Create Password"**

It is no good backing up your data only to leave the item, you backed up to next to the computer; if someone steals your computer it is likely that they will also steal your backups too. If you have a fire, then again you will lose your backups if the backups are stored next to the computer. Ideally, backups should be stored off-site at a safe location. At the very least, consider storing your backups in a fireproof safe, which will give some protection against fire damage.

The need for backups:
The most important thing which you store on your computer is information. Often the contents of a hard disk can represent years of work. If the hard disk stops working one day you could lose all those years of work. For this reason it is VITAL that you take regular backups of the information that is stored on the computer. In large organisations this backup procedure is normally performed automatically by your computer support team, where the data is normally held on a centralised, networked computer.

In smaller organisations, it is often up to the individual to organise some sort of data backup. If nothing else is available, copy your files to a USB memory stick or CD/DVD disk and make sure that these backups are stored away from the computer, ideally off-site. If there is a fire and your office burns down, if your backup disks are stored next to the computer they too will be incinerated.
Disk Clean up-Help in removing unnecessary files from the Hard drive. Follow this procedure; Open "Computer" icon on desktop and right-click a drive you want to clean, e.g. C: after right-clicking click 'Properties" and

under "General" tab click" Disk Clean up". The computer will calculate the amount of disk space to be freed and will give you an option to remove.

Organizing your computer for better backups
When you think about it, you have a computer containing many programs and also a large amount of data that you have created, then it is only the data that really needs to be backed up. If you create a folder structure that contains only data then only this folder (plus any sub-folders of this folder) needs to be backed up.

Complete vs. incremental backups
A complete backup means that you backup all the data on your computer. This has the advantage that the entire hard disk can be backed up, but suffers from the disadvantage that this process can take a long time if your computer contains a lot of data. An incremental backup means that once a week you can perform a complete backup, but every night for the rest of the week, you only backup files that have been newly created or modified since the last backup, saving time. With the right backup software, this process is automatic, and normally you only have to select full or incremental.

Firewalls
A firewall is a system that secures your network from access by unauthorized users. A firewall can be implemented via software, hardware or by a combination of the two. If you are using broadband for Internet access, it is vital that some sort of firewall is in place to stop people trying to hack into your computer.

Computer viruses
Viruses are small programs that hide themselves on your disks (both diskettes and your hard disk). Unless you use virus detection software, the first time that you know that you have a virus is when it activates. Different viruses are activated in different ways. BEWARE: Viruses can destroy all your data.

Viruses hide on a disk and when you access the disk (either a diskette or another hard disk over a network) the virus program will start and infect your computer. The worst thing about a computer virus is that it can spread from one computer to another, either via the use of infected disks, or over a computer network. The Internet allows you to access files from all over the world and you should never connect to the Internet unless you have a virus-checking program installed on your computer. It is vital to keep your virus monitoring software up to date. Many anti-virus programs, such as Norton Anti-Virus allow you to update the program so that the program can check for recently discovered viruses.

More Information:
McAfee Anti-virus software http://www.mcafee.com
Norton Anti-virus software http://www.symantec.com/avcenter
AVG anti-virus software http://www.grisoft.com/
Microsoft Essential Security Anti-virus software
http://windows.microsoft.com/en-US/windows/products/security-essentials

There are many ways in which a virus can infect your computer. A very common way that viruses gain access to a computer, is when people download files from the Internet. Never download files from a website unless you are sure that the website can be trusted. Many anti-virus products now rate websites and mark those that are known to distribute viruses, with a warning.

For the same reason you should never open an e-mail attachment unless the e-mail has come from a trusted source.

Another common route of virus infection is by attaching portable storage disks to your computer that have been supplied to you. In most cases, good up-to-date virus checking software should offer you pretty good protection against catching a virus when downloading or sharing files.

In many organisations, attaching an un-authorised storage device to a computer is an offence that can result in dismissal from the organisation.

The safest way to use a computer is to not connect it to a Local Area network or the Internet. This is called a 'stand-alone' computer, providing that you do not use disks on that PC that have been used in other computers, this type of computer is virtually immune from any form of intrusion.

Unfortunately it is the ability to connect to other computers or indeed the Internet, that makes the modern computer so versatile and so useful.

Always make sure that all computers require an ID and password to access them. Make sure that all relevant 'security patches' from Microsoft have been applied.

Make sure that the password is long enough, contains a random mixture of numbers and letters, and that the passwords are changed on a regular basis.

There are many examples, where people have used passwords that relate to something personal, such as a partner's first name, the dog's or cat's name, etc. For a determined, serious computer hacker, these are easy to guess. If you have a system, where lots of different passwords are required to access the system, then security often breaks down and computer users will sometimes keep a list of these passwords in their disk. This defeats the whole object. If you forget your network access password, the network administrator should be able to assign you with a new one.

If you discover a virus on your computer don't panic. If your virus checker alerts you to a virus, then the chances are that it has caught the virus before the virus could infect your computer and cause damage. For instance you may insert a disk into your computer and the virus checker should automatically scan the disk. If the disk contains a virus, a message will be displayed telling you that the disk is infected, and it should automatically remove the virus. The other common method of infection is via emails.

If you work within a larger company, you should have a company IT support group that will come and rid your computer of viruses. Be sure that you are familiar with your company's policy regarding viruses.

Anti-virus software can only detect viruses (or types of viruses) that the software knows about. As such it is vital that you keep your Anti-virus software up to date so that it can detect new viruses that are constantly appearing.

Malware

The word Malware is a combination of the words "malicious" and "software". Malware is software designed to install itself and run without your consent and without your knowledge. Sometimes when you download free programs from an internet site, they come bundled with hidden programs that you did not ask for and will not want. Often these hidden programs send back marketing information to companies. Sometimes they may have more sinister purposes, such as sending your credit card details to criminals intending to steal from you.

When installing free programs you find on the net always read the licensing terms, as often the malware content is hidden away within this long document.

Spyware

This is different from a virus. Details such as your online browsing habits can be sent, without your knowledge, to marketing companies, or even criminal organizations that will try to get information such as your credit card details or access passwords.

Worms

A computer worm is a self-replicating computer program that sends copies of itself to other computers via a network. It can copy itself from computer to computer without your knowledge.

It is different from a virus because it has no need to hide itself within another program. Many worms can reduce your available bandwidth due to their copying activities, but otherwise do not actually damage your files. However there are also destructive worms that will attack or compromise your data.

Trojans
A Trojan horse (often just called a 'Trojan') is a type of software that you normally expect to do one thing, but in fact it does something else that you did not intend. A Trojan is not a computer virus and does not try and copy itself across your network. It is basically just a program that you need to run. Sometimes you may run this Trojan program when you actually think you are running a legitimate program. The name comes from the classical story of the wooden Trojan horse.

Scare ware
These are popup messages that you may see displayed within a web browser, such as Internet Explorer, that falsely warn you that your computer is infected with a virus or spyware. They invite you to you click on the popup link to solve the problem and then ask you to pay for software that will allegedly fix the problem. In many cases the software that you then purchase is useless.

NOTE: Do not confuse scare ware scams with legitimate popup messages from the virus checking program that is installed on your computer.

Hardware
The term hardware refers to the physical components of your computer such as the system unit, mouse, keyboard, monitor etc.

Parts of a computer

You should understand some of the basic elements that make up a computer including:

- Central processing unit (CPU).
- Types of memory.
- The hard disk.
- Input and output devices.

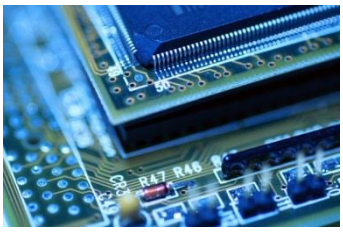
The CPU (Central Processing Unit)
Normally an Intel chip (or equivalent) and it is one of the most important components within your computer. It determines how fast your computer will run and the CPU speed is measured by its GHz speed. Thus, a 4 GHz CPU is much faster than say a 1 GHz CPU. It is the CPU that performs all the calculations within the computer, when running programs such as word-processors, spread sheets and databases.

The CPU contains the following elements:

Control Unit:
The control unit is responsible for controlling the sequencing and timing of the other elements making up the CPU.

Arithmetic Logic Unit (ALU):
The ALU performs the mathematical calculations using data stored within the CPU
Registers:
The registers are memory storage areas within the CPU that hold the data that is worked on by the ALU.
BUS:
The computer bus transports data between the memory and registers.

More information:
Intel: http://www.intel.com
AMD: http://www.amd.com



RAM (Random Access Memory
Houses within your computer is where the operating system is loaded to, when you switch on your computer, and also where your applications are copied to when you start an application, such as a word processor or database program. When you create data, such as letters and pictures, these are initially created and held in RAM and then copied to disk when you save the data. As a rule of thumb, the more RAM you have installed in your computer the better. These days you will commonly find over 2 G Bytes of RAM installed.

Disks
You use disks to store any data that you create. This can range from a memo created within a word processor to a video file created using a video camera. There are many different types of disk. Software is also supplied on disk, normally a CD or DVD disk.

Hard disks are the main, large data storage areas within your computer. Hard disks are used to store your operating system, your application programs (i.e. your word processor, games etc.) and your data. They are much faster than CD or DVD disks and can also hold much more data. Hard disks are installed within the system unit of your computer.

Input and Output ports
Normally located at the back or on the side of your computer. These include ports such as USB, serial, parallel, network and FireWire ports. You plug cables into these ports to connect your computer to other devices, such as printers, scanners and cameras.

The Universal Serial Bus
You will see one or more USB sockets at the back of the system unit, allowing you to plug in devices designed for the USB. These devices include printers, scanners and digital cameras. Memory sticks can also be plugged into a USB port allowing you to copy data to, or from, your hard disk.

The Serial Port
The serial port is a socket located at the back of your computer that enables you to connect items to the computer, such as a modem. They are commonly labelled as COM1 or COM2.

The parallel port
Is a socket located at the back of your computer that enables you to connect items to the computer, such as a printer. Commonly labelled as LPT1 or LPT2.

NOTE: The parallel port used to be the main way the computer connected to a printer. These days you are more likely to use a USB cable to connect the computer to a printer.

The network port
Allows you to plug a 'network cable' into your computer, which then lets you communicate with other computers connected to your local network or to other computers via the Internet.

FireWire
Is an interface from Apple Inc. that allows high speed data transfer between your computer and a compatible device such as a digital camera. FireWire has largely replaced earlier ways of transferring data. There are numerous versions of FireWire including fibre optic, coaxial and wireless versions. Most multimedia computers will have FireWire ports built into them. Fire wire connectors usually look like this:

What is software?

The software is the collection of instructions that makes the computer work. For instance, when you type in words via the keyboard, the software is responsible for displaying the correct letters, in the correct place on the screen. Software is held either on your computer's hard disk, CD, DVD or on a diskette (floppy disk) and is loaded (i.e. copied) from the disk into the computers RAM (Random Access Memory), as and when required.

What is an operating system?

The operating system is a special type of program that loads automatically when you start your computer. The operating system allows you to use the advanced features of a modern computer without having to learn all the details of how the hardware works. There are a number of different types of operating system in common use. The IBM PC (Personal Computer) was introduced way back in 1981 and was originally supplied with an operating system called DOS (Disk Operating System). This operating system was very basic, and you had to be a bit of a computer expert just to understand how to use it. It was NOT user-friendly. Later on, Microsoft introduced Windows and this is the operating system which is most widely used on PCs today. To complicate matters further, there are a number of different types of Windows. Most people are today running either Windows XP, Windows Vista or Windows 7.

UNIX and Linux are other examples of operating systems that may be run on PCs.

Other types of computers, such as those manufactured by Apple have a completely different operating system.

Microsoft Windows: Microsoft: http://www.microsoft.com
IBM OS/2: http://www.ibm.com/software/os/warp
Mac OS X: http://www.apple.com
Linux: http://www.linux.org
UNIX: http://www.unix.org

Difference between the operating system and application programs
The operating system works closely with the hardware that you have installed within your computer. It interprets the input via the mouse or keyboard and outputs data to the screen.
The application programs sit above the operating system, and make use of the functionality built into the operating system. They are specific to a particular task. For instance Microsoft Word is designed as a word processing program, while Microsoft Excel is a spread sheet program.

Examples of software applications
An application program is the type of program that you use once the operating system has been loaded. Examples include word-processing programs (for producing letters, memos etc.), spread sheets (for doing accounts and working with numbers), databases (for organising large amounts of information), games programs and graphics programs (for producing pictures, advertisements, manuals etc.).
It is important that you recognise examples of application programs covering the following areas:

- Word processing
- Spread sheets
- Databases
- Presentations
- E-mailing
- Web browsing
- Photo editing
- Computer games

A word processing program (such as Microsoft Word) allows you to produce letters, memos, etc., easily. You can easily mail merge a list of names and addresses to produce mass mailers, individually addressed to customers or subscribers.

A spread sheet program (such as Microsoft Excel) allows you to work out a company's income, expenditure and then calculate the balance. It enables you to make 'what if' type projections of how the company will fair in the future and to forecast how changes in prices will affect profits.

A database program (such as Microsoft Access) allows you to compile information and then to search this information to extract just the information you require. For instance, if you have a database of all the equipment housed within an office you can very simply produce a report listing only the equipment above a certain value.

A presentation program (such as Microsoft PowerPoint) allows you to produce professional looking presentations that can be printed out directly onto slides for use with an overhead projector. Alternatively, you can display your presentations directly on a computer screen or via a computerised projector.

There are many emailing programs available. As the name suggests you use these to send and receive emails. Microsoft Outlook is supplied within Microsoft Office. Another well know example is the Thunderbird email program.

Applications used to view and interact with the World Wide Web (WWW).

MS Internet Explorer: http://www.microsoft.com
Google Chrome: http://www.google.com/chrome
Firefox: http://www.mozilla.org/products/firefox

These programs allow you to edit digital photos. You can adjust items such as the picture brightness, contrast and colour balance. You can remove defects such the red eye effect often caused when using a flash. You can apply interesting special effects and filters to visually enhance your photographs. Examples include Photoshop from Adobe and Paint Shop Pro from Corel.

Computer Performance

Factors affecting computer performance
There are a wide range of factors that can affect the performance of your computer. These include CPU speed, RAM size, type of graphics card, plus the number of applications running. It is important to realise that it is not just the speed of the CPU that affect the overall performance of your computer. There is no point in having a very fast CPU if the other parts of a computer may slow down the real world performance.

CPU Clock speed
The computer clock speed governs how fast the CPU will run. The higher the clock speed, the faster the computer will work for you. The clock speed is given in Gigahertz (GHz). The higher the GHz speed the faster the computer.

RAM size
As a rule the more memory you have the faster the PC will appear to operate. Windows also uses the hard disk a lot, so logically the faster the hard disk can operate, the faster the PC will appear to run.

Hard disk speed and storage
Hard disks are also measured by their speed, defined by the disk access time, which is measured in milliseconds. The smaller this access time, the faster the hard disk will store, or retrieve data. The data storage capacity of hard disks continues to increase as new products are released. The disk storage capacity is measured in Gigabytes (G Bytes). 1 G Byte is equivalent to 1024 Mbytes.

Free hard disk space
To get the most out of your Windows based PC, you not only need a fast hard disk, but also a large hard disk, with plenty of "spare space". This is due to the fact that Windows is constantly moving data between the hard disk and RAM (Random Access Memory). Microsoft Windows will create many so-called "temporary files" that it uses for managing your programs. In fact, if you have very little free hard disk space, you may find that Microsoft Windows will not be able to run your programs at all.

Error-Checking
This is a process of scanning the surface of the drive for any bad sectors. It detects and removes any broken part of cluster. It helps in increasing the life span of the Hard disk.
Procedure;

1. Open "Computer"
2. Right-click desired drive e.g. C: then click "Properties"
3. Click "Tools" then click "Error-Checking". It will either do the process or schedule to run when you restart the computer.

Disk Clean up
Disk Clean up-Help in removing unnecessary files from the Hard drive. Follow this procedure; Open "Computer" icon on desktop and right-click a drive you want to clean, e.g. C: after right-clicking click 'Properties" and under "General" tab click "Disk Clean up". The computer will calculate the amount of disk space to be freed and will give you an option to remove.

De-fragmenting files
Disk Defragmentation help to arrange files in a better way so that it is easy for Operating Software to open it, hence improve computer performance.
If you are running Windows you may find that if you click on the Start menu, select Programs, and then select the Accessories / System tools group, there is a de-fragmentation program. Running this periodically may noticeably speed up the operation of your PC. When you use a PC, over a period of time the files get broken up into separate pieces that are spread all over the hard disk. De-fragmentation means taking all the broken up pieces and joining them back together again.

Multitasking considerations
Windows is a multitasking system, which means that it can run more than one program at a time. However the more programs that are running at the same time, the slower each one will run. To some extent this slowing effect depends on what each program is doing. Editing a large high definition video for instance can take up a lot of CPU time.

CPU speeds
The speed (operating frequency) of the CPU is measured in gigahertz (GHz). The higher the value the faster the CPU will operate. The original IBM PC released way back in 1981 ran at 4.77 MHz whereas modern PCs can run at over 4000 MHz, which gives you an idea of how far things have progressed.
1 MHz means that the device will run at one million cycles per second.
1 GHz is a thousand times faster, so that 1 GHz = 1000 MHz.

Memory
What is computer memory?
You can store data on your hard disk, while data that is being processed is stored in RAM (Random Access Memory). Data that is stored on a hard disk can be permanent, while data in RAM is only temporary. Normally when people talk about memory in relation to a PC, they are talking about RAM.

RAM
Random Access Memory (RAM) is the main 'working' memory used by the computer. When the operating system loads from disk, when you first switch on the computer, it is copied into RAM. Commonly modern computers are supplied with over 2 G Bytes of RAM. As a rough rule, a Microsoft Windows based computer will operate faster, if you install more RAM. When adverts refer to a computer having 2 G Bytes of memory, it is this RAM which they are talking about. Data and programs stored in RAM are volatile (i.e. the information is lost when you switch off the computer).

ROM
Read Only Memory (ROM) as the name suggests is a special type of memory chip that holds software that can be read but not written to. A good example is the ROM-BIOS chip that contains read-only software. Often network cards and video cards also contain ROM chips.
Data Storage

Measurement of storage capacity
It is important that you understand a little about the measurements used to define storage capacities:

Bit:
Computers are digital. This means they work by processing ones and zeros. The basic one or zero is called a bit of information.

Byte:
There are eight bits in a Byte.

KB - Kilobyte:
There are approximately a thousand bytes in a KB (also called a K Byte)

MB - Megabyte:
There are approximately a million bytes in a MB (also called a M Byte)

GB - Gigabyte:
There are approximately a thousand, million bytes in a GB (also called a G Byte)

TB - Terabyte:
There are approximately a million, million bytes in a TB (also called a T Byte).

Types of storage media
There are a range of storage media to choose from including CDs, DVDs, USB flash drives, memory cards, internal hard disks, external hard disks, network drives and on-line file storage. Some are more suitable than others for a particular job, for instance a flash drive is great for quickly transferring relatively small amounts of data from one computer to another.
Internal hard disks
All PCs are supplied with an internal hard disk. This is where the operating system (such as Windows) is stored. It is also were you store your data. When you install new applications, they are copied from CD or DVD to your internal hard disk.

External hard disks
As the name suggests these are secondary hard disks that you can plug into your computer. They are normally connected via a USB cable. They are available in a range of speeds and storage capacities and are an ideal way to back up your data, such as photos or movies.

CDs
Most computers are now supplied with a CD drive. CD data discs look exactly like music CDs but contain computer data instead of music. The advantage of a CD is that it can hold a vast amount of data. The other big advantage of CDs is that they are interchangeable. This means that you can own a range of different CDs and choose which one to insert into your CD drive.

DVDs
Short for "Digital Versatile Disk". Similar to CD drives but allows you to use DVD disks, which contain vastly more information than a traditional CD disk. These also transfer the data from the disk to the computer far faster, allowing you to watch movies on your computer screen. A CD disk can store 650 MB of data, while a DVD disk can store over 4 GB of data.

USB memory sticks
Flash drives plug into the USB port and when viewed via the Windows Explorer, look just like any other drive. They are supplied in a range of sizes with the 1 GB devices being a very cheap way of transferring relatively small amounts of data between computers.

Memory cards
A memory card (also called a flash memory card) is a card containing memory chips that is often used in devices such as digital cameras, telephones, music players, video game consoles, GPS system and similar devices where there is a need to store data in a compact form, often using a battery power source. There are a number of different types of memory cards with different storage capacities.

Many new PCs have built-in slots for different types of memory cards.

Network drives and on-line file storage
Within an office it is normal that the computers are connected together via a network. This allows you to store your data centrally, on a network server. This network server should be backed-up by the IT support staff on a daily basis. This means that your data is safely backed up for you.
Alternatively you may create and store your data on your own PC or laptop and periodically copy it across the network to be stored safely on a central network server. In many companies network software automatically backs up selected folders on each computer to the central server.

Floppy disks (diskettes)

Floppy disks are also known as diskettes. They are very slow compared to hard disks, CD or DVD disks and hold relatively small amounts of data (1.44 Mbytes). Sometimes people will backup (i.e. copy) important data from their hard disk to floppy disks. However, as diskettes are notoriously unreliable this is not the best way of backing up valuable data (but is better than nothing). Modern computers are not normally supplied with this type of drive. Floppy disks have almost entirely been replaced by CD or DVD disks.

Input and Output Devices

What are input devices?

Input devices allow you to input information to the computer and include things such as the keyboard and mouse.

Keyboard

The keyboard allows you to type information into the computer. It has evolved over the years. The keyboard is built into laptop computers but is a separate item if used with a Desktop computer. They can be connected via cables or may be wireless.

Mouse

When using an operating system, such as Microsoft Windows, you use the mouse to select drop down menus, to point and click on items, to select items and to drag and drop items from one place to another.

What are output devices?

Includes items such as screens (monitors), printers, speakers and headphones.

Traditional computer monitor

An output device. The original computer monitors were TV type screens on which you viewed your programs. They were supplied in different sizes, common sizes range from 15" to 21" screens. You should be aware that poor quality or badly maintained monitors could harm your eyesight.

Flat screen computer screens

Traditional computer monitors are based on the same sort of technology that is used within a television screen.

More recently, flat screen computer screens have become available. These take up a lot less room on a desk and use less energy than the traditional, more bulky monitors.

You should be aware that often if you specify a screen of a certain size, say a 17-inch screen, this is the size measured diagonally, not horizontally across the screen. If you are upgrading you should also ask for the "visible viewing area" of the screen.

Printers
Most data is printed once you have created it and there are a vast number of different printers available to accomplish this. Most common are ink jet and laser printers both of which can now produce coloured output (at a cost).

Different types of printer
There are many different types of printers. In large organisations, laser printers are most commonly used because they can print very fast and give a very high quality output. In most organisations, the printers are connected to the computers via a network. This means that each person with a computer does not require his or her own printer. Each computer connected to the network can print using a particular shared printer. When you buy a printer, one of the things the salesperson will not necessarily stress is how much it will cost to keep that printer running. Laser printers do not use ink; they use something called toner that is normally supplied in a sealed unit called a toner cartridge. Each toner cartridge will allow you to print a certain amount of pages and when the toner is used up it needs to be replaced. In some cases the costs of these toner cartridges is very high. Ink jet printers can work out even more expensive to run.

Laser printers
Laser printers produce high print quality at high speed. They are called "laser printers" due to the fact that they contain a small laser within them. There is a wide range of laser printer manufacturers and one buzzword to be aware of is Postscript, a type of printer that is designed to give very high quality reproduction of pictures.

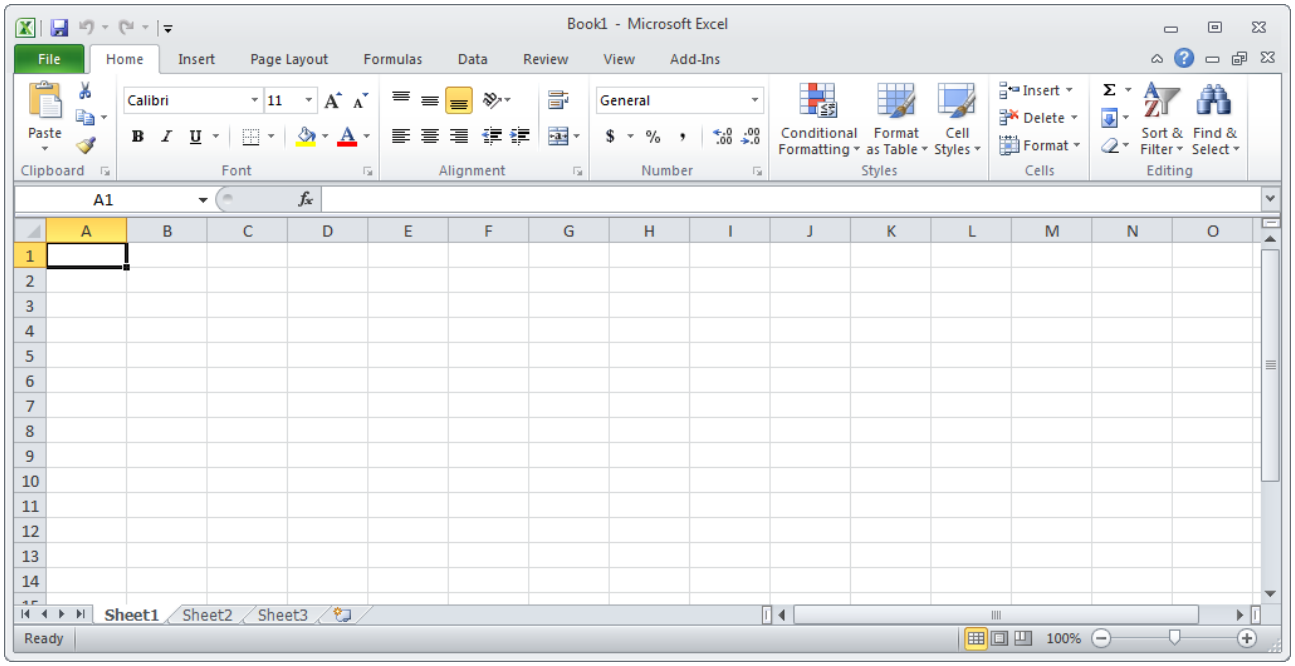
Colour laser printers
Originally, most laser printers would only print in black and white (mono). More recently colour laser printers have dropped in price and are entering wide spread use. While many of these produce excellent results, you should be aware of the fact that the "price per page", especially if you are using a lot of colour on a page can be very high compared to the cost of printing in black and white.

Inkjet printers
Inkjet printers work by using tiny jets to spray ink onto the paper. Inkjet printers are very quiet in operation and produce print quality comparable to that of laser printers, though laser printers still have the edge in terms of speed. Inkjet printers are ideal for low volume printing where high quality print is required and speed is not a high priority, e.g. printing letters in a small office or in the home.

Using Excel 2010

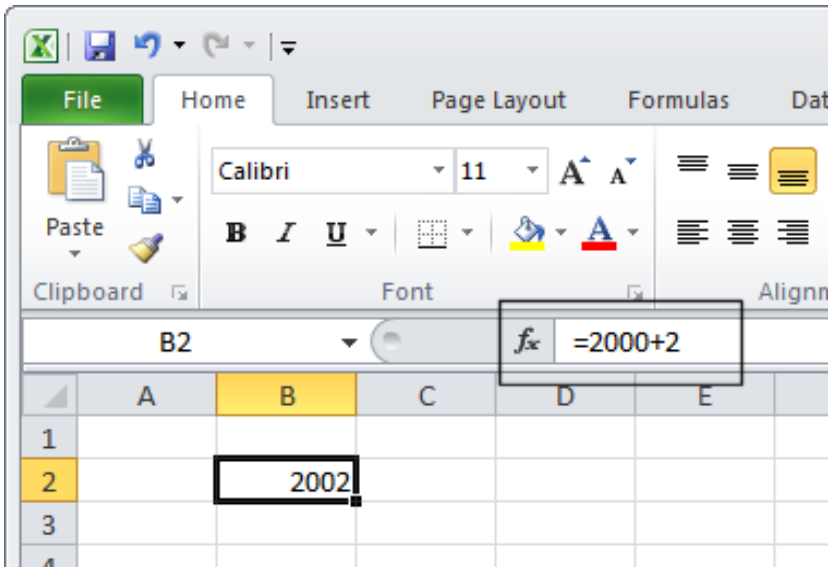
Starting the Excel program Excel 2010

Click on the Start button (bottom-left of the screen). Click on All Programs. Click on Microsoft Office. Click on Microsoft Excel 2010. The Excel window will be displayed, as illustrated.



What is the Active Cell?

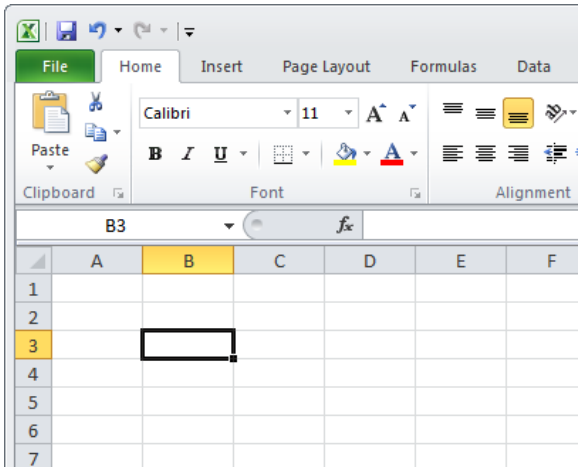
Excel identifies the active cell with a bold outline around the cell and highlighting the column heading letter and row heading number of the cell. In the following example, B2 is the active cell:



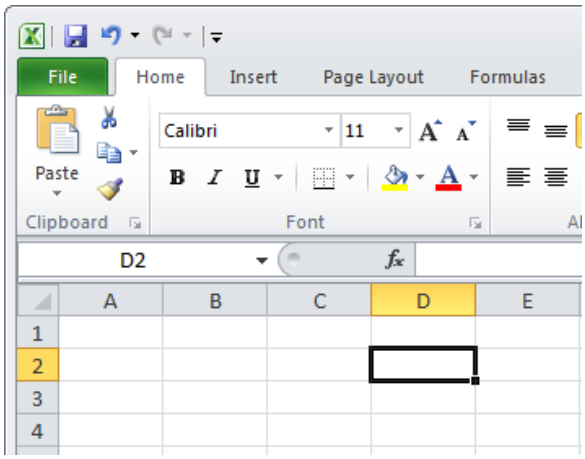
In the above illustration, notice that B2 is displayed in the Name Box and the contents of the cell is displayed in the Formula Bar. In this case, 2002 is a calculated value, 2000+2.
In order for you to enter data into a cell, it needs to be the active cell. The active cell will accept keyboard entries. You can make a cell active by clicking on it or navigating to it.

The Excel cell referencing system

An Excel worksheet is made up of individual cells, each of which has a unique reference. Look at the illustration below. We have clicked on cell B3, which means that the cell is in column B, row 3.



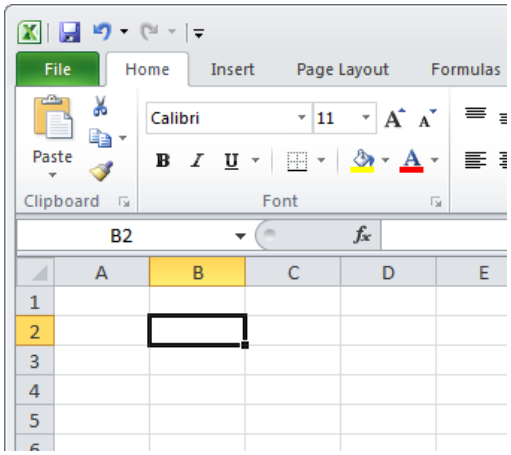
In the illustration below, we have clicked on cell D2.



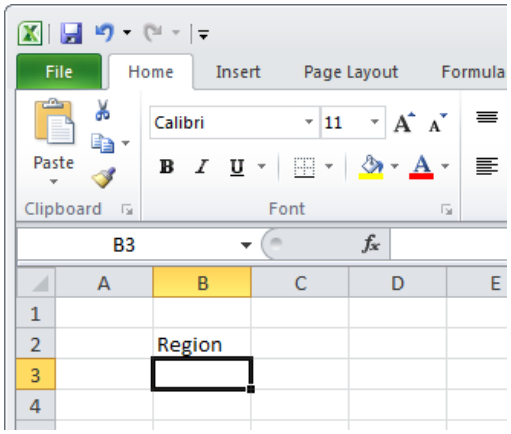
If you look carefully you will see that the current cell reference is displayed just above the actual worksheet.

Entering numbers and text

Click on cell B2, as illustrated.

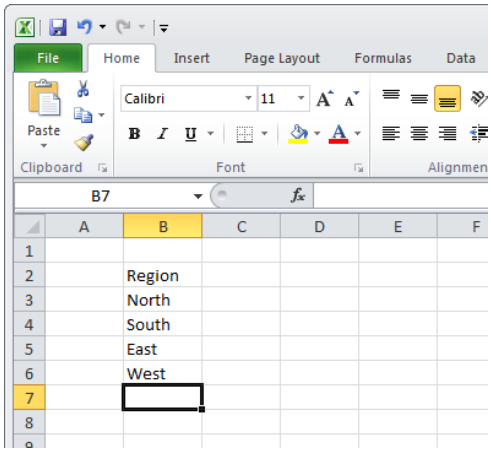


Type in the word 'Region'. Press the Enter key. When you press the Enter key you will automatically drop down to the next cell within the worksheet. Your screen will now look like this.



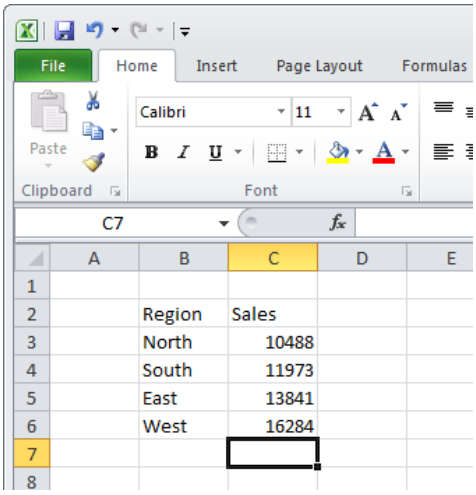
The active cell is now B3. Type in the word 'North'. Press the Enter key.
The active cell is now B4. Type in the word 'South'. Press the Enter key.
The active cell is now B5. Type in the word 'East'. Press the Enter key.
The active cell is now B6. Type in the word 'West'. Press the Enter key.

Your screen will now look like this:



Click on cell C2. Type in the word 'Sales'. Press the Enter key.
Type in the number 10488 and press the Enter key.
Type in the number 11973 and press the Enter key.
Type in the number 13841 and press the Enter key.
Type in the number 16284 and press the Enter key.

Your screen will now look like this:

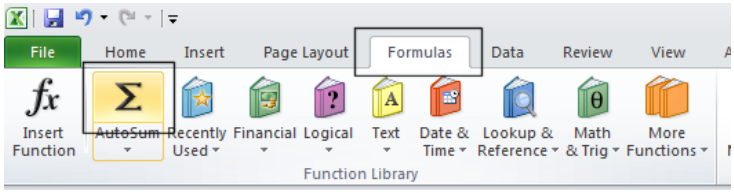


Default text and number alignment

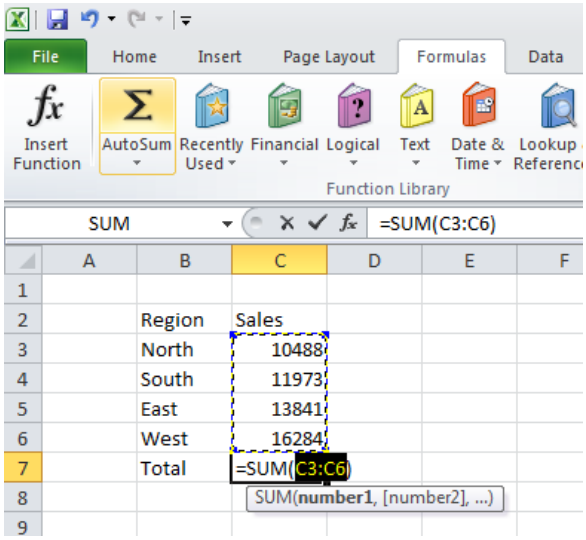
If you look carefully at what you have typed in you will see that by default text is aligned within a cell to the left, while numbers are aligned within the cell to the right. This makes sense, as normally text starts from the left of a page and it is the same within a cell. Numbers on the other hand normally align to the right. Think how you would write down a column of numbers on a page that you want to add up. Numbers align to the right.

Summing a column of numbers

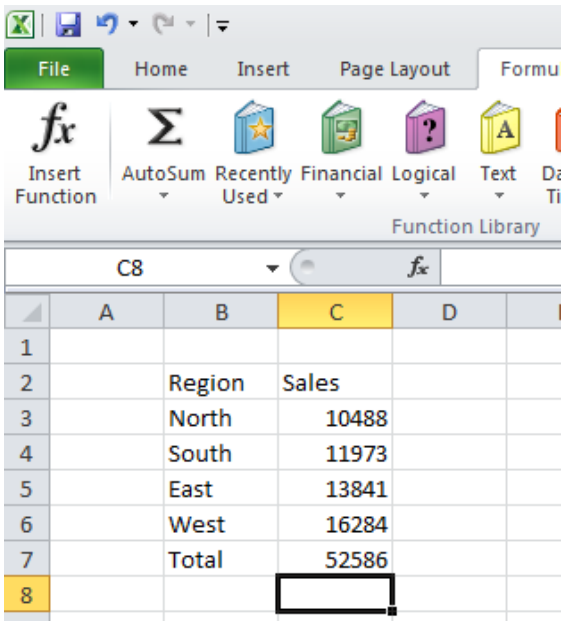
Click on cell B7 and type in the word 'Total'. Click on cell C7. Click on the Formulas tab, and then click on the AutoSum button.



Your screen will look like this:



Press the Enter key and Excel will automatically add up the column of numbers, as illustrated.



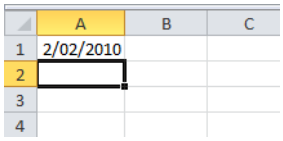
We have hardly started to use Excel but already you have seen how powerful and easy to use it is. We will see more of the Excel functions for performing calculations later.

The best thing about Excel is that if you make changes to the numbers then totals and other calculations are automatically updated. Click on cell C4 and type in a different number. When you press the Enter key you will see that the total value displayed in cell C7 changes to recalculate the total value of the sales.

Entering a date

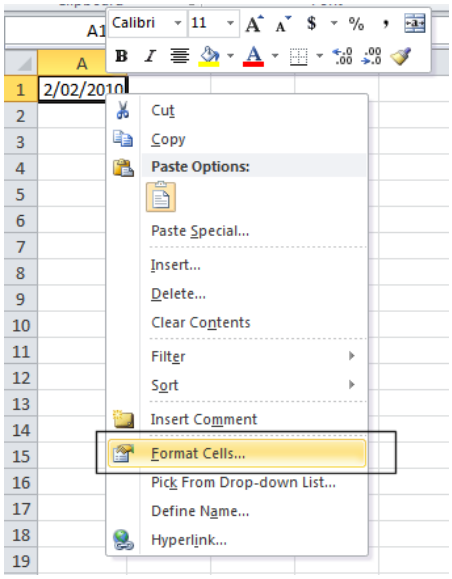
Click on cell A1. Enter the following information and then press the Enter key.

"2/2/2010"



Excel recognises this as a date and automatically marks the cell as containing date information.

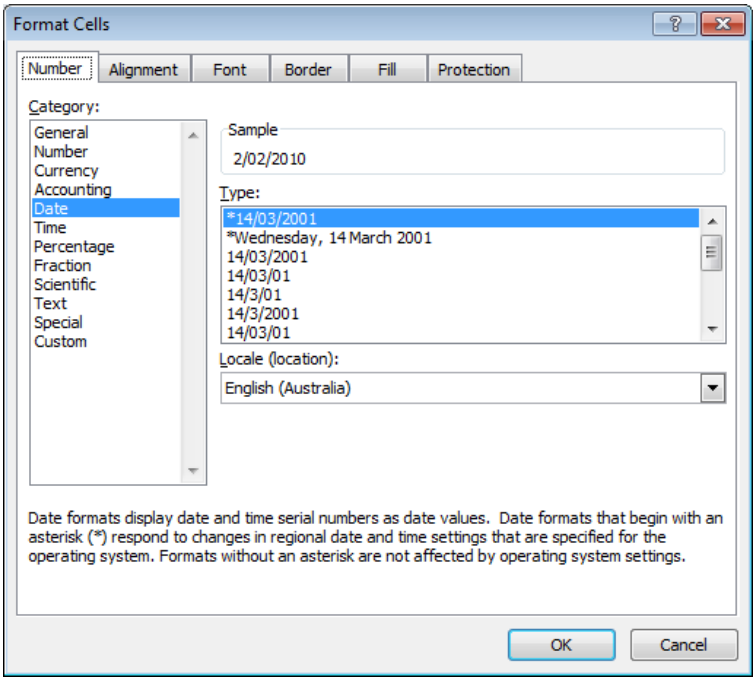
Right click over the date you have just entered. From the popup menu displayed, select the Format Cells command, as illustrated.



Excel recognises this as a date and automatically marks the cell as containing date information.

Right click over the date you have just entered. From the popup menu displayed, select the Format Cells command, as illustrated.

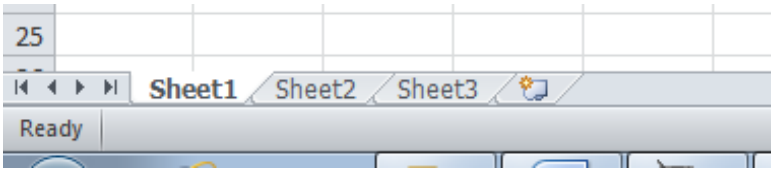
This will display the Format Cells dialog box.



If you have time you can select a different type of date format, using the Type section of the dialog box. Click on the OK button to apply any changes you make.

Worksheets and Workbooks

Look at the bottom-left of your screen and you will see the worksheet tabs displayed.

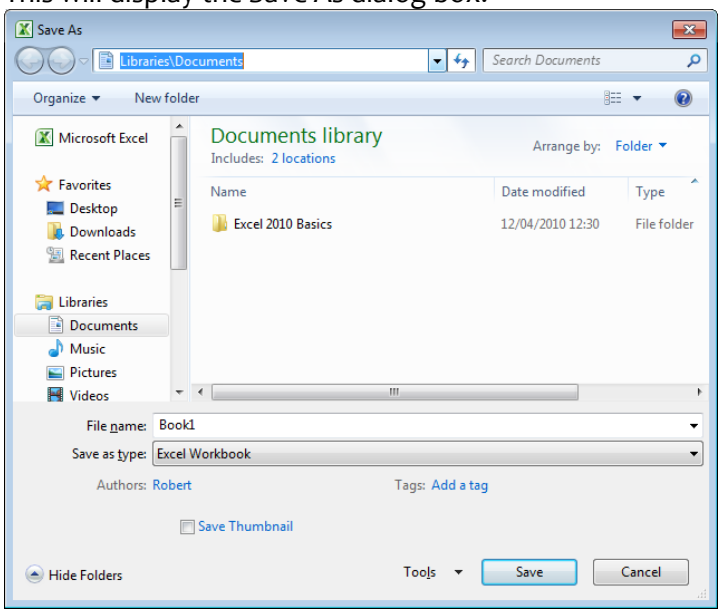


By default each workbook contains three worksheets. This is similar to a **Note**book that contains separate pages. Click on the Sheet 2 worksheet tab and the second worksheet is displayed. Click on the Sheet 3 worksheet tab and the third worksheet is displayed. Click on the Sheet 1 worksheet tab and the first worksheet, containing your data is displayed again. As we will see later you can add or remove worksheets as well as reordering and renaming them.

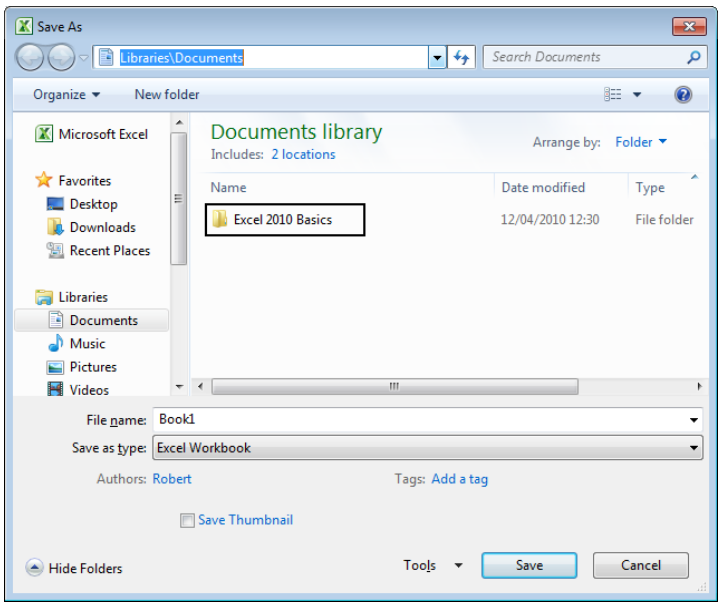
Saving a workbook

To save the workbook click on the Save icon (top-left part of your screen).

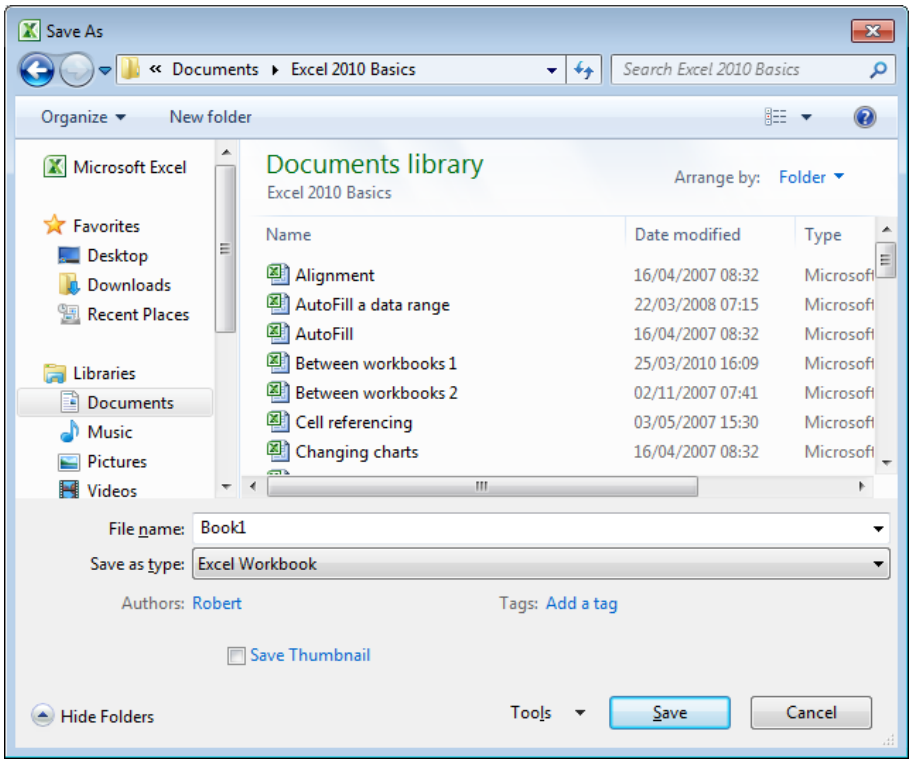
This will display the Save As dialog box.



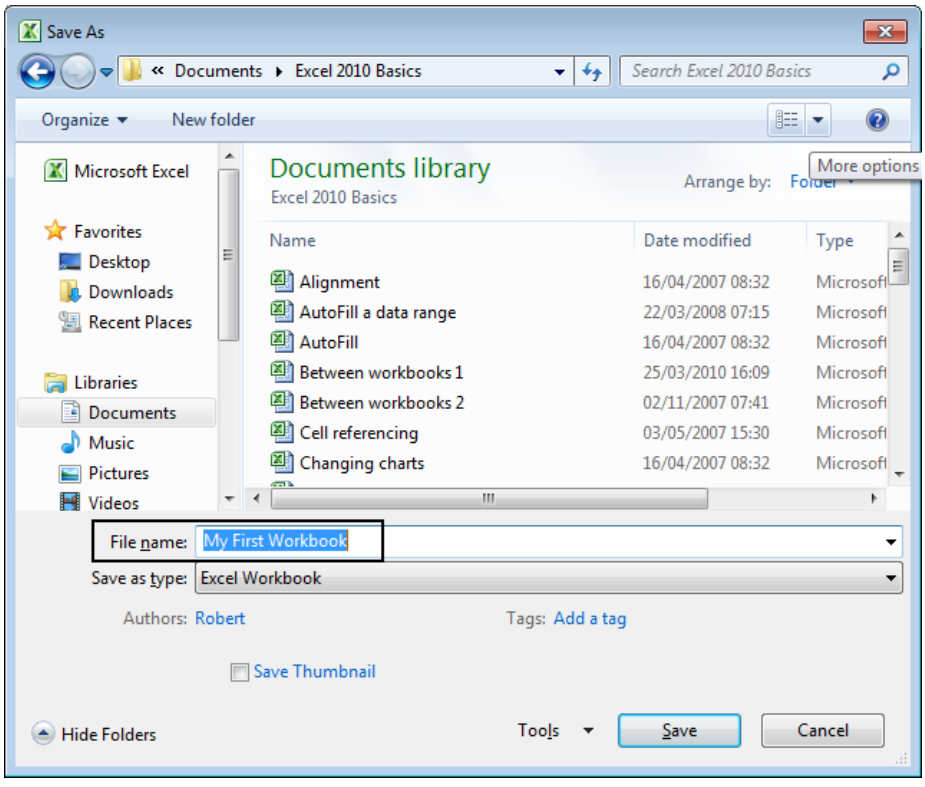
Navigate to the folder containing your sample files. To do this, double click on the Excel 2010 Basics folder.



You will see the sample files listed within the Excel 2010 Basics folder.



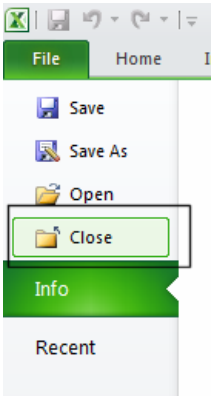
Click within the File name section of the dialog box to name the file. In this case use the file name My First Workbook.



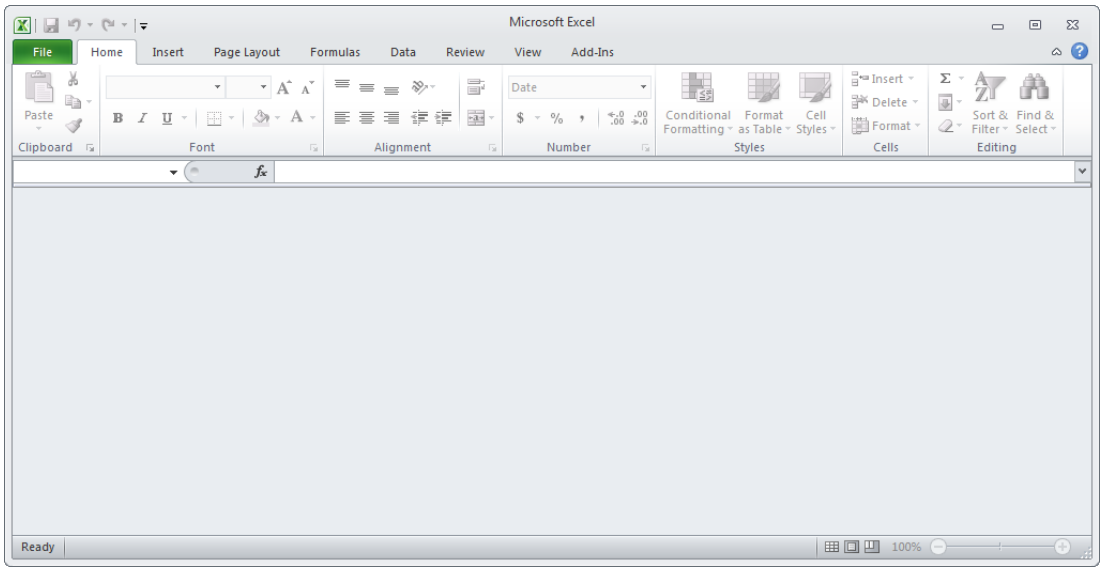
Click on the Save button to save the file to disk.

Closing a workbook and exiting the Excel program

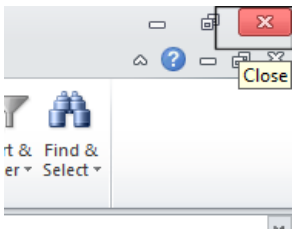
To close the workbook, click on the File Tab (top-left of your screen), from the drop down options displayed, click on the Close command.



The screen will now look like the illustration below. The Excel program is open but no workbook is displayed within the program.



To close the Excel program, click on the Close icon. This icon is the small cross displayed at the top right of the Excel screen.



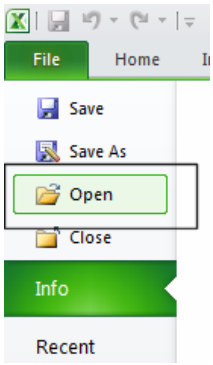
Creating a new workbook

Start the Excel program. Each time you start the Excel program, by default, it displays a new blank workbook containing three blank worksheets. Type in your First Name in to cell A1 and press the Enter key.
To create a new workbook, press Ctrl+N. This is the keyboard shortcut for creating a new file. A new workbook will be created containing three worksheets. Type in your Second Name in to cell A1.
Close both workbooks without saving your changes.

Opening a workbook

Press Ctrl+O which is the keyboard shortcut to open an existing file.

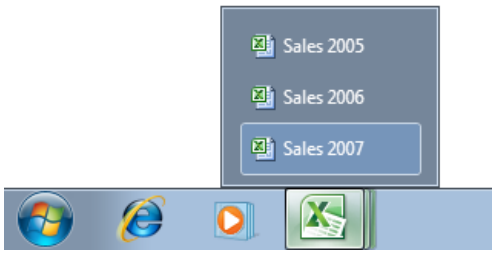
Or click on the File Tab (top-left) and then click on the Open command.



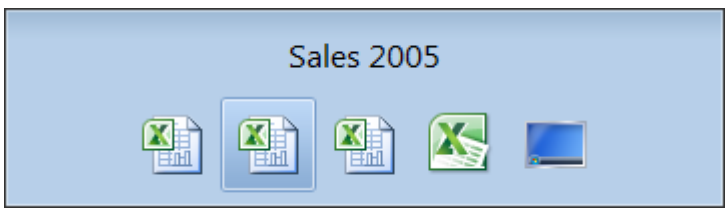
This will display the Open dialog box. Navigate to the folder called Excel 2010 Basics, (under the Documents folder), containing your sample files.
Select a file called Sales 2005, and then click on the Open button to open the workbook.
Open the workbook called Sales 2006 and also a workbook called Sales 2007. You now have three open workbooks.

Switching between workbooks

To switch to a particular Excel workbook, click on the Excel workbook icon displayed within the Windows Taskbar (across the bottom of the screen). From the popup list displayed select the required wordbook.

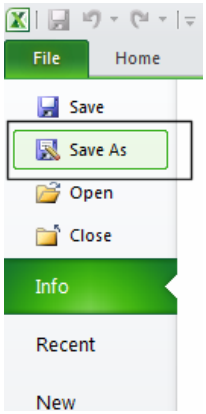


TIP: You can use the Alt+Tab keyboard shortcut to switch between open programs.

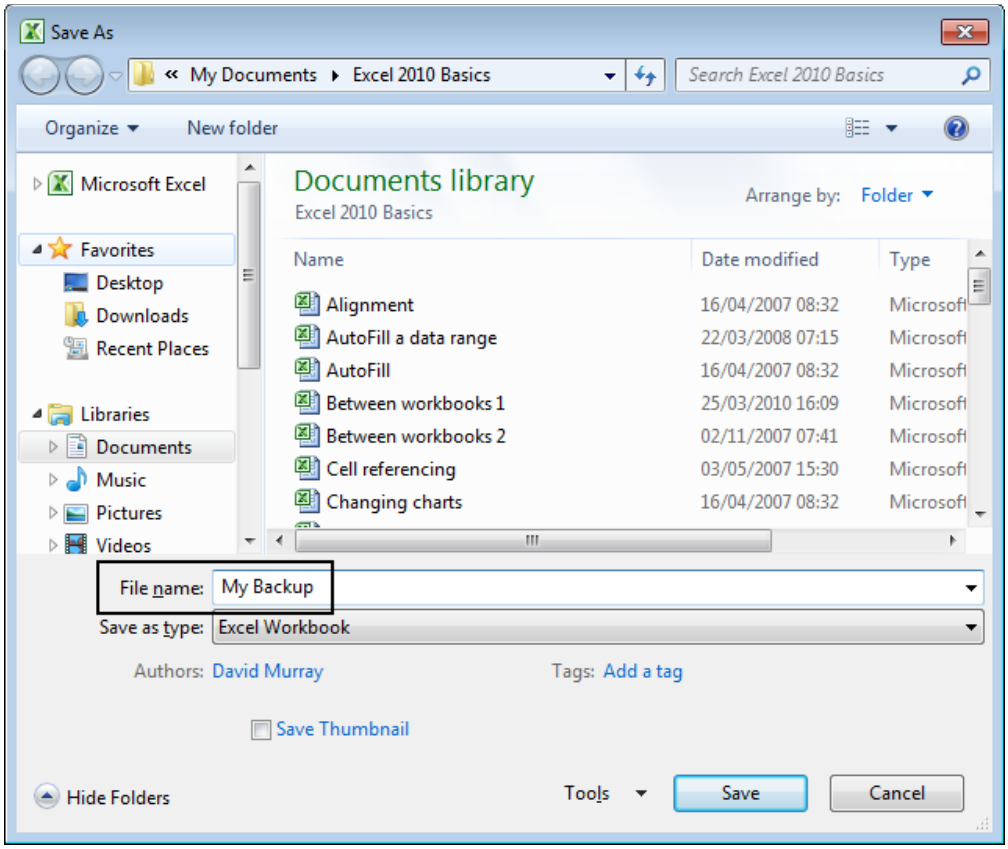


Saving a workbook using another name

Open the workbook called Sales 2005. Click on the File Tab and then select the Save As command.



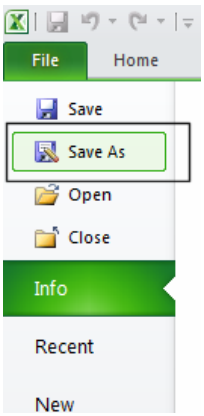
The Save As dialog box will be displayed.



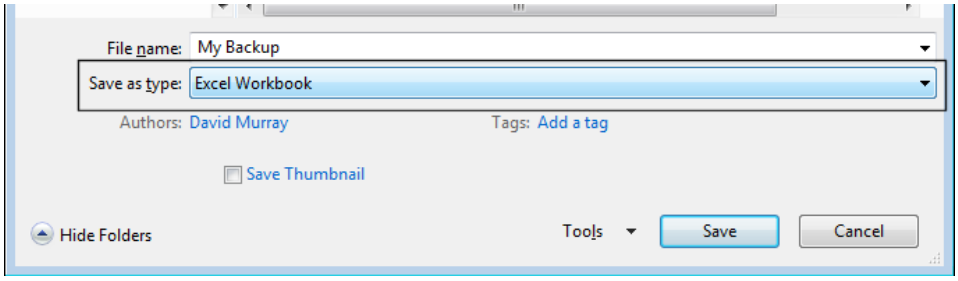
In the File name section enter a new file name, in this case called My Backup. Click on the Save button. You now have two copies of the same file, both containing the same information. This can be useful for making backups of your data or for retaining copies of a workbook with different versions of the data in each file.

Saving a workbook using a different file type

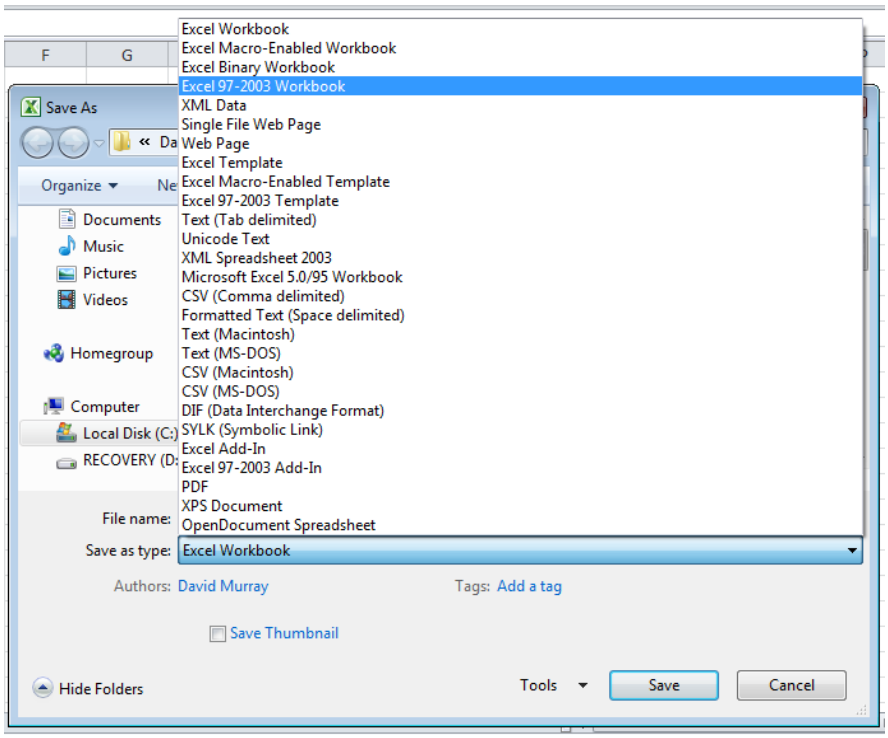
Click on the File Tab and then select the Save As command.



The Save As dialog is displayed. Click on the down arrow within the Save as type section of the dialog box.



You can select the required file type from the drop down displayed.

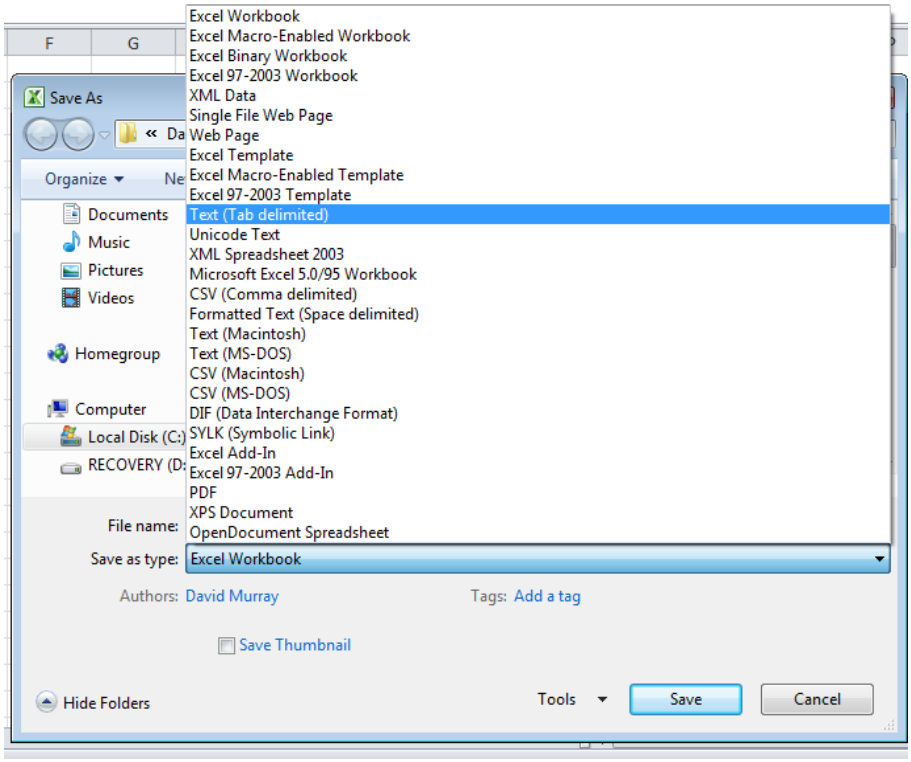


TIP: If you want to email a copy of an Excel 2010 workbook to someone that has an earlier version of Excel, such as Excel 2003, then you may need to save the file in the Excel 97-2003 Workbook file format.

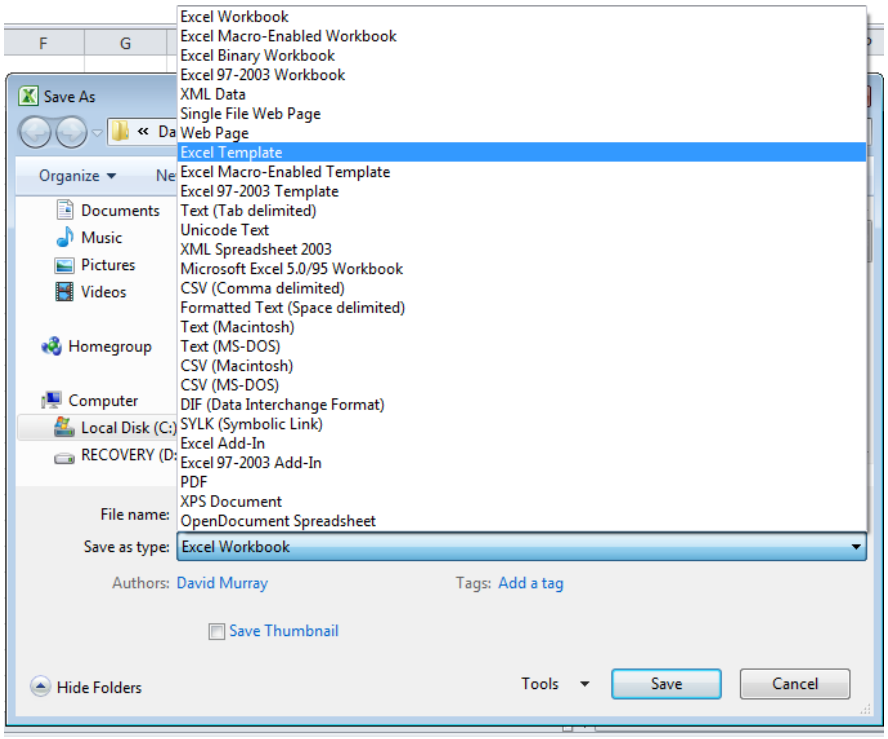
Alternatively, people with earlier versions of Excel can download additional free software from Microsoft allowing them to open and view (but not necessary edit), files created using Excel 2010.

Other commonly used file type options include:

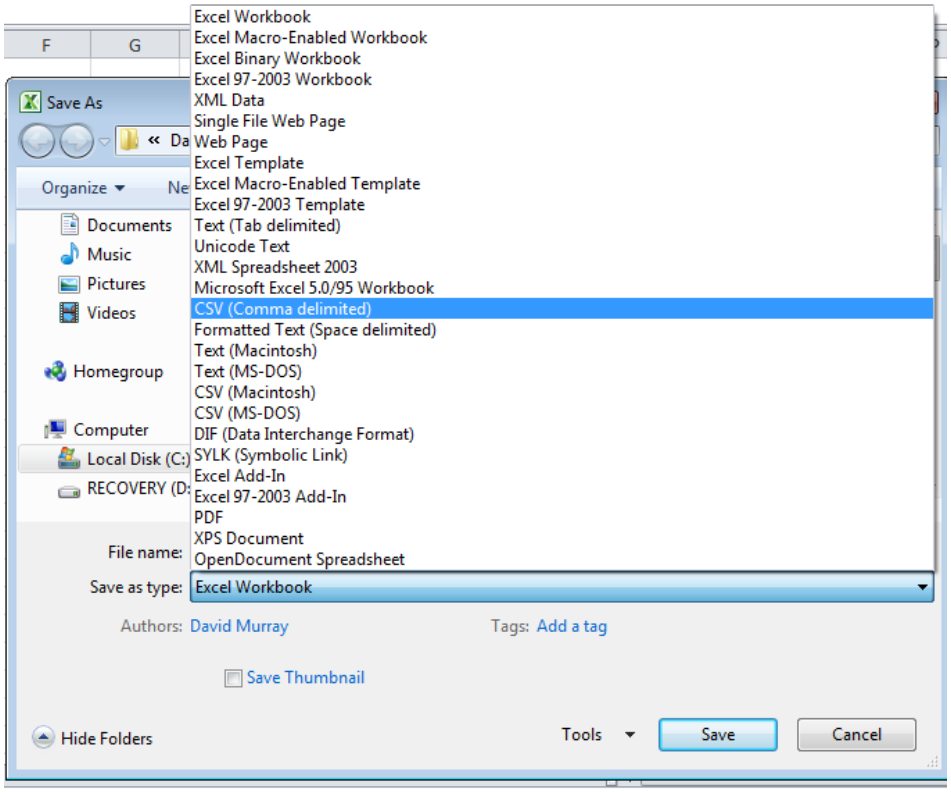
Text file:
Saving your worksheet as a plain text file will remove all the formatting you have added to your worksheet (such as bold, italics & underlining). It will also remove any pictures or other features such as tables. Only plain text will be saved. Be very careful about using this option.



Template:
You normally save a workbook as a workbook file. You can however save a workbook as a template. This means that you can create new workbooks in the future; based on the templates you create.



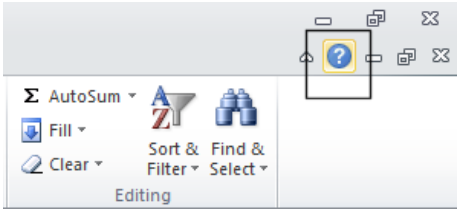
CSV file:
This saves table data in a form that can be used by other programs. It is short for Comma Separated Value.



Close any open dialog boxes and close all open worksheets.

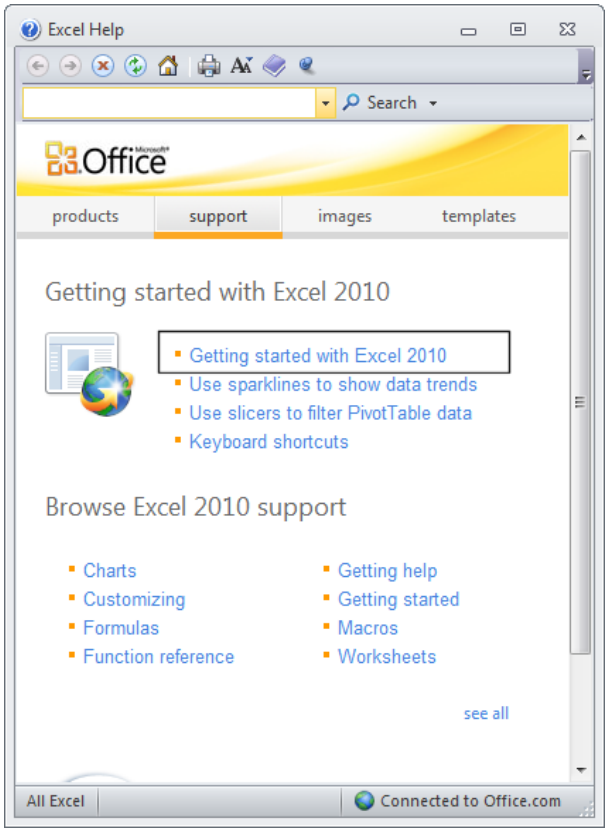
Getting help within Excel 2010

Click on the Microsoft Excel Help icon (towards the top-right of the screen).

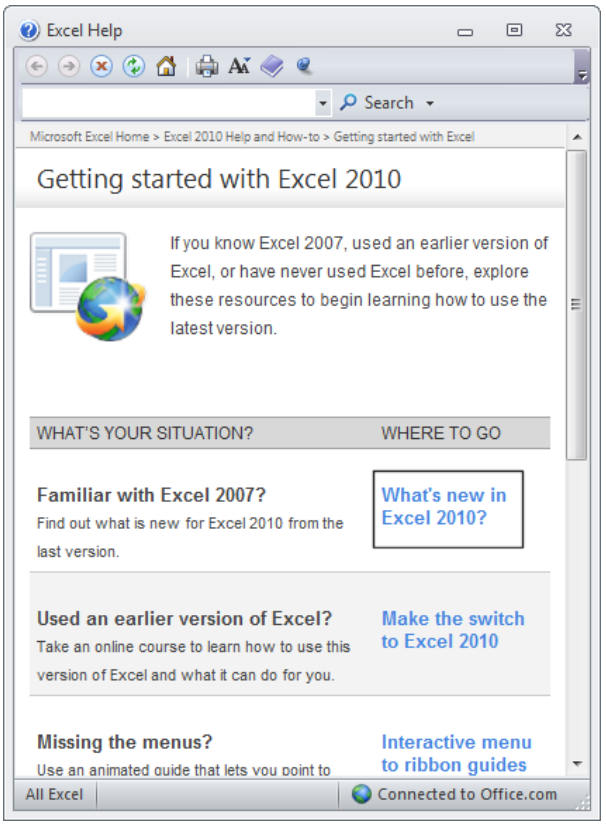


TIP: Or press the F1 help key.

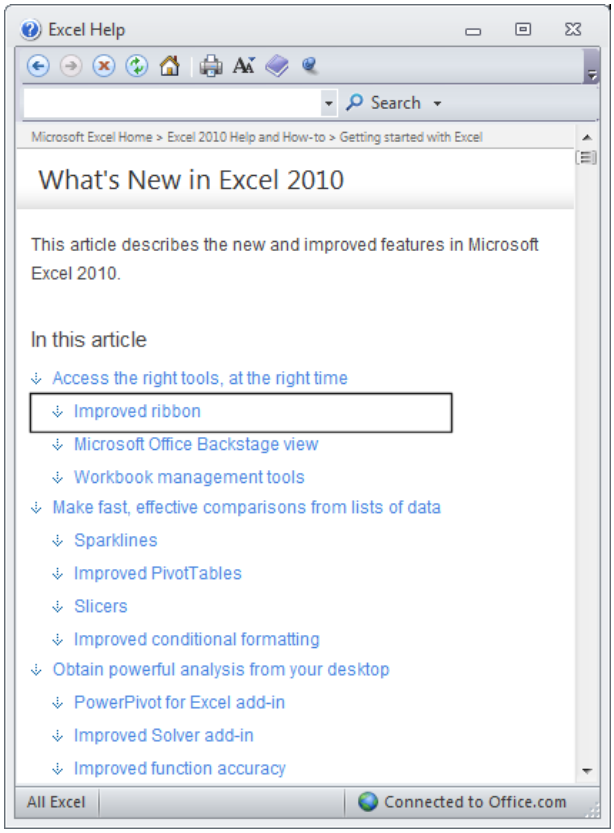
The Excel Help window is displayed.



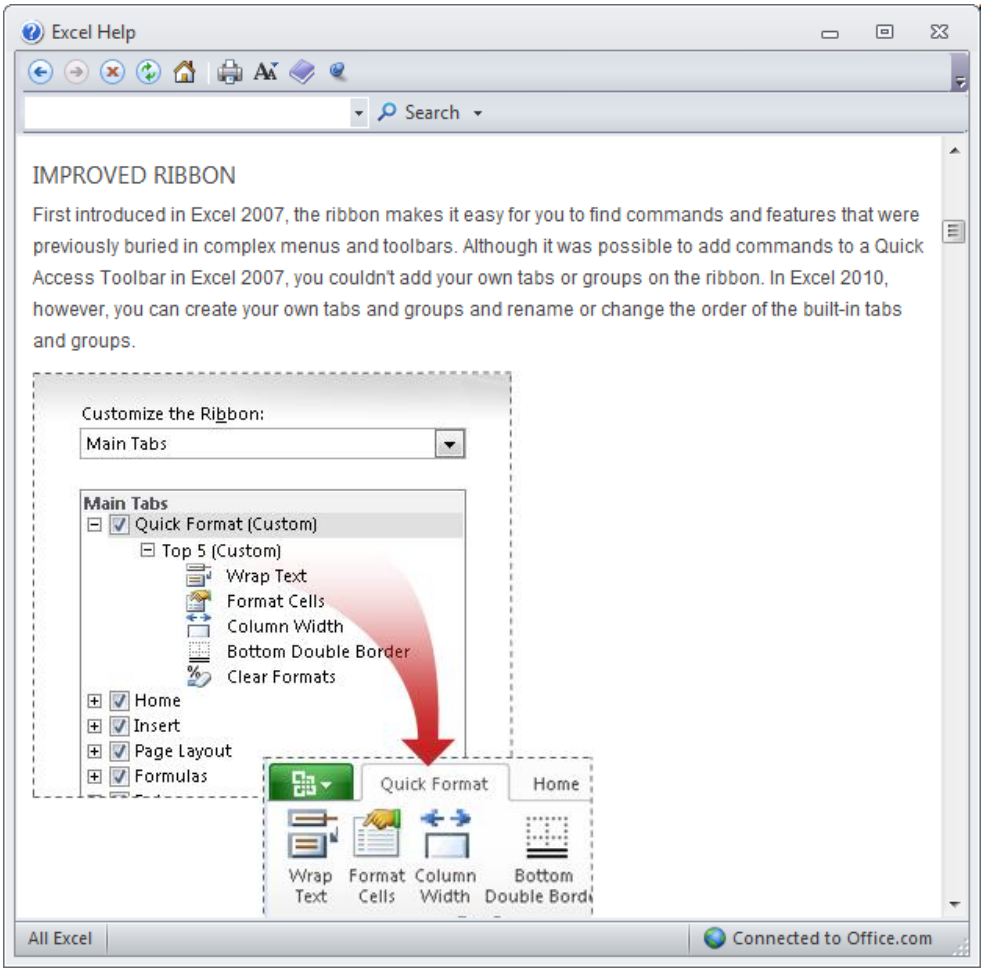
As you can see a wide range of help topics are displayed. Click on the Getting Started with Excel 2010 link. This will display the following information.



Click on the What's new in Excel 2010? link. You will see the following.



Click on the Improved Ribbon link. You will see the following.

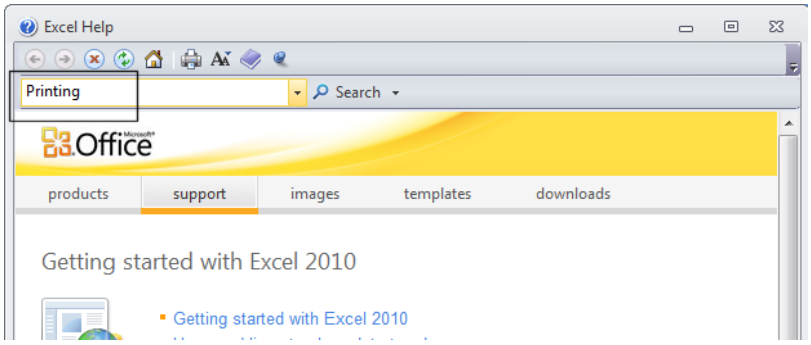


TIP: Click on the Maximise button within the top-right part of the dialog box. This will make the dialog box fill the screen and the information within it will be easier to read.

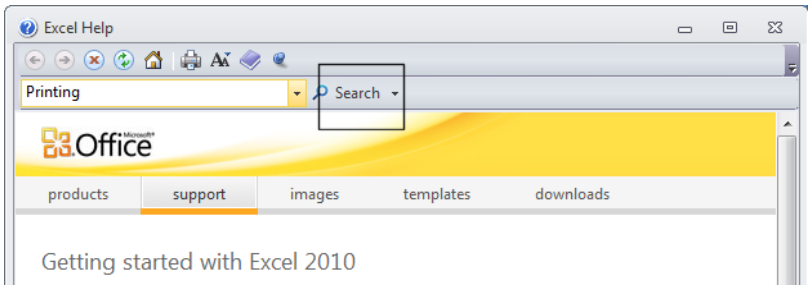
Spend a little time browsing what's new within this version of Excel.
When you have finished experimenting, close the Excel Help window.

Searching for Help

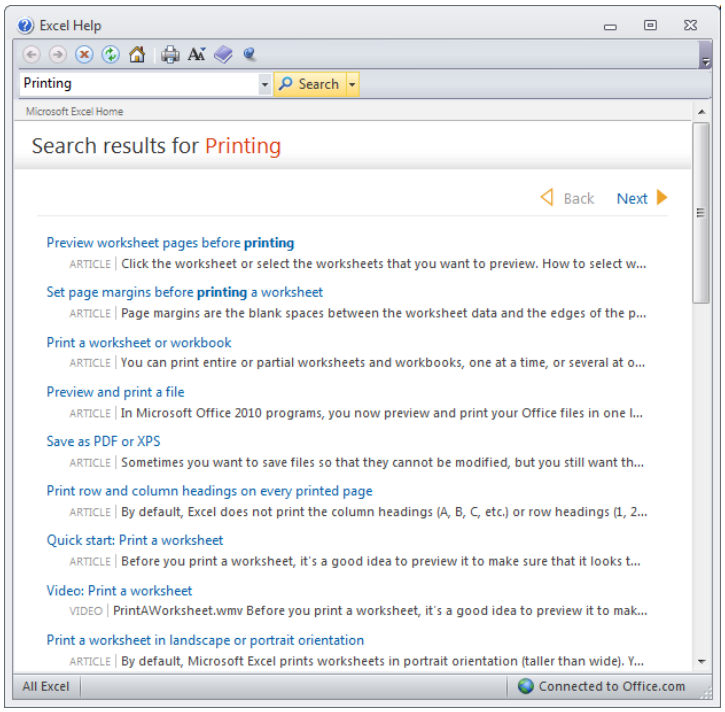
You can search for help on a topic of particular interest. Press F1 to display the Excel Help window. Within the text box near the top of the Excel Help window, type in a word or words relating to the help you need. For instance, to display help about printing, type in the word 'printing'.



Click on the Search button next to the text input box.



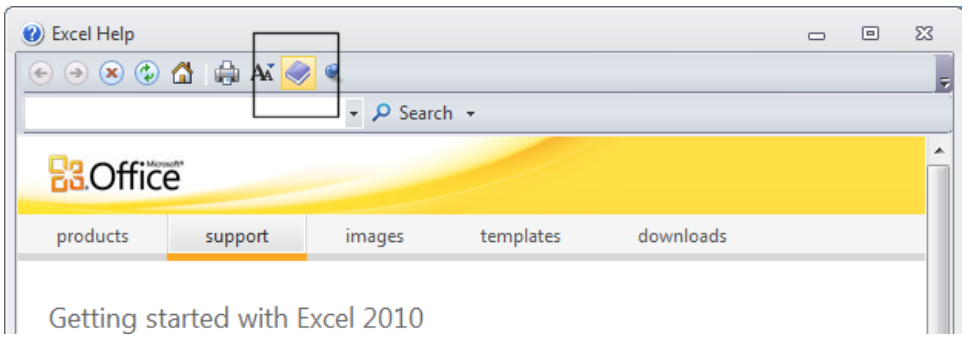
You will see a range of topics related to printing. Clicking on any of these topics will display more information about printing.



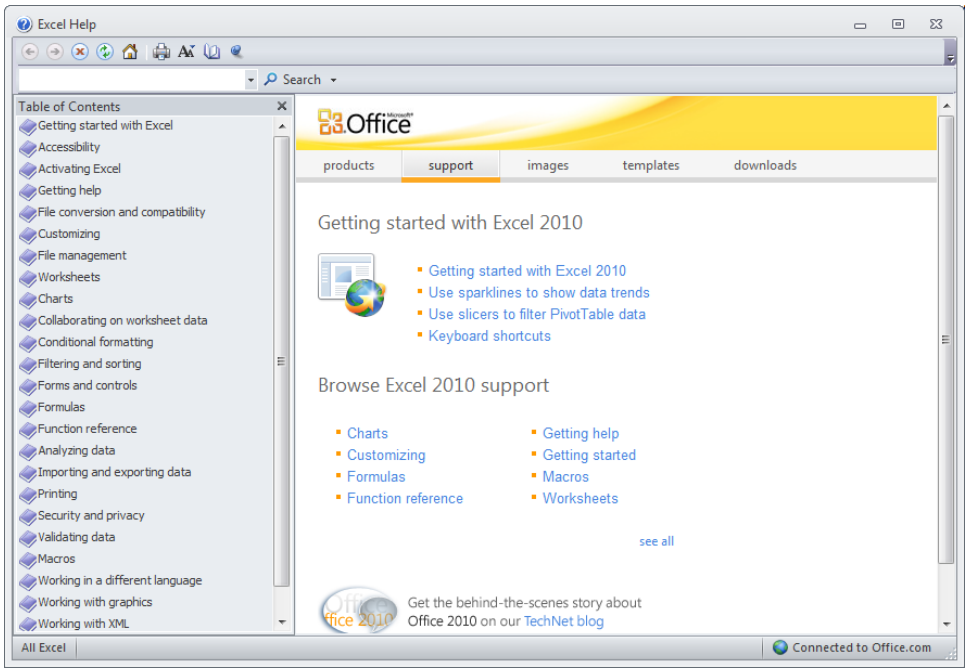
Close the Excel Help window when you have finished experimenting.

The Help 'Table of Contents'

Press F1 to display the Excel Help window. Click on the Table of Contents icon (the book icon displayed within the Excel Help window toolbar).



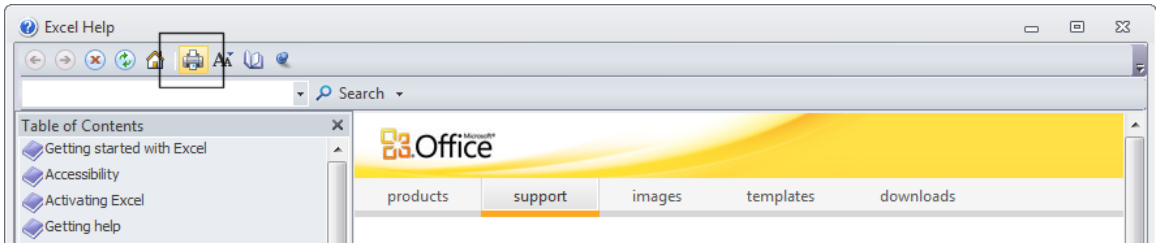
You will now see a Table of Contents displayed down the left side of the Excel Help window.



Take a little time learning to navigate through this table of contents.

Printing a Help topic

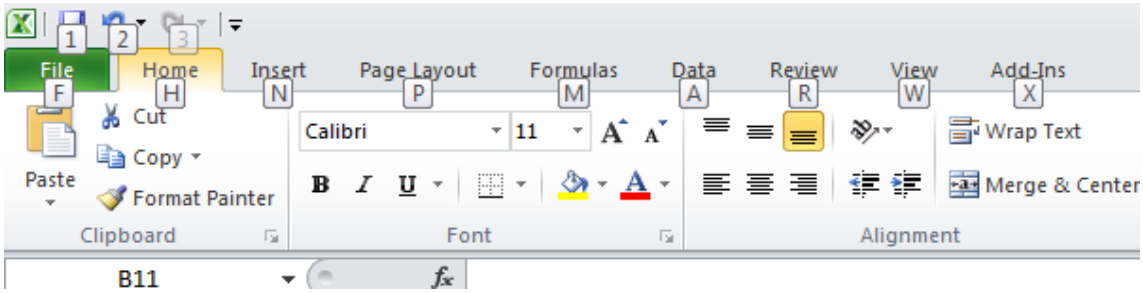
Display an item of interest within the Excel Help window. Click on the Print icon displayed within the Excel Help toolbar.



Close all open dialog boxes before continuing.

Alt key help

Press CTRL+N to open a new blank workbook
Click on the Home tab.
Press the Alt key and you will see numbers and letters displayed over icons, tabs or commands, towards the top of your screen.



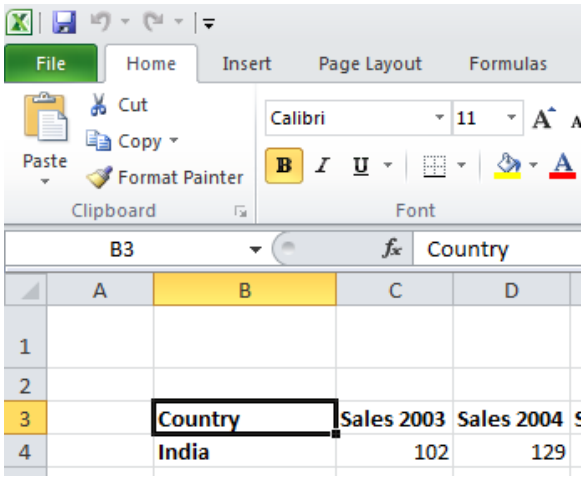
If you type in a number or letter you will activate a command. For instance in the example shown, the number 1 is displayed over the **Save** icon. Type in 1 and you will see the **Save As dialog** box displayed. Close this dialog box.
Press the **Alt key** again and you will see an **N** displayed over the **Insert** tab. Press **N** and you will see the contents of the **Insert** tab displayed.
This is a very easy way of learning keyboard shortcuts. You now know that **Alt+1** will display the **Save As** dialog box and that **Alt+N** will display the **Insert** Tab.
Click on the **Home** tab before continuing.

Selection techniques

Why are selection techniques important?
Often when you want to do something within Excel you need to select an item first. This could involve selecting a cell or multiple cells. It may need you to select a row, a column or even the entire table.

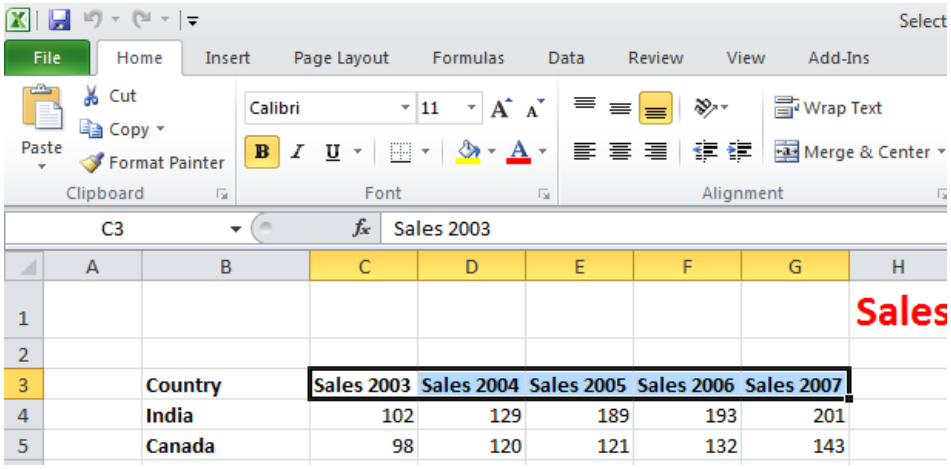
Selecting a cell

Open a workbook called Selection techniques. To select a cell simply click on that cell. Thus to select cell B3, click on cell B3.



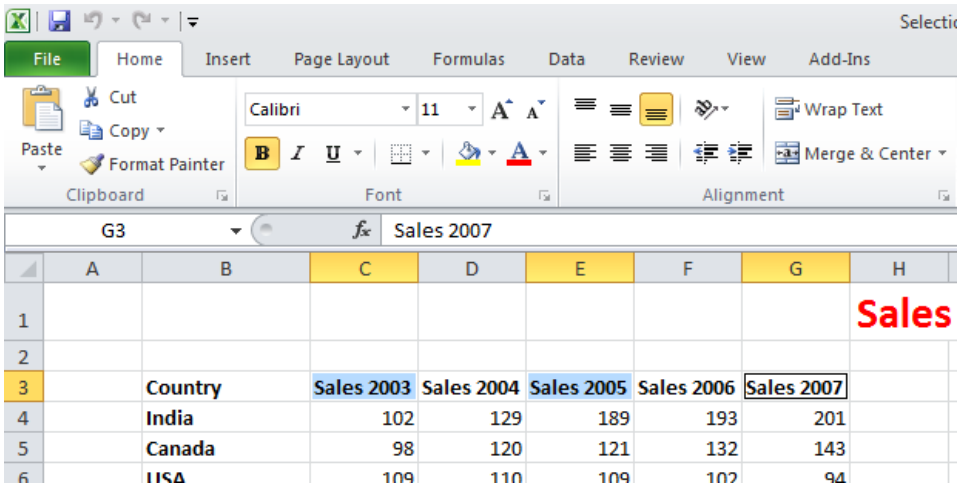
Selecting a range of connecting cells

We want to select the cells from **C3** to **G3**. To do this click on the first cell within the range, i.e. **C3**. Then press down the Shift key (and keep it held down). Click on cell **G3**. When you release the **Shift** key the cell range will remain selected, as illustrated.



Selecting a range of non-connecting cells

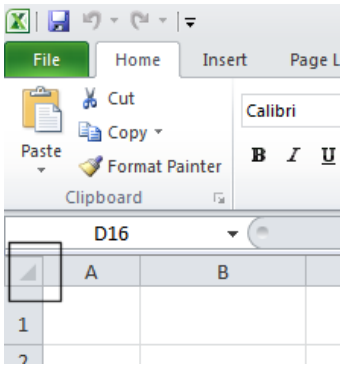
Sometimes we need to select multiple cells that are not next to each other, as in the example below, where **C3**, **E3** and **G3** have been selected.



To do this click on the first cell, i.e. **C3**. Then while keeping the **Ctrl** key pressed click on the cells **E3** and **G3**. When you release the **Ctrl** key the cells will remain selected.

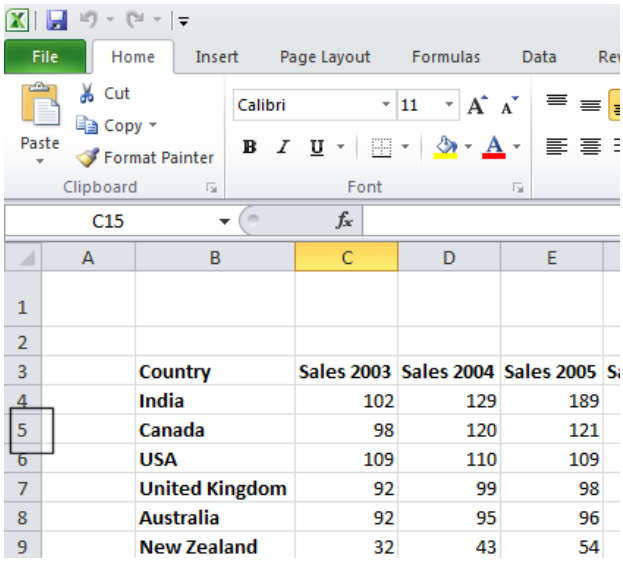
Selecting the entire worksheet

To select the entire worksheet, click on the intersection between the column and row referencing numbers.



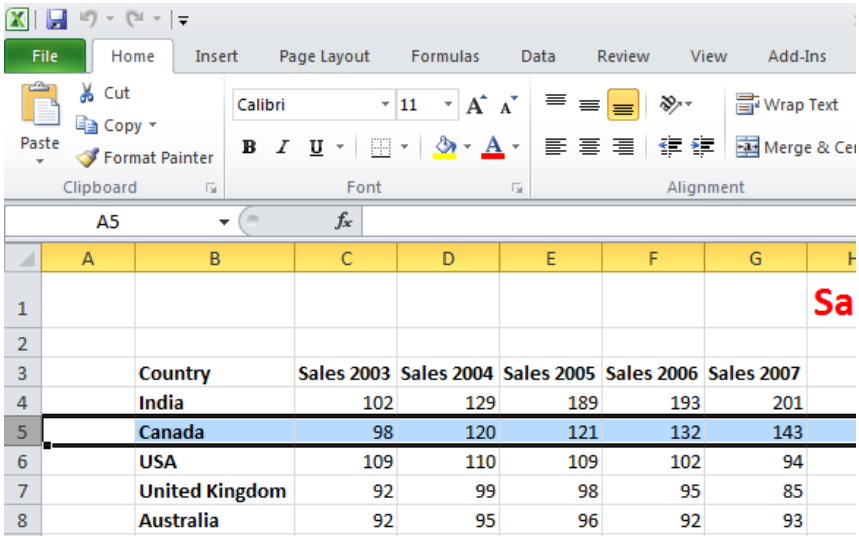
Selecting a row

To select a row, say the row relating to **Canada**, click on the relevant row number displayed down the left side of the worksheet.



	A	B	C	D	E
1					
2					
3		**Country**	**Sales 2003**	**Sales 2004**	**Sales 2005**
4		**India**	102	129	189
5		**Canada**	98	120	121
6		**USA**	109	110	109
7		**United Kingdom**	92	99	98
8		**Australia**	92	95	96
9		**New Zealand**	32	43	54

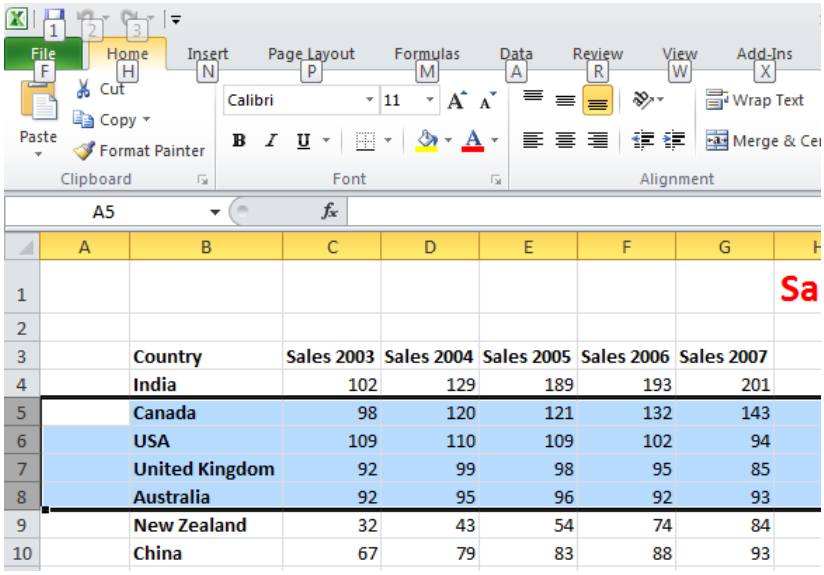
The selected row will look like this.



	A	B	C	D	E	F	G
1							
2							
3		**Country**	**Sales 2003**	**Sales 2004**	**Sales 2005**	**Sales 2006**	**Sales 2007**
4		**India**	102	129	189	193	201
5		**Canada**	98	120	121	132	143
6		**USA**	109	110	109	102	94
7		**United Kingdom**	92	99	98	95	85
8		**Australia**	92	95	96	92	93

Selecting a range of connecting rows

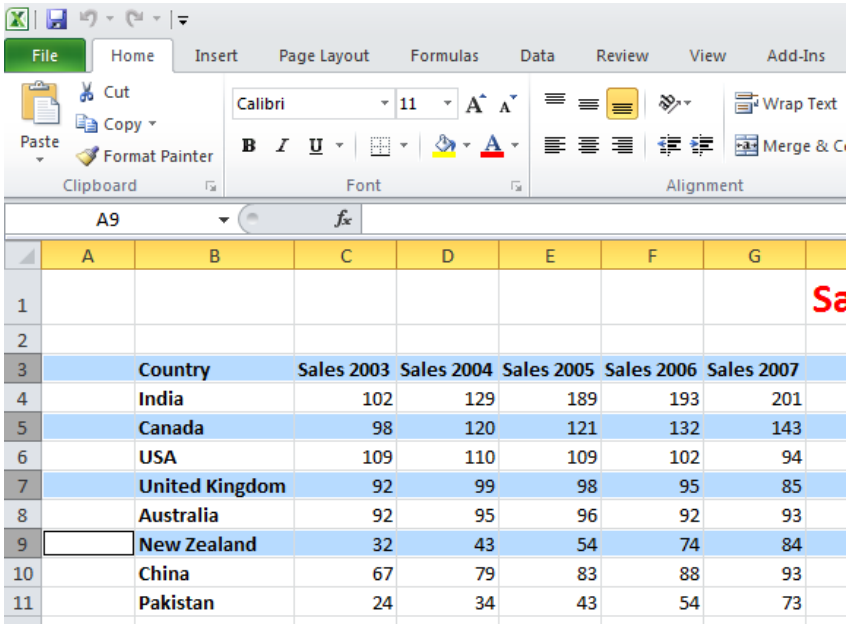
To select the rows relating to Canada, USA, UK and Australia. First click on the row number next to **Canada** (i.e. 5). Press down the **Shift** key and keep it pressed. Click on the row number relating to **Australia** (i.e. 8). When you release the **Shift** key the multiple rows remain selected.



	A	B	C	D	E	F	G
1							
2							
3		**Country**	**Sales 2003**	**Sales 2004**	**Sales 2005**	**Sales 2006**	**Sales 2007**
4		**India**	102	129	189	193	201
5		**Canada**	98	120	121	132	143
6		**USA**	109	110	109	102	94
7		**United Kingdom**	92	99	98	95	85
8		**Australia**	92	95	96	92	93
9		**New Zealand**	32	43	54	74	84
10		**China**	67	79	83	88	93

Selecting a range of non-connected rows

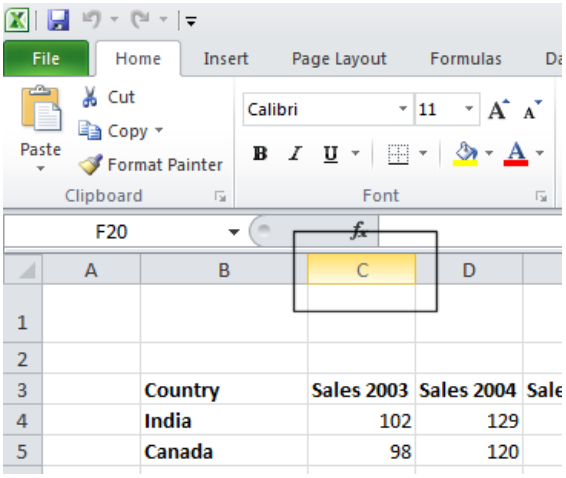
Click on the row number 3 and press down the Ctrl key. Click on row number 5, then row number 7 and finally number 9. Release the Ctrl key and the rows will remain selected.



	A	B	C	D	E	F	G
1							
2							
3		Country	Sales 2003	Sales 2004	Sales 2005	Sales 2006	Sales 2007
4		India	102	129	189	193	201
5		Canada	98	120	121	132	143
6		USA	109	110	109	102	94
7		United Kingdom	92	99	98	95	85
8		Australia	92	95	96	92	93
9		New Zealand	32	43	54	74	84
10		China	67	79	83	88	93
11		Pakistan	24	34	43	54	73

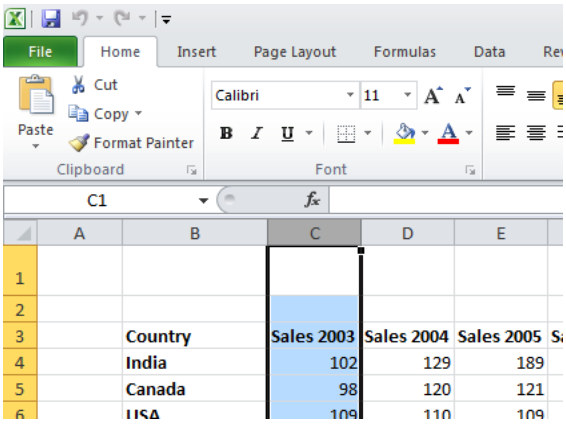
Selecting a column

To select the column containing data relating to 2003, click on the column header C, as illustrated.



	A	B	C	D
1				
2				
3		Country	Sales 2003	Sales 2004
4		India	102	129
5		Canada	98	120

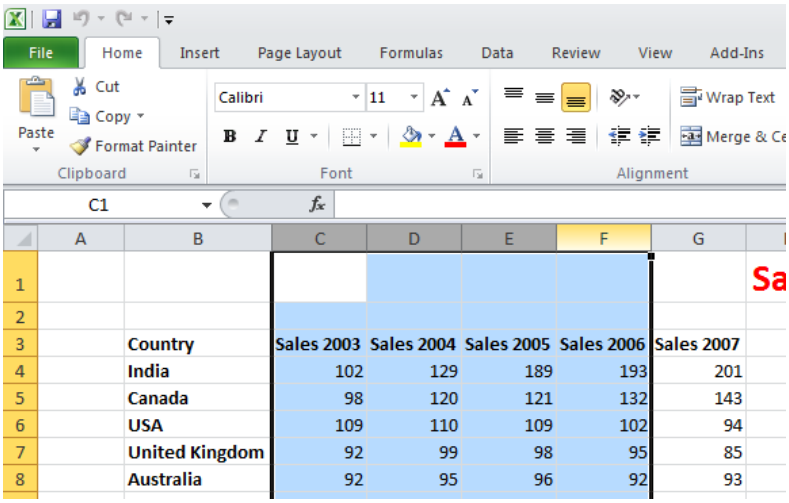
The selected column will look like this.



	A	B	C	D	E
1					
2					
3		Country	Sales 2003	Sales 2004	Sales 2005
4		India	102	129	189
5		Canada	98	120	121
6		USA	109	110	109

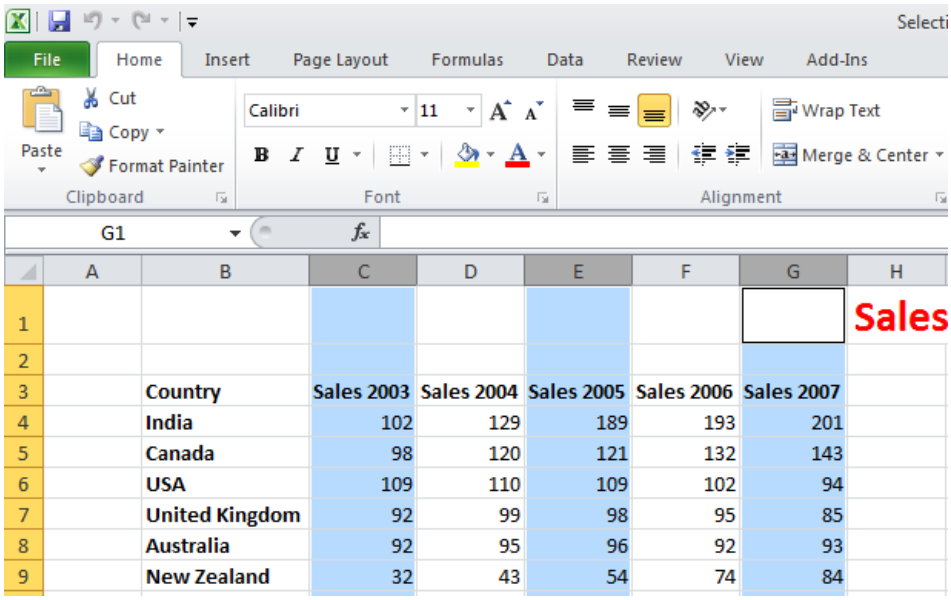
Selecting a range of connecting columns

To select the columns relating to the sales figures for 2003-2006, first select column C. Press the Shift key and while keeping it pressed select column F. When you release the Shift key the columns will remain selected.



Selecting a range of non-connecting columns

To select the columns relating to 2003, 2005 and 2007, first select the column C. Press the Ctrl key and keep it pressed. Select column E and then select column G. Release the Ctrl key and the columns remain selected.



Close the workbook without saving any changes you may have made.

Recommended techniques when creating or editing lists

Each cell should contain the smallest data element. For instance if you are storing a person's name, use one cell for the first name and another cell for the second name. This means that at a later date you could manipulate the data to sort by the second name. For the same reason split the details of an address into as many smaller parts as possible so that later you could search by state/region , by post code/zip code or even by country if you are maintaining an international list.

The top row of your data will often contain the headers of each column. These are called field names.

A list should not contain blank rows or columns within the data. This can cause problems when later sorting your data.

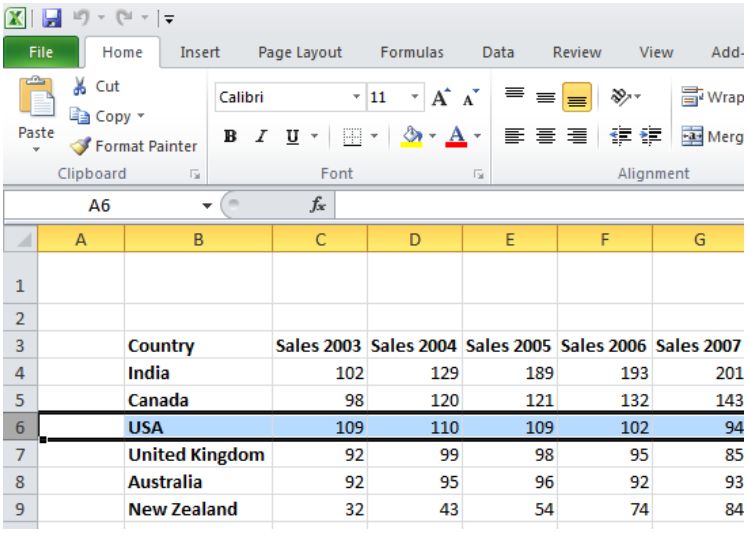
Ensure that cells bordering your list are blank.

If your data has a bottom row which contains totals, it is often a good idea to insert a blank line above the row of totals.

Manipulating rows and columns

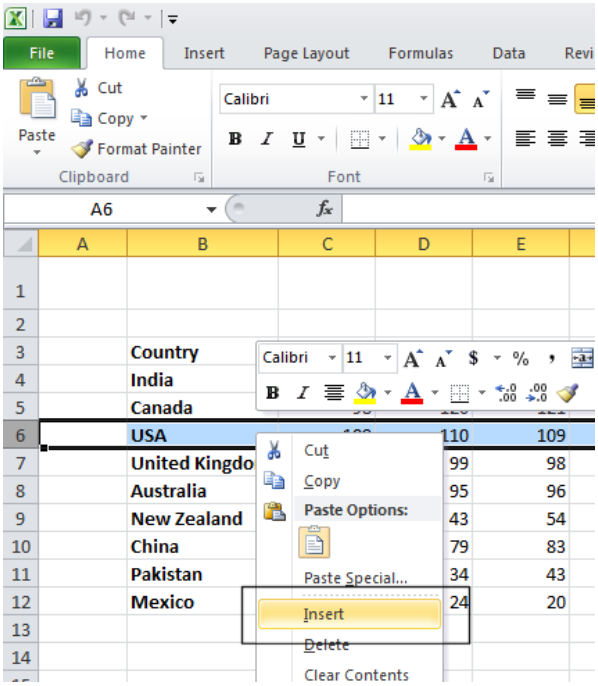
Inserting rows into a worksheet

Open a workbook called **Rows and columns**. We need to insert a row for **Japan** between the row for **Canada** and the row for the **USA**. Select the row for the **USA**, as illustrated.

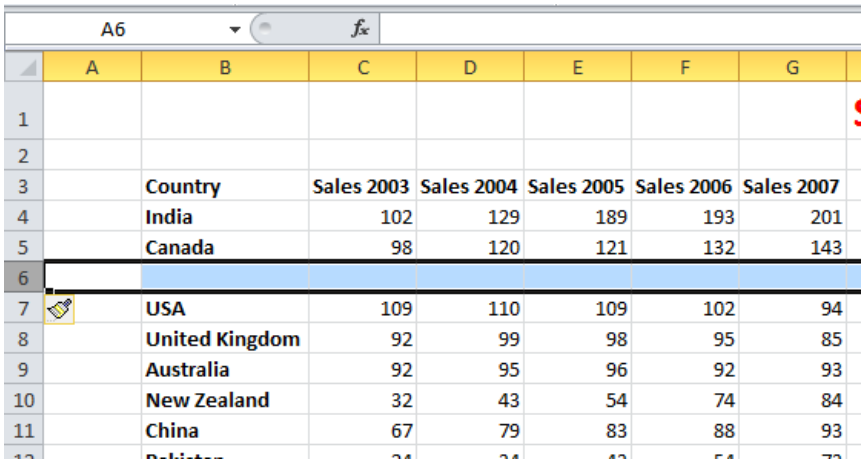


	A	B	C	D	E	F	G
1							
2							
3		Country	Sales 2003	Sales 2004	Sales 2005	Sales 2006	Sales 2007
4		India	102	129	189	193	201
5		Canada	98	120	121	132	143
6		USA	109	110	109	102	94
7		United Kingdom	92	99	98	95	85
8		Australia	92	95	96	92	93
9		New Zealand	32	43	54	74	84

Right click over the selected row and from the popup menu displayed select the **Insert** command.

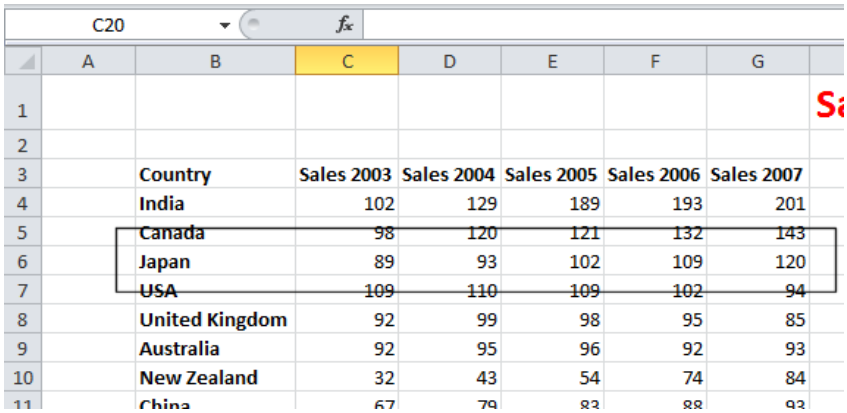


The table will now look like this.



	A	B	C	D	E	F	G
1							
2							
3		Country	Sales 2003	Sales 2004	Sales 2005	Sales 2006	Sales 2007
4		India	102	129	189	193	201
5		Canada	98	120	121	132	143
6							
7		USA	109	110	109	102	94
8		United Kingdom	92	99	98	95	85
9		Australia	92	95	96	92	93
10		New Zealand	32	43	54	74	84
11		China	67	79	83	88	93

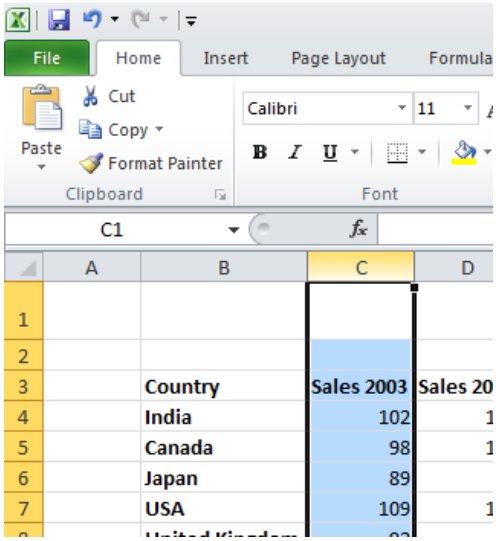
Click on cell **B6** and type in the word **'Japan'.** Enter the following sales figures for **Japan.**



	A	B	C	D	E	F	G
1							
2							
3		Country	Sales 2003	Sales 2004	Sales 2005	Sales 2006	Sales 2007
4		India	102	129	189	193	201
5		Canada	98	120	121	132	143
6		Japan	89	93	102	109	120
7		USA	109	110	109	102	94
8		United Kingdom	92	99	98	95	85
9		Australia	92	95	96	92	93
10		New Zealand	32	43	54	74	84

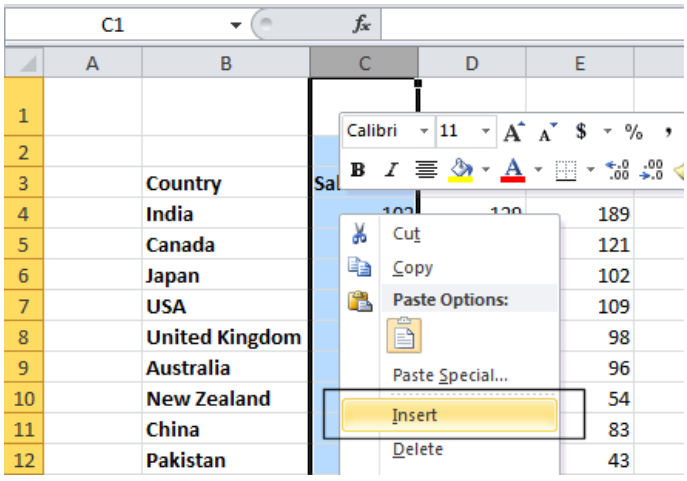
Inserting columns into a worksheet

We want to insert a column for sales figures in 2002, which needs to be inserted before the 2003 column. Select the column relating to 2003, as illustrated.



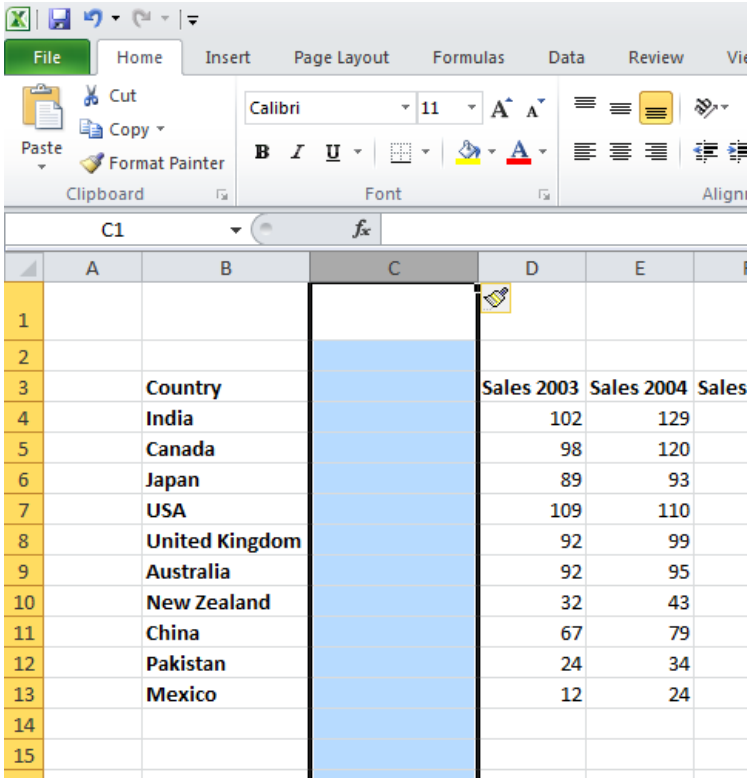
	A	B	C	D
1				
2				
3		Country	Sales 2003	Sales 20
4		India	102	1
5		Canada	98	1
6		Japan	89	
7		USA	109	1

Right click over the selected column and from the popup menu displayed select the Insert command.

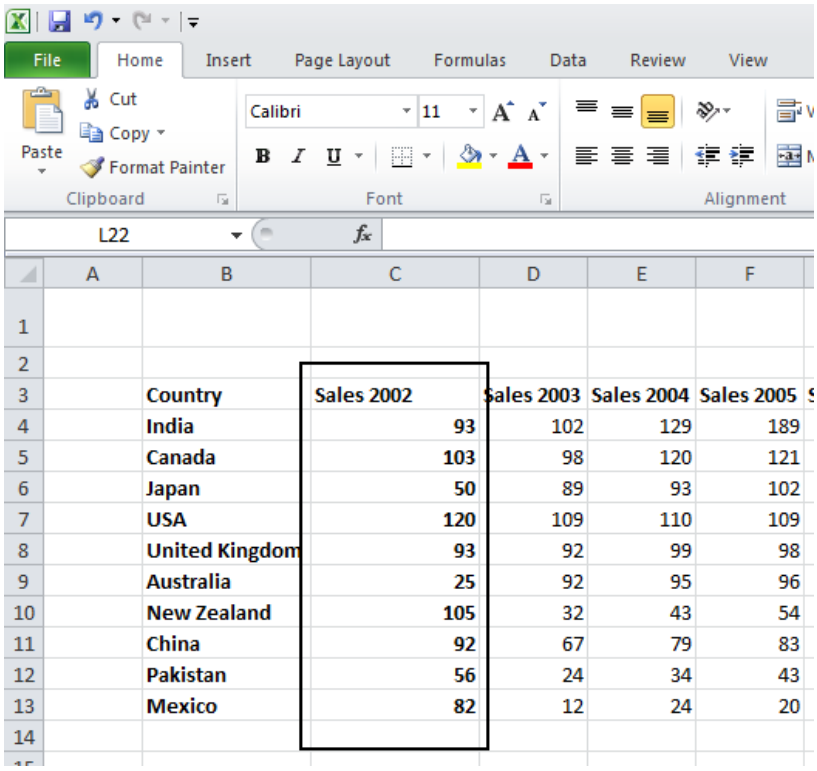


	A	B	C	D	E
1					
2					
3		Country			
4		India			189
5		Canada			121
6		Japan			102
7		USA			109
8		United Kingdom			98
9		Australia			96
10		New Zealand			54
11		China			83
12		Pakistan			43

The column will be inserted, as illustrated.



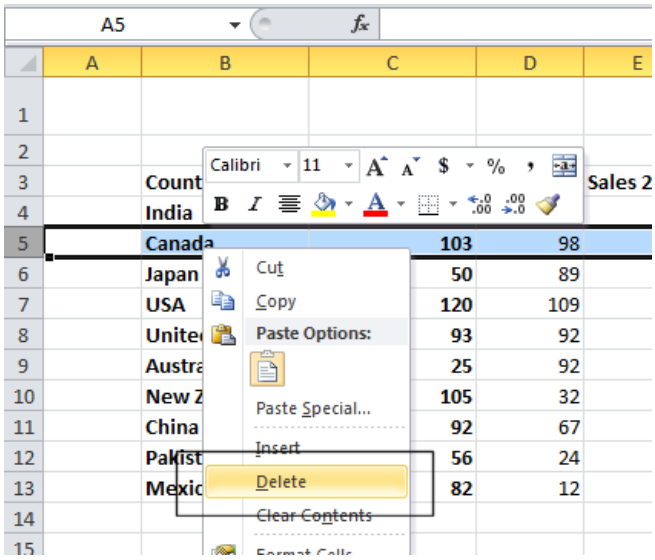
Enter the following data into the column.



Deleting rows and columns

Deleting rows within a worksheet

Select the row relating to **Canada**. Right click over the selected row and from the popup menu displayed select the **Delete** command.

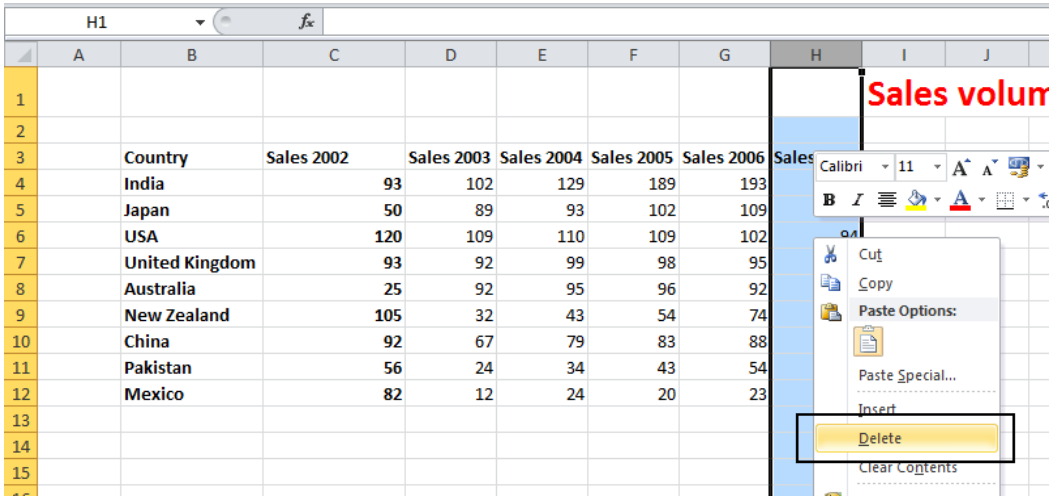


The row is deleted without any additional warning.

TIP: To delete multiple connected rows, use the Shift key trick to select multiple rows and then right click to delete the rows. To delete multiple non-connected rows, use the Ctrl key trick to select the multiple rows and then right click to delete the rows.

Deleting columns within a worksheet

Select the column relating to Sales 2007. Right click over the selected column and from the popup menu displayed select the Delete command.



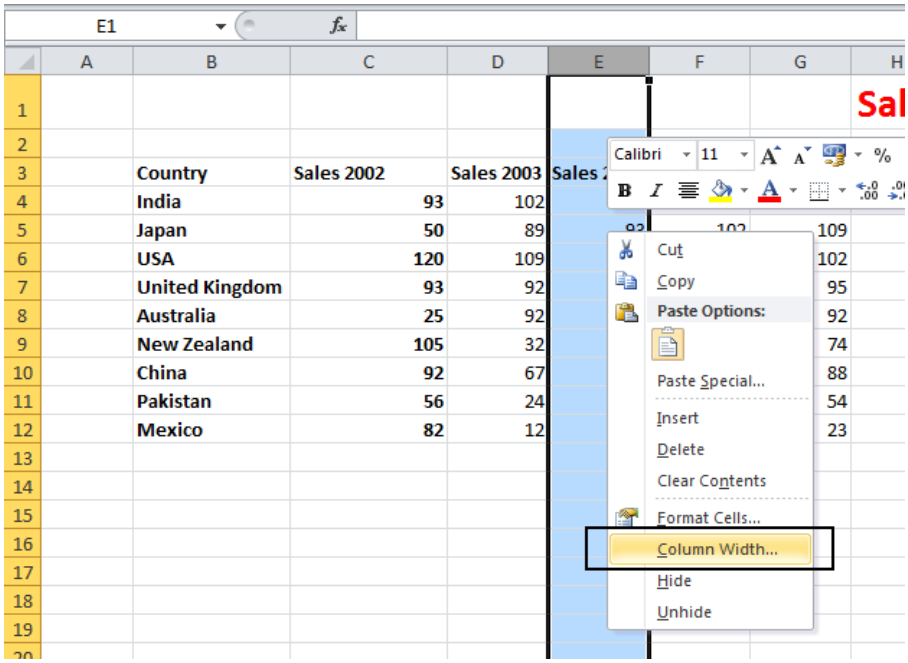
The column is deleted without any additional warning.

TIP: To delete multiple connected columns, use the Shift key trick to select multiple columns and then right click to delete the columns. To delete multiple non-connected columns, use the Ctrl key trick to select the multiple columns and then right click to delete the columns.

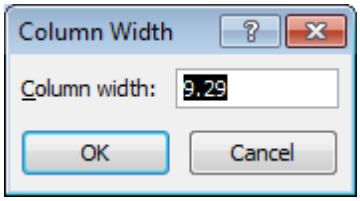
Modifying

Modifying column widths

Select a column, such as the **Sales 2004** column. Right click over the selected column and from the popup menu displayed select the **Column Width** command.

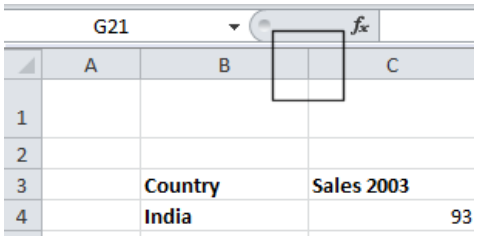


The **Column Width** dialog box is displayed which allows you to set the column width. Click on the **Cancel** button to close the dialog box.



Modifying column widths using 'drag and drop'

Move the mouse pointer to the line between the header for column B and column C, as illustrated below.



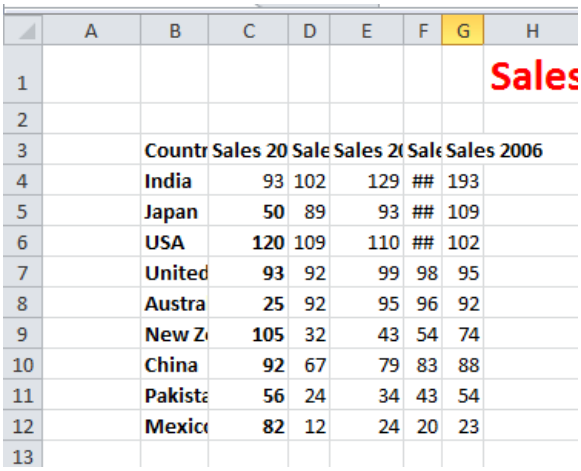
Press the mouse button and keep it pressed.

The pointer changes to a black cross with double arrows when placed on the line between two columns.

Move the mouse pointer left or right to make the column narrower or wider. Release the mouse button and the column width will change as required.

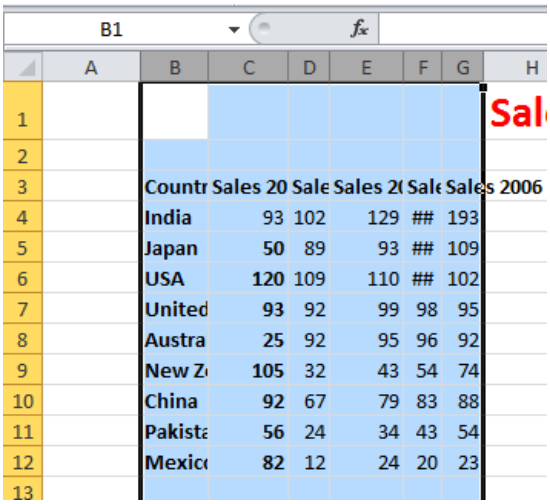
Automatically resizing the column width to fit contents

Resize all the columns so that they are too narrow to properly display the data contained within the columns. Your screen will look similar to the illustration below.



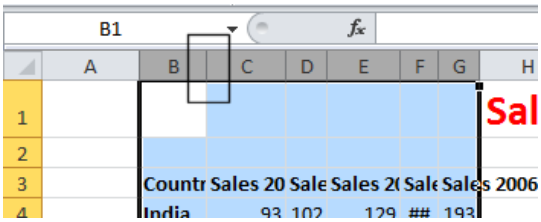
	A	B	C	D	E	F	G	H
1								Sales
2								
3		Countr	Sales 20	Sale	Sales 2(	Sale	Sales 2006	
4		India	93	102	129	##	193	
5		Japan	50	89	93	##	109	
6		USA	120	109	110	##	102	
7		United	93	92	99	98	95	
8		Austra	25	92	95	96	92	
9		New Z	105	32	43	54	74	
10		China	92	67	79	83	88	
11		Pakista	56	24	34	43	54	
12		Mexic	82	12	24	20	23	
13								

To automatically resize each column width to fit the contents, select all the columns containing data.



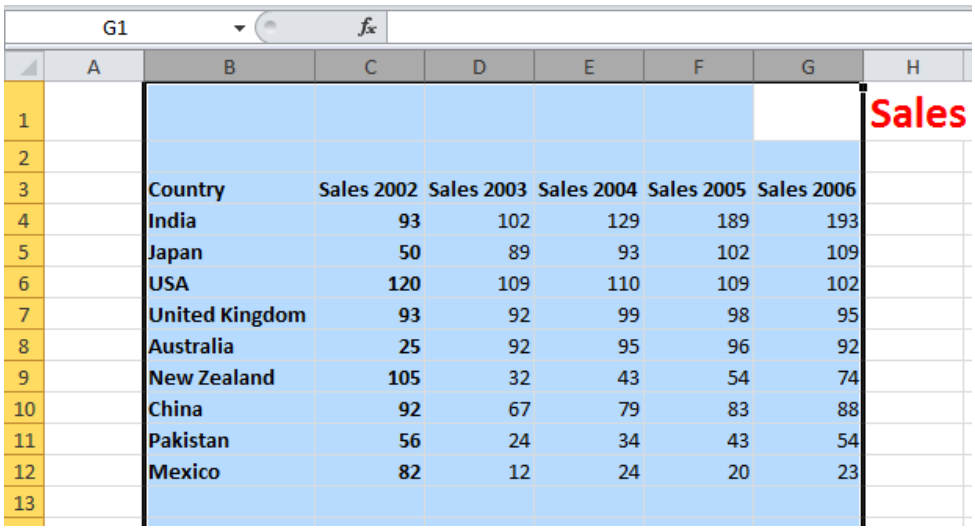
	A	B	C	D	E	F	G	H
1								Sal
2								
3		Countr	Sales 20	Sale	Sales 2(	Sale	Sales 2006	
4		India	93	102	129	##	193	
5		Japan	50	89	93	##	109	
6		USA	120	109	110	##	102	
7		United	93	92	99	98	95	
8		Austra	25	92	95	96	92	
9		New Z	105	32	43	54	74	
10		China	92	67	79	83	88	
11		Pakista	56	24	34	43	54	
12		Mexic	82	12	24	20	23	
13								

Double click on the junction between one of the column headers within the selected columns.



	A	B	C	D	E	F	G	H
1								Sal
2								
3		Countr	Sales 20	Sale	Sales 2(	Sale	Sales 2006	
4		India	93	102	129	##	193	

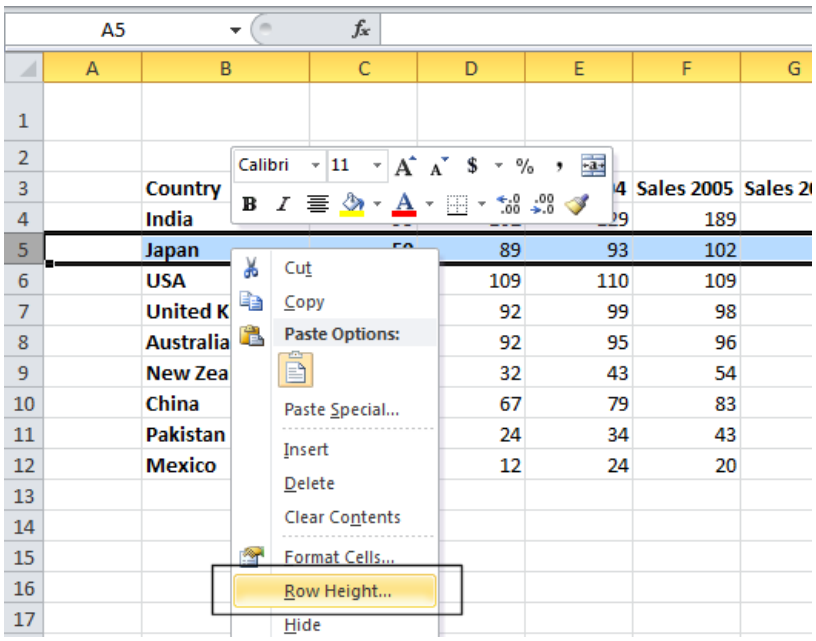
The columns will automatically resize to accommodate the data within each column.



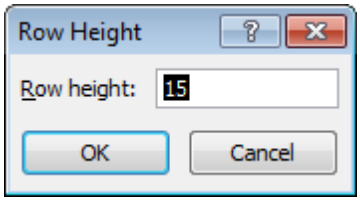
	A	B	C	D	E	F	G	H
1								Sales
2								
3		Country	Sales 2002	Sales 2003	Sales 2004	Sales 2005	Sales 2006	
4		India	93	102	129	189	193	
5		Japan	50	89	93	102	109	
6		USA	120	109	110	109	102	
7		United Kingdom	93	92	99	98	95	
8		Australia	25	92	95	96	92	
9		New Zealand	105	32	43	54	74	
10		China	92	67	79	83	88	
11		Pakistan	56	24	34	43	54	
12		Mexico	82	12	24	20	23	
13								

Modifying row heights

Select one or more rows and then right click over the selected row(s). From the popup menu displayed select the **Row Height** command.



The **Row Height** dialog is displayed allowing you to set the exact row height, as required.



TIP: If you click between any two row headers, you can drag the row height up or down as required, to modify the row height.

Save your changes and close the workbook.

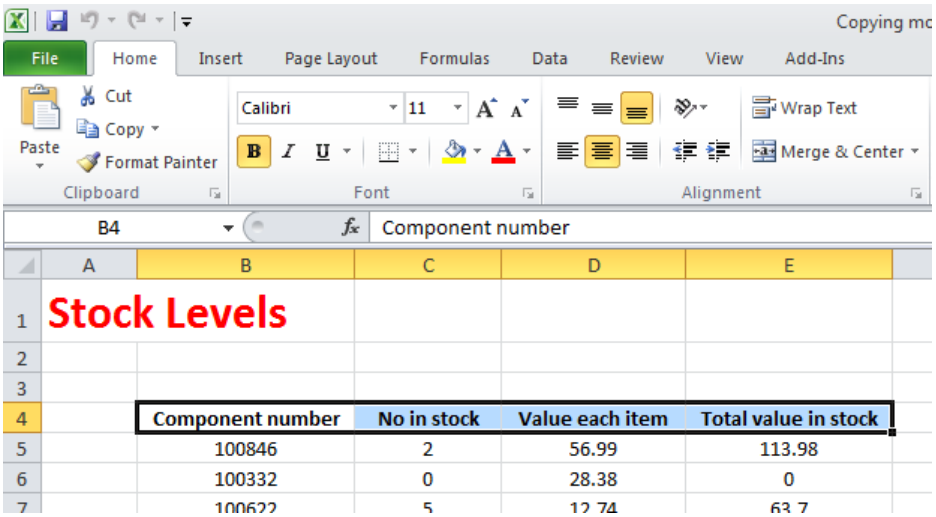
Manipulating cells and cell content

Copying a cell or range contents within a workbook

Open a workbook called Copying moving and deleting. Select a cell, range, row or column to copy. In this case select the range **B4** to **E4**.

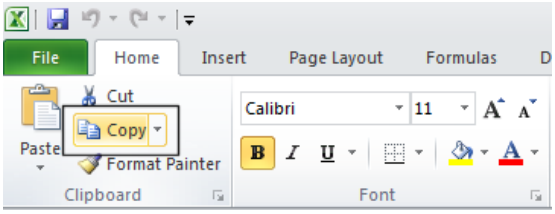
TIP: A range like this is often written as **B4:E4**.

Your screen will look something like this:



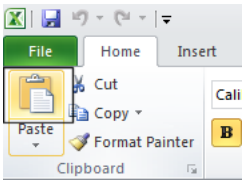
Press **Ctrl+C** to copy the selected range to the Clipboard.

TIP: To copy a selected item to the Clipboard using the Ribbon, click on the **Home** tab and then click on the **Copy** icon in the **Clipboard** group on the **Ribbon**.

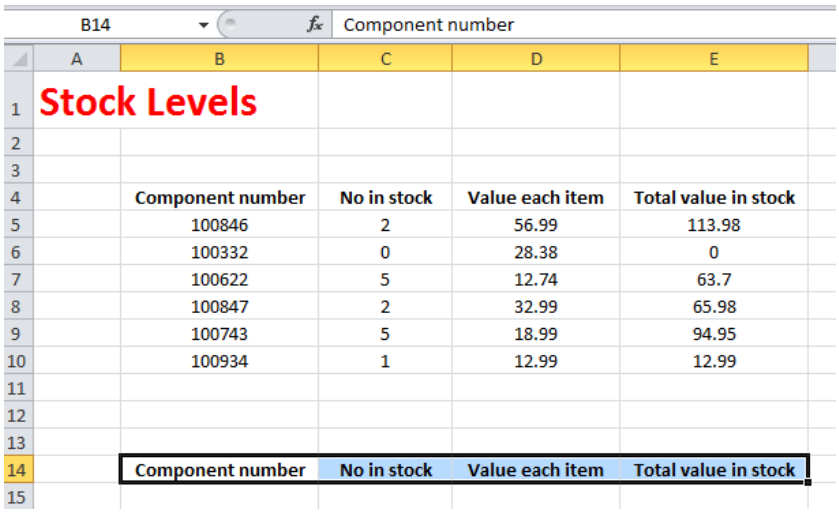


Click at the location you wish to paste the data to. In this case click on cell **B14** and press the **Ctrl+V** keys to paste the data from the Clipboard.

TIP: To paste an item from the Clipboard using the Ribbon, click on the **Home** tab and then click on the **Paste** icon, in the **Clipboard** group on the **Ribbon**.

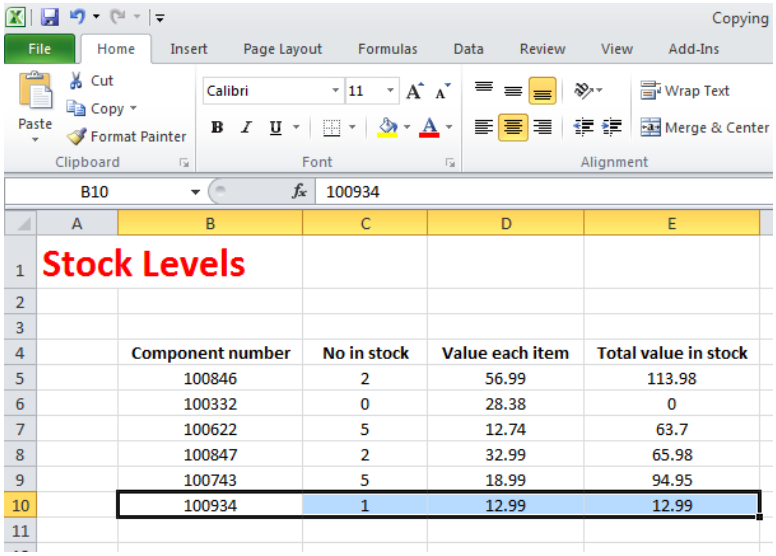


Your data will now look like this.



TIP: You can use the same technique to copy entire rows or columns. Pressing **Ctrl+A** will select everything within a worksheet and allow you to copy the entire worksheet contents to the Clipboard when you press **Ctrl+C**.

Deleting cell contents



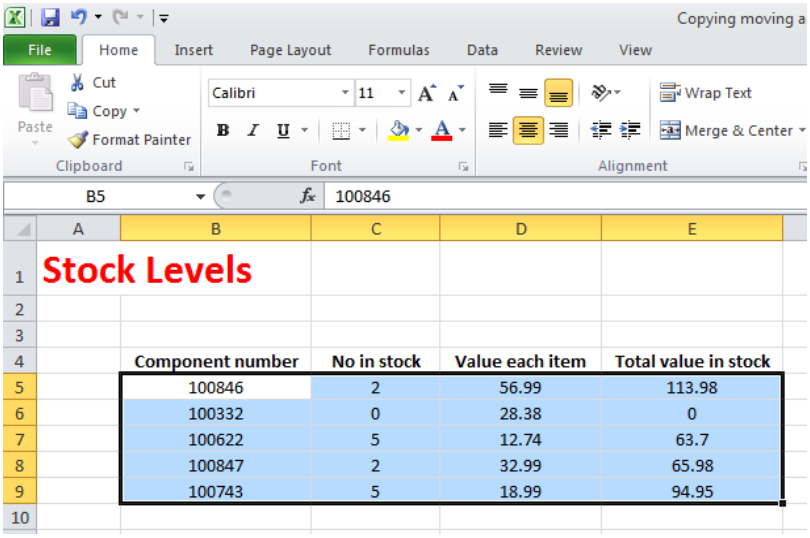
Select the range that you wish to delete the contents of. In this case select the range **B10:E10**, as illustrated.

Press the **Del** key and the cell contents will be deleted.

TIP: You can use the same technique to delete entire rows or column contents.

Pressing **Ctrl+A** will select everything within a worksheet and allow you to delete the entire worksheet contents when you press the **Del** key.

Moving the contents of a cell or range within a workbook



Select the range you wish to move and then cut it to the Clipboard. In this case select the data, as illustrated.

Press the **Ctrl+X** keys to cut the selected data to the Clipboard.
Click at the location you wish to move the selected data to, in this case click in cell **B15**, and press **Ctrl+V**, to paste the data.

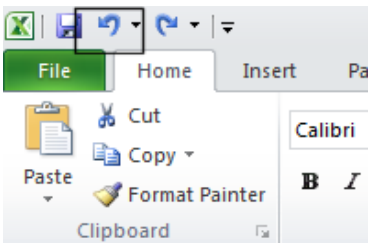
TIP: You can use the same technique to move entire rows or columns.

Save your changes and close the workbook.

Editing cell content

It is easy to edit existing data within a cell or to replace existing data within a cell. Open a workbook called Editing.
Click on cell **B3**. Double click in front of the word **'Region'** and insert the word **'Sales'** followed by a space. Press the **Enter** key to commit your changes to the cell.
Click on cell **B7**. Double click on the word **'West'**, to select it and then over type the selected word with the word **'Central'**. Press the **Enter** key to commit your changes to the cell.

Undo and Redo



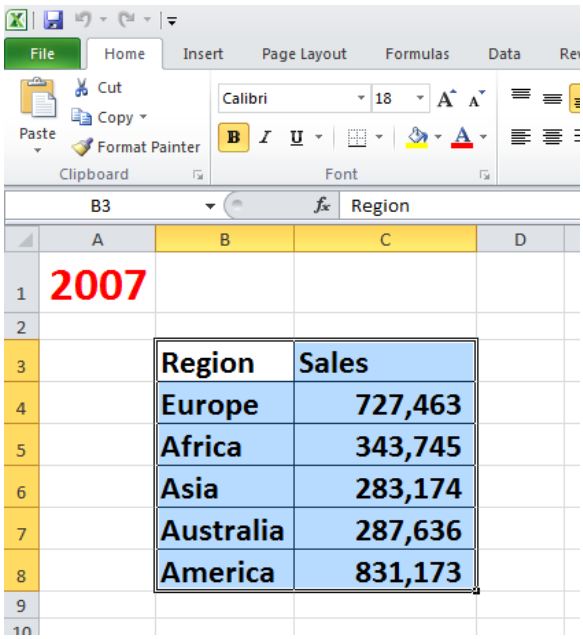
Click on the **Undo** icon (top-left of your screen) to reverse the last action. Try it now.

Click on the **Redo** icon (top-left of your screen) to reapply the last action. Try it now.

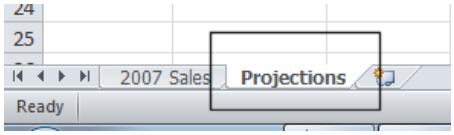
Save your changes and close the workbook.

Copying data between worksheets (within the same workbook)

Open a workbook called Worksheet manipulation.
Select a cell, range, row or column to copy. In this case select the range **B3:C8**. Your screen will look something like this:



Press **Ctrl+C** to copy the selected range to the Clipboard. Click on the second worksheet tab (called Projections).



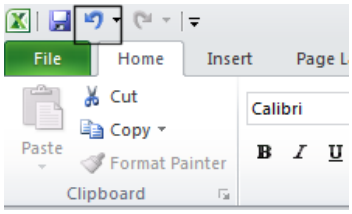
You will now see the contents of the second, empty worksheet displayed.

Click at the location you wish to paste the data to. In this case click on cell **C4** and press the **Ctrl+V** keys to paste the data from the Clipboard. You have successfully copied selected data from one worksheet to another worksheet within the same workbook.

BEFORE CONTINUING: Click on the Undo icon to undo this copy.

The **Undo** icon is displayed towards the top-left of your screen.

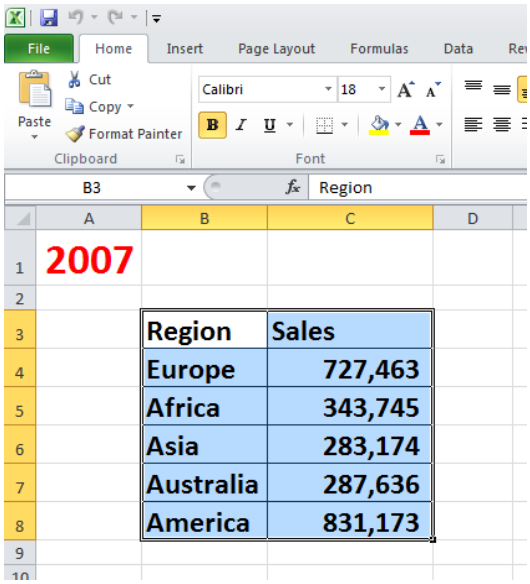
Leave the workbook open and carry on to the next section.



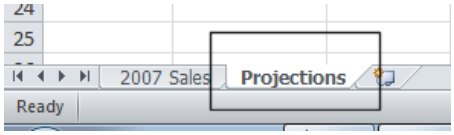
Moving data between worksheets

Moving data between worksheets (within the same workbook)

Switch back to the first worksheet within the workbook called Worksheet manipulation.
Select a cell, range, row or column to move. In this case select the range **B3:C8**. Your screen will look something like this:



Press **Ctrl+X** to cut (move) the selected range to the Clipboard.
Click on the second worksheet tab (called Projections).



You will now see the contents of the second, empty worksheet displayed.

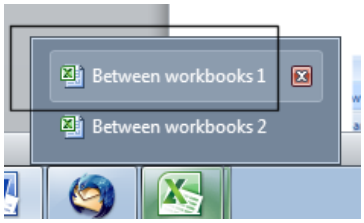
Click at the location you wish to paste the data to. In this case click on cell **C4** and press the **Ctrl+V** keys to paste the data from the Clipboard. You have successfully moved selected data from one worksheet to another worksheet within the same workbook.

Save your changes and close the workbook.

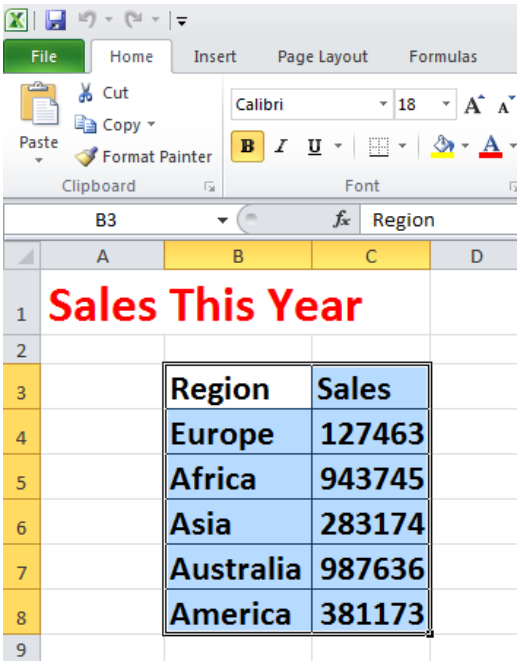
Moving data worksheets (in different workbooks)

Open a workbook called **Between workbooks 1**.
Open a second workbook called **Between workbooks 2**.
Display the contents of the **Between workbooks 1** workbook.

NOTE: To switch between multiple open workbooks, click on the **Excel** icon displayed within the Taskbar at the bottom of the screen and click on **Between Workbooks 1**.



Within the **Between workbooks 1** workbook, select a cell, range, row or column to move. In this case select the range **B3:C8**. Your screen will look something like this:



Press **Ctrl+X** to cut (move) the selected range to the Clipboard.

Switch to the second workbook (called **Between workbooks 2**). Click at the location you wish to paste the data to. In this case click on cell **C4** and press the **Ctrl+V** keys to paste the data from the Clipboard. You have successfully moved selected data from one workbook to another workbook.

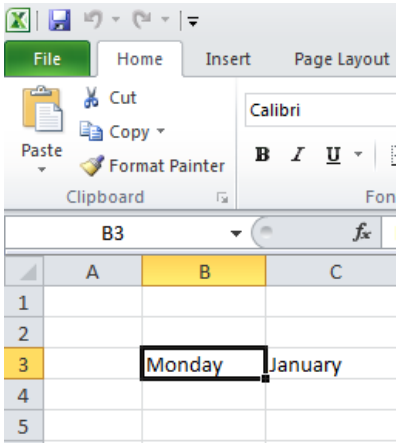
NOTE: You could have selected a different worksheet within the second workbook if you wanted.

Copying data between worksheets (in different workbooks)
Select the data in the second workbook.
Press **Ctrl+C** to copy the selected data to the Clipboard.
Switch back to the first workbook.
Click where you wish to paste the data to.
Press **Ctrl+V** to paste the data from the Clipboard.

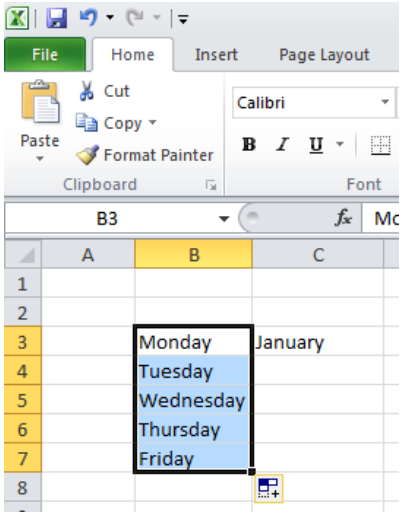
You have now copied selected data from one workbook to another workbook.

Auto Fill

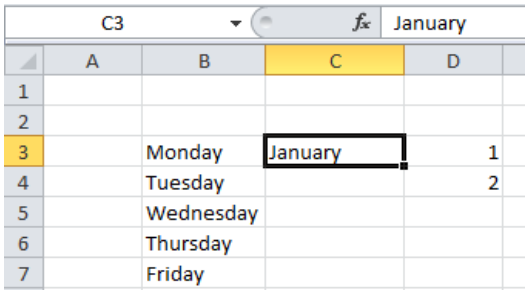
Open a workbook called **AutoFill**.
Click on cell **B3** which contains the word **Monday**.



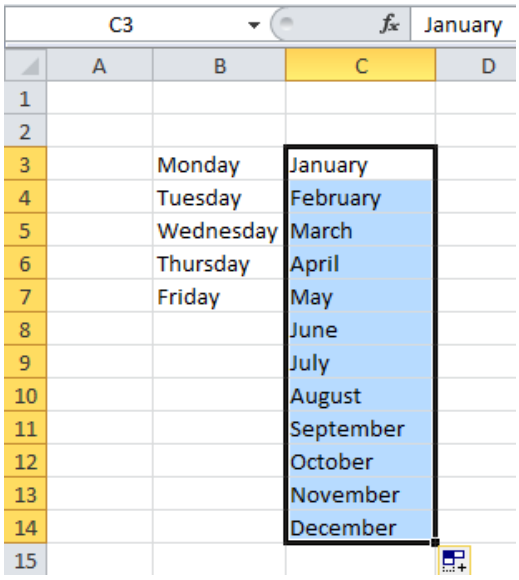
Move the mouse pointer to the bottom-right corner of this cell and the mouse pointer shape will change to the shape of a small black cross. When the mouse pointer changes shape, press the mouse button down, and while keeping it pressed move slowly down the page to cell **B7**. When you release the mouse button you will see that Excel has 'Auto Filled' the range you dragged across with days of the week.



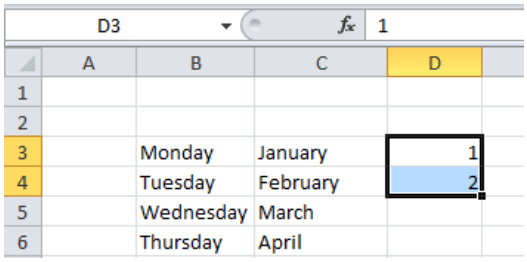
Click on cell **C3** which contains the word **January**.



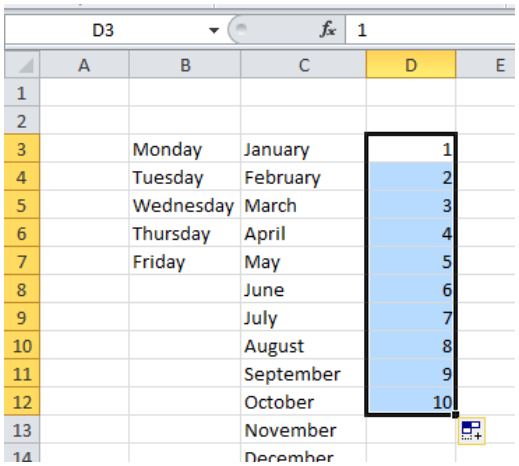
Use the AutoFill feature to automatically create a column containing all the months of the year.



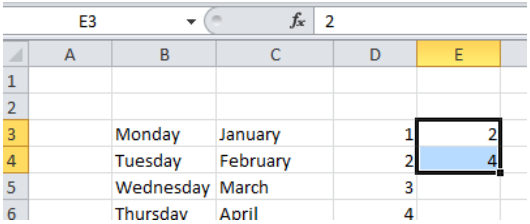
Select the cell range **D3:D4**.



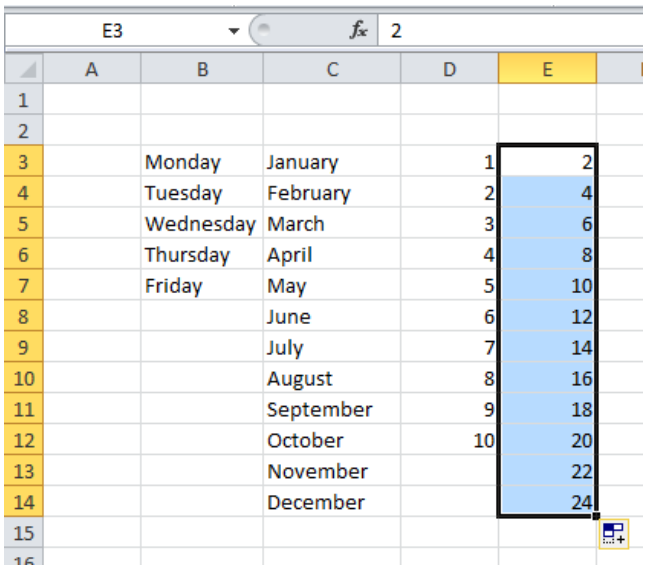
Use **AutoFill** to extend the series down the page. As you will see the series becomes **1,2,3,4,5,6,7 etc**.



Select the cell range **E3:E4**.



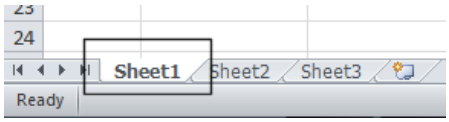
Use AutoFill to extend the series down the page. As you will see the series becomes **2,4,6,8,10** etc.



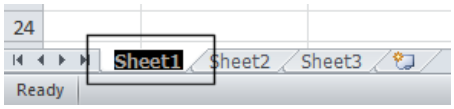
Save your changes and close the workbook.

Renaming a worksheet

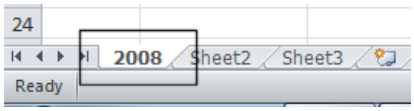
Click on the **Sheet1** tab to display the first worksheet. Double click on the **Sheet1** tab.



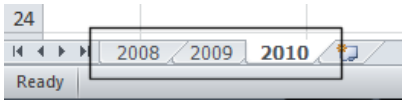
The worksheet tab will be highlighted and you will be able to type in a new name.



In this case type in the name **2008** and then press the **Ente**r key to confirm the change, as illustrated.



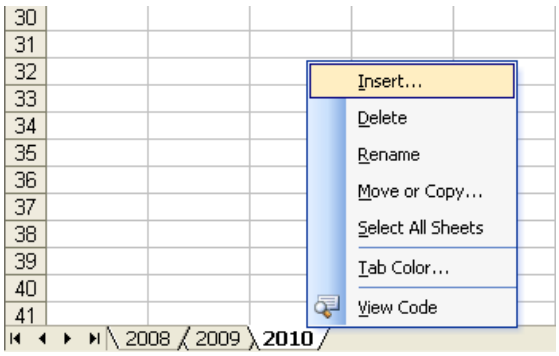
Double click on the **Sheet2** tab and rename it **2009**.
Double click on the **Sheet3** tab and rename it **2010**. Your tabs will now look like this:



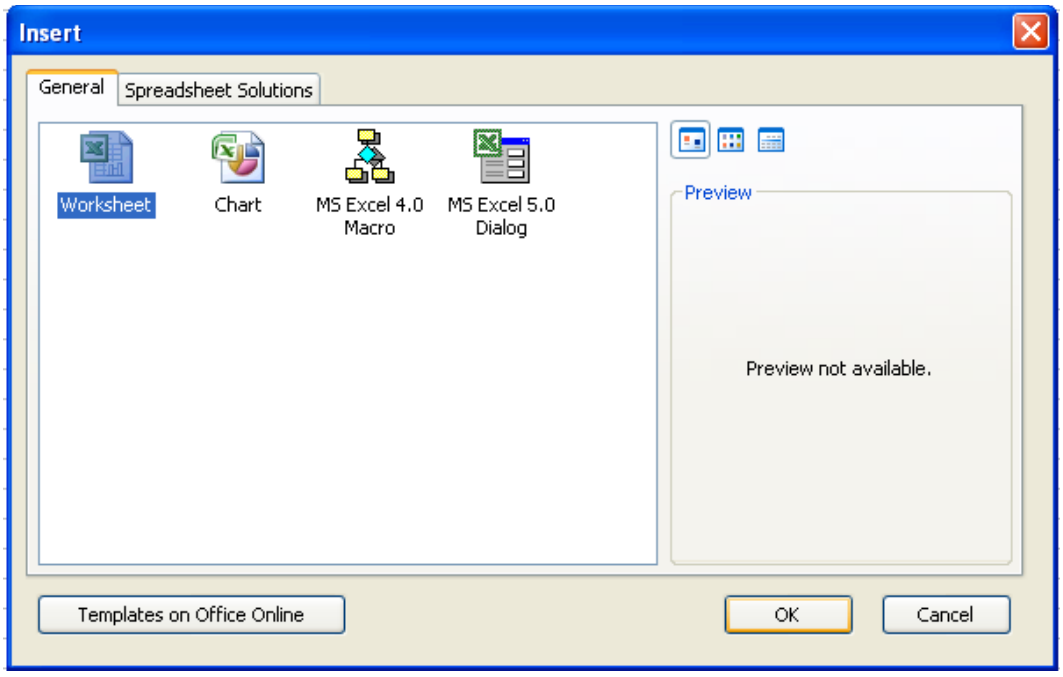
By default worksheets are called **Sheet1**, **Sheet2** and **Sheet3**. You should use meaningful names for your worksheets, especially if you are using multiple worksheets within a workbook. This can make a complicated workbook much easier to understand.

Inserting a new worksheet

Click on the 2010 worksheet tab to select it. Right click over the tab and from the popup menu displayed, click on the Insert command.



The Insert dialog is displayed. Make sure that the Worksheet object is selected within the dialog box.



Then Click Ok button to insert a New worksheet

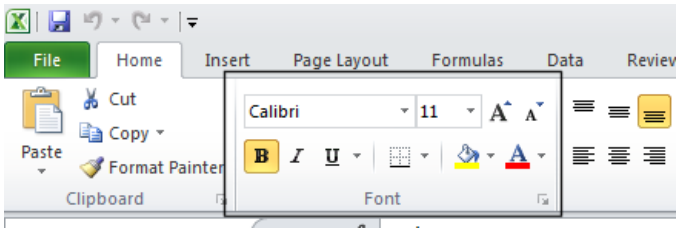
Deleting a worksheet

Make sure that the new tab that you have just inserted is selected. Right click on the tab and from the popup menu displayed select the Delete command. The new worksheet will be deleted.

Formatting

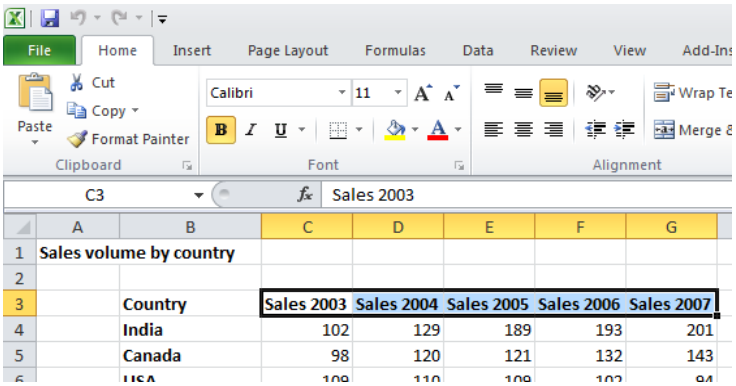
Font formatting

Font formatting options
The font formatting options are located on the Home tab within the Font group.

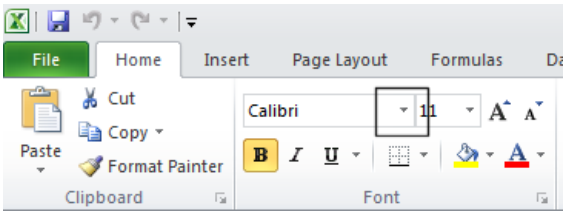


Font type

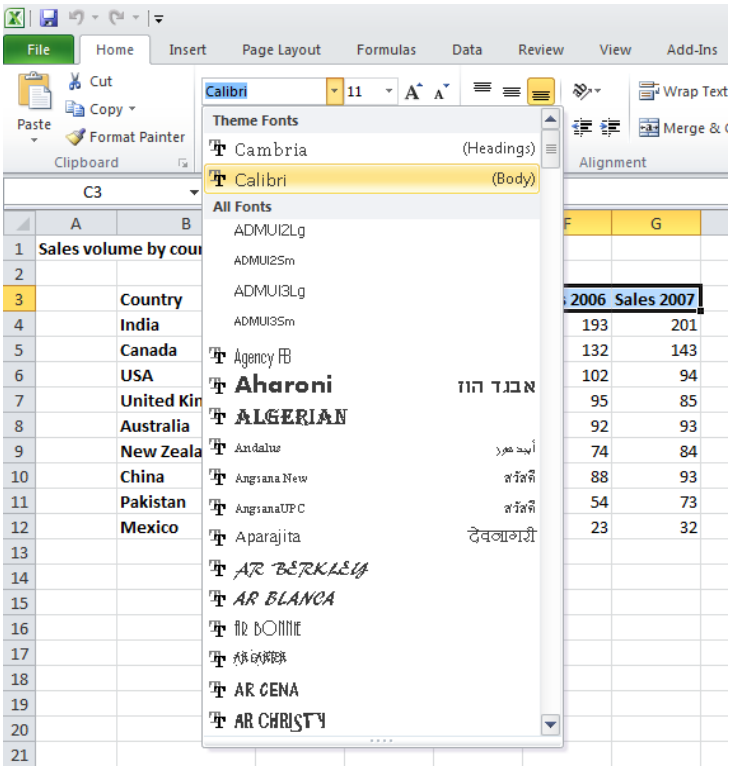
Open a workbook called **Font formatting**. Select the range **C3:G3**.



Under the **Home** tab, click on the **down arrow** next to the Font section.



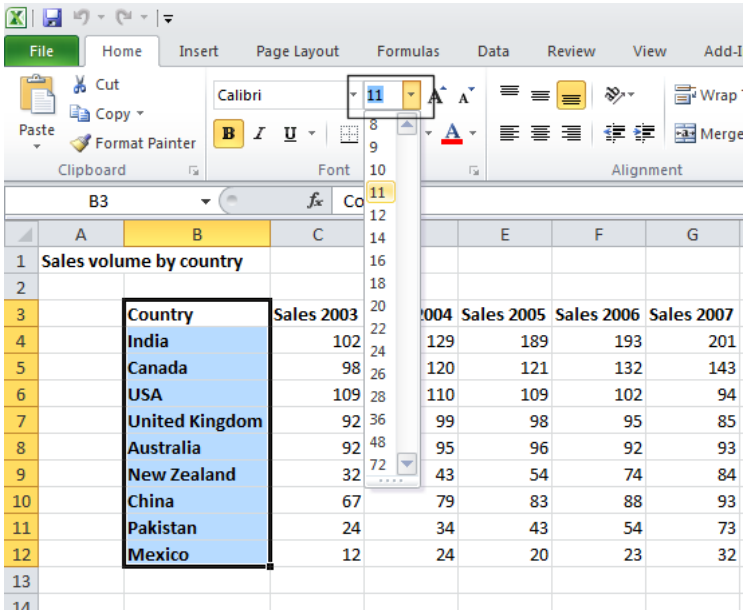
From the drop down list displayed, select a different font type, such as **Arial**.



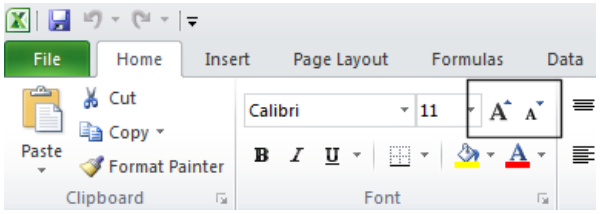
Experiment with applying different fonts to your data.

Font size

Select the range B3:B12. Click on the down arrow within the Font Size section and select a different font size.

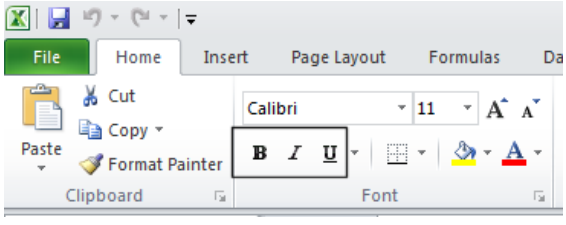


TIP: You can also select a range and use the **Increase Font Size** and **Decrease Font Size icons.**



Bold, italic, underline formatting

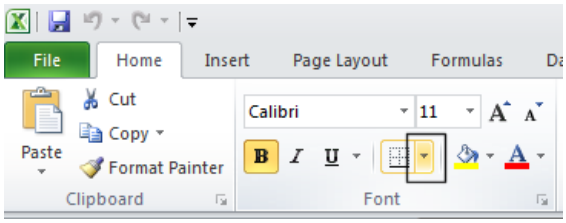
Select the range C4:G12 and experiment with applying bold, italic and underline formatting using the icons illustrated below.



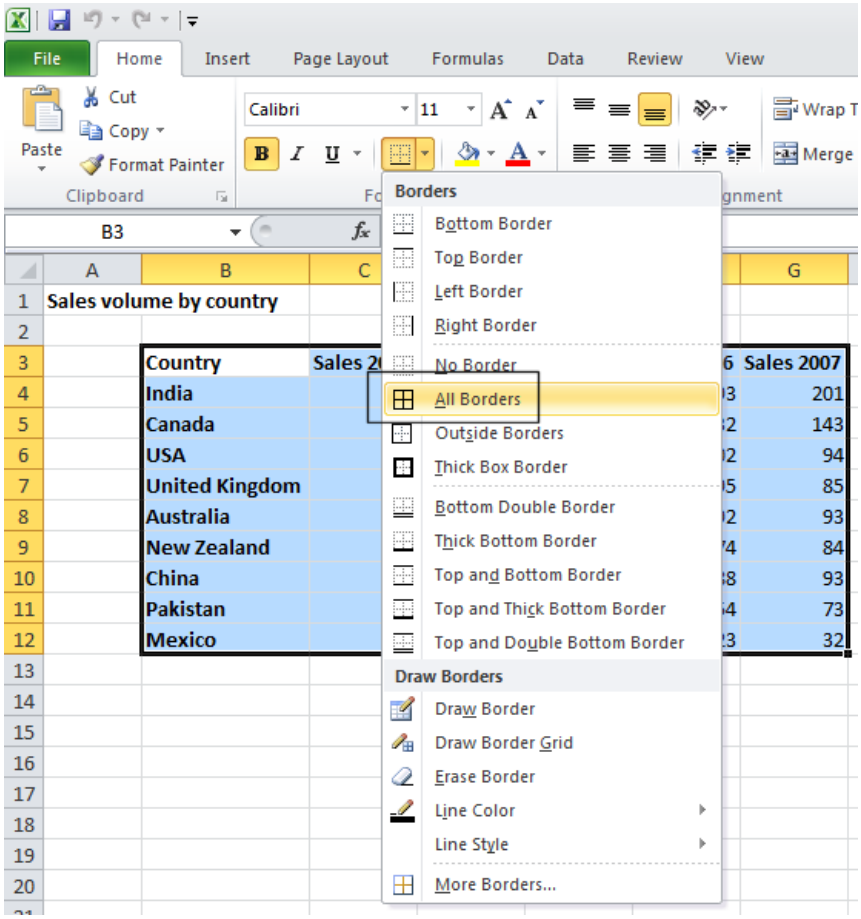
TIP: You can easily apply double underline formatting. To do this click on the **down arrow** next to the **Underline** icon. Select the **Double Underline** command.

Cell border formatting

Select the range **B3:G12**. Click on the down arrow next to the **Border** icon.



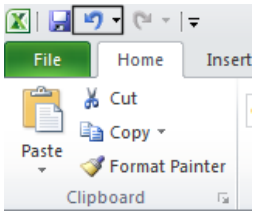
A drop down list is displayed from which you can select the required border. Select **All Borders**.



Your data will now look like this.

Country	Sales 2003	Sales 2004	Sales 2005	Sales 2006	Sales 2007
India	102	129	189	193	201
Canada	98	120	121	132	143
USA	109	110	109	102	94
United Kingdom	92	99	98	95	85
Australia	92	95	96	92	93
New Zealand	32	43	54	74	84
China	67	79	83	88	93
Pakistan	24	34	43	54	73
Mexico	12	24	20	23	32

Click on the **Undo** icon (top-left of your screen) to undo this formatting.

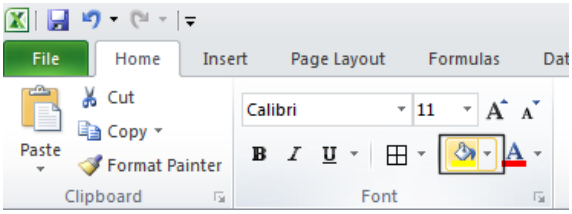


Spend a little time experimenting with applying different types of borders. Remember that you can use the **Undo** icon to **undo** any formatting that you apply.

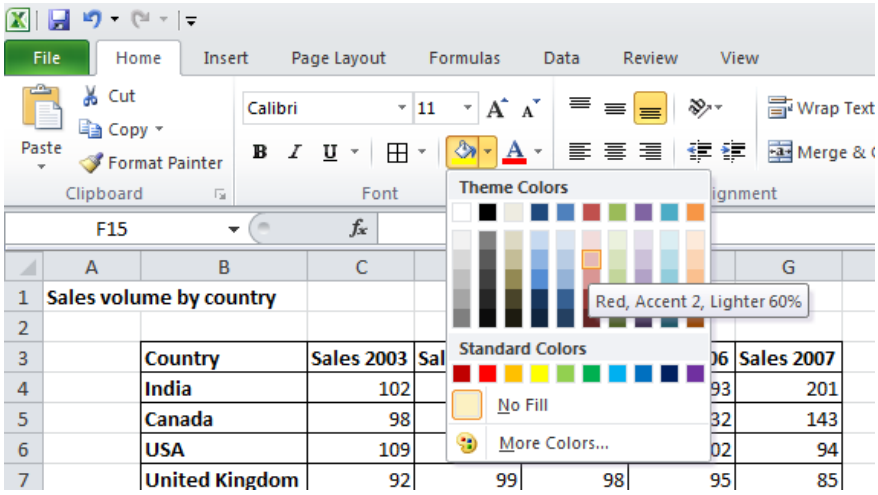
TIP: Experiment with applying border formatting effects, such a thick or double edged border effects.

Formatting the background colour

Select the range **B3:G3**. Click on the down arrow next to the **Fill Colour** icon.



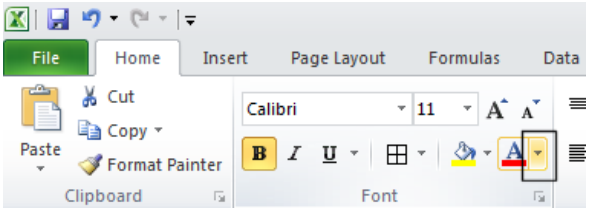
Move the mouse over a colour and you will see the colour formatting previewed within your data. Click on a colour to apply it.



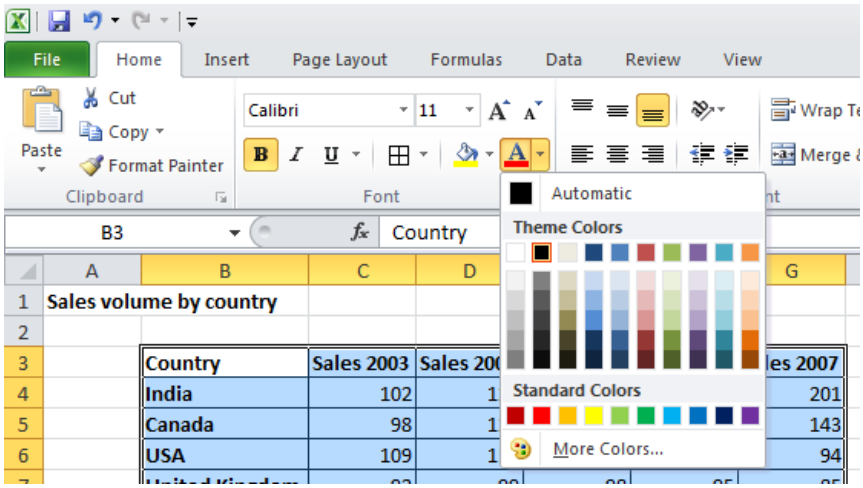
TIP: Be careful when applying background fill colours as it may make any text within the range difficult to see. Avoid using similar text colours and background fill colours.

Formatting the font colour

Select the range **B3:B12**. Click on the **down arrow** next to the **Font Colour** icon.



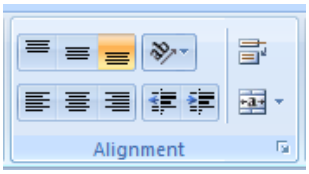
This will display a drop down from which you can select the required colour. Experiment with applying different font colours.



Save your changes and close the workbook.

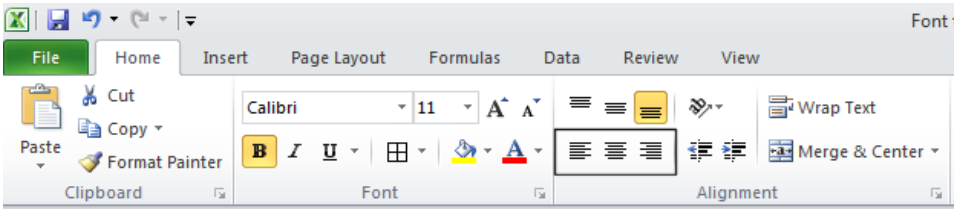
Alignment formatting

The alignment options are contained within the Alignment group on the Home tab.



Horizontally aligning contents in a cell range

Open a workbook called Alignment. Select the range **C3:G12**. Click on the Centre icon to **centre** the cell contents in this range. Try applying **left** and then **right** alignment formatting. Use the alignment icons illustrated below.



Centring a title over a cell range

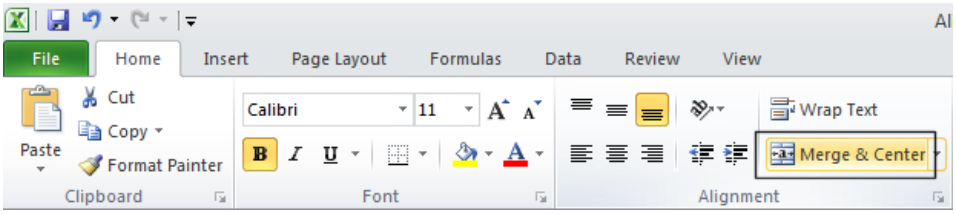
Click on cell **C2** and type in the word **'Sales'**.

	A	B	C	D	E	F	G
1							
2			Sales				
3		Country	2003	2004	2005	2006	2007
4		India	102	129	189	193	201
5		Canada	98	120	121	132	143
6		USA	109	110	109	102	94
7		United Kingdom	92	99	98	95	85
8		Australia	92	95	96	92	93

We want to centre this within the range **C2:G2**. To do this, select the range **C2:G2**.

	A	B	C	D	E	F	G
1							
2			Sales				
3		Country	2003	2004	2005	2006	2007
4		India	102	129	189	193	201

Click on the Merge and Centre icon.



Your screen will now look like this.

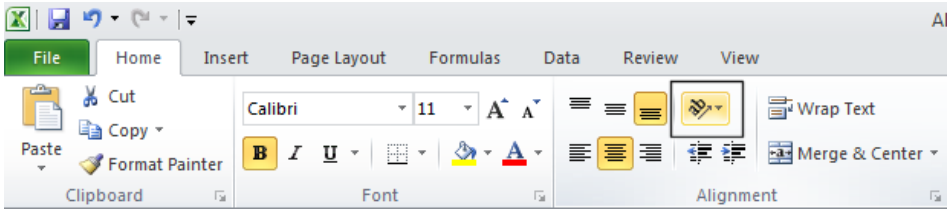
	A	B	C	D	E	F	G
1							
2					Sales		
3		Country	2003	2004	2005	2006	2007
4		India	102	129	189	193	201
5		Canada	98	120	121	132	143
6		USA	109	110	109	102	94
7		United Kingdom	92	99	98	95	85
8		Australia	92	95	96	92	93

Cell orientation

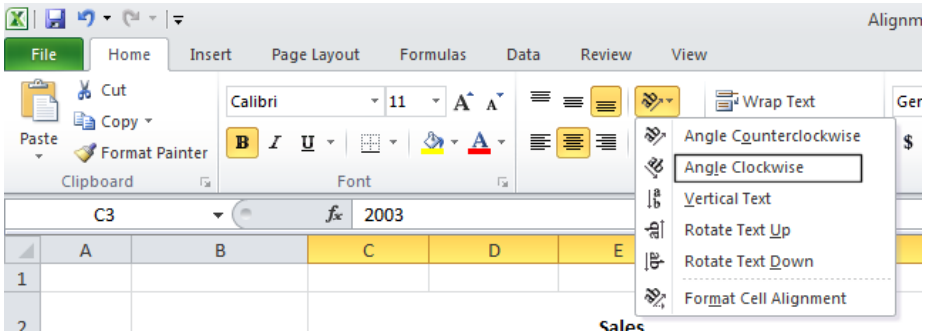
Select the range **C3:G3**.

	A	B	C	D	E	F	G
1							
2					Sales		
3		**Country**	**2003**	**2004**	**2005**	**2006**	**2007**
4		**India**	102	129	189	193	201
5		**Canada**	98	120	121	132	143
6		**USA**	109	110	109	102	94

Click on the **Orientation** icon.



You will see a drop down menu allowing you to format the cell orientation.



Select the **Angle Clockwise** command. Your data will now look like this.

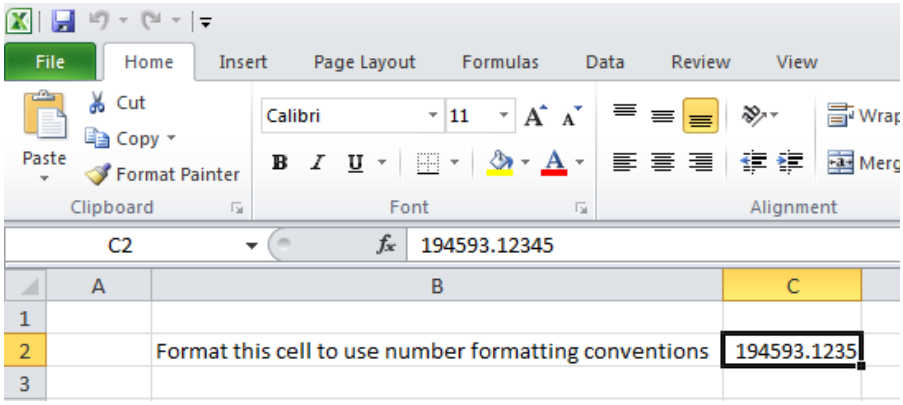
	A	B	C	D	E	F	G
1							
2					Sales		
3		**Country**	**2003**	**2004**	**2005**	**2006**	**2007**
4		**India**	102	129	189	193	201
5		**Canada**	98	120	121	132	143
6		**USA**	109	110	109	102	94
7		**United Kingdom**	92	99	98	95	85
8		**Australia**	92	95	96	92	93

Experiment with applying some of the other orientation effects.

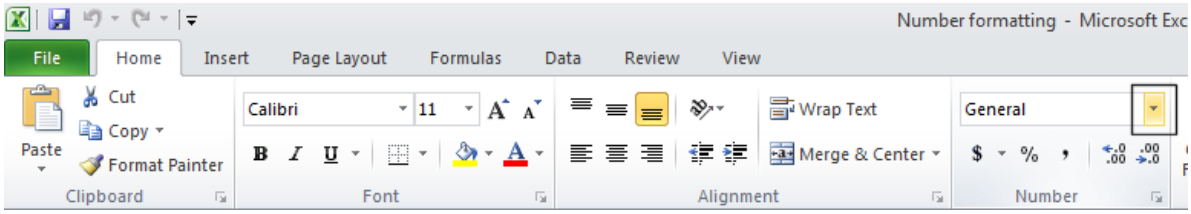
Save your changes and close the workbook.

Number formatting

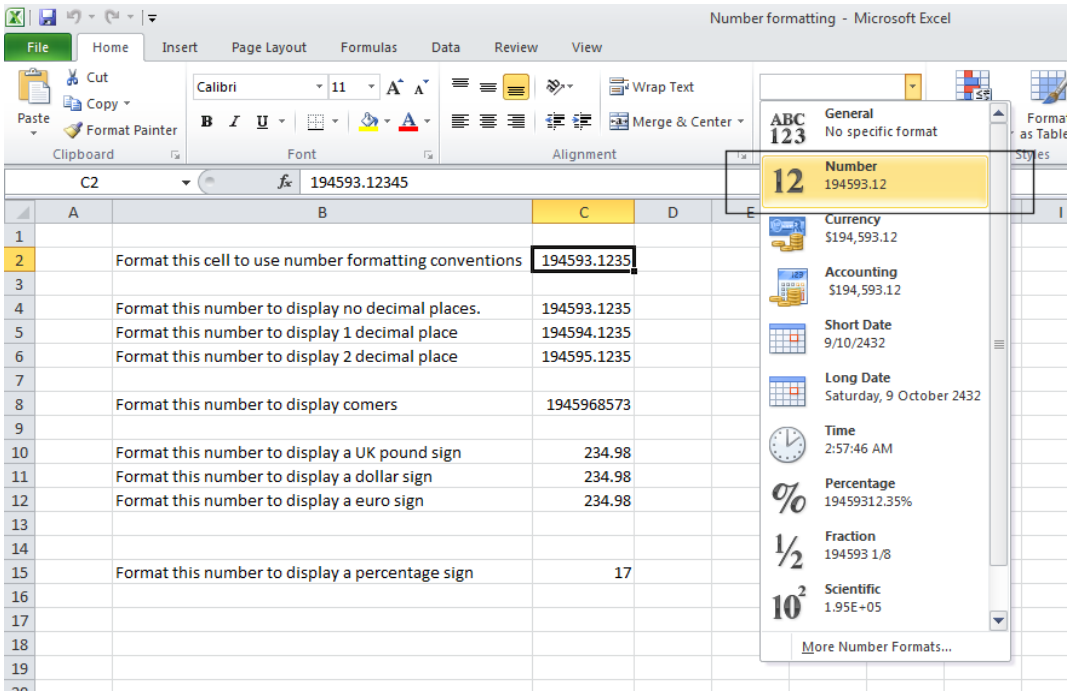
Open a workbook called **Number formatting**. Click on cell **C2**.



Click on the **down arrow** next to the **Number Format** control.



You will see a drop down menu from which you can select the format. In this case select **Number**.



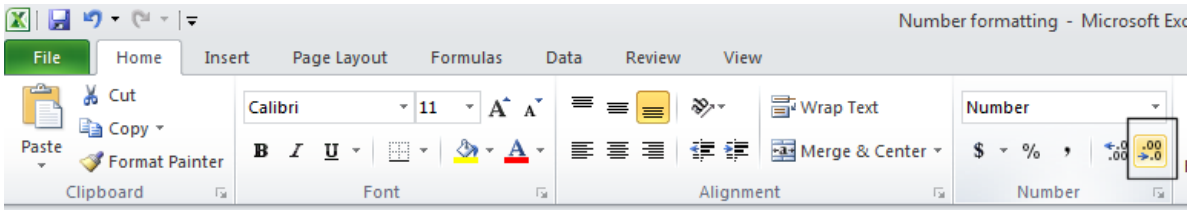
This tells Excel that the data contained within this cell should always now be treated as a number, rather than say text or a date.

Decimal point display

Click on cell **C4**.

	A	B	C
1			
2		Format this cell to use number formatting conventions	194593.12
3			
4		Format this number to display no decimal places.	194593.1235
5		Format this number to display 1 decimal place	194594.1235
6		Format this number to display 2 decimal place	194595.1235

Click on the **Decrease Decimal** icon a few times, so that no decimal places are displayed.



The cell contents should now look like this.

Format this number to display no decimal places.	194593

Set the contents of cell **C5** to display **1** decimal point.

	A	B	C
1			
2		Format this cell to use number formatting conventions	194593.12
3			
4		Format this number to display no decimal places.	194593
5		Format this number to display 1 decimal place	194594.1
6		Format this number to display 2 decimal place	194595.1235
7			

Set the contents of cell **C6** to display **2** decimal points.

	A	B	C	D
1				
2		Format this cell to use number formatting conventions	194593.12	
3				
4		Format this number to display no decimal places.	194593	
5		Format this number to display 1 decimal place	194594.1	
6		Format this number to display 2 decimal place	194595.12	
7				

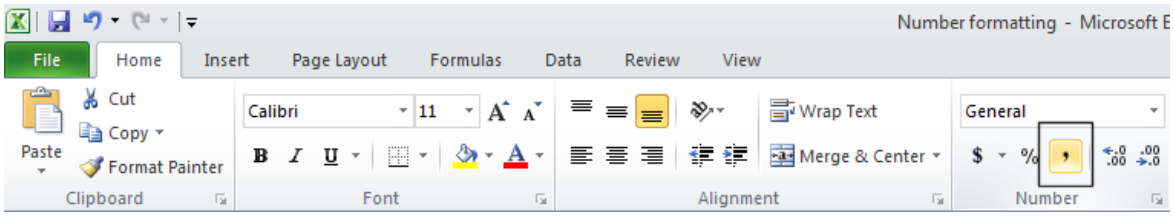
TIP: To increase the number of decimal points displayed, click on the **Increase Decimal** icon.

Applying and removing comma style formatting (to indicate thousands)

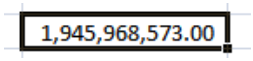
Click on cell **C8**.

	A	B	C
1			
2		Format this cell to use number formatting conventions	194593.12
3			
4		Format this number to display no decimal places.	194593
5		Format this number to display 1 decimal place	194594.1
6		Format this number to display 2 decimal place	194595.12
7			
8		Format this number to display comers	1945968573
9			

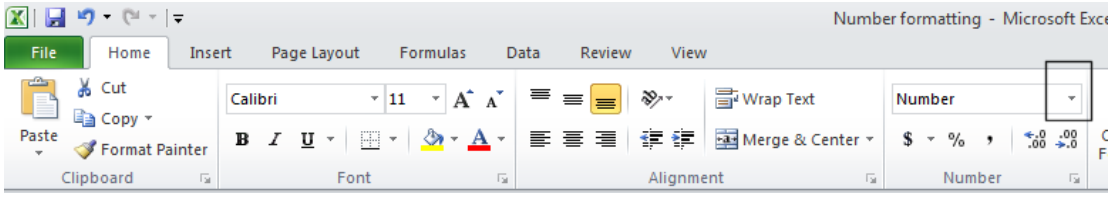
Click on the **Comma** Style icon (within the **Number** group under the **Home** tab) to format the number using commas.



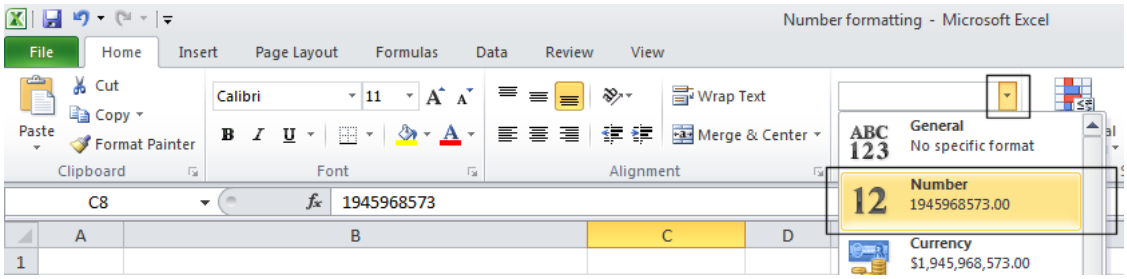
Your number should now look like this.



NOTE: To remove comma style formatting, click on the down arrow next to the **Number format** icon (within the **Number** section of the **Home** tab).



Select the General or Number format option, as illustrated.



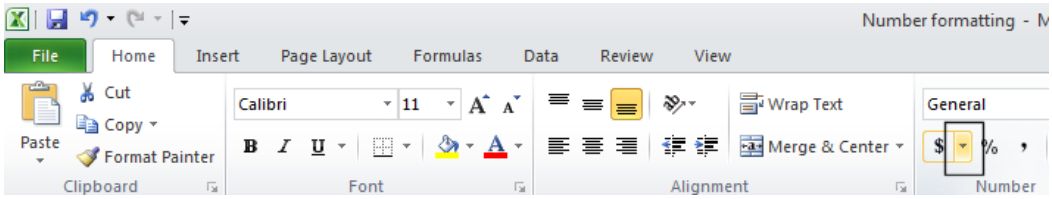
The cell contents will now be displayed without comma style formatting.

Currency symbol

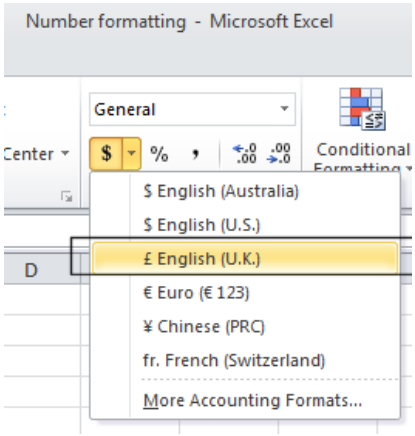
Select cell **C10**.

	A	B	C
1			
2		Format this cell to use number formatting conventions	194593.12
3			
4		Format this number to display no decimal places.	194593
5		Format this number to display 1 decimal place	194594.1
6		Format this number to display 2 decimal place	194595.12
7			
8		Format this number to display comers	1945968573.00
9			
10		Format this number to display a UK pound sign	234.98
11		Format this number to display a dollar sign	234.98

Format it to display the British Pound symbol. To do this click on the down arrow next to the Currency icon.



From the list displayed, select the £ option.

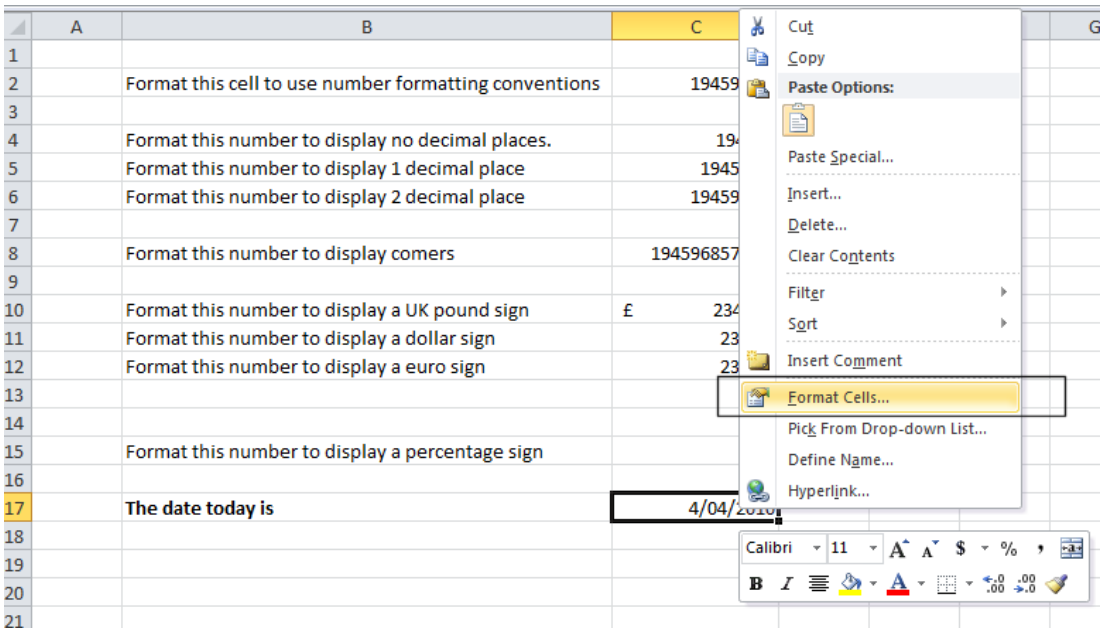


Select cell C11 and format it to display the Dollar symbol.
Select cell C12 and format it to display the Euro symbol. Your data will now look like this.

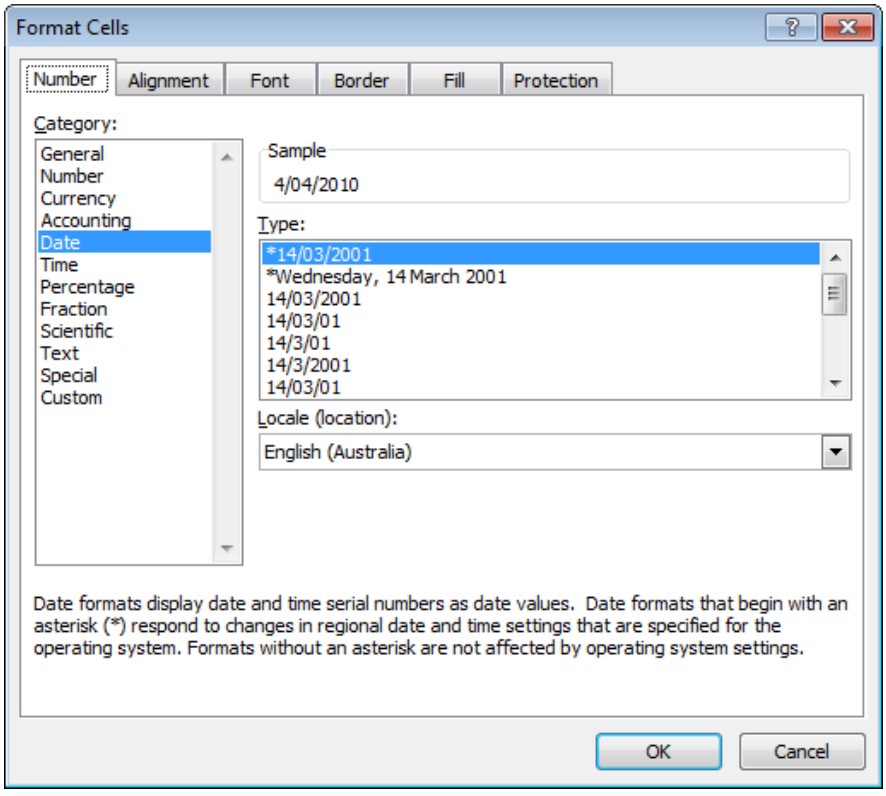
£	234.98
$	234.98
€	234.98

Date styles

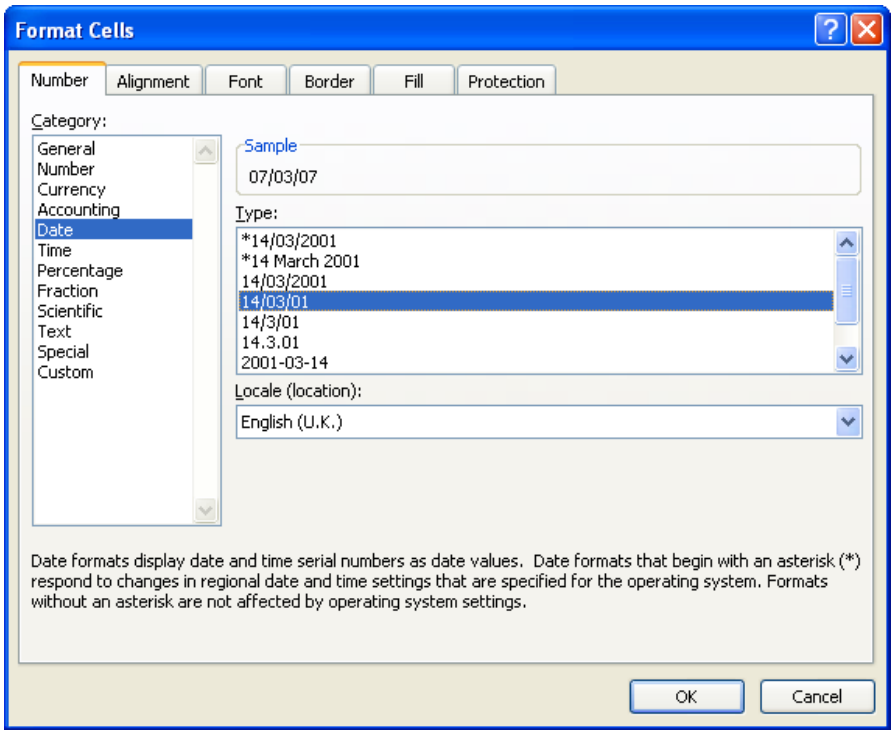
Click on cell **B17** and type in the text **'The date today is'**.
Click on cell **C17** and type in today's date. When you press the **Enter** key you may find that the style of the date changes automatically.
Right click over cell **C17** and from the popup menu displayed select the **Format Cells** command.



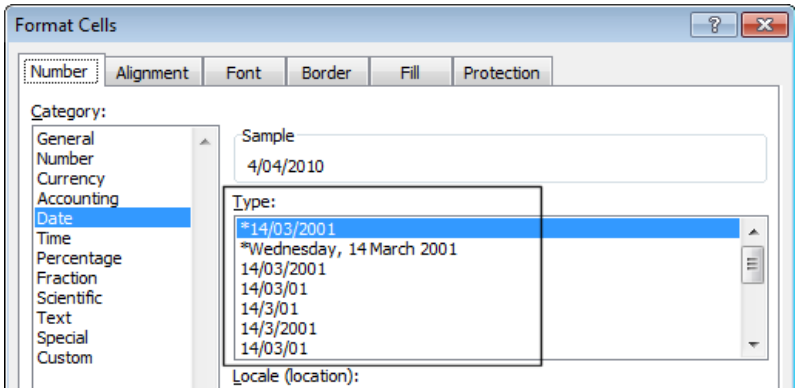
This will display the **Format Cells** dialog box.



If necessary, within the **Category** section of the dialog box, select the **Date** category.



Select the required format from the **Type** section of the dialog box.



Click on the **OK** button to apply the date format. Experiment with applying different types of date format to the cell.

Formulas

Creating formulas

Open a workbook called **Formulas**. Click on cell **E3**.

In cell **E3** we need to create a formula that will calculate the value of the stock for that particular component. To do this we need to multiply the contents of cell **C3** by the content of cell **D3**.

All formulas within Excel start with the 'equals' symbol.

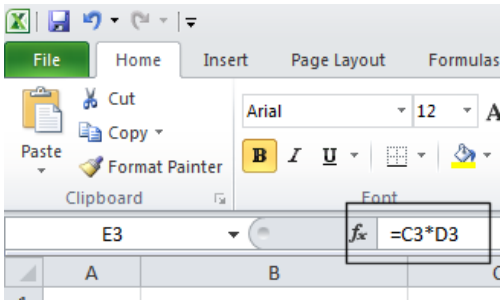
Type in the following formula.

=C3*D3

TIP: the * symbol means 'times'.

Press the **Enter** key and you will see the result of the calculation in cell **E3**.

Click on cell **E3** and you will see the formula displayed in the bar above the worksheet.



The easy way to create formulas

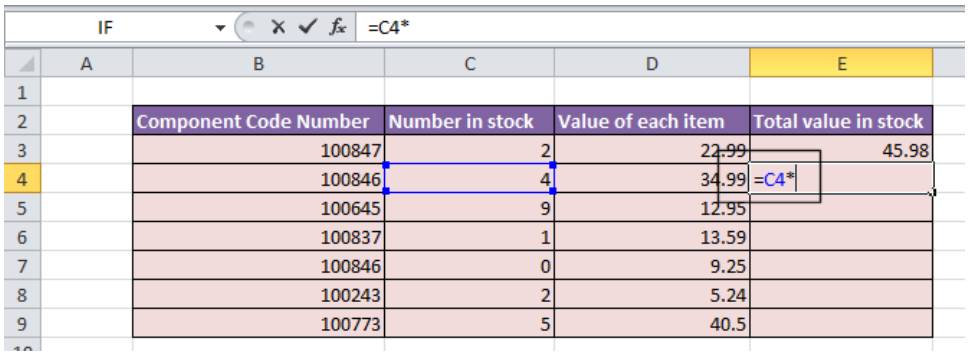
Click on cell **E4** and type in the equals sign.

	A	B	C	D	E
1					
2		Component Code Number	Number in stock	Value of each item	Total value in stock
3		100847	2	22.99	45.98
4		100846	4	34.99	=
5		100645	9	12.95	
6		100837	1	13.59	
7		100846	0	9.25	
8		100243	2	5.24	
9		100773	5	40.5	
10					

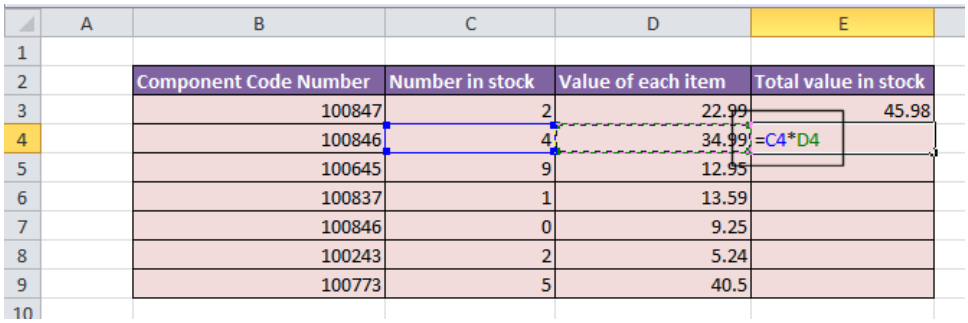
Click on cell **C4** and you see this.

	A	B	C	D	E
1					
2		Component Code Number	Number in stock	Value of each item	Total value in stock
3		100847	2	22.99	45.98
4		100846	4	34.99	=C4
5		100645	9	12.95	
6		100837	1	13.59	

Type in the * symbol, you see this.



Click on cell **D4** and you will see this.



Press the **Enter** key and you see the result of the calculation. This method may seem more complicated at first but when you are creating complex formulas, you will find this method is actually easier and helps to reduce errors, such as typing incorrect cell references.

Using operators in formulas

Open a workbook called Formula operators.

Click on cell C3 and enter the following which will add the number **3** and **7**:
=3+7

Press the **Enter** key and you will see the result displayed in the cell.

Click on cell **C4** and enter the following which will subtract the number **4** from the number **18**:
=18-4

Press the **Enter** key and you will see the result displayed in the cell.

Click on cell **C5** and enter the following which will divide the number **20** by the number **4**:
=20/4

Press the **Enter** key and you will see the result displayed in the cell.

Click on cell C6 and enter the following which will multiply the number **4** by the number **9**:
=4*9

Press the **Enter** key and you will see the result displayed in the cell.

Save your changes and close the workbook.

Formula error messages

When writing formulas it is easy to make a mistake: listed below are some common error messages.

#######
The contents of the cell cannot be displayed correctly as the column is too narrow.

#REF!
Indicates that a cell reference is invalid. This is often displayed when you delete cells which are involved in a formula.

#NAME?
Excel does not recognise text contained within a formula.

#DIV/0!
This indicates that you have tried to divide a number by zero (0).

Relative cell referencing within formulas

Open a workbook called **Cell referencing**.
The first worksheet within the workbook lets us look at relative addressing.
Click on cell **E4**. We need to insert the formula for multiplying items in column C by the items in columns D.

Type in the following formula:
=C4*D4

Press the **Enter** key and you will see the result of the calculation in cell **E4**.
Click on cell **E4**, and move the mouse pointer to the bottom-right corner of cell **E4**, and when the pointer changes to the shape of a small black cross, press the mouse button, and keep it pressed down. Drag down the page to cell **E12** and then release the mouse button.

If you click on cell **E5** you will see the following **=C5*D5**
If you click on cell **E6** you will see the following **=C6*D6**
If you click on cell **E7** you will see the following **=C7*D7**
If you click on cell **E8** you will see the following **=C8*D8**
If you click on cell **E9** you will see the following **=C9*D9**
If you click on cell **E10** you will see the following **=C10*D10**
If you click on cell **E11** you will see the following **=C11*D11**
If you click on cell **E12** you will see the following **=C12*D12**

As you can see the referencing is completely relative. This will become clearer when you have worked through the rest of this section.

Absolute cell referencing within formulas

Click on the **Absolute** tab at the bottom of the worksheet.
Click on cell **D4**. We need to enter a formula that will take the price and then add 5% to the price to give a total value.

The 5% figure has been entered into cell **C15**.

Type in the following formula into cell **D4**.
=C4*C15

If you do the sums, you will find that this formula displays the correct delivery charge price in cell **D4**.

Click on cell **D4**, and move the mouse pointer to the bottom-right corner of cell **D4**, and when the pointer changes to the shape of a small black cross, press the mouse button, and keep it pressed down. Drag down the page to cell **D12** and then release the mouse button. The data will look something like this.

Part Number	Price (excluding delivery)	Cost of delivery
100837	22.99	1.15
100263	10.95	0.00
100937	20.50	0.00
100234	10.50	0.00
100375	12.95	0.00
100746	29.84	0.00
100387	23.43	0.00
100883	9.48	0.00
100338	20.50	0.00

As you can see something has gone very wrong, as the 5% delivery charge appears to be 0 for most of the items.

Click on cell **D5** and you can see what the problem is. The formula contained within this cell is:
=C5*C16

Part of the cell reference points to cell **C16** (which if you check is empty). The problem is that because of the relative nature of the formula, the component that should always refer to the contents of the cell in **C15** (i.e. the delivery charge percentage), in fact moves down as you drag down the screen to extend your calculations.

Select the range **D4:D12** and press the **Del** key to delete the cell contents.

Click on cell **D4** and we will try again. This time type in the following formula.
=C4*$C$15

The dollar signs make the reference to cell **C15** absolute.

Try extending the formula to fill the range down to **D12**. This time you should find that the delivery charges are calculated correctly.

Part Number	Price (excluding delivery)	Cost of delivery
100837	22.99	1.15
100263	10.95	0.55
100937	20.50	1.03
100234	10.50	0.53
100375	12.95	0.65
100746	29.84	1.49
100387	23.43	1.17
100883	9.48	0.47
100338	20.50	1.03

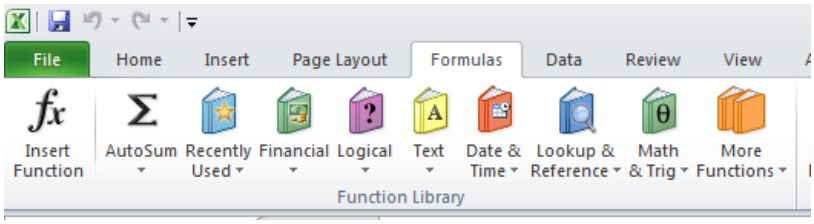
TIP: You have seen relative and absolute referencing. You can also have mixed references, which contain an absolute and a relative reference.

Save your changes and close the workbook.

Functions

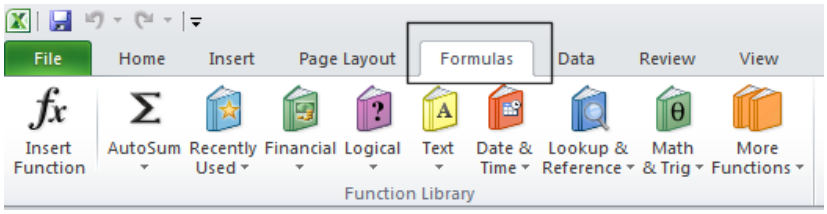
What are functions ?

A function allows you to calculate a result such as adding numbers together, or finding the average of a range of numbers. Functions are located under the **Formulas** tab.

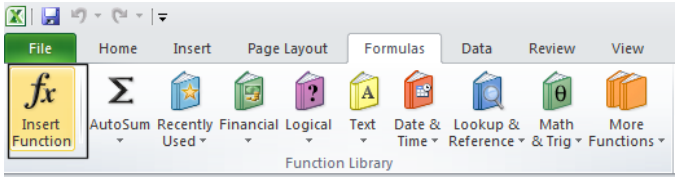


Common functions

Some commonly used functions include:



AVERAGE: Used to determine the average value of the selected cells contents.



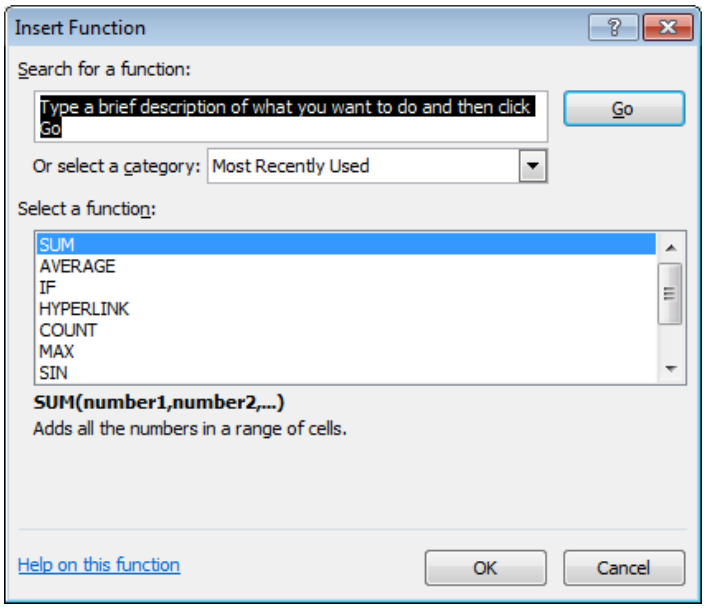
COUNT: Used to count how many numbers are in the list.

MAX: Used to return the maximum number from a list.

MIN: Used to return the minimum number from a list.

SUM: Used to add the contents of selected cells.

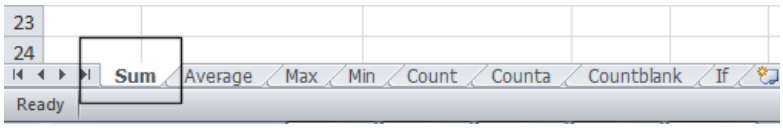
This will display the **Insert Function** dialog box.



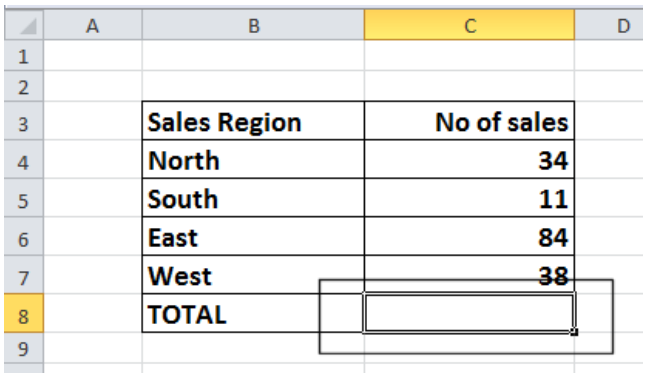
Scroll down the list which as you will see is extensive.

Sum function

Open a workbook called **Functions.**
If necessary, click on the **Sum** worksheet tab.



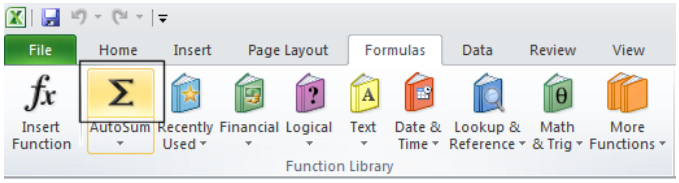
Click on cell **C8.**



	A	B	C	D
1				
2				
3		Sales Region	No of sales	
4		North	34	
5		South	11	
6		East	84	
7		West	38	
8		TOTAL		
9				

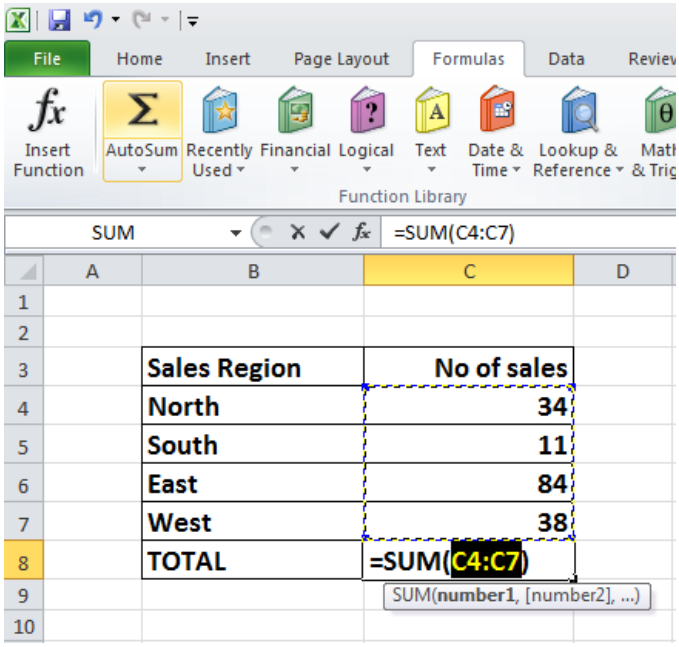
In this cell we need to sum the values in the column above.

Click on the Formulas tab and within the Function Library group click on the AutoSum icon.

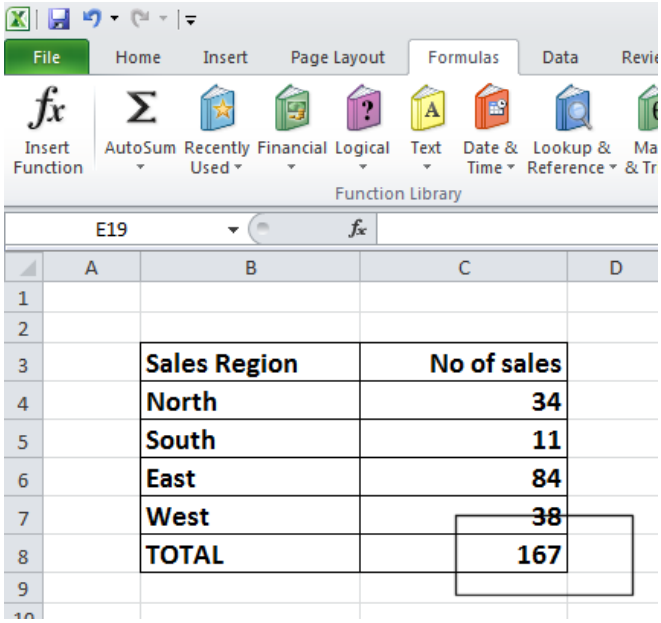


TIP: Click on the **AutoSum** icon, not the **down arrow** under or beside the icon.

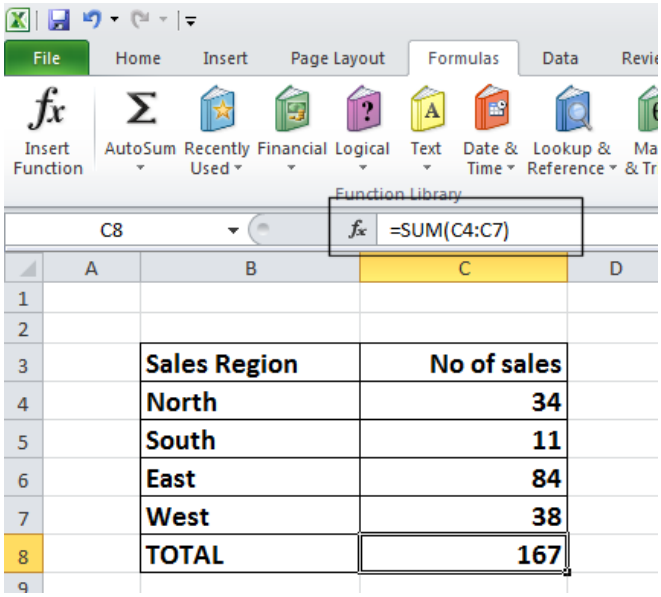
You will see the following displayed on your screen.



Press the **Enter** key and you will see the AutoSum result in cell **C8.**



Click on cell **C8,** and you will see the function displayed in the bar just above your worksheet.



As you can see the function is:

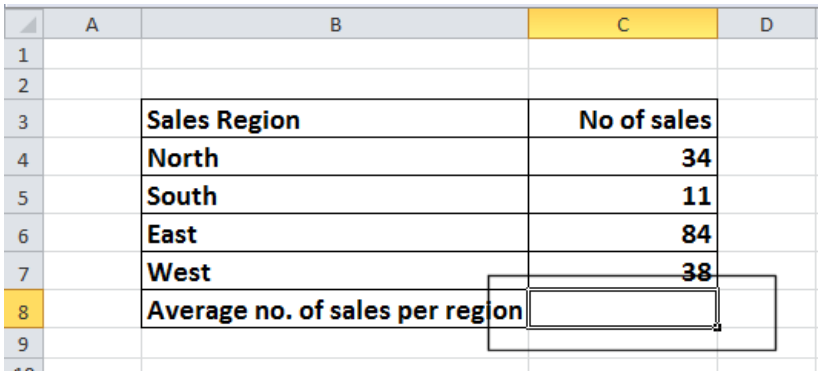
=SUM(C4:C7)

This function tells Excel to sum the values in the range **C4:C7.**

Average function

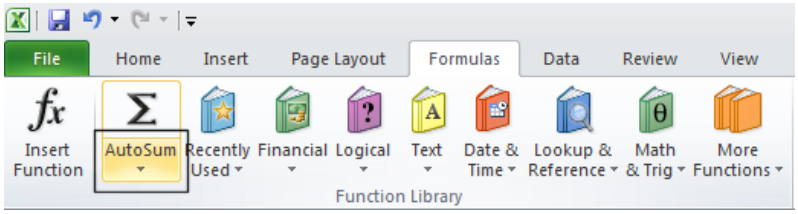
Click on the **Average** worksheet tab.

Click on cell **C8**.

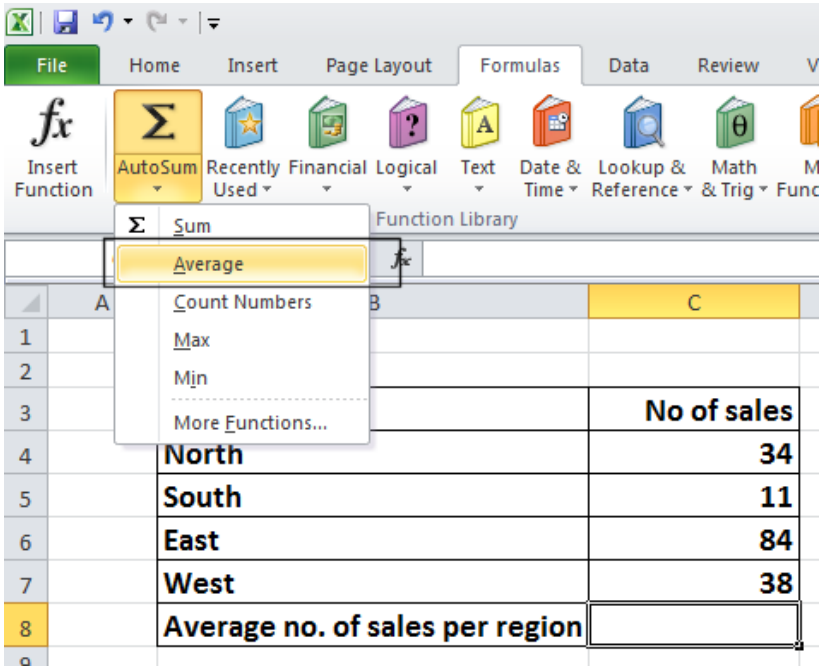


	A	B	C	D
1				
2				
3		Sales Region	No of sales	
4		North	34	
5		South	11	
6		East	84	
7		West	38	
8		Average no. of sales per region		
9				

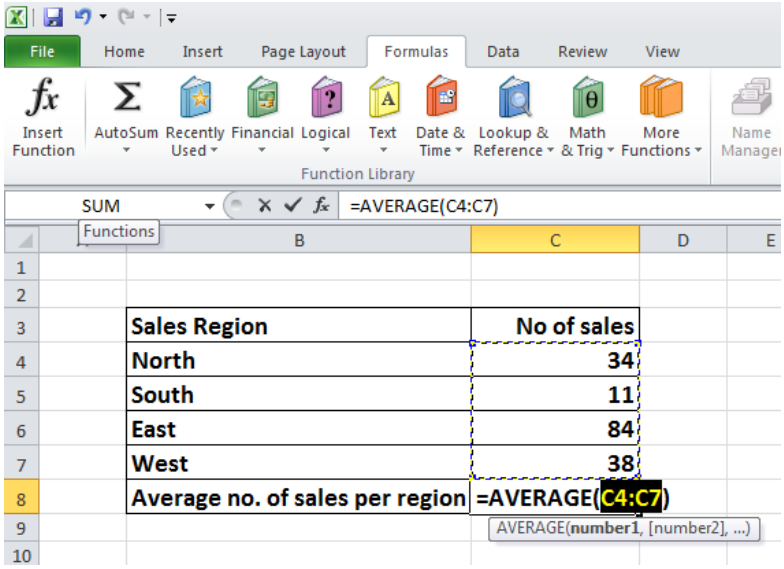
In this cell we want to display the average number of sales within the regions.
Click on **the Formulas** tab and within the **Function Library** group click on the **arrow** under (or next to) the **AutoSum** icon.



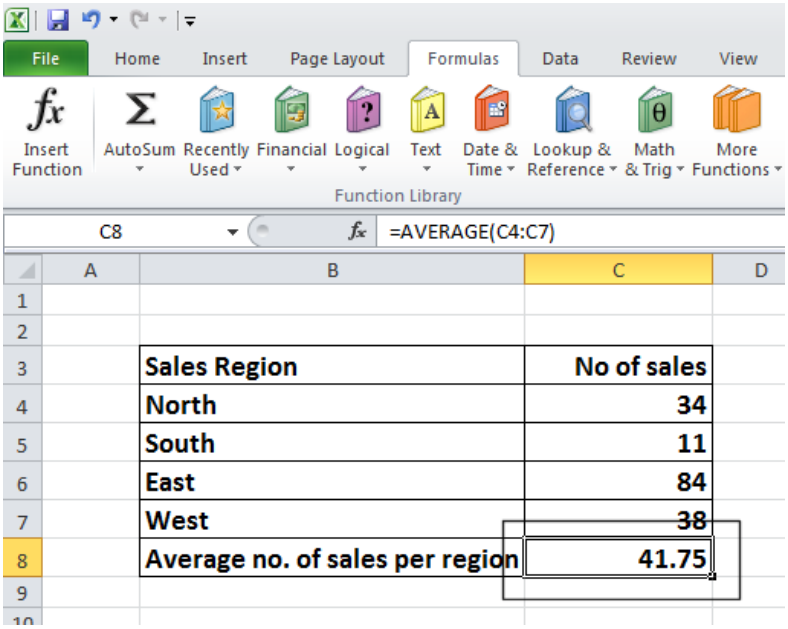
You will see a drop down list displayed.
Click on the **Average** command.



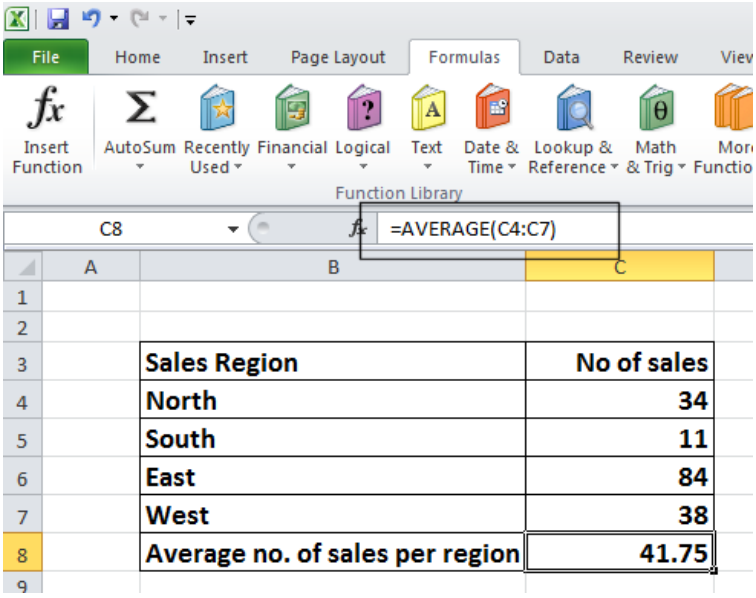
You will see the following displayed on your screen.



Press the **Enter** key and you will see the average value displayed in cell **C8**.



Click on cell **C8,** and you will see the function displayed in the bar just above your worksheet.



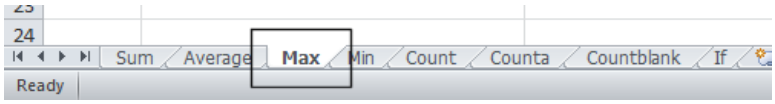
As you can see the function is:

=AVERAGE(C4:C7)

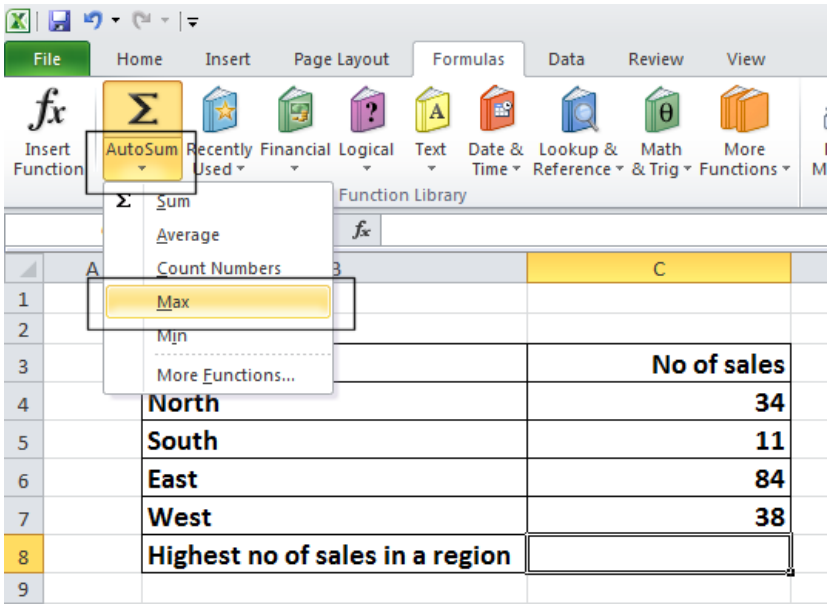
This function tells Excel to sum the average in the range **C4:C7**.

Max function

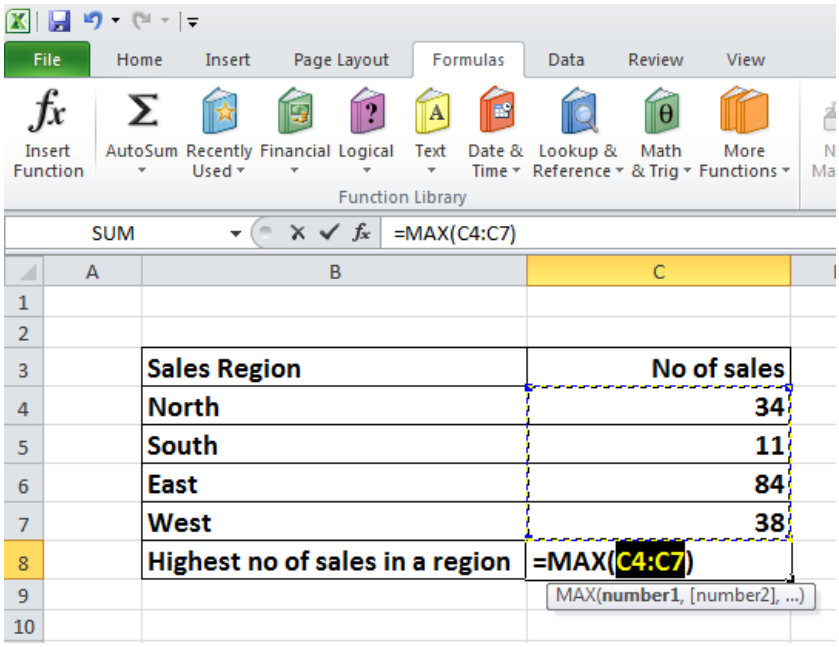
Click on the **Max** worksheet tab.



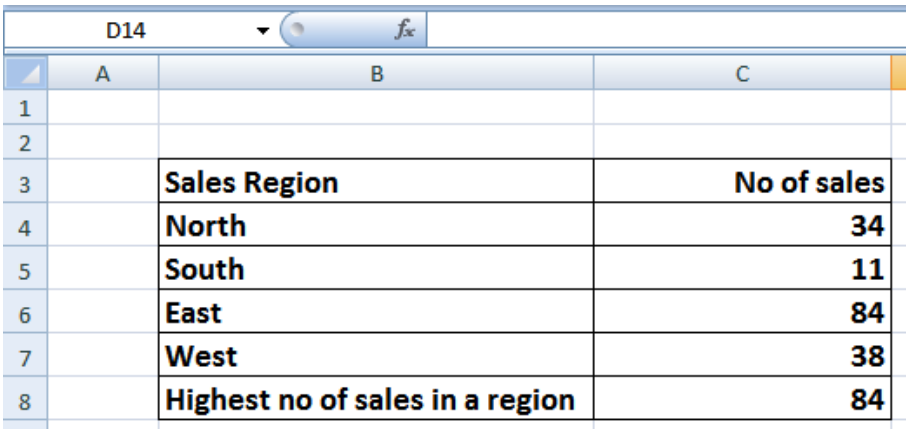
Click on cell **C8.** In this cell we want to display the highest number of sales within a region.
Click on the **Formulas** tab and within the **Function Library** group click on the **down arrow** under (or next to) the **AutoSum** icon. You will see a drop down list displayed. Click on the **Max** command.



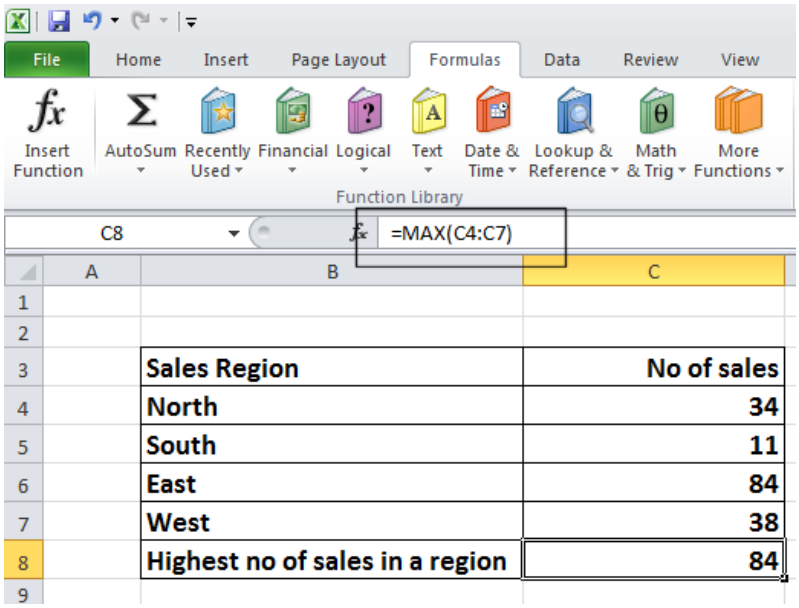
You will see the following displayed on your screen.



Press the **Enter** key and you will see the maximum value displayed in cell **C8**.



Click on cell **C8,** and you will see the function displayed in the bar just above your worksheet.



As you can see the function is:

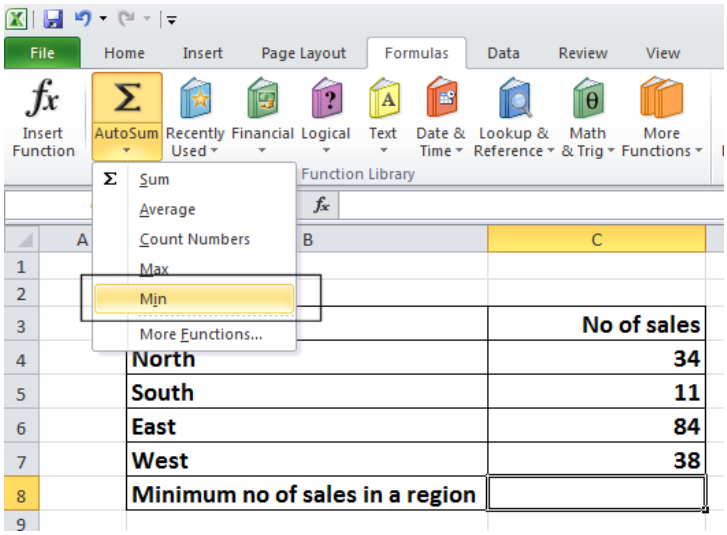
=MAX(C4:C7)

This function tells Excel to display the maximum value within the range **C4:C7**.

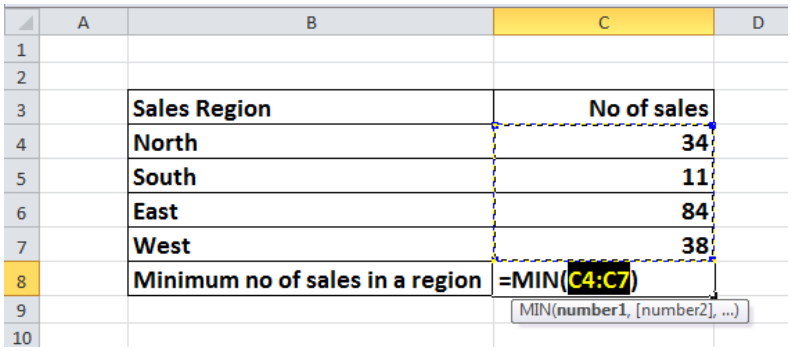
Min function

The MIN function will display the minimum number within a range.
Click on the **Min** worksheet tab.

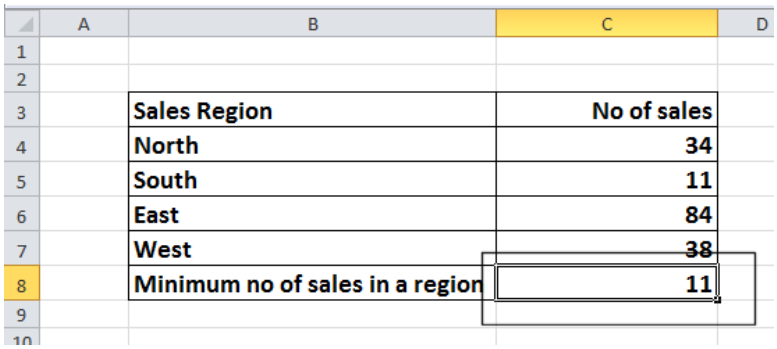
Click on cell **C8**. In this cell we want to display the lowest number of sales within a region.
Click on the Formulas tab and within the **Function Library** group click on the **down arrow** under (or next to) the **AutoSum** icon. You will see a drop down list displayed. Click on the **Min** command.



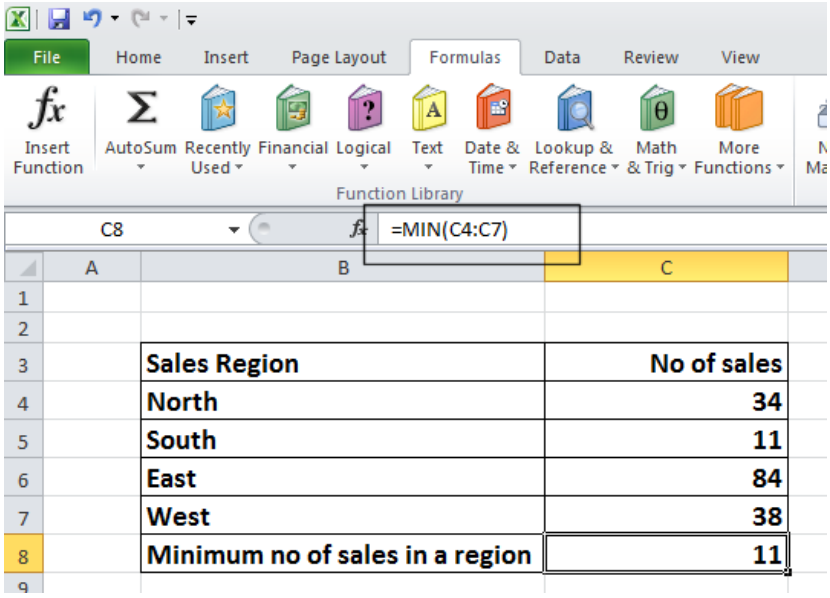
You will see the following displayed on your screen.



Press the **Enter** key and you will see the minimum value displayed in cell **C8**.



Click on cell **C8,** and you will see the function displayed in the bar just above your worksheet.



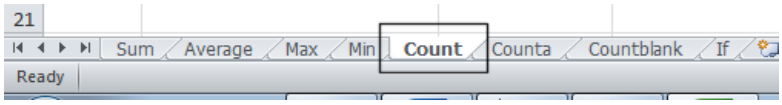
As you can see the function is:

=MIN(C4:C7)

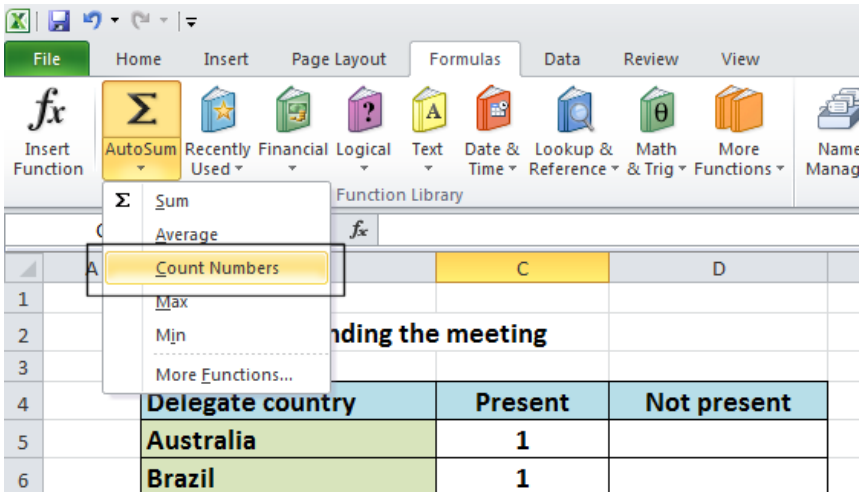
This function tells Excel to display the minimum value within the range **C4:C7**.

Count function

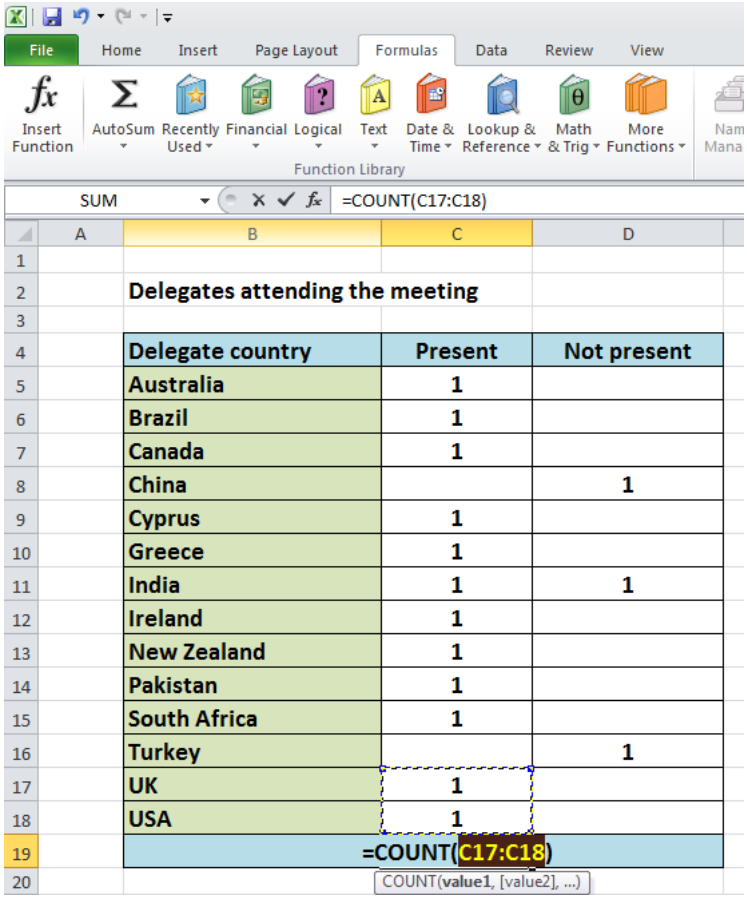
The **Count** function will count up the number of cells which contain numbers.
Click on the **Count** worksheet tab.



Click on cell **C19.** In this cell we want to display the number of cells in the column above that contain a number. Click on the **Formulas** tab and within the **Function Library** group click on the **down arrow** under (or next to) the **AutoSum** icon. You will see a drop down list displayed. Click on the **Count Numbers** command.



You will see the following displayed on your screen.

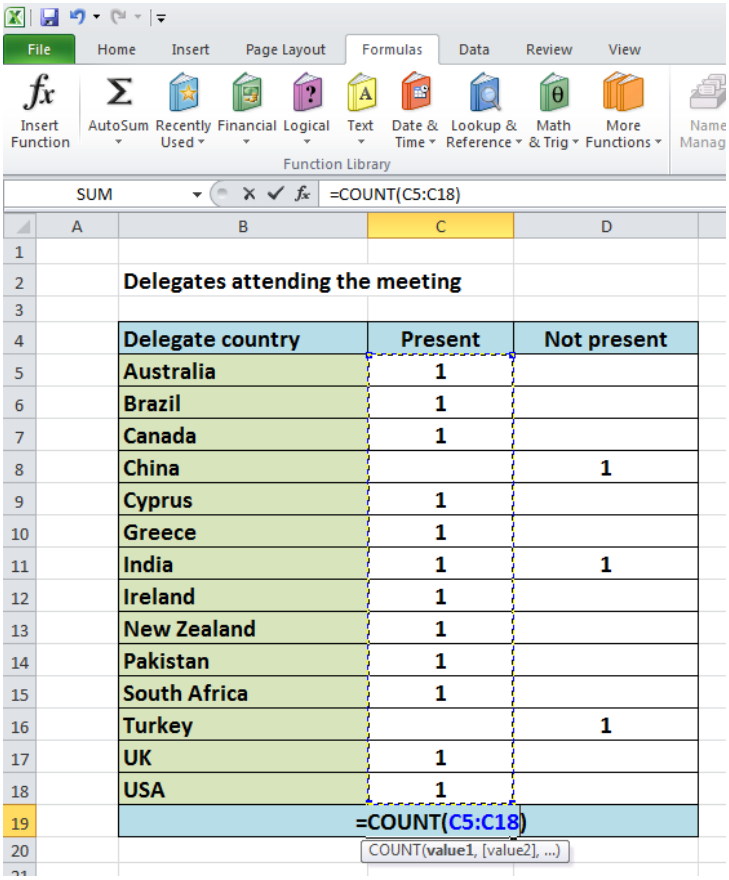


Setup & Printing Issues

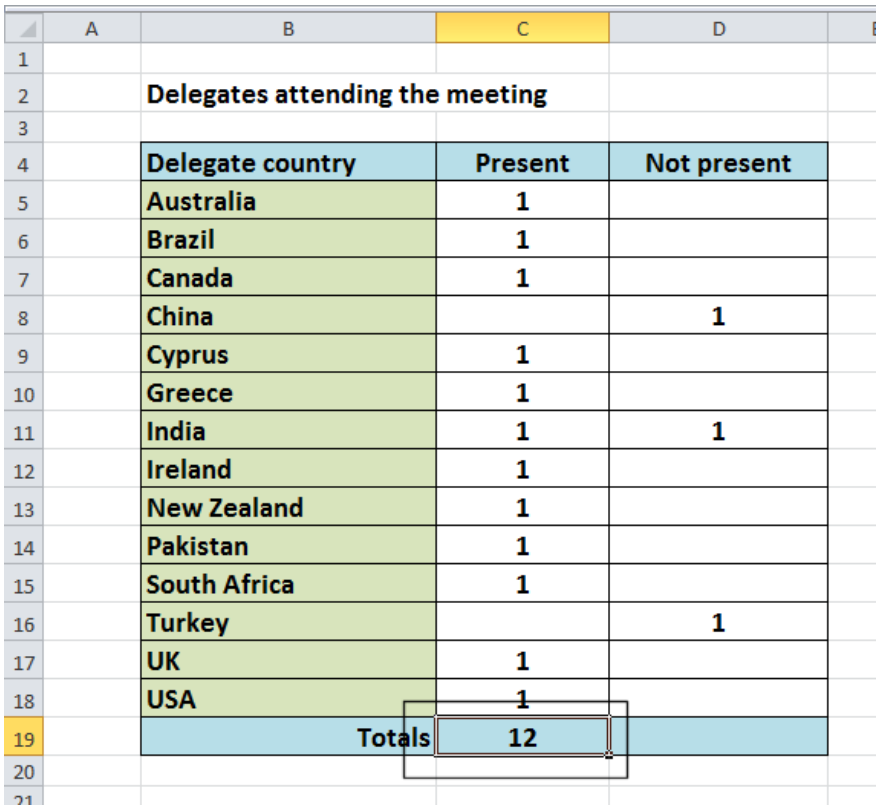
In all the previous examples, there was a column containing values immediately above the cell into which we inserted the function. In this case some of the cells within the column are empty and Excel, as you can see, has only applied the Count function to the range C17:C18. The reason for this is that the next cell up, i.e. cell C16 is empty.

We need to tell Excel that the range we are interested in actually extends from C5:C18.

To do this, click on cell C18 and while holding down the mouse button drag up to cell C5. Then release the mouse button. Your screen should now look like this.

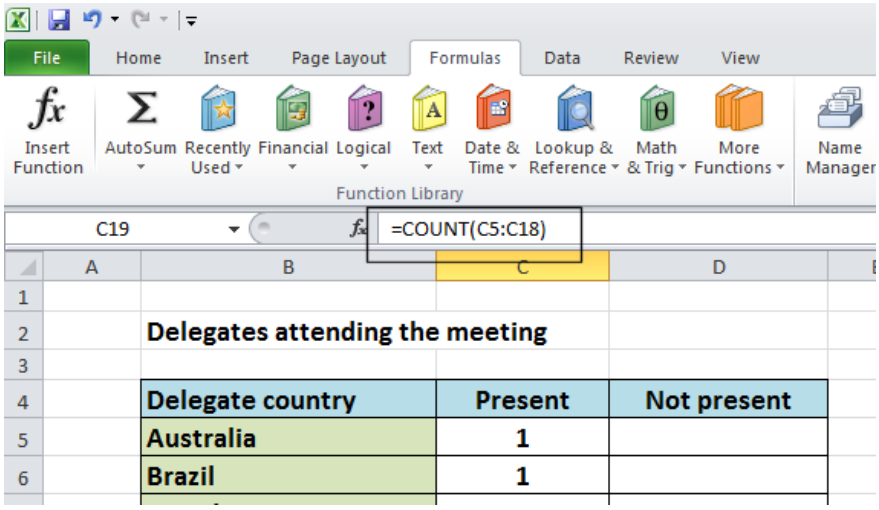


Press the **Enter** key and you will see the count value displayed in cell **C19.**



	A	B	C	D
1				
2		**Delegates attending the meeting**		
3				
4		**Delegate country**	**Present**	**Not present**
5		**Australia**	**1**	
6		**Brazil**	**1**	
7		**Canada**	**1**	
8		**China**		**1**
9		**Cyprus**	**1**	
10		**Greece**	**1**	
11		**India**	**1**	**1**
12		**Ireland**	**1**	
13		**New Zealand**	**1**	
14		**Pakistan**	**1**	
15		**South Africa**	**1**	
16		**Turkey**		**1**
17		**UK**	**1**	
18		**USA**	**1**	
19		**Totals**	**12**	
20				

Click on cell **C19,** and you will see the function displayed in the bar just above your worksheet.



	A	B	C	D
1				
2		**Delegates attending the meeting**		
3				
4		**Delegate country**	**Present**	**Not present**
5		**Australia**	**1**	
6		**Brazil**	**1**	

As you can see the function is:

=COUNT(C5:C18)

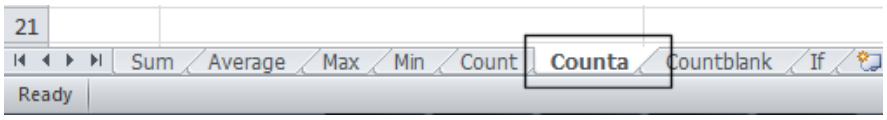
This function tells Excel to display the number of cells containing a value within the range **C5:C18.**

NOTE: If you made a mistake, click on cell **C19** and press the **Del** key. Then try again.

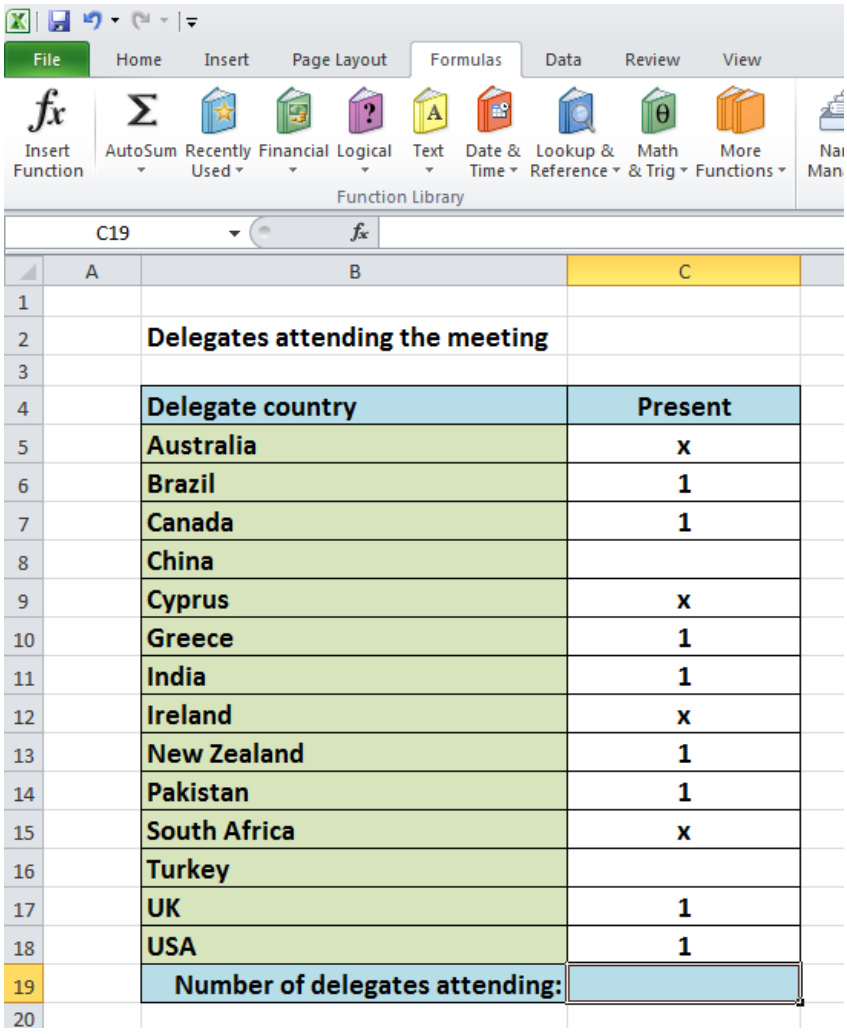
Use the same technique to count up the number of people who could not attend, and display the value in cell **D19.**

The COUNTA function

Used to count the number of cells within a range that are not empty.
Click on the **Counta** worksheet tab.

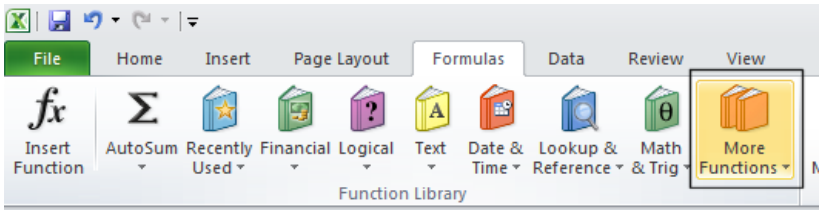


You will see data that contains a mixture of numbers (1) and letters (x).

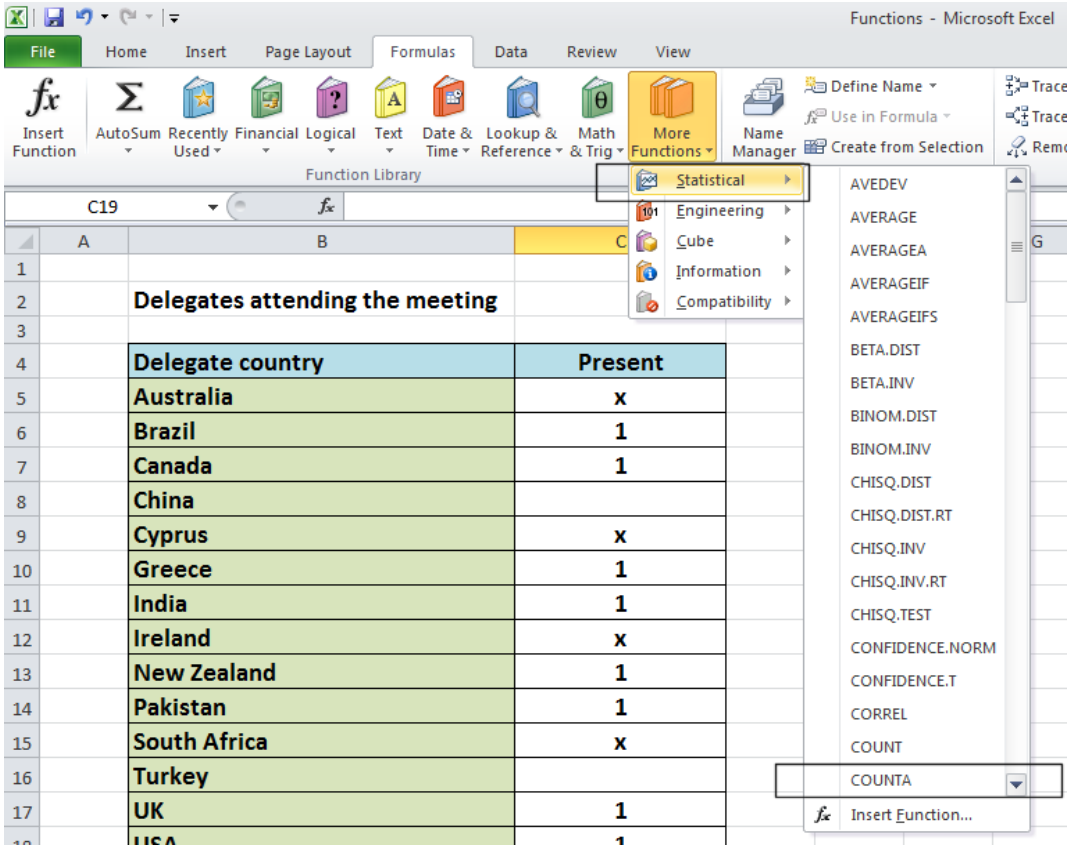


	A	B	C
1			
2		**Delegates attending the meeting**	
3			
4		**Delegate country**	**Present**
5		**Australia**	**x**
6		**Brazil**	**1**
7		**Canada**	**1**
8		**China**	
9		**Cyprus**	**x**
10		**Greece**	**1**
11		**India**	**1**
12		**Ireland**	**x**
13		**New Zealand**	**1**
14		**Pakistan**	**1**
15		**South Africa**	**x**
16		**Turkey**	
17		**UK**	**1**
18		**USA**	**1**
19		**Number of delegates attending:**	
20			

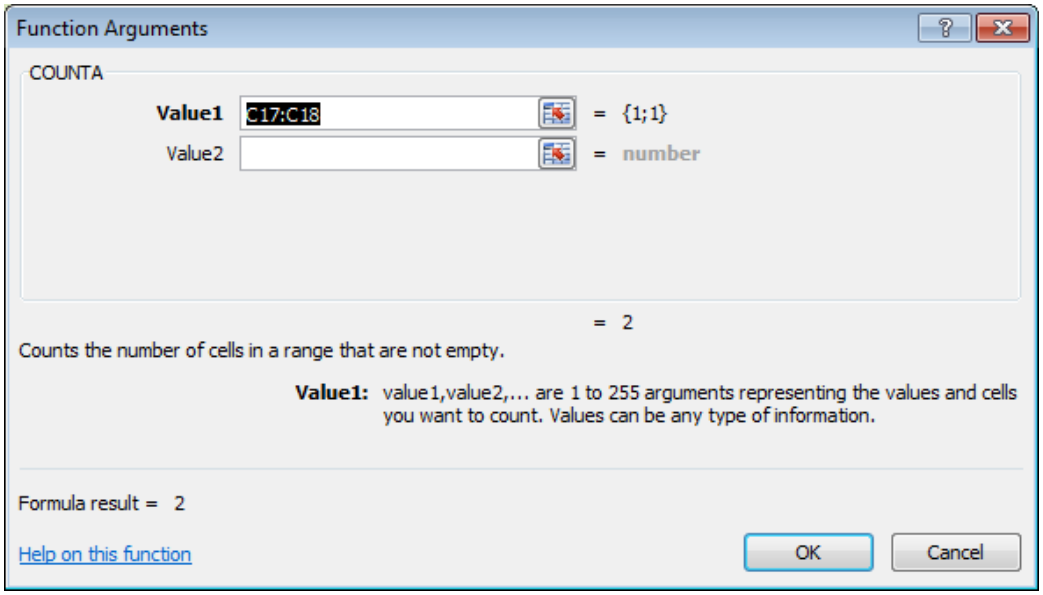
The Count function would only count up the number of cells containing numbers, whereas Counta will count the number of cells containing numbers and letters.
Click on cell **C19**.Click on the **More Functions** icon (contained within the **Function Library** section of the **Formulas** tab).



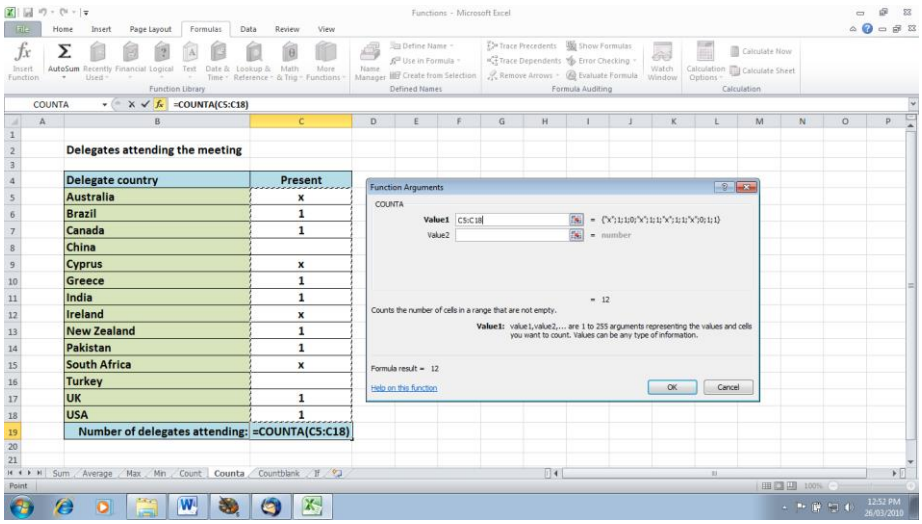
From the drop down displayed, select **Statistical**. From the submenu select **Counta**.



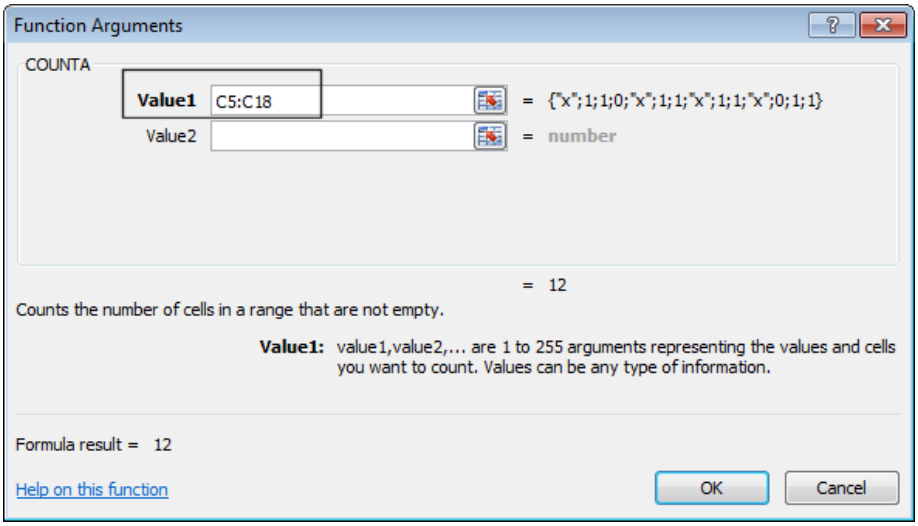
This will display the **Function Arguments** dialog box, as illustrated.



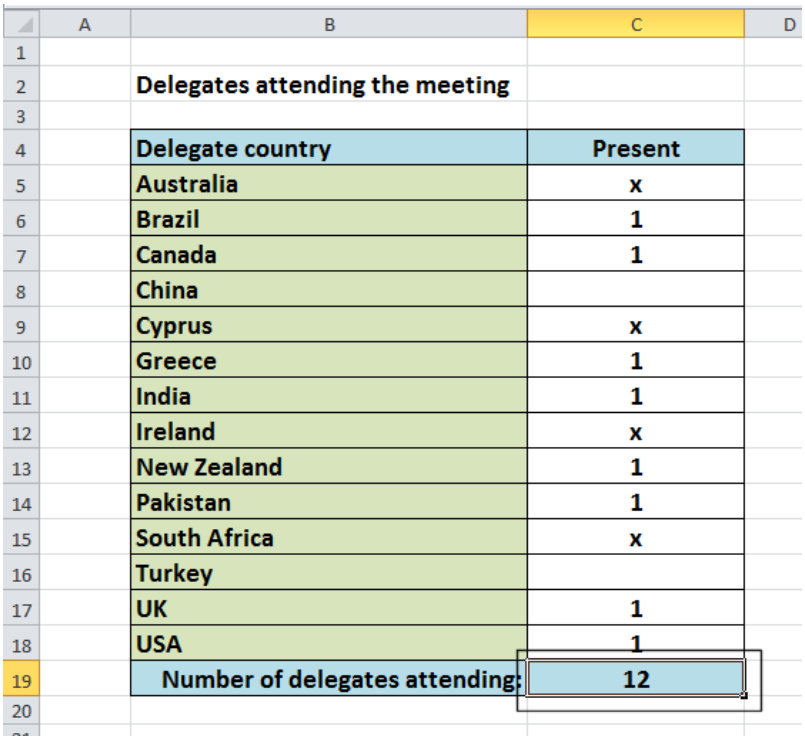
If necessary move the dialog box to one side and then select the cell range **C5:C18**, as illustrated.



The **Function Argument** dialog box will look like this.



Click on the **OK** button and you will see the following.



As you can see the function has counted every instance of a number or letter within the specified cell range.

What are 'IF functions'?

Excel has a number of functions which allow us to evaluate values and make decisions based on the result of the evaluation. The **IF( ) FUNCTION** is one of these.

IF( ) SYNTAX
The format (Syntax) of the IF( ) function is as follows:
IF(LOGICAL_TEST, ACTION_IF_TRUE, ACTION_IF_FALSE)

LOGICAL_TEST
The logical_test evaluates an expression to see if it passes the test, i.e. is TRUE or does not pass the test, i.e. is FALSE

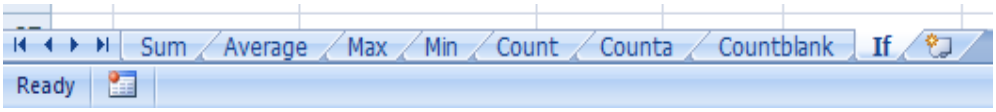
Logical operators		Values for Evaluation A=10 B=5 C=15 D=10	Result
	= (Equal to)	A=B	FALSE
		A=D	TRUE
	> (Greater than)	A>B	TRUE
		A>C	FALSE
	< (Less than)	A<B	FALSE
		A<C	TRUE
	>= (Greater than or Equal to)	A>=B	TRUE
		A>=D	TRUE
		A>=C	FALSE
	<= (Less than or Equal to)	A<=B	FALSE
		A<=C	TRUE
		A<=D	TRUE

ACTION_IF_TRUE
Action_if_true can be a value or an operation. Whichever, the result is placed in the cell which contains the IF( ) Function if the logical_test is true.

ACTION_IF_FALSE
Action_if_false can be a value or an operation. Whichever, the result is placed in the cell which contains the IF( ) Function if the logical_test is false.

Using the IF function

Click on the If worksheet tab.

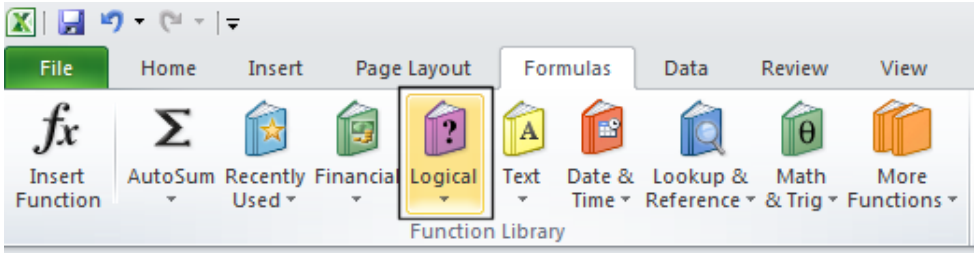


In cells **J8:J13** we need to display the word **PASS** or **FAIL**, depending on whether the average is over **70%**.

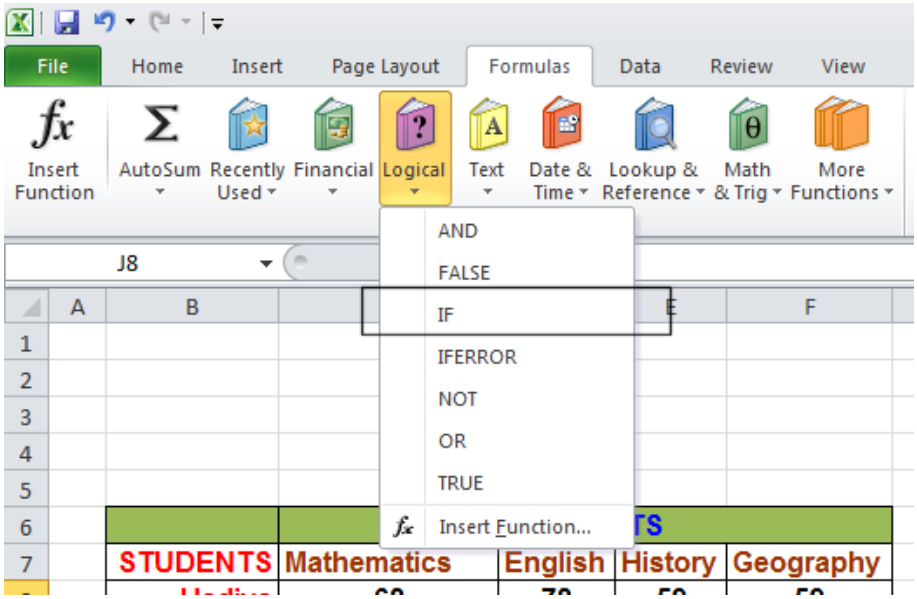
		SUBJECTS					
	STUDENTS	Mathematics	English	History	Geography	Average grades	Passed?
	Hadiya	68	78	59	59	66	
	Dai	69	69	69	67	69	
	Aaron	76	78	79	87	80	
	Rowan	67	86	58	65	69	
	Aaliyah	85	77	87	78	82	
	Gabriela	59	68	78	89	74	

To pass a student needs an average grade of over 70%

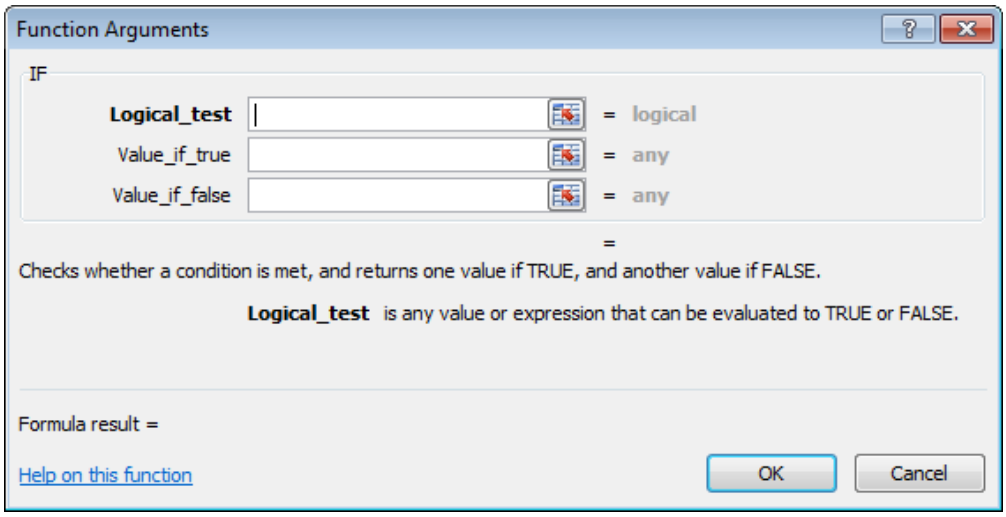
Click on the cell **J8.**
Click on the **Logical** icon within the **Function Library** group of the **Formulas** tab.



This will display a drop down list. Select the **IF** command.



This will display the **Function Arguments** dialog box.

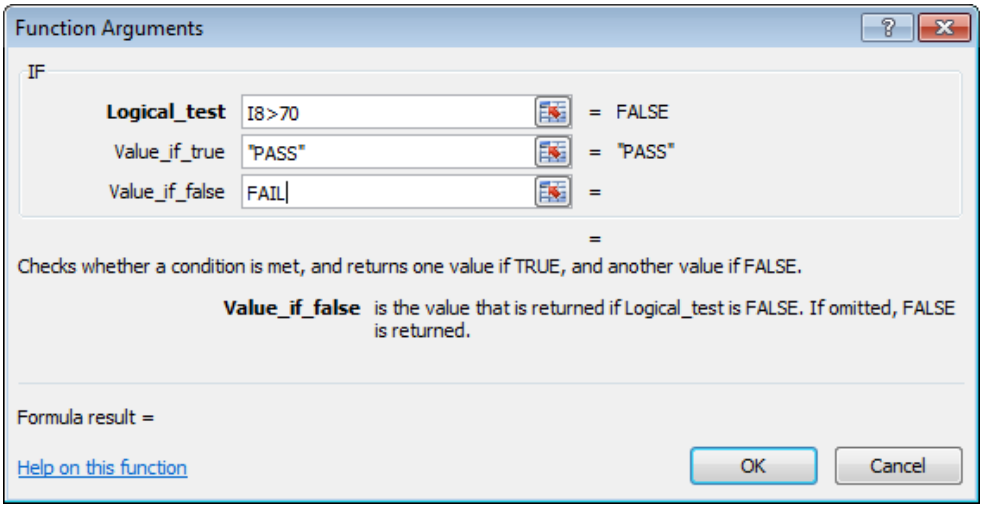


In the **LOGICAL_TEST** section of the dialog box, we enter the logical test, i.e. **I8>70**

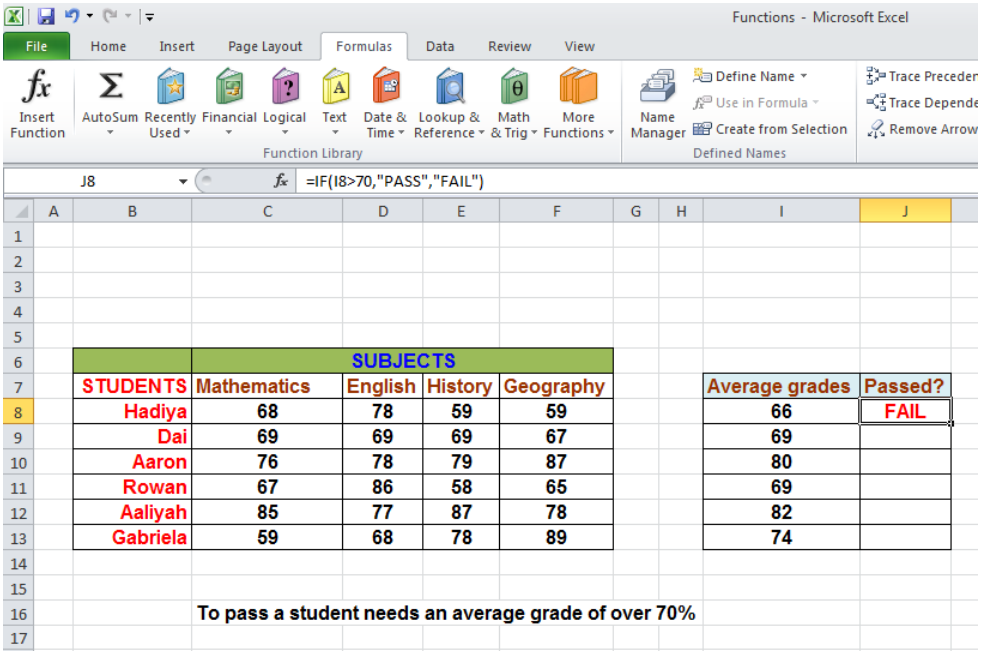
In the **VALUE_IF_TRUE** section of the dialog box, we enter the word **PASS.**

In the **VALUE_IF_FALSE** section of the dialog box, we enter the word **FAIL.**

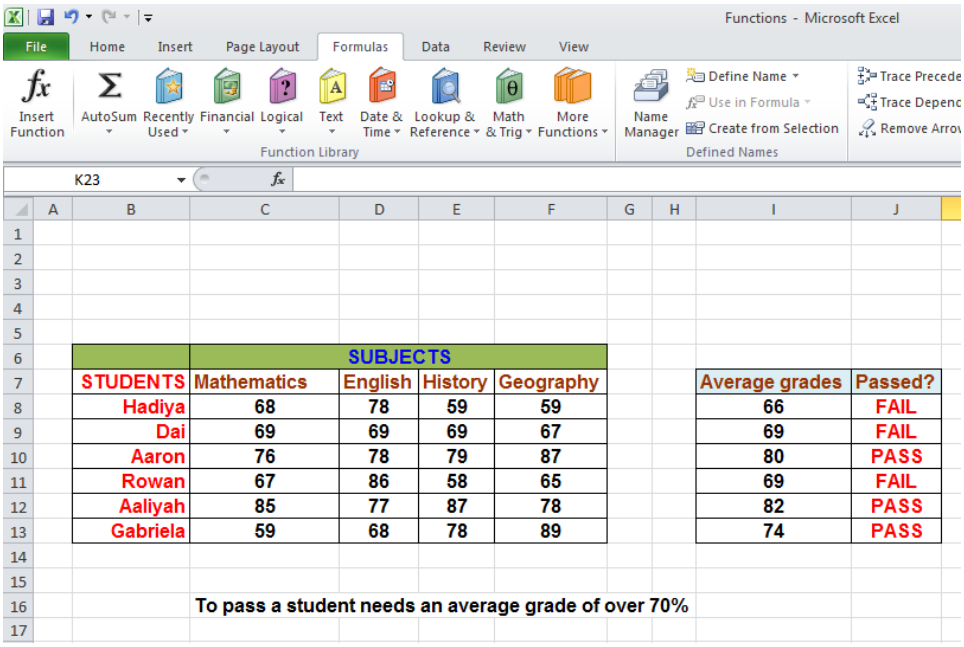
Your dialog box will now look like this.



Click on the **OK** button to continue. Your screen will now look like this.



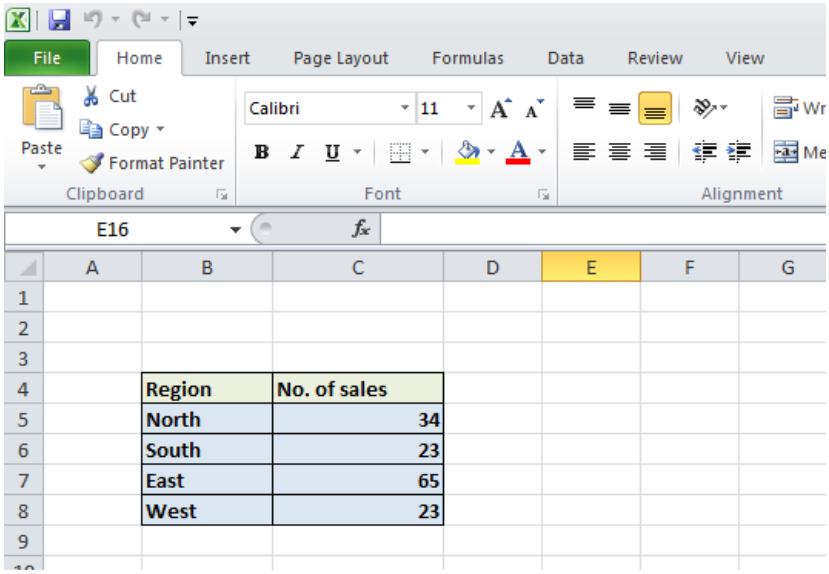
Use the normal Excel drag techniques to extend this function to the cells I9:J13. Your screen will now look like this.



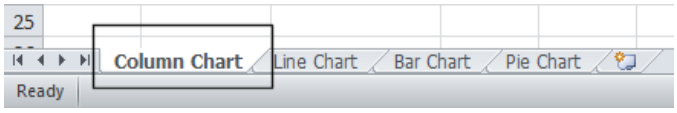
Charts

Inserting a column chart

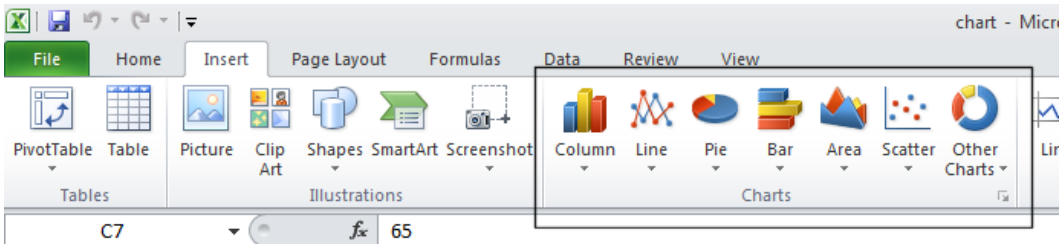
Open a workbook called **Chart.**



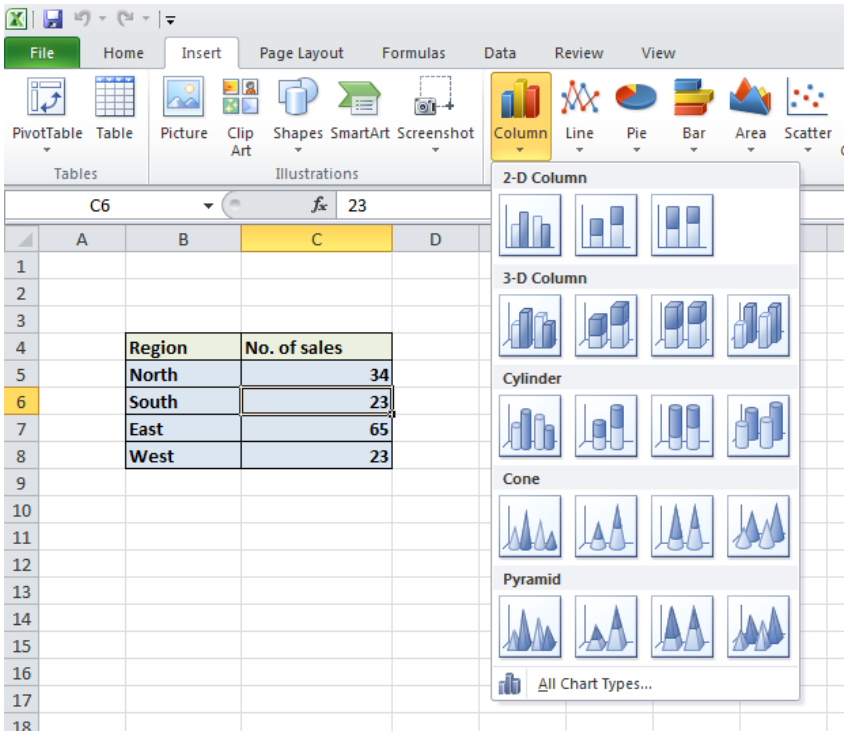
If necessary, click on the **Column Chart** worksheet tab (at the bottom-left of your screen).



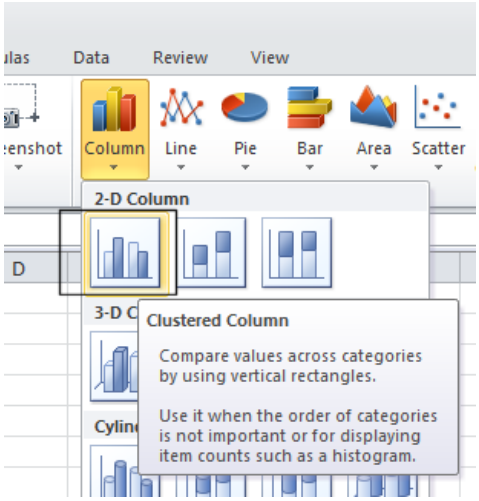
Click within the table of data.
Click on the **Insert** tab and you will see the **Charts** group displayed within the Ribbon.



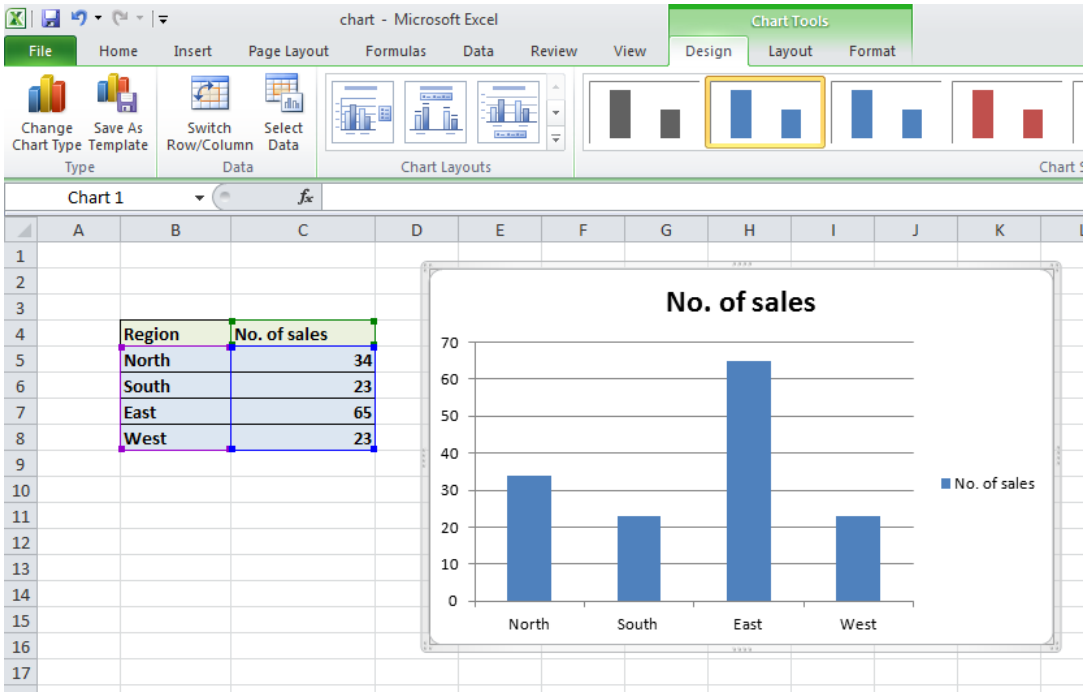
Click on the **Column** icon and you will see a drop down displaying a range of column chart options.



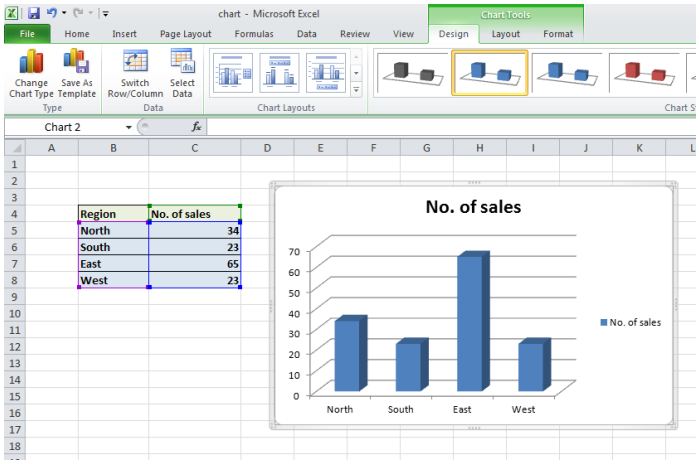
Click on the first option, the **2-D Clustered** format, as illustrated.



You will see the following chart inserted into your worksheet.



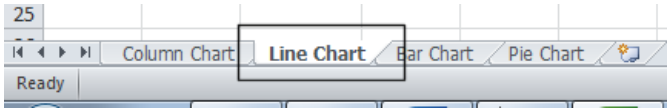
Click on the Undo icon (top-left of your screen), and experiment with inserting other types of column chart such as a 3-D chart, as illustrated below.



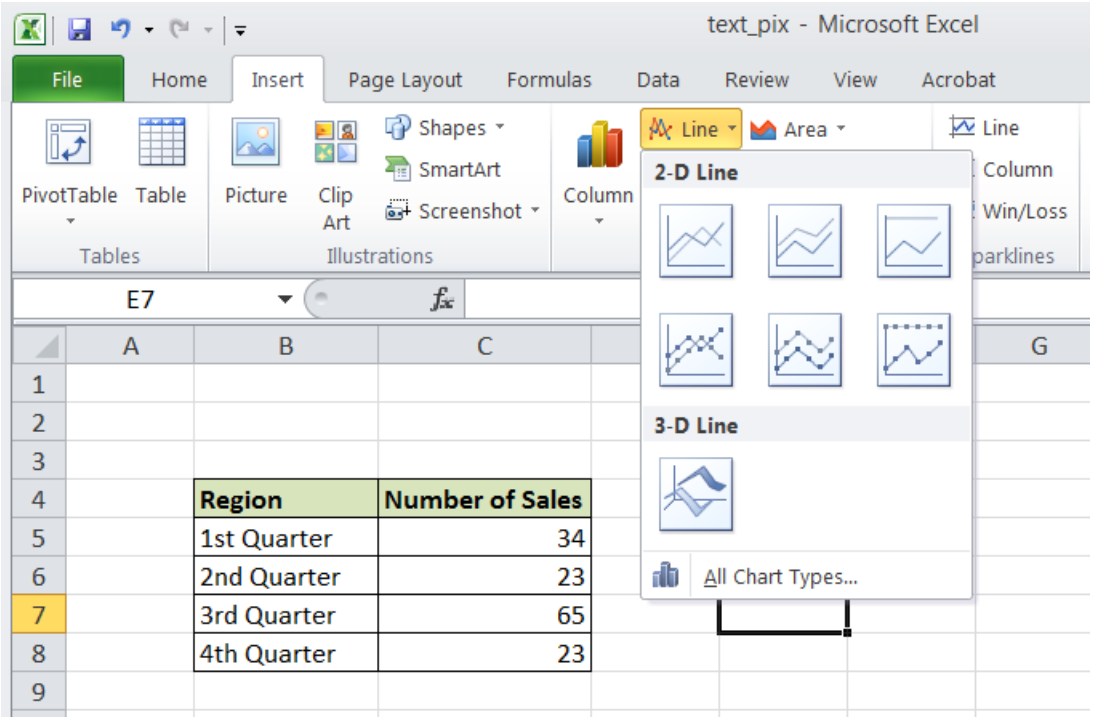
NOTICE:
Do not use 3-D chart unless it is required.

Inserting a line chart

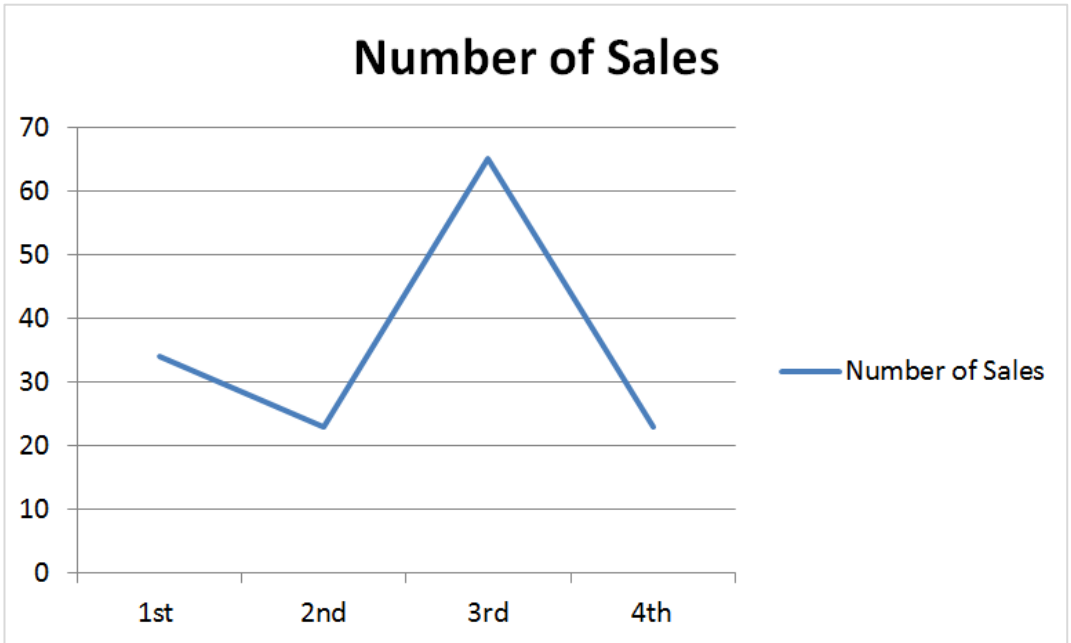
Click on the **Line Chart** worksheet tab at the bottom of your screen.



Click within the data and then click on the **Insert** tab. Experiment with inserting different types of line chart, by clicking on the **Line** button.

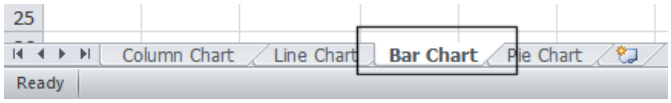


An example is illustrated below.

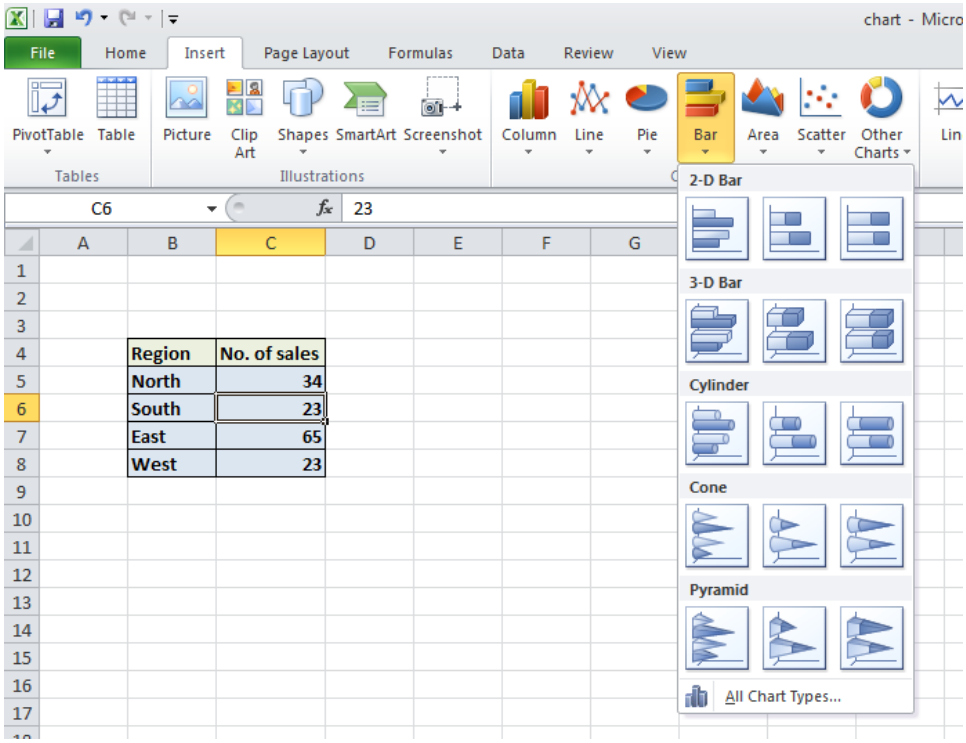


Inserting a bar chart

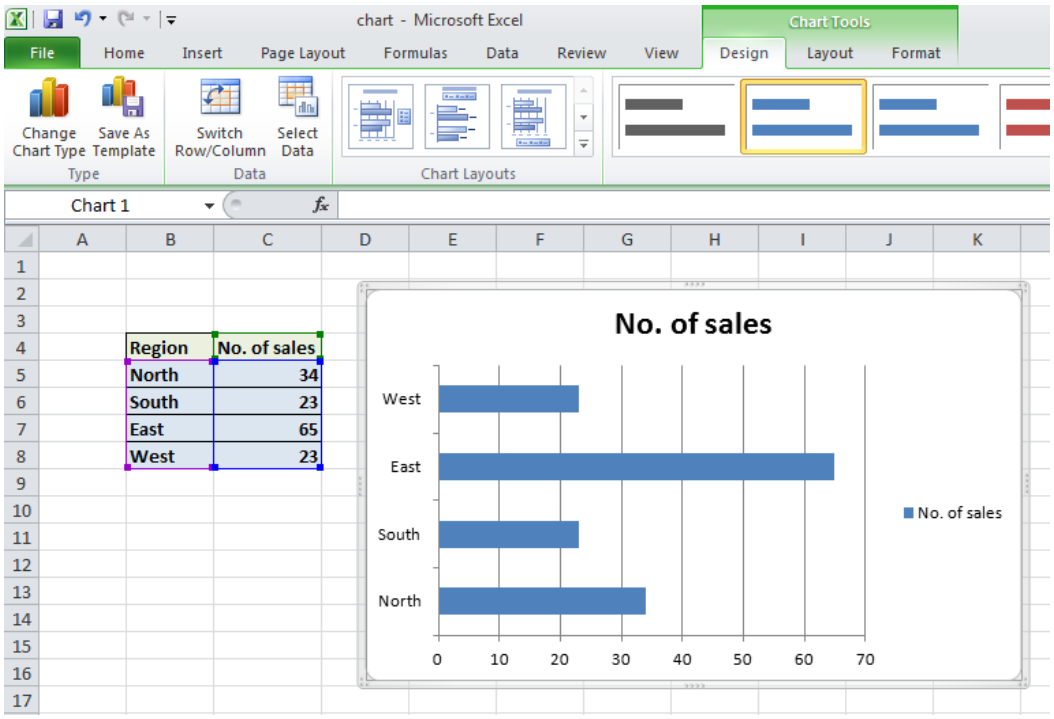
Click on the **Bar Chart** worksheet tab at the bottom of your screen.



Click within the data and experiment with inserting different types of bar chart, by clicking on the **Bar** button (under the **Insert** tab).

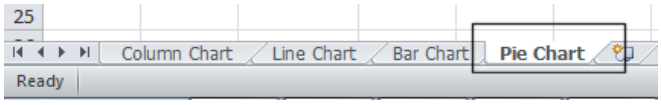


An example is illustrated below.

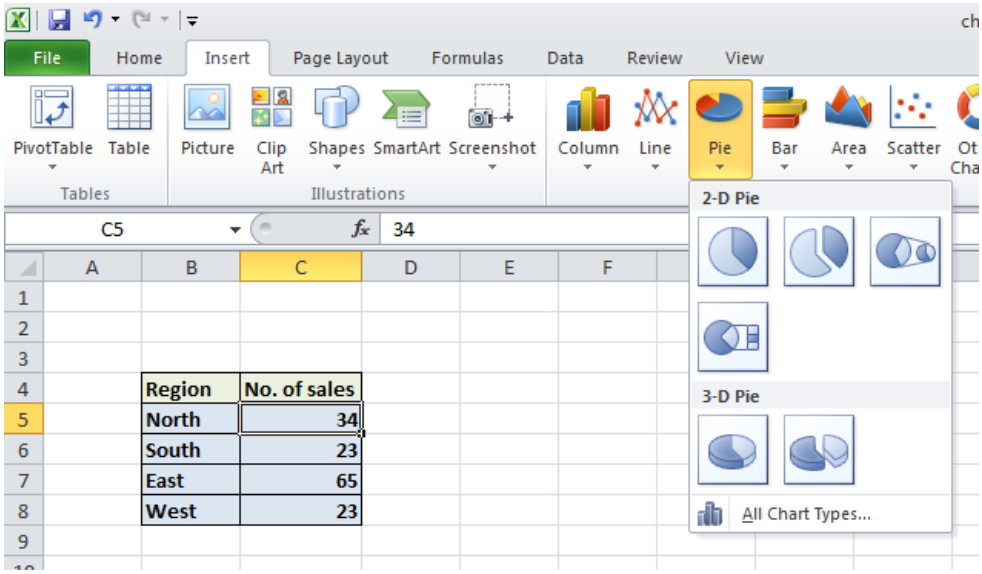


Inserting a Pie Chart

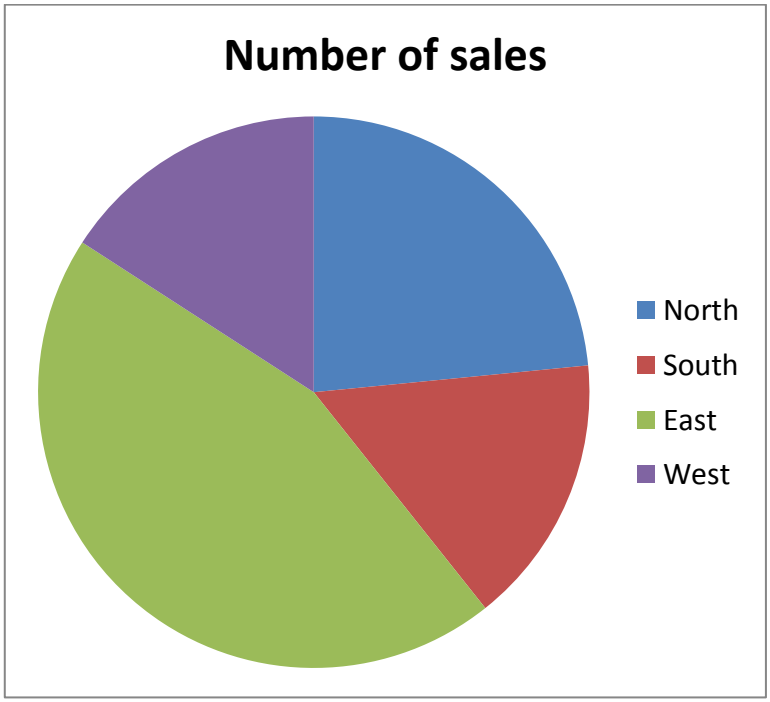
Click on the **Pie Chart** worksheet tab at the bottom of your screen.



Click within the table of data.
Experiment with inserting different types of pie chart.

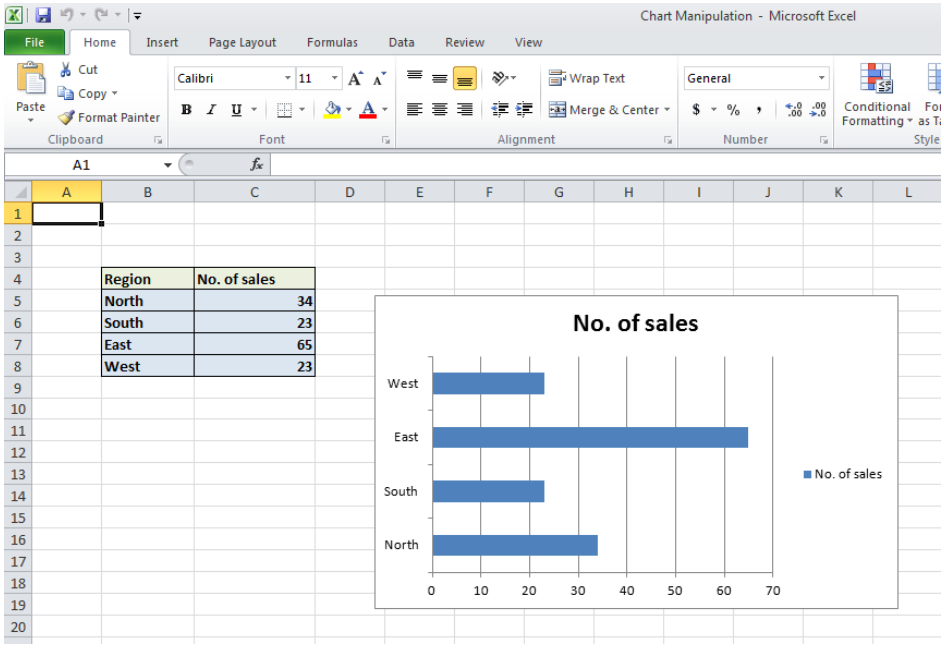


An example is illustrated below.

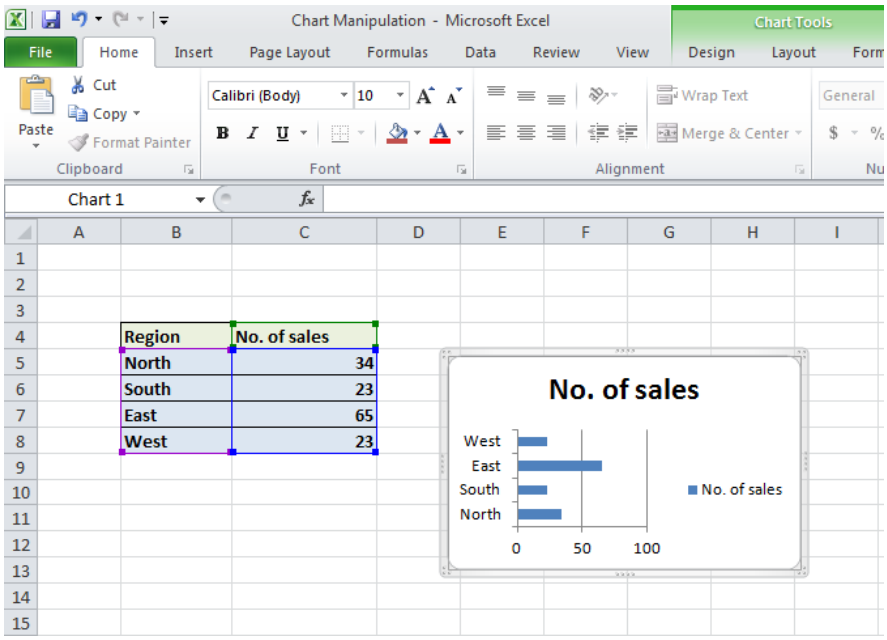


Resizing a chart

Open a workbook called **Chart Manipulation**.



Click on it to select it.
Move the mouse pointer to one of the four corners of the chart. You will notice that the mouse pointer changes to the shape of a diagonal line with an arrow at each end. When you see the mouse pointer change, press the mouse button and while keeping the button pressed move diagonally across the screen. Move away from the centre of the chart to make the chart larger and toward the centre of the chart to make the chart smaller. When you release the mouse button the chart will be resized.

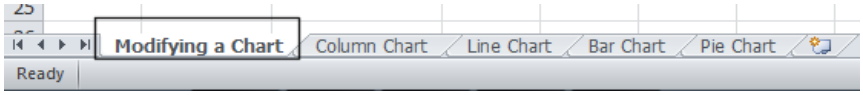


Deleting a chart

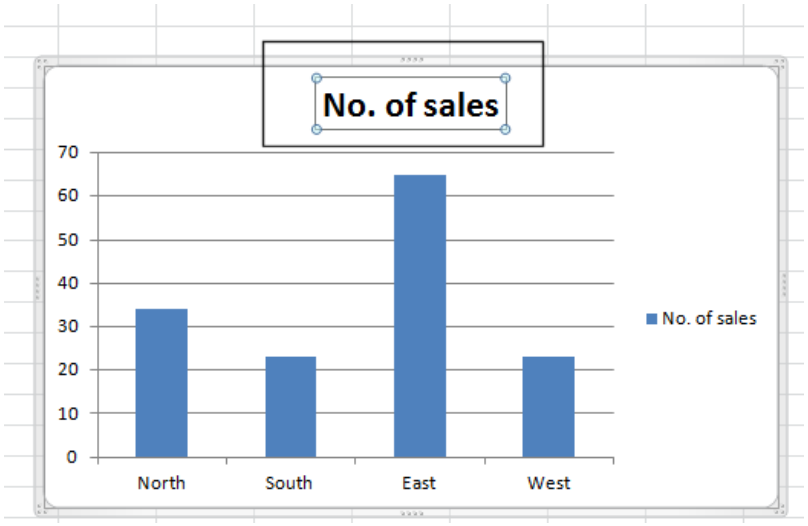
Select the chart and press the **Del** key.
Save your changes and close the workbook.

Chart title or labels

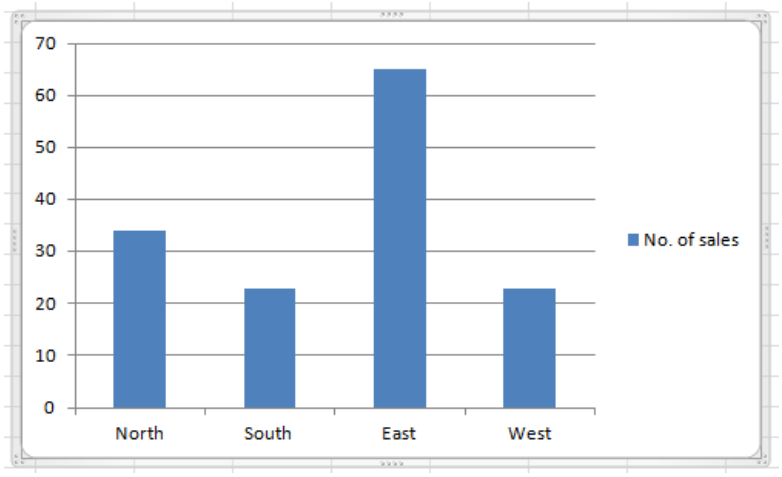
Open a workbook called **Modifying charts**.
If necessary, click on the **Modifying a Chart** worksheet tab (at the bottom-left of your screen).



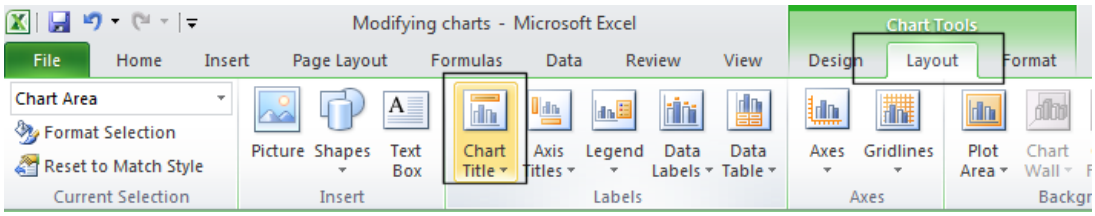
You can see a column chart displayed within the workbook. Click on the chart title, as seen below.



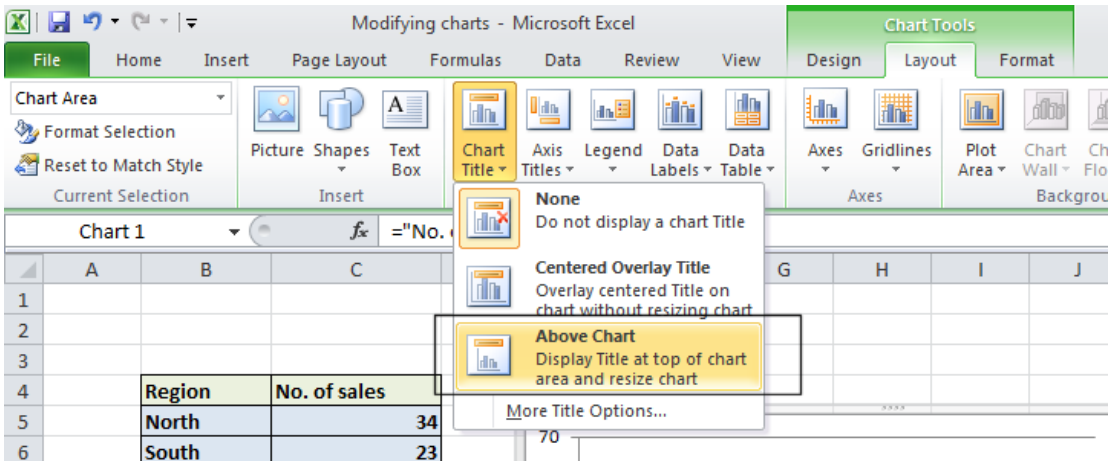
Press the Del key to remove the chart title. Your chart will now look like this.



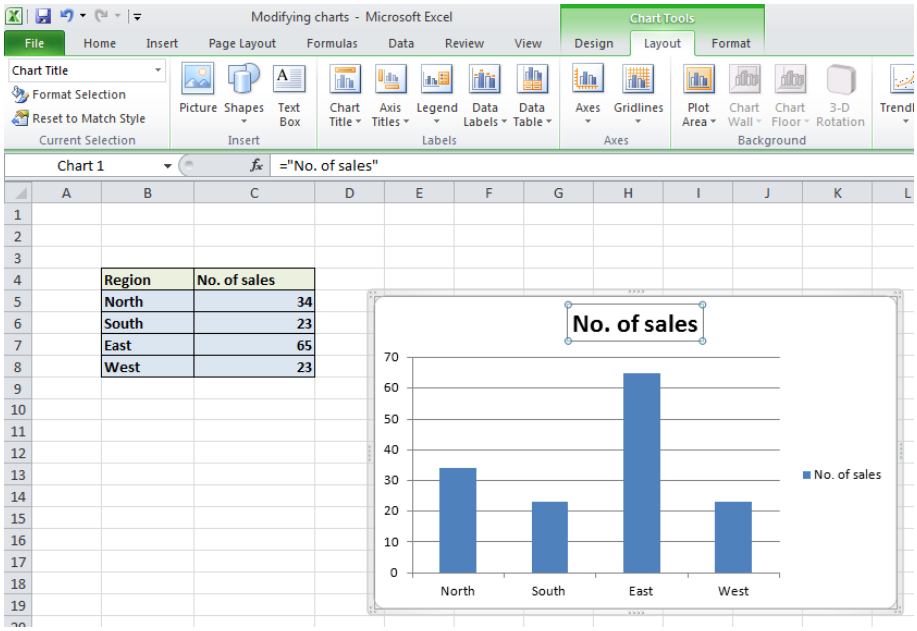
To insert a chart title, click on chart and then click on the **Layout** tab. Click on the **Chart Title** icon within the **Layout** Ribbon.



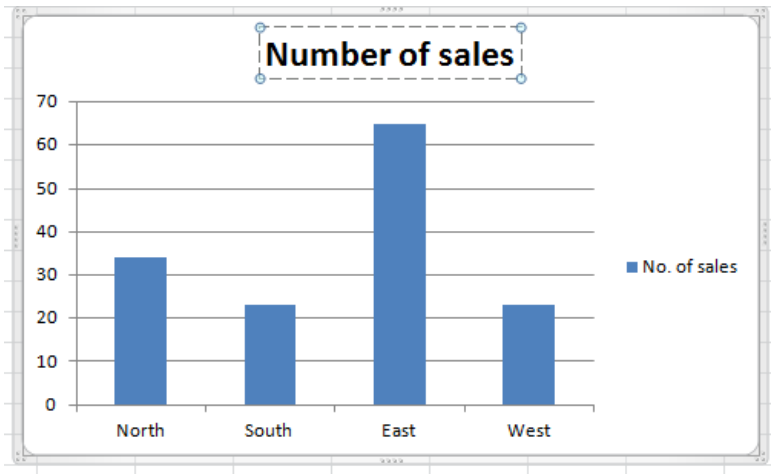
Select the required option from the drop down list displayed, such as **Above Chart**.



Your chart title is once again displayed, as illustrated.

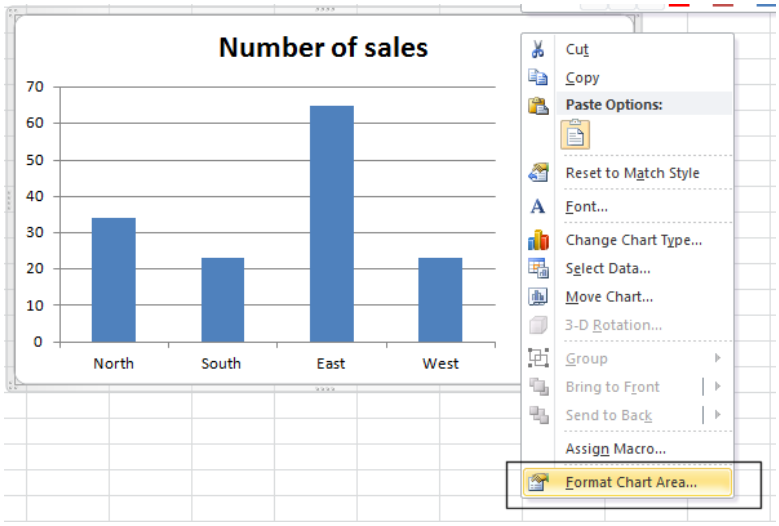


TIP: To modify the chart title text, click within the **Chart Title** and simply edit the text in the normal way. You can also apply text formatting to the Chart Title as required. An example is shown below.



Changing the chart background colour

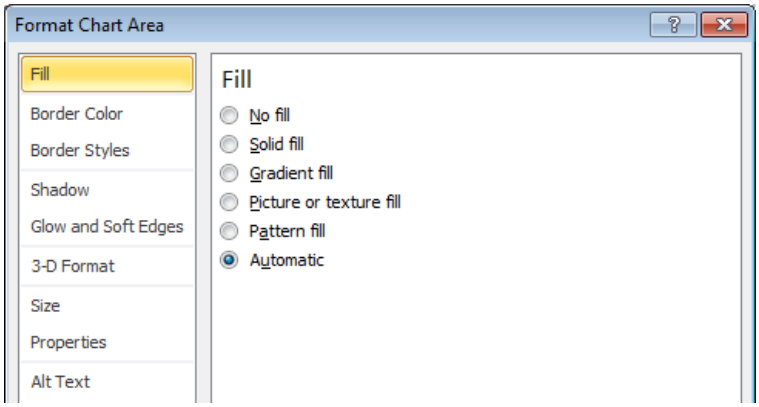
Click on the chart to select it. Right click over an empty part of the chart background, and you will see a popup menu displayed.



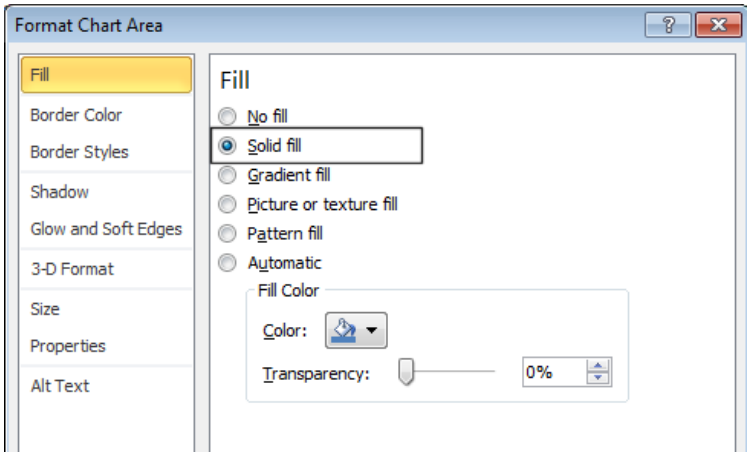
Click on the **Format Chart Area** command.

TIP: If you do not see this command, right click on a different, empty part of the chart, until you do see this command.

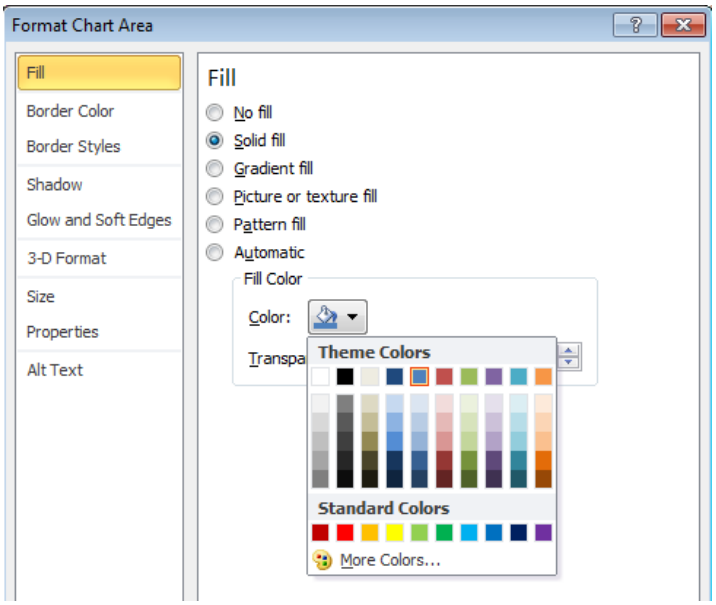
You will see the **Format Chart Area** dialog box displayed.



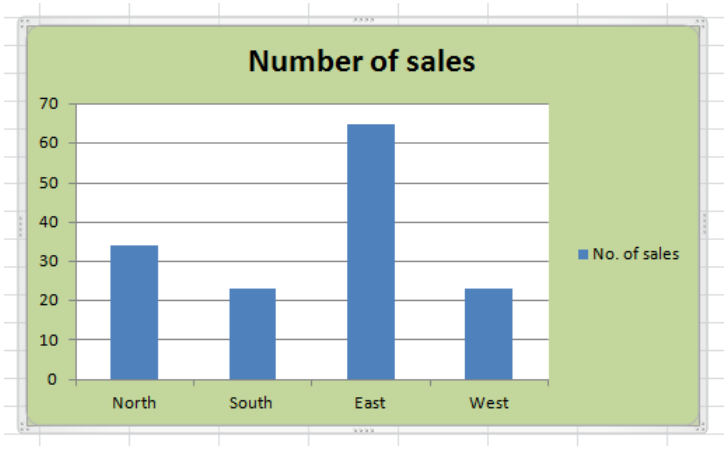
If necessary, click on the **Solid fill** button and you will see extra controls displayed within the dialog box.



Click on the **down arrow** next to the **Colour** control and select a light colour from the options displayed.

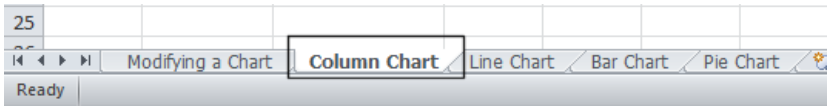


Click on the **Close** button to apply the colour, as illustrated below.

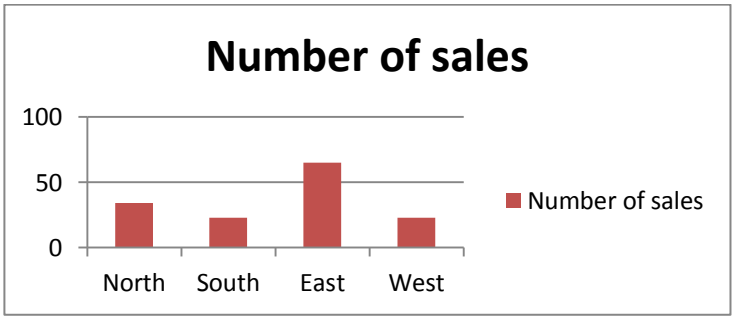


Changing the column, bar, line or pie slice colours in a chart

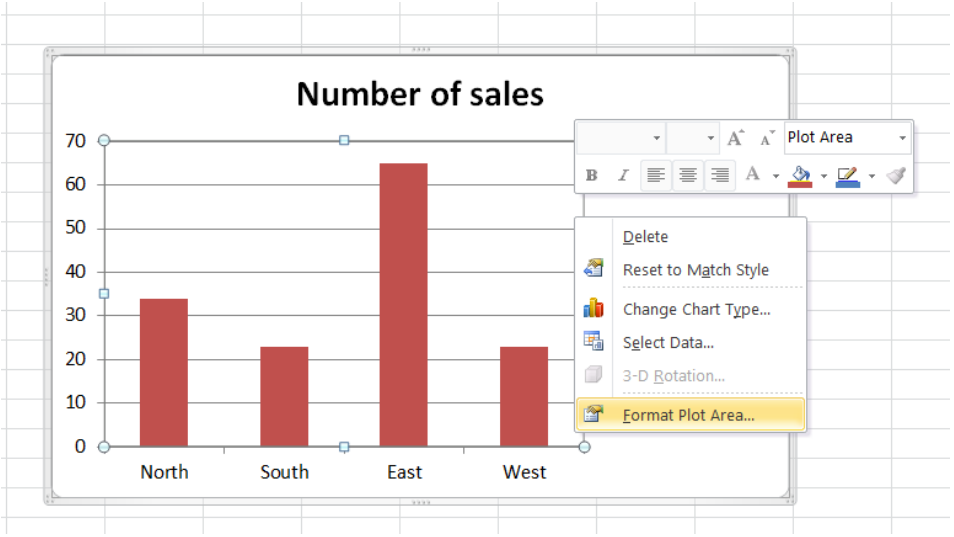
Click on the second worksheet tab, called Column Chart.



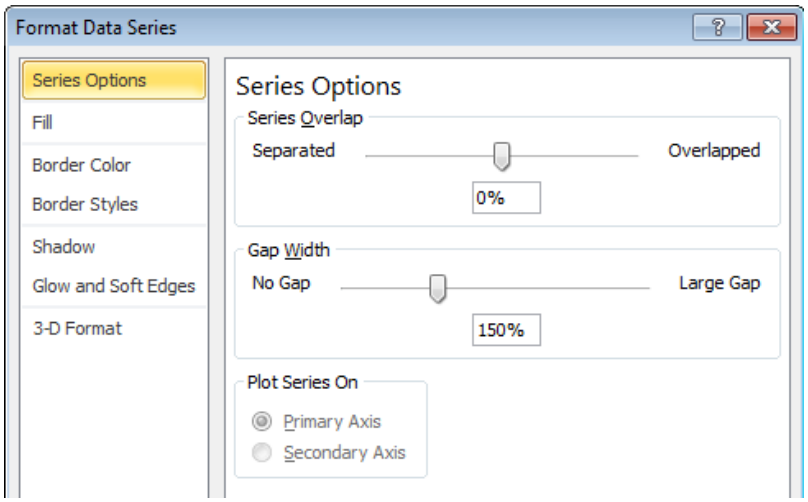
Click on one of the columns within the chart. You should see all the columns are selected, as seen below.



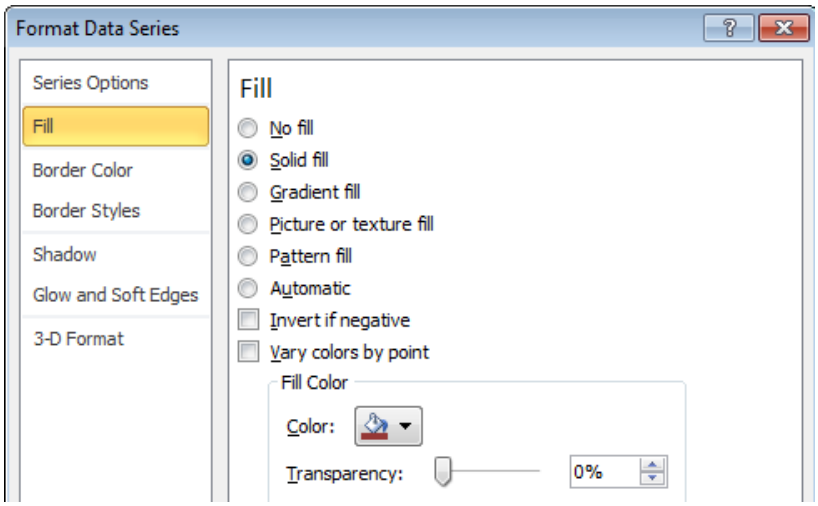
Right click over one of the selected columns and from the popup menu displayed select the **Format Data Series** command.



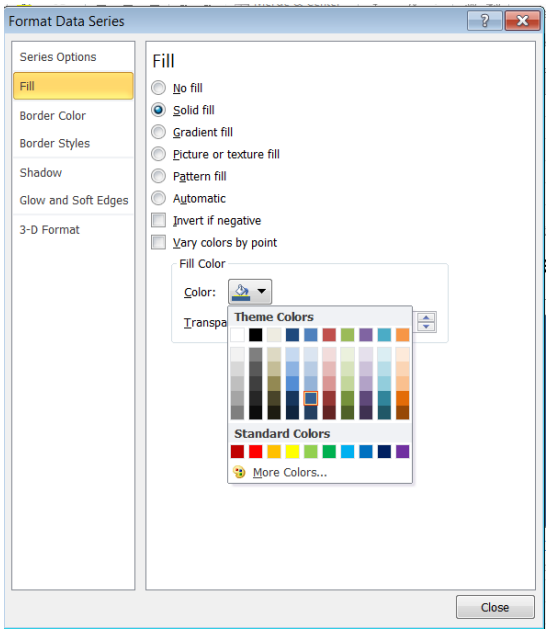
This will display the **Format Data Series** dialog box.



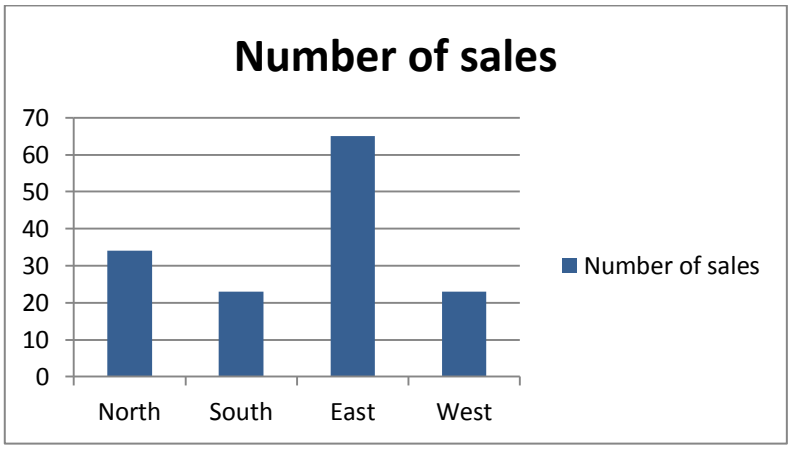
Click on the **Fill** side tab within the dialog box, as illustrated.



If necessary, click on the **Solid fill** button.
Click on the **down arrow** in the **Colour** section and select a colour for your columns.



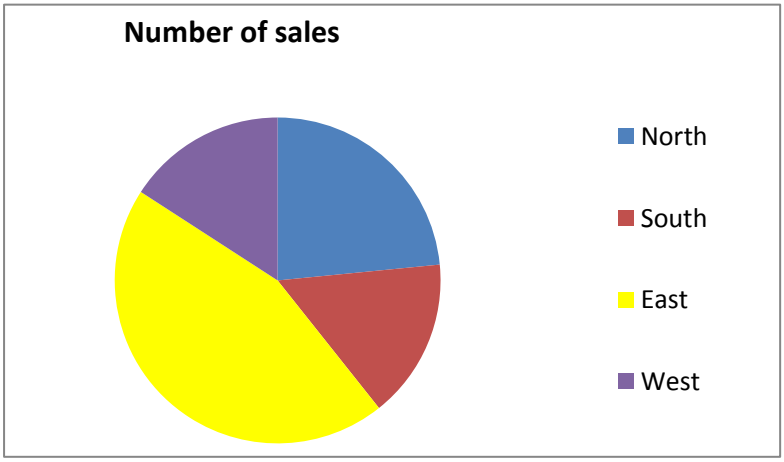
When you click on the **Close** icon the selected colour will be applied, as seen below.



Click on the **Line Chart** worksheet tab and change the colour of the line.

Click on the **Bar Chart** worksheet tab and change the colour of the bars.

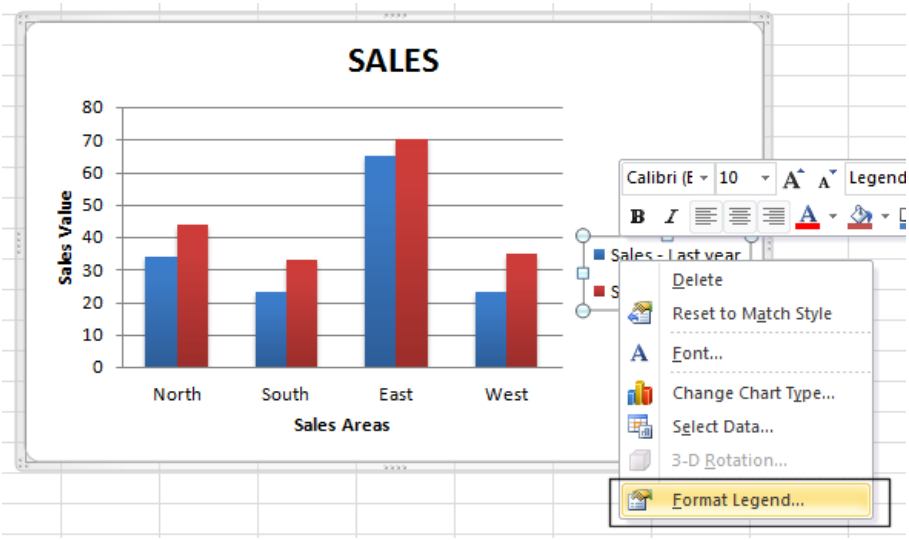
Click on the **Pie Chart** worksheet tab to display the pie chart. The whole point of a pie chart is that each segment of the pie chart should be a different colour. Bearing this is mind click once on the pie chart to select all the segments within the pie chart. Then click again on a particular segment to select just that segment. At this point you can then right click and change the colour of just that segment. An example is seen below.



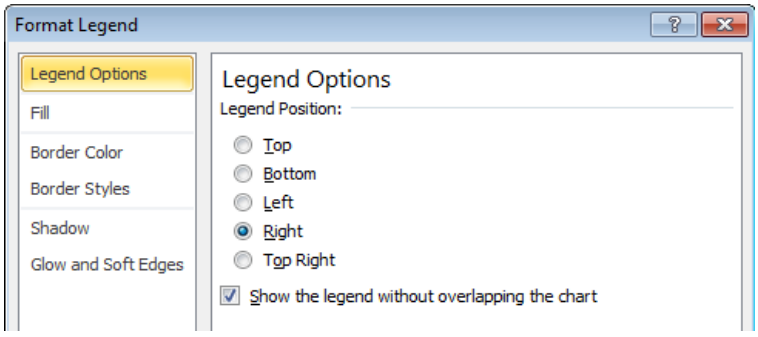
Modifying the legend fill colour

Open a workbook called **Legend.**
Select the legend within the chart, as illustrated.

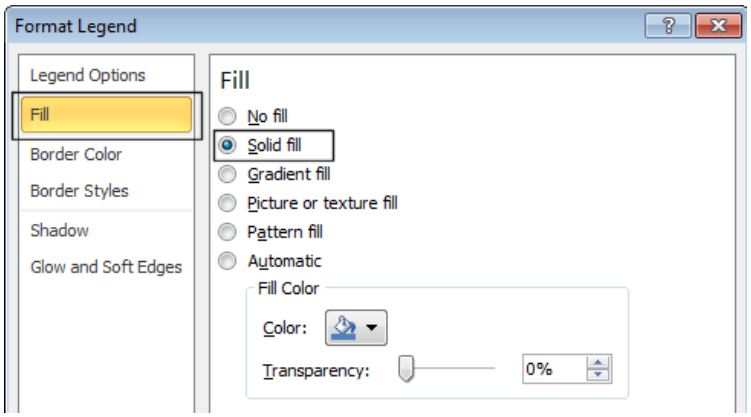
Right click over the selected legend and from the popup menu displayed select the **Format Legend** command.



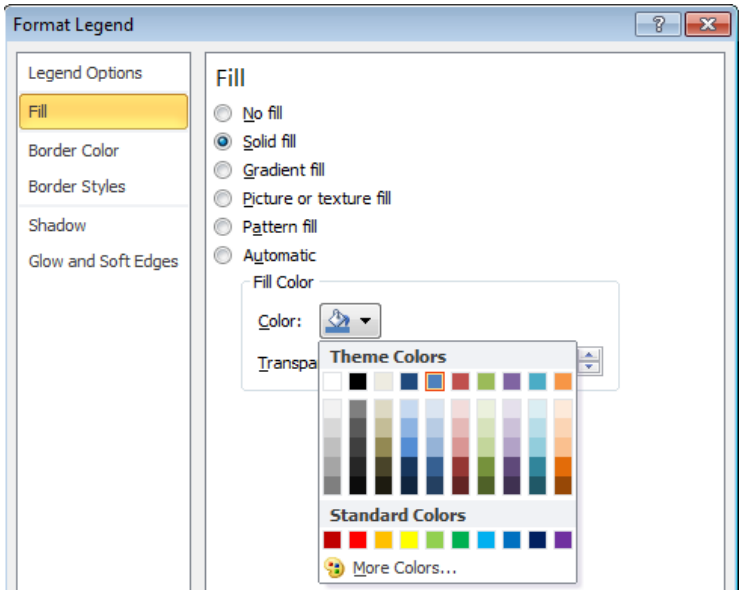
This will display the **Format Legend** dialog box, as illustrated.



Select the **Fill** side tab. Select the **Solid fill** button and you will see the following.



Click on the **down arrow** in the **Colour** control and select a colour as illustrated below.

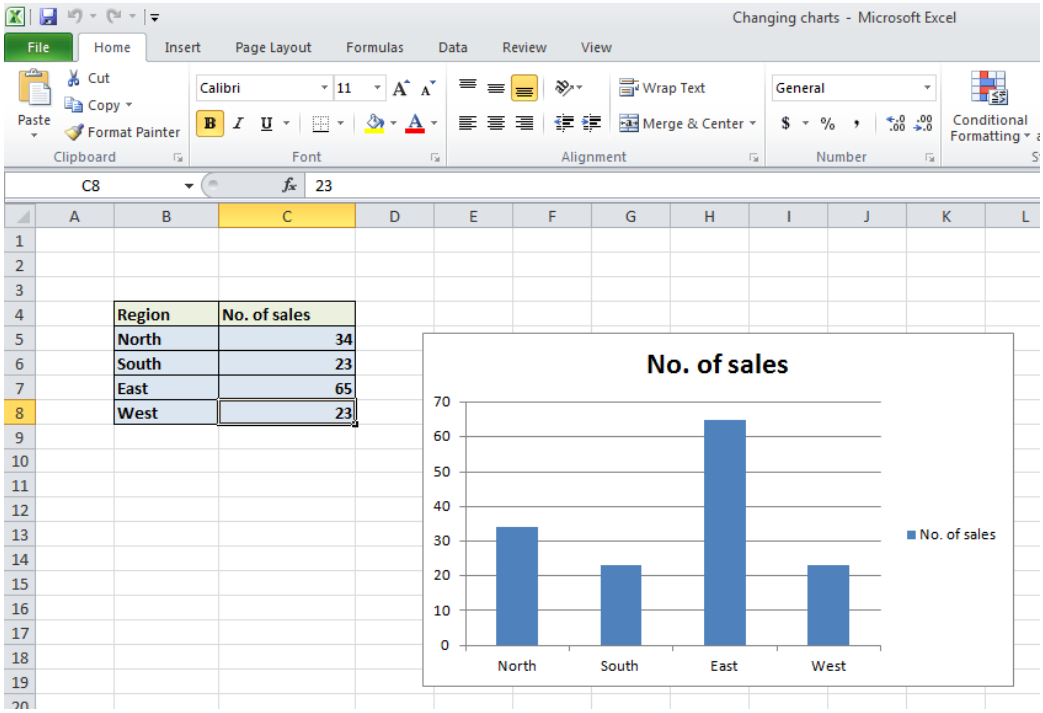


Click on the **Close** button to apply the formatting and close the dialog box.
If you have time try experimenting with some of the other options within the Fill section of the **Format Legend** dialog box, such as **Gradient Fills** or adjusting the fill transparency.

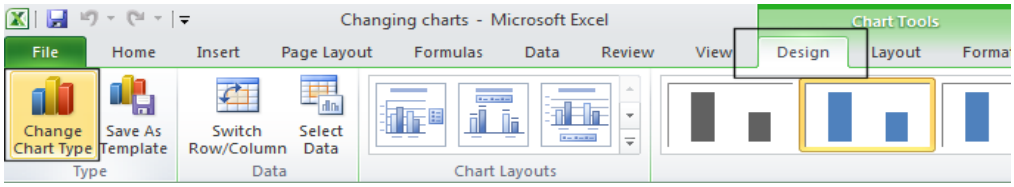
Save your changes and close the workbook.

Changing the Chart type

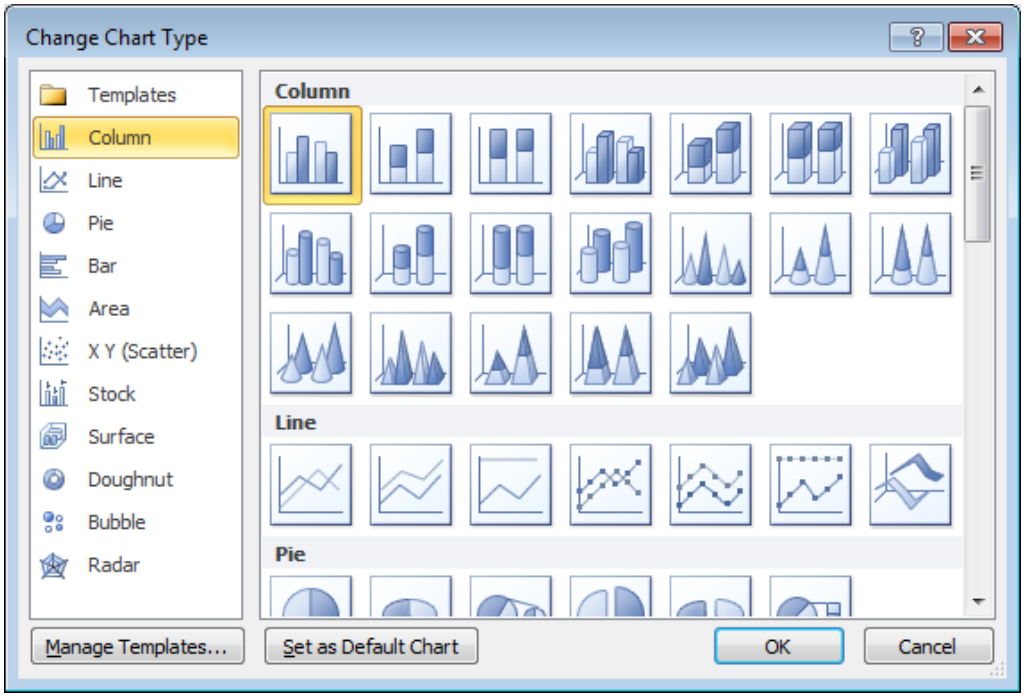
Open a workbook called Changing charts.



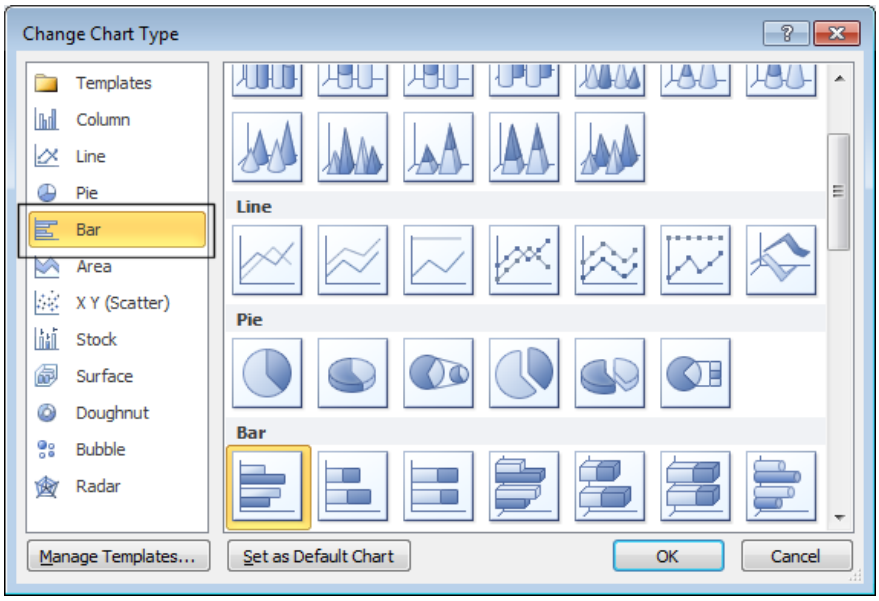
This workbook contains a column chart. Click on the chart to select it. Click on the **Design** tab. Click on the **Change Chart Type** icon displayed within the **Type** group of the **Design** Ribbon.



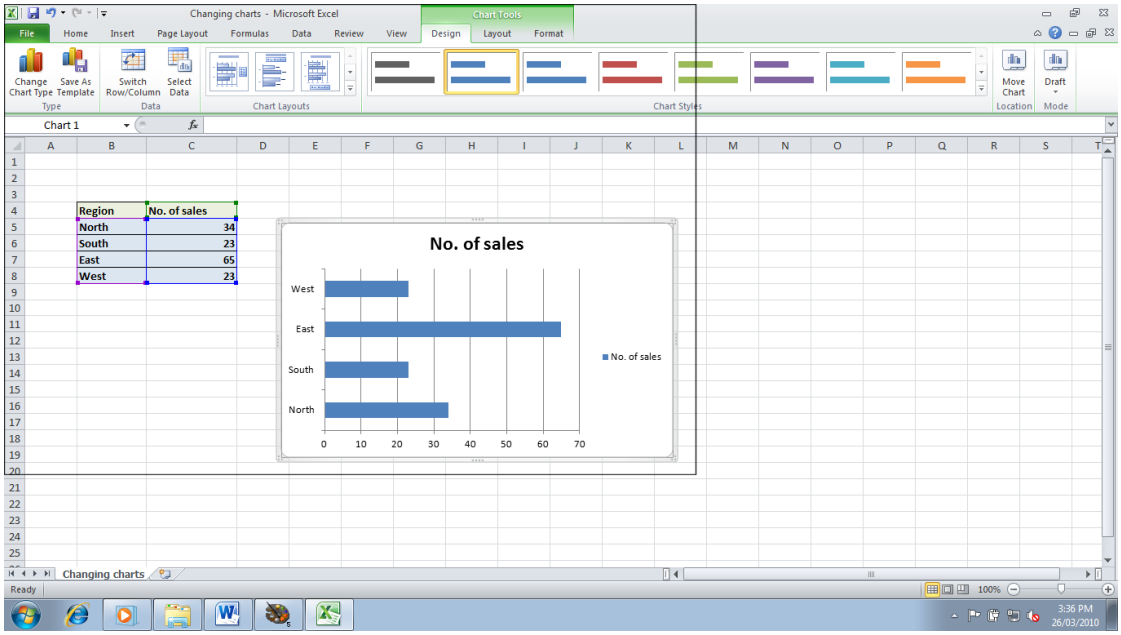
This will display the **Change Chart Type** dialog box.



Select a different type of chart, such as a **Bar** chart.



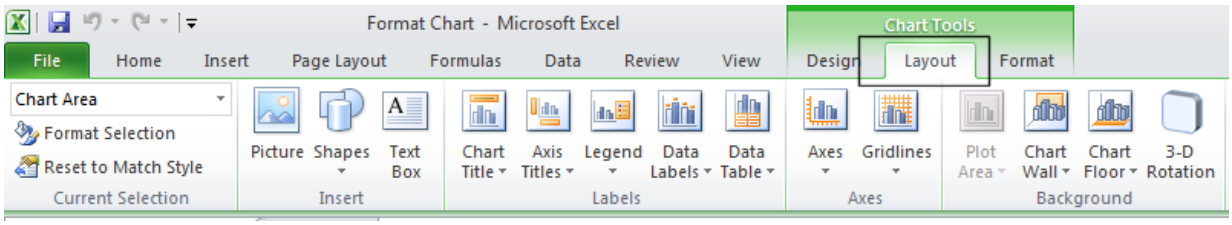
Click on the **OK** button.



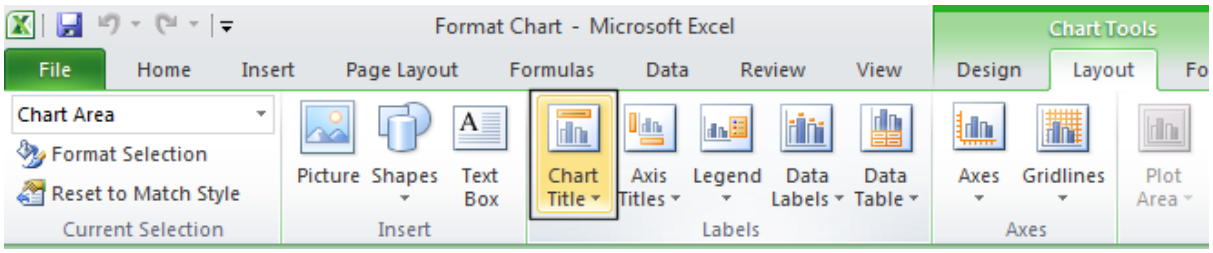
Experiment with applying different types of chart.
Save your changes and close the workbook.

Modifying charts using the Layout tab

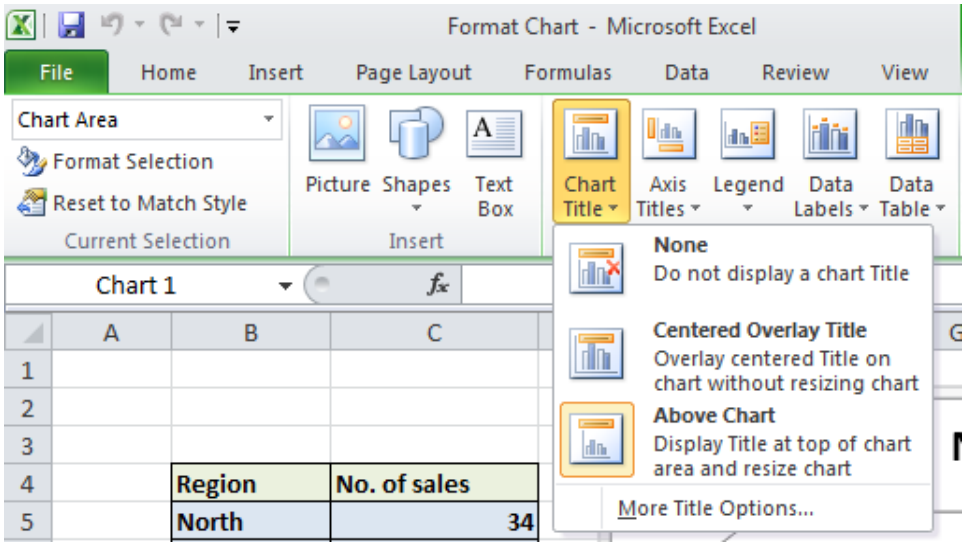
Open a workbook called **Format Chart**.
Select the chart and then click on the **Layout** tab.



The **Layout** tab includes many options for controlling how the various chart elements are displayed. Click on the **Chart Title** button in the **Labels** group.

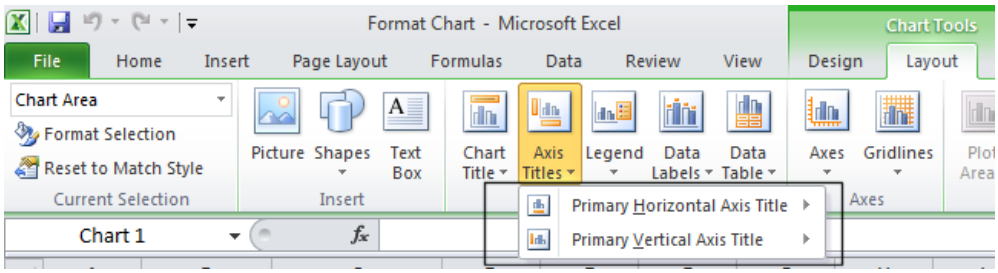


A menu will be display allowing you to control where or if the chart title is displayed. The default is **Above Chart,** try selecting the other options and observe the effect on the chart.

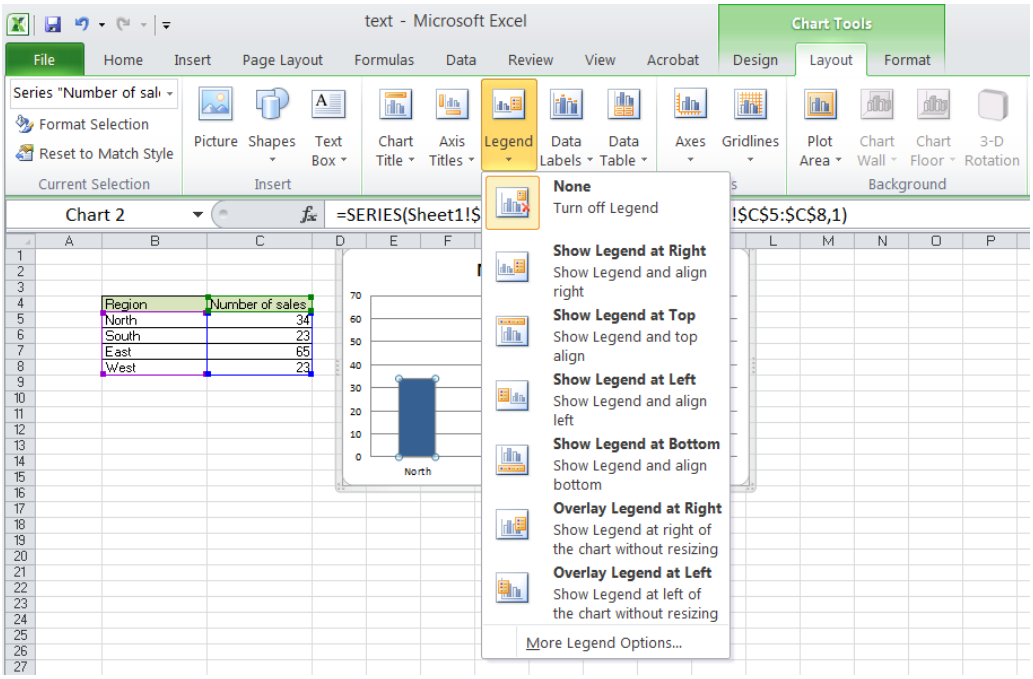


NOTICE:
A title of chart is placed at rhea bottom of chart. See p.118 for examples.

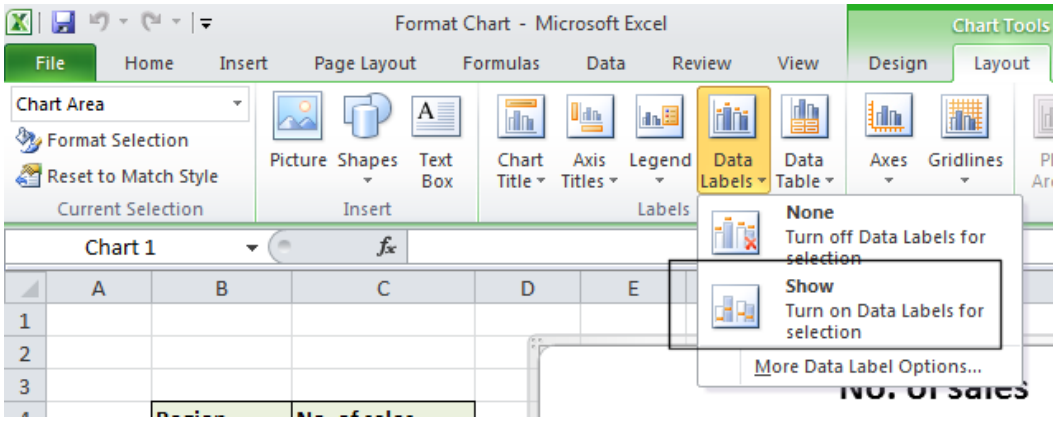
Click on the **Axis Titles** button in the **Labels** group. A menu will be displayed allowing you to control how the labels for each axis are displayed. Experiment with some of the available options and view their effect on the chart.



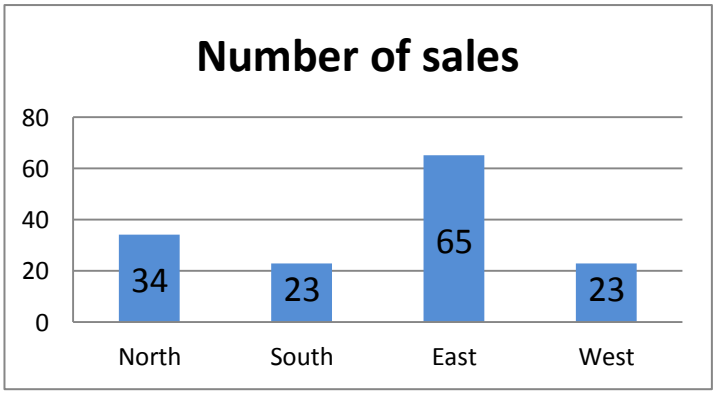
Click on the **Legend** button in the **Labels** group. A menu will be displayed allowing you to control where the chart legend is displayed. Experiment with some of the available options and view their effect on the chart.



Click on the **Data Labels** button in the **Labels** group. A menu will be displayed allowing you to choose if labels should be applied to data in the chart. Click on the **Show** option.

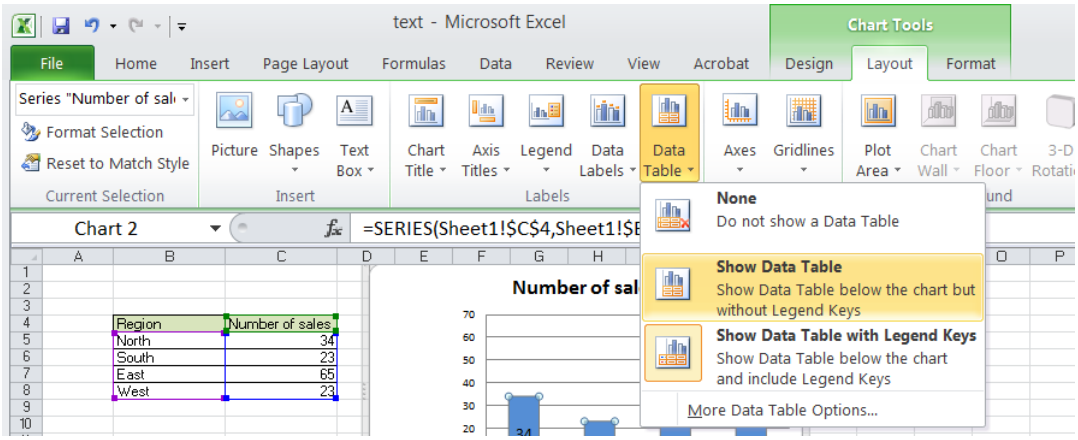


The chart should now look like this.

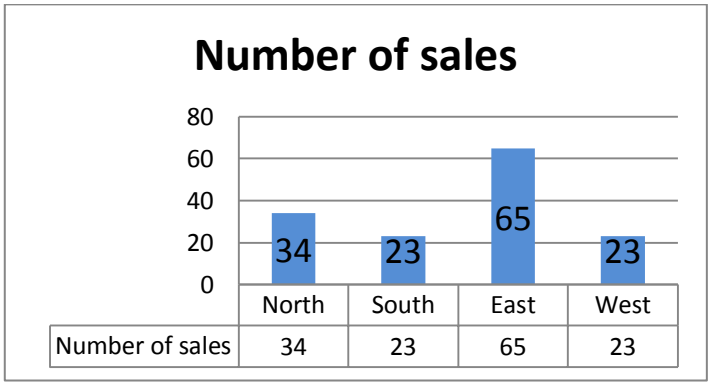


Notice that each column is now labelled with its value.

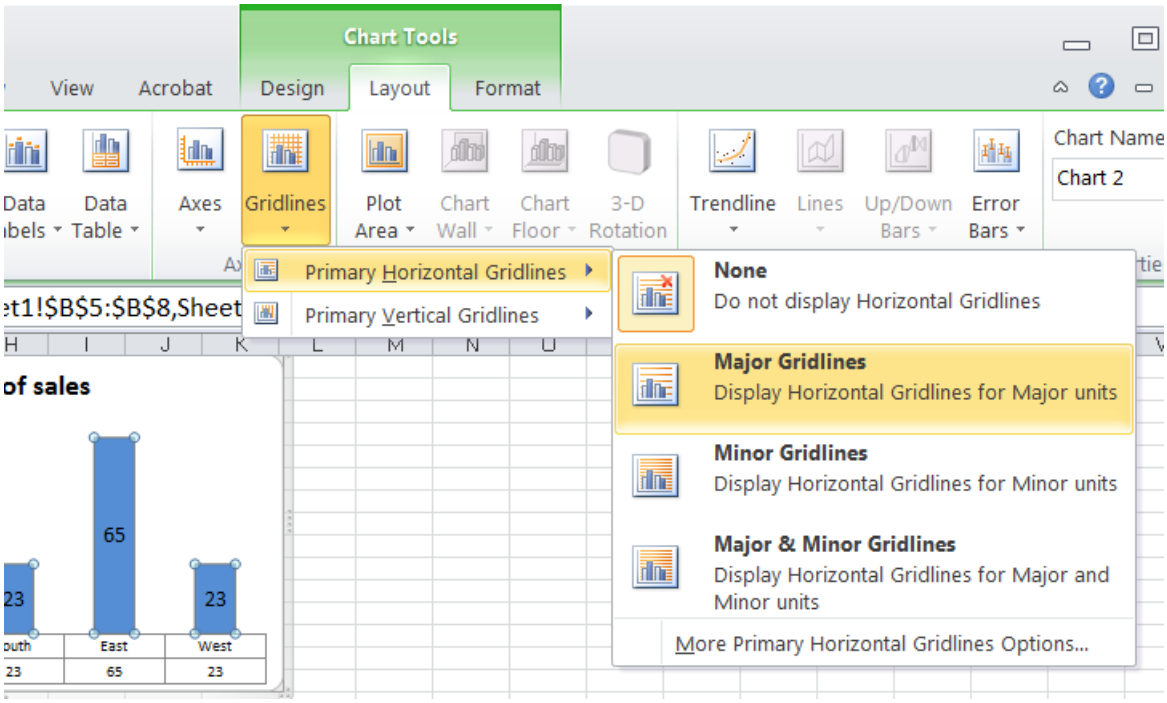
Click on the **Data Table** button in the **Labels** group. A menu will be displayed allowing you to show the data used to create the chart. Click on the **Show Data Table** option.



A small table will be displayed below the chart containing the relevant data.



Click on the **Gridlines** button in the **Axes** group. A menu will be displayed allowing you to control how the gridlines for each axis are displayed. Experiment with some of the available options and view their effect on the chart.

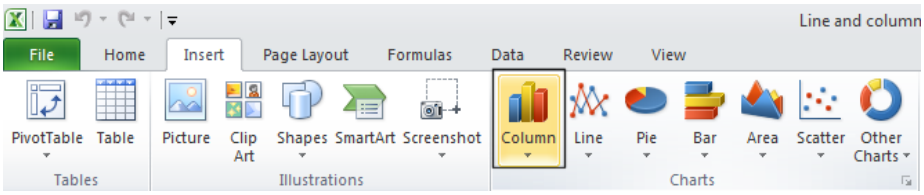


Creating a combined line and column chart.

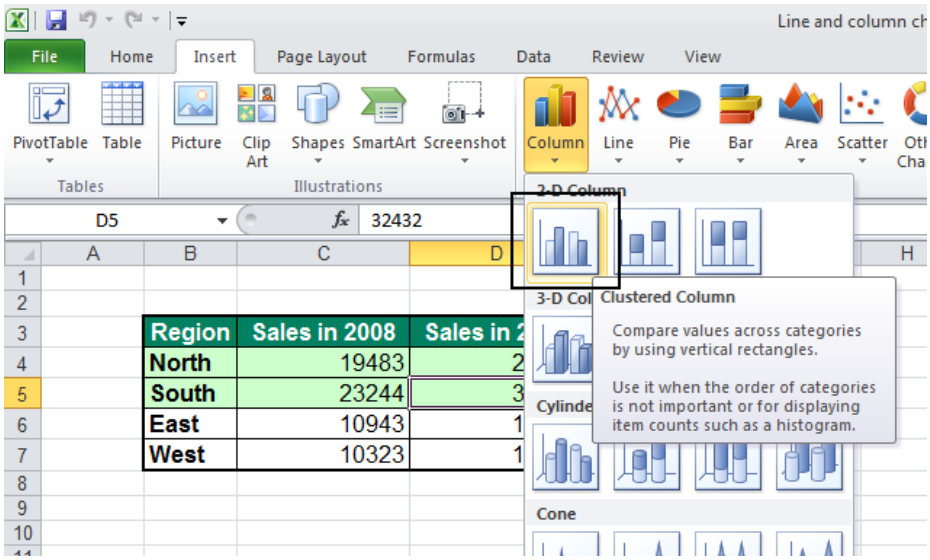
Open a workbook called Line and column chart.

Region	Sales in 2008	Sales in 2009
North	19483	23232
South	23244	32432
East	10943	12432
West	10323	12654

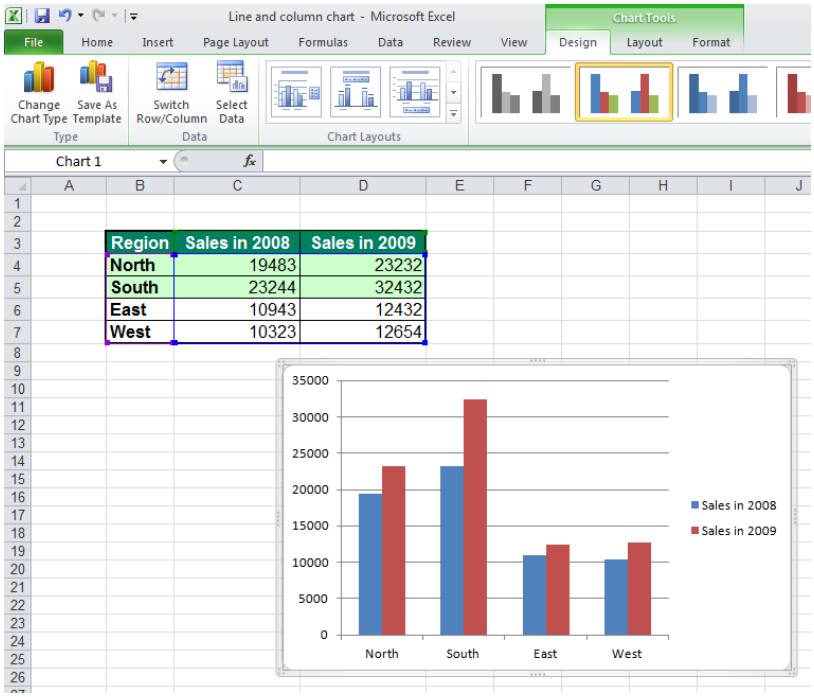
Click within the table of data.
Click on the **Insert** tab and within the **Charts** group click on the **Column** button.



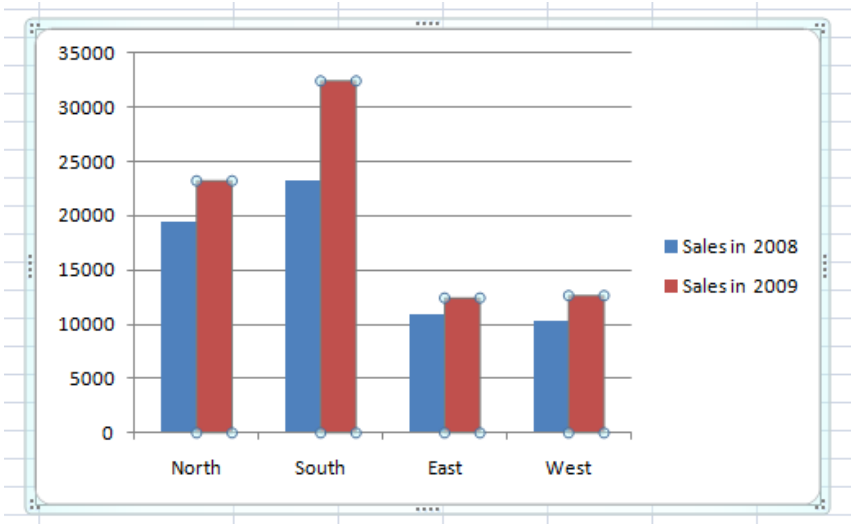
From the drop down list displayed, click on the first **2-D column chart** option.



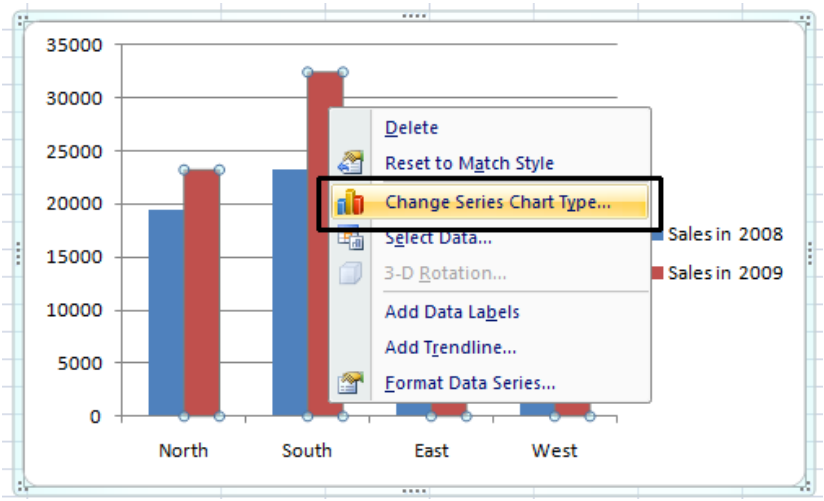
A column chart will be inserted into the worksheet.



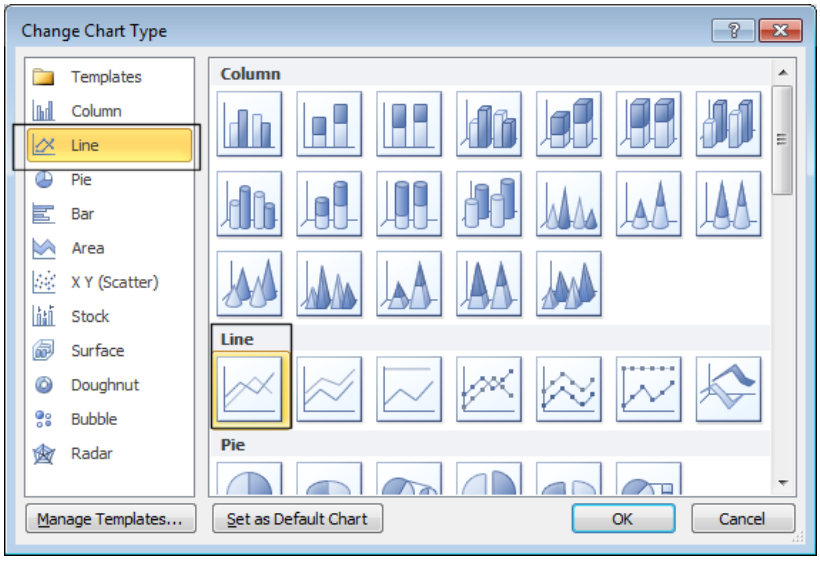
Click on one of the columns within the chart that you wish to convert to a line rather than column.



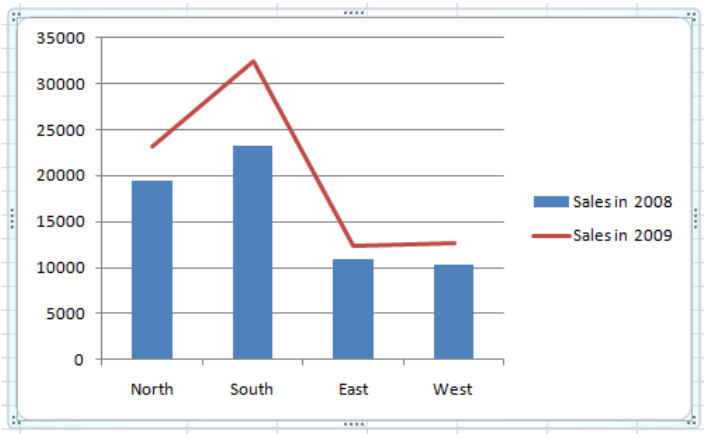
Right click over one of the selected columns and from the pop-up menu displayed, click on the **Change Series Chart Type** command.



The **Change Chart Type** dialog box will be displayed.



Within the left-hand side of the dialog box click on the **Line** button.
Select the first option within the **Line** formats displayed in the right section of the dialog box.
Click on the **OK** button and you will now see a chart displayed using both columns and lines.



NOTICE:
Line chart are used to see a trend. This is just an exercise to change chart types.

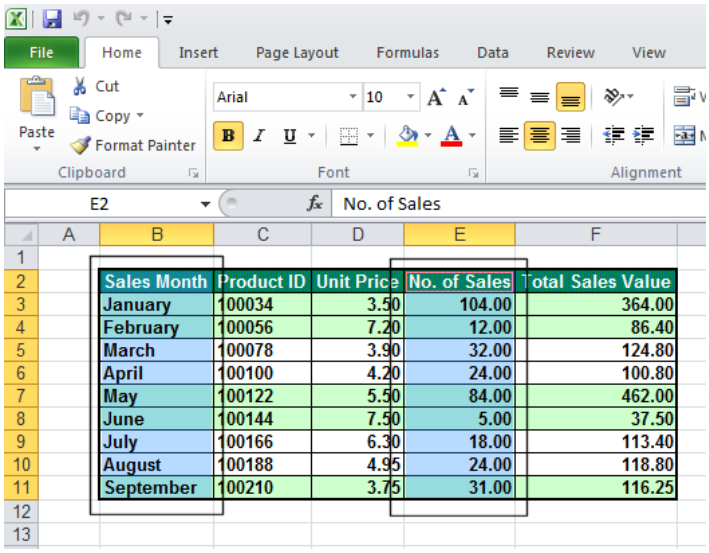
Save your changes and close the workbook.

Adding a secondary axis to a chart.

Open a workbook called **Secondary Axis**.

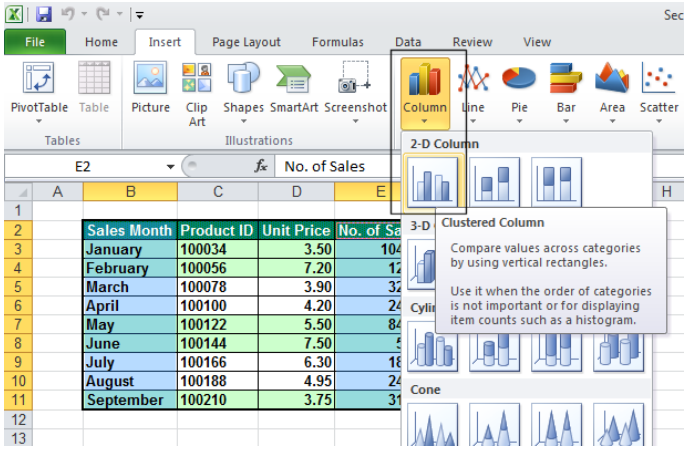
	A	B	C	D	E	F
1						
2		Sales Month	Product ID	Unit Price	No. of Sales	Total Sales Value
3		January	100034	3.50	104.00	364.00
4		February	100056	7.20	12.00	86.40
5		March	100078	3.90	32.00	124.80
6		April	100100	4.20	24.00	100.80
7		May	100122	5.50	84.00	462.00
8		June	100144	7.50	5.00	37.50
9		July	100166	6.30	18.00	113.40
10		August	100188	4.95	24.00	118.80
11		September	100210	3.75	31.00	116.25
12						

Select the range **B2:B11**. Hold down the **Ctrl** key and then also select the range **E2:E11**. Release the **Ctrl** key. The selected data will look like this.

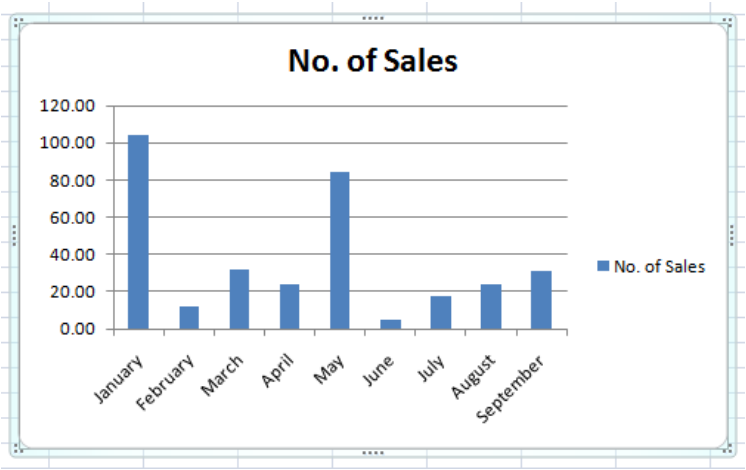


	A	B	C	D	E	F
1						
2		Sales Month	Product ID	Unit Price	No. of Sales	Total Sales Value
3		January	100034	3.50	104.00	364.00
4		February	100056	7.20	12.00	86.40
5		March	100078	3.90	32.00	124.80
6		April	100100	4.20	24.00	100.80
7		May	100122	5.50	84.00	462.00
8		June	100144	7.50	5.00	37.50
9		July	100166	6.30	18.00	113.40
10		August	100188	4.95	24.00	118.80
11		September	100210	3.75	31.00	116.25
12						
13						

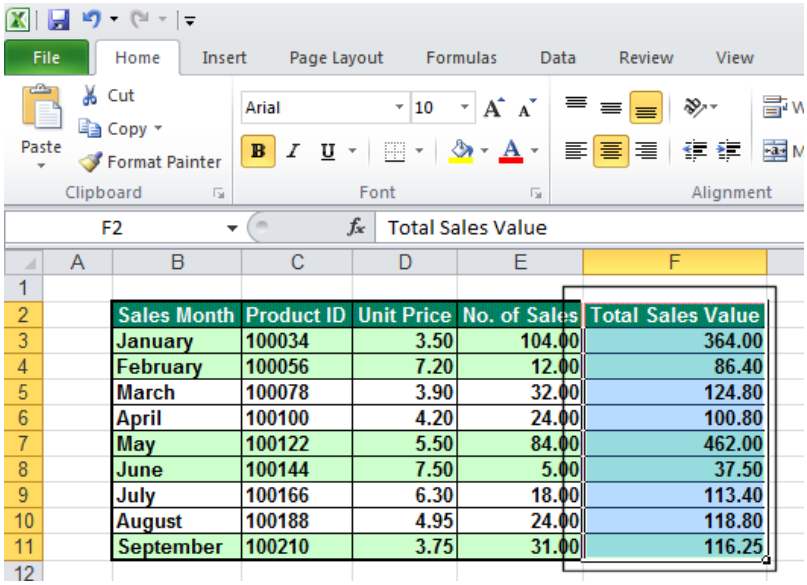
Click on the **Insert** tab and within the **Charts** group click on the **Column** button. From the drop-down displayed select a **2-D Column** chart format.



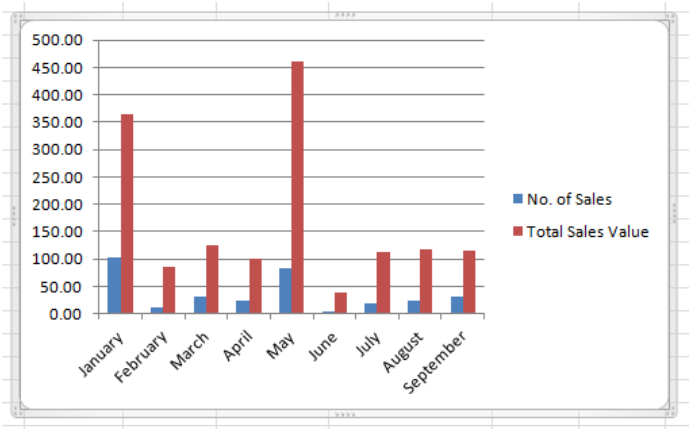
A column chart will be created within the worksheet.



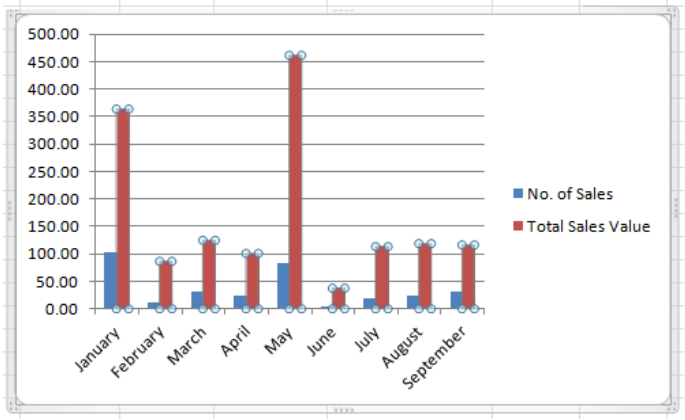
This chart displays information about the number of unit sales per month. We shall now add another data series which will use a secondary axis to display the relevant information.
Select the range **F2:F11**.



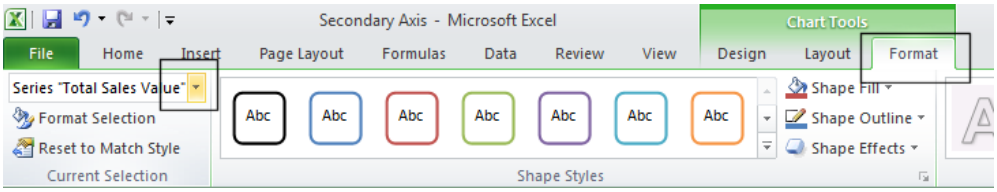
Press **Ctrl+C** to copy the selected data to the clipboard.
Click once on the chart to select it, press **Ctrl+V** to paste the selected data into the chart. The chart will now look like this.



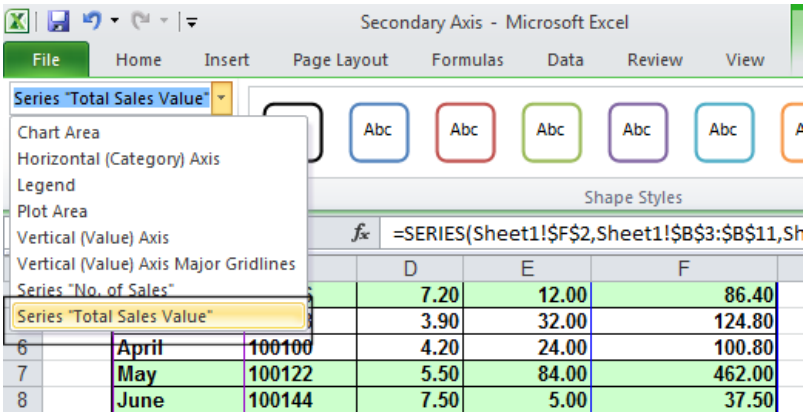
Make sure the chart is selected.
Within the chart click on one of the columns that you have just inserted.



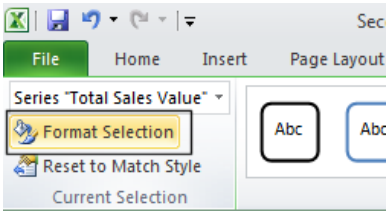
Click on the **Format** tab within the current selection group, click on the **down arrow** displayed at the top of the group.



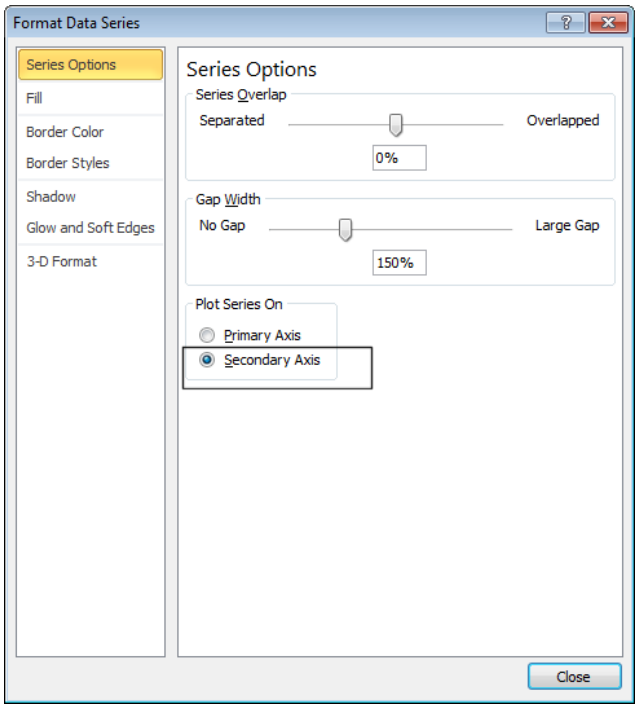
From the drop-down list displayed select **Series 'Total Sales Value'**.



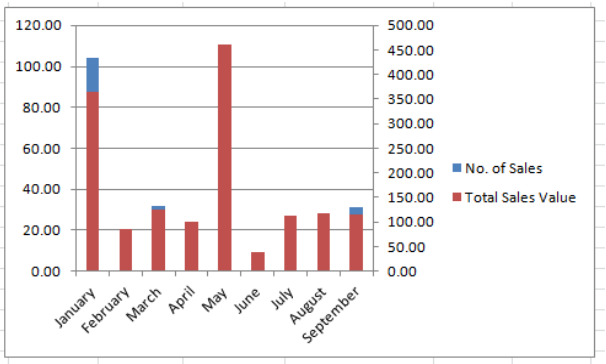
Within the Current Selection group click on Format Selection.



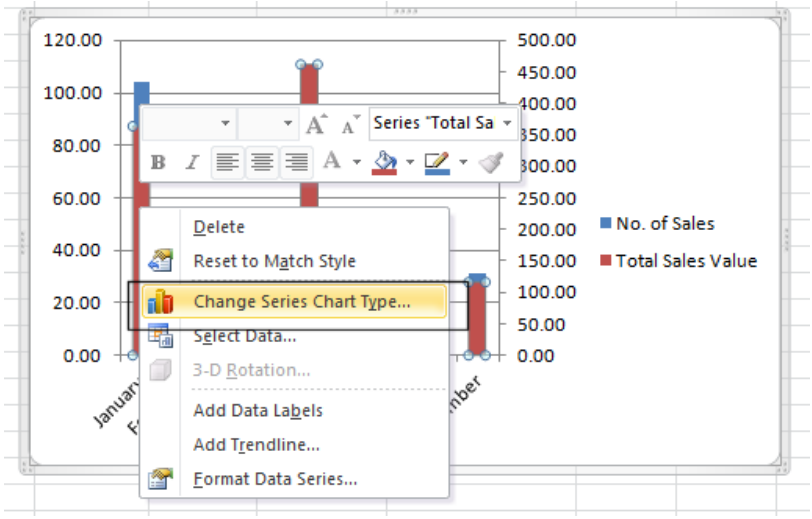
The **Format Data Series** dialog box will be displayed. Click on the **Secondary Axis** button. Click on the Close button.



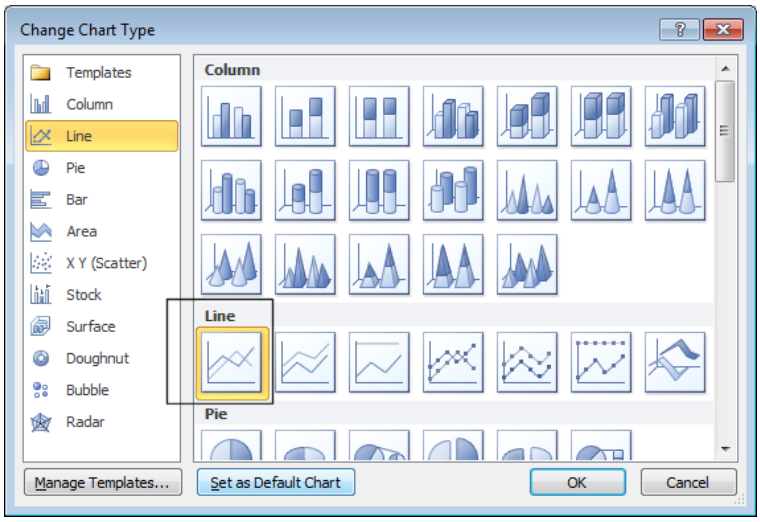
The chart will now look like this.



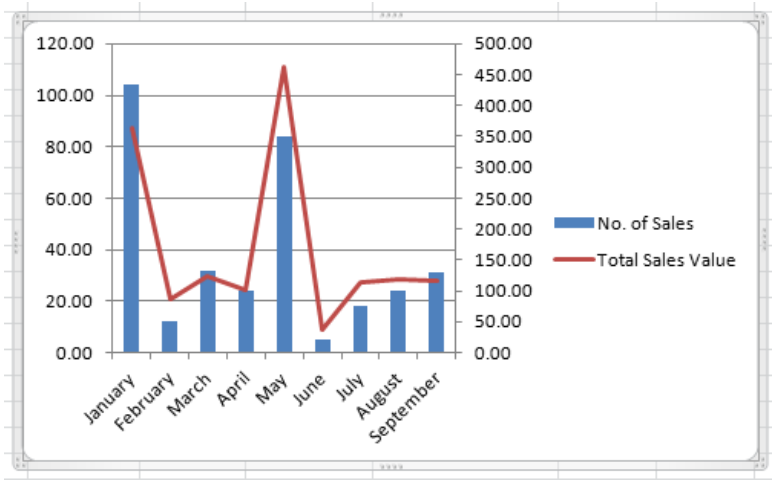
Right click on any part of a column relating to the **Number of Sales**.
From the pop-up menu displayed click on the **Change Series Chart Type** command.



The **Change Chart Type** dialog box will be displayed. Select a line chart type.



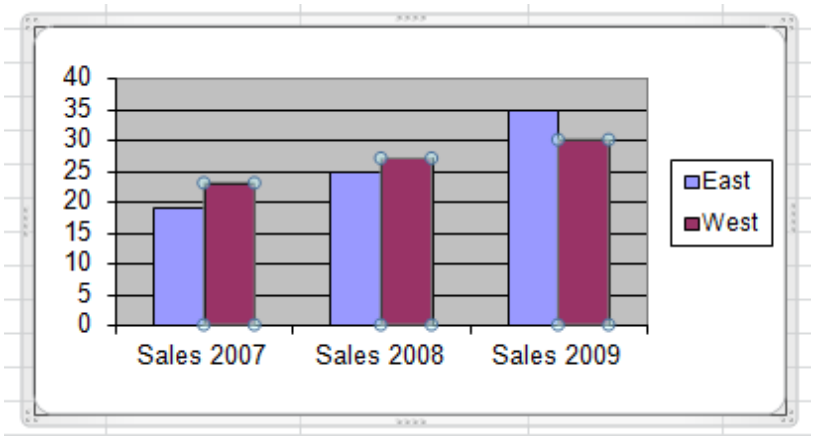
Click on the **OK** button and the chart will now look like this.



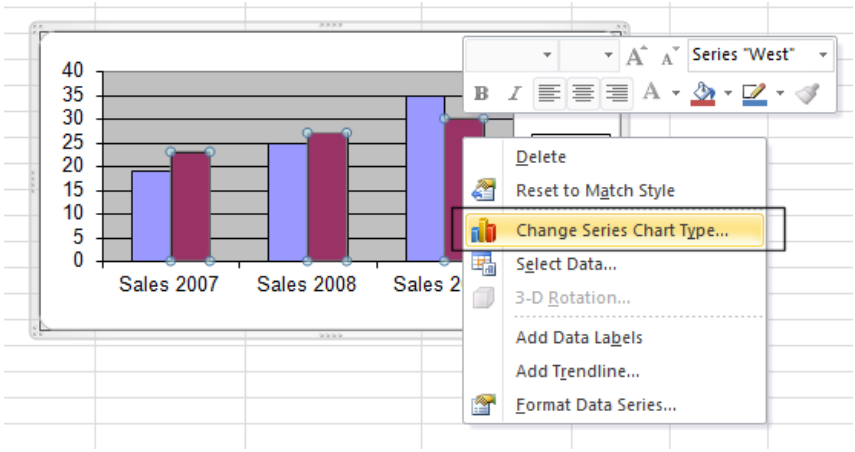
Save your changes and close the workbook.

Changing the chart type for a particular data series.

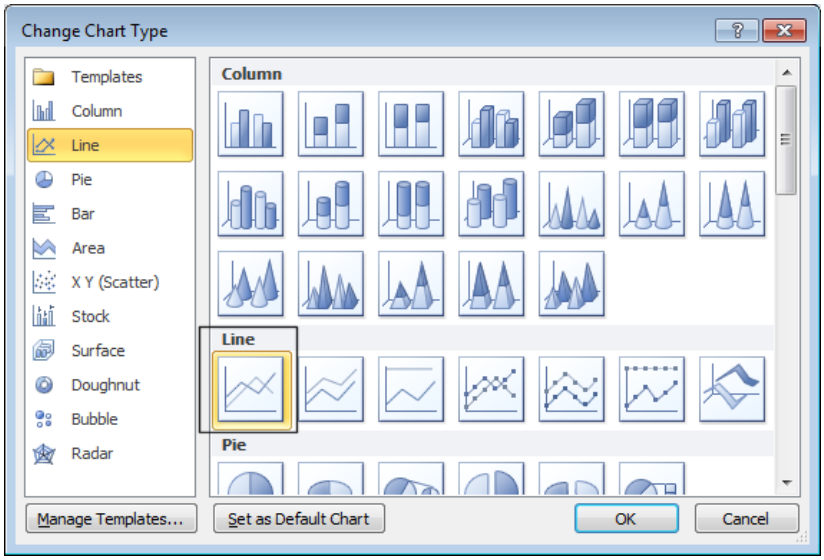
Open a workbook called **Chart Types**.
Click on the second data series within the chart (in the example illustrated we clicked on one of the columns, representing the data for the **West** sales region).



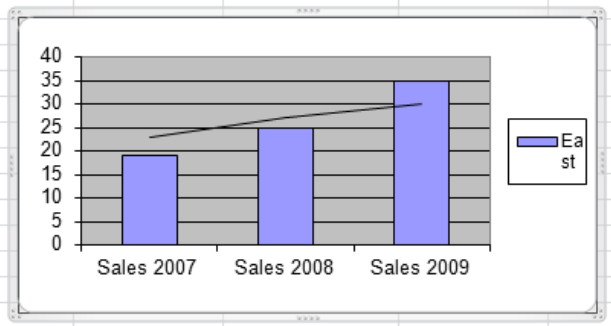
Right click and you will see a pop-up menu displayed.



From the pop-up menu displayed, select **Chart Series Chart Type.** This will display the **Change Chart Type** dialog box.
Select the required chart type, and if necessary chart sub-type. In this case, select a **Line** chart.



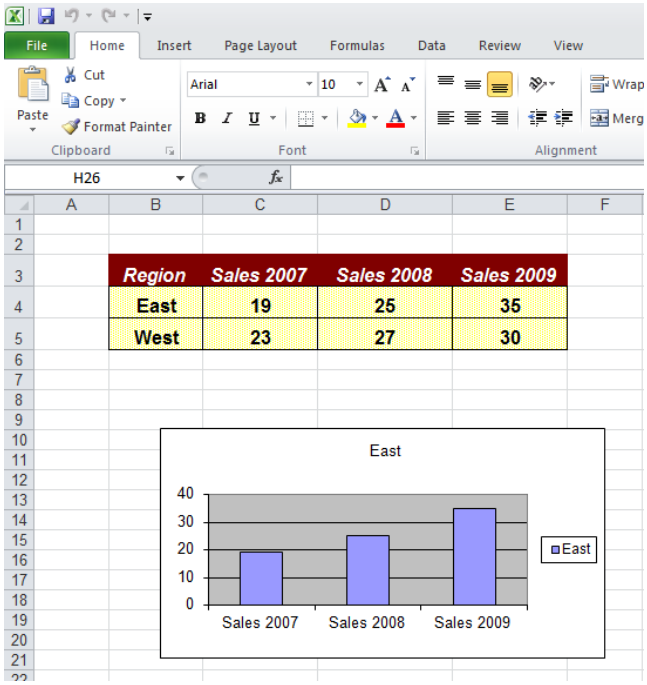
Click on the **OK** button to change the chart type, as seen below.



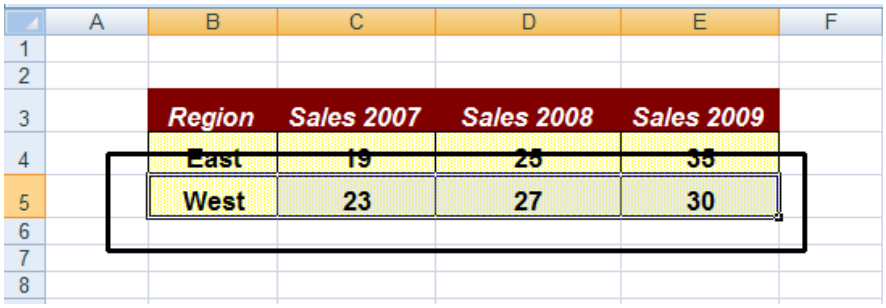
Experiment with applying other chart types.
Save your changes and close the workbook.

Adding a data series to a chart.

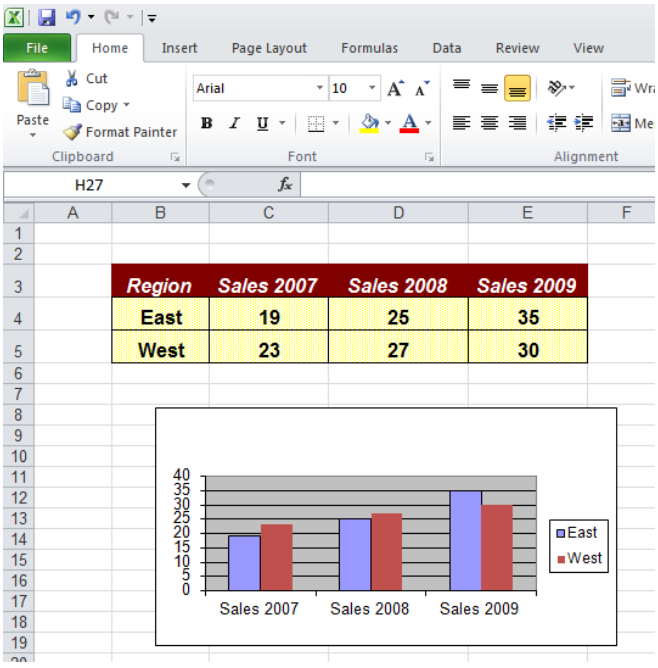
Open a workbook called **Adding a Data Series**. This workbook contains a chart that is only displaying information relating to the **East** region.



You can select a data range from your worksheet and add this to the chart. To add information related to the **West** region to the chart we need to select the data relating to the **West** region, as illustrated.



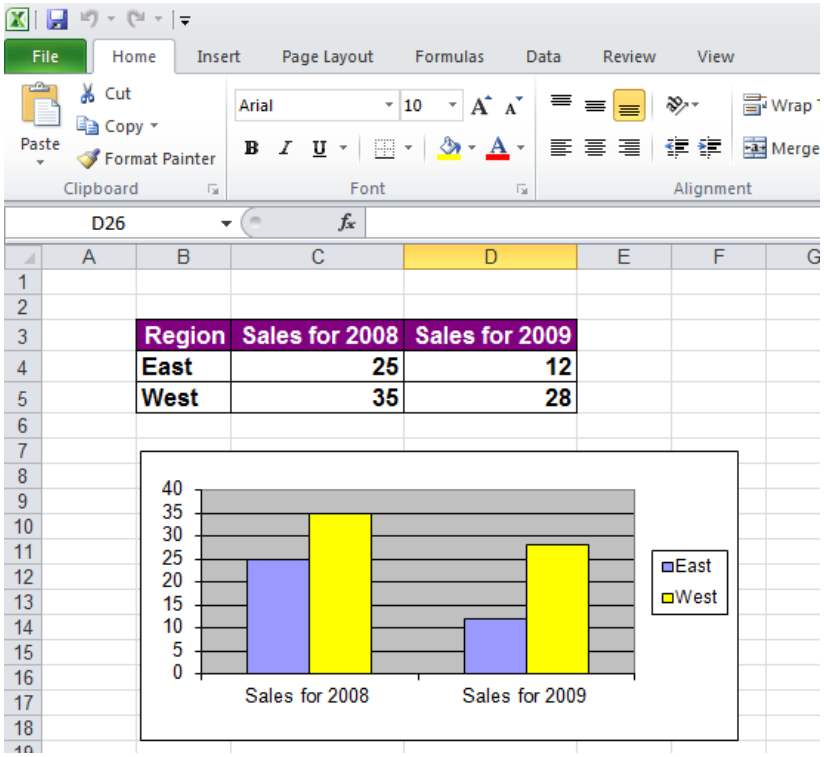
Press **Ctrl+C** to copy the selected data to the Clipboard. Click on the chart to select it and press **Ctrl+V** to paste the data to the chart. The chart will now look like this.



Save your changes and close the workbook.

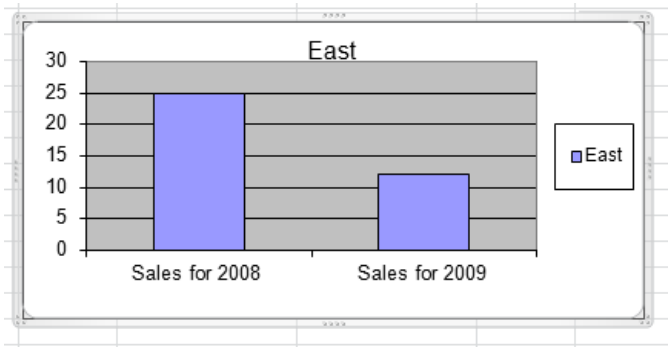
Removing a data series from a chart.

Open a workbook called **Deleting a Data Series**. This workbook contains a chart.



To delete a data series from the chart, click on one of the columns (representing the data series that you wish to remove). In the example illustrated, we clicked on the sales data for the sales from the **West** region, (i.e. the yellow column).

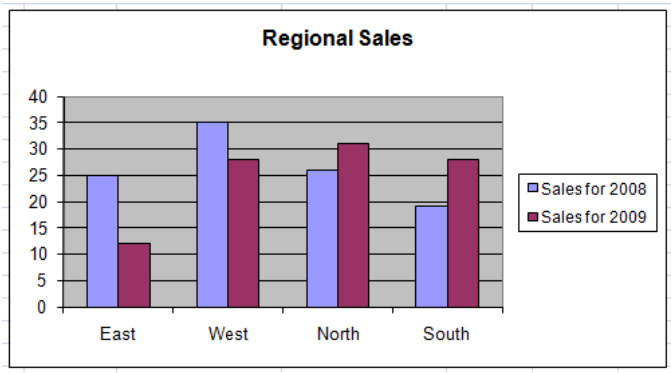
Press the **Del** key. The result will be as seen below.



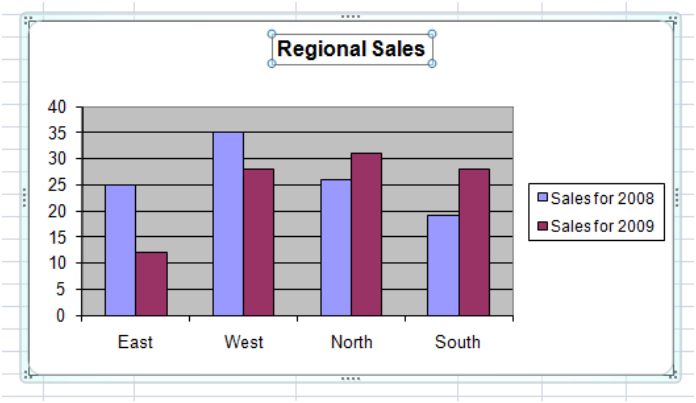
Save your changes and close the workbook.

Re-positioning chart title.

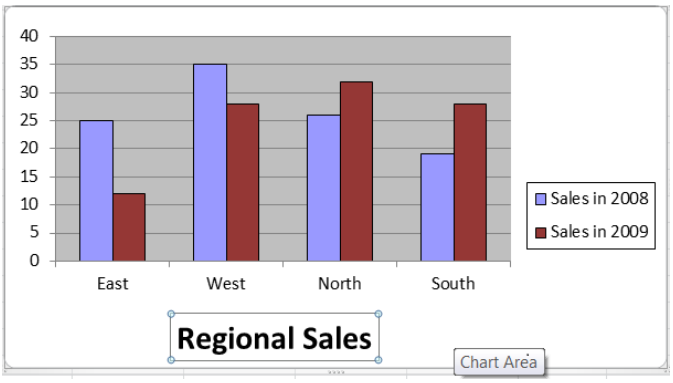
Open a workbook called **Moving Chart Titles**. The chart within the workbook looks like this.



To move the chart title, first click on the chart title to select it, as illustrated.



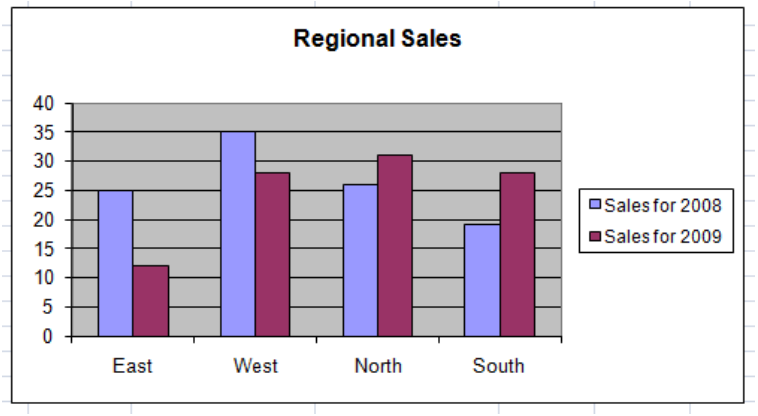
Move the mouse pointer to the edge of the chart title and drag the title to a new location.



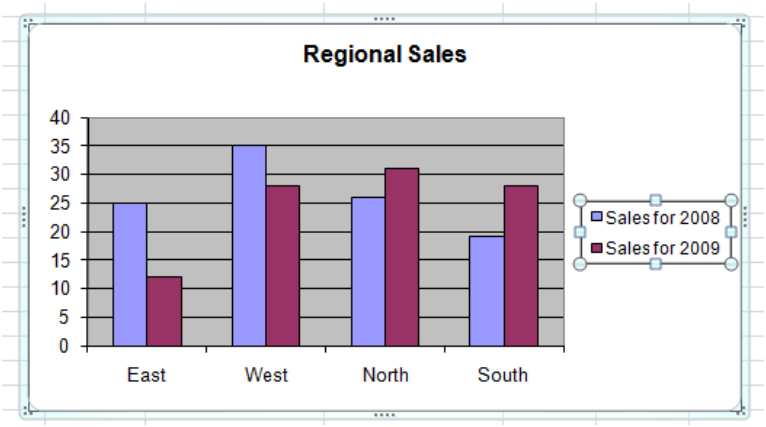
Save your changes and close the workbook.

Re-positioning the chart legend.

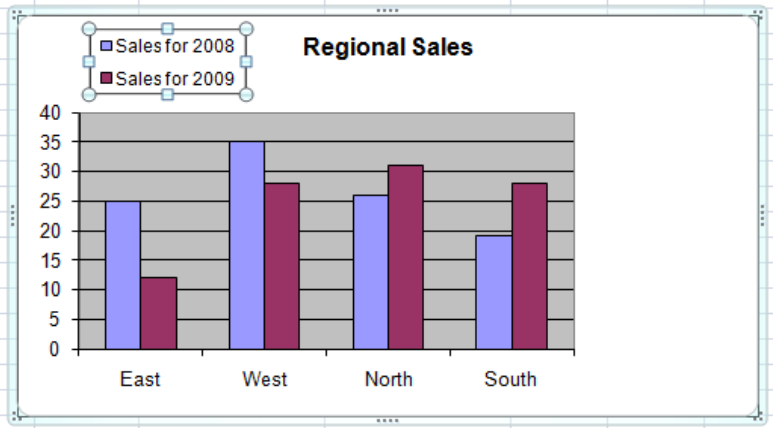
Open a workbook called **Moving Chart Legends**. The chart within the workbook looks like this.



Click on the chart legend to select it, as illustrated.



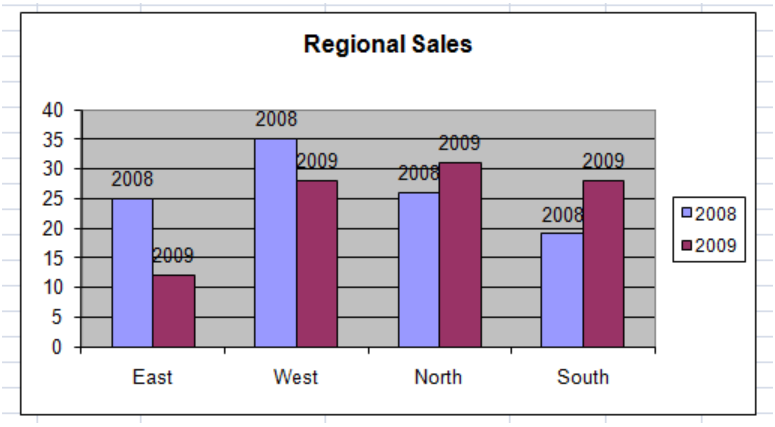
Move the mouse pointer to the edge of the chart legend, and drag the legend to a new location, as in the illustration.



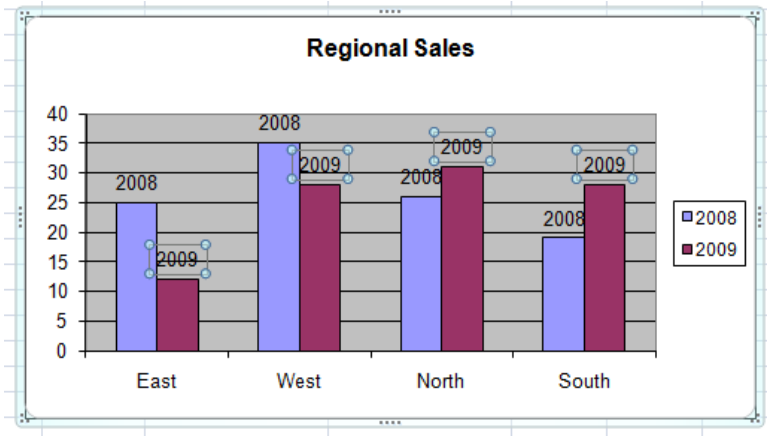
Save your changes and close the workbook.

Moving and formatting chart data labels.

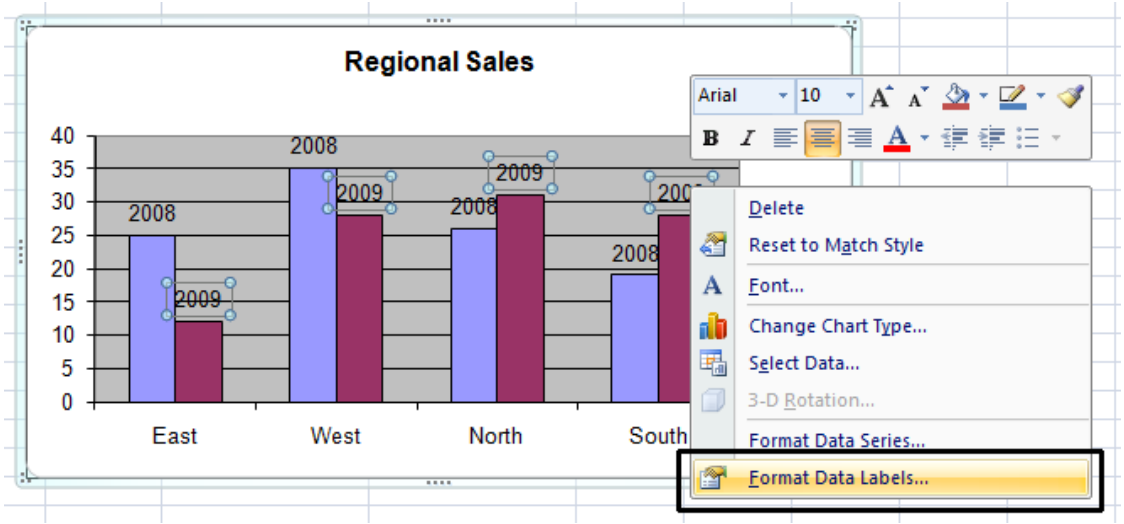
Open a workbook called **Moving Chart Data Labels**. The chart within the workbook looks like this.



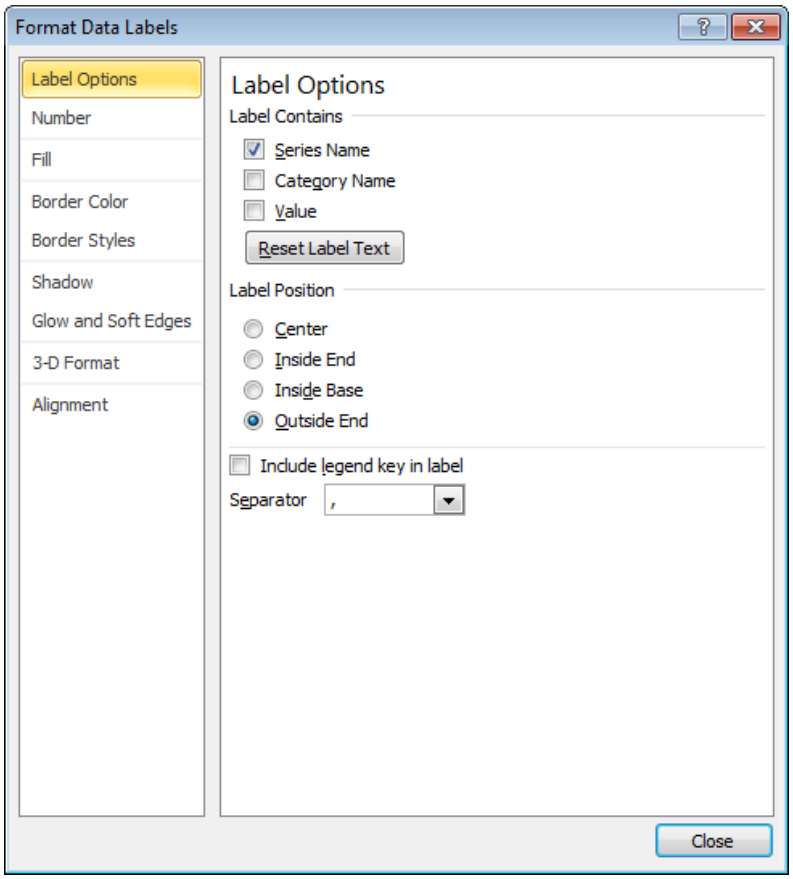
Click on the chart data label, for the **2009** columns, to select them, as illustrated.



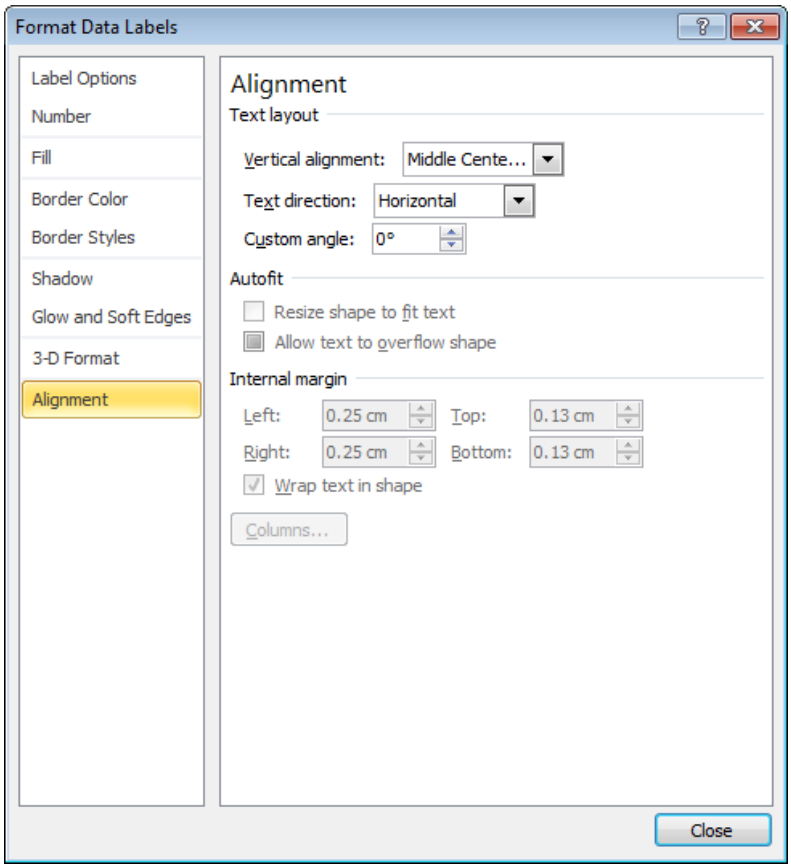
Right click over a selected data label and from the pop-up menu displayed click on the **Format Data Labels** command.



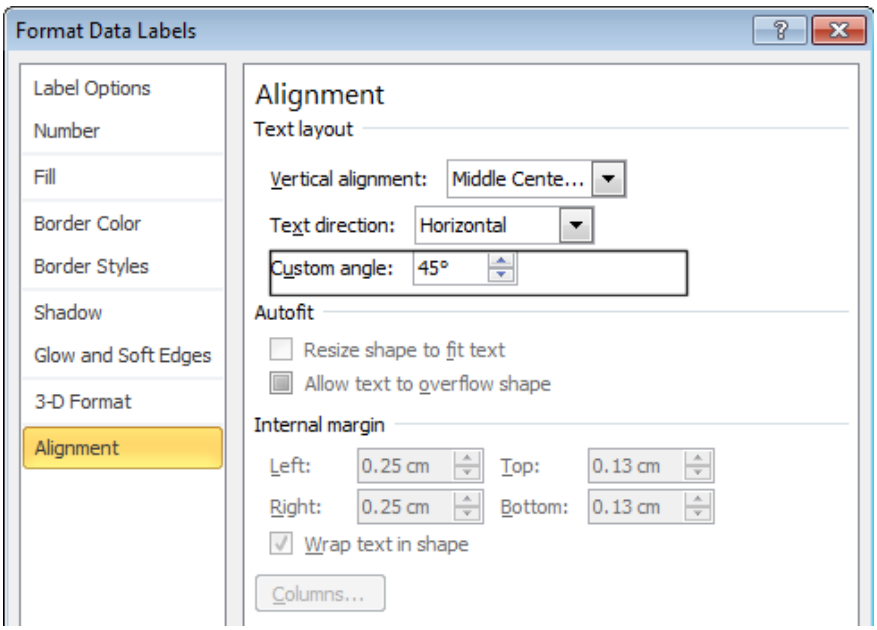
This will display the **Format Data Labels** dialog box.



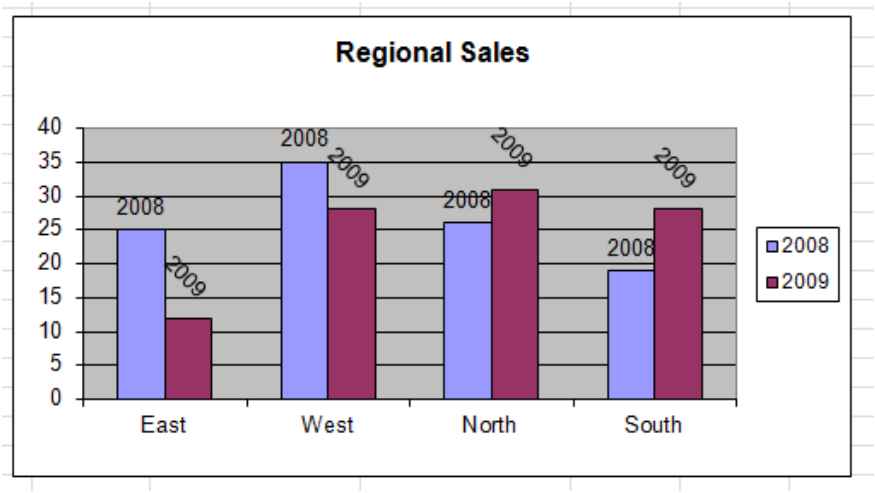
Click on the **Alignment** tab.



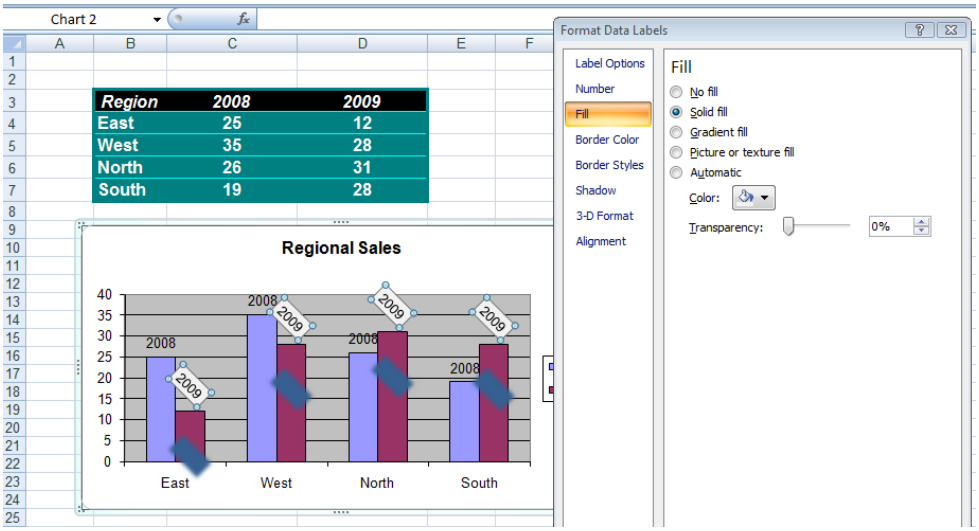
Use the various options available to reposition the data labels within the chart. For instance use the **Custom Angle** section within the dialog box to display the text at **45 degrees**.



If you click on the **Close** button the chart will look like this.



Experiment with applying other formatting options. For instance, within the **Format Data Labels** dialog box, you can click on the **Fill** tab and apply fill formatting to the data labels.

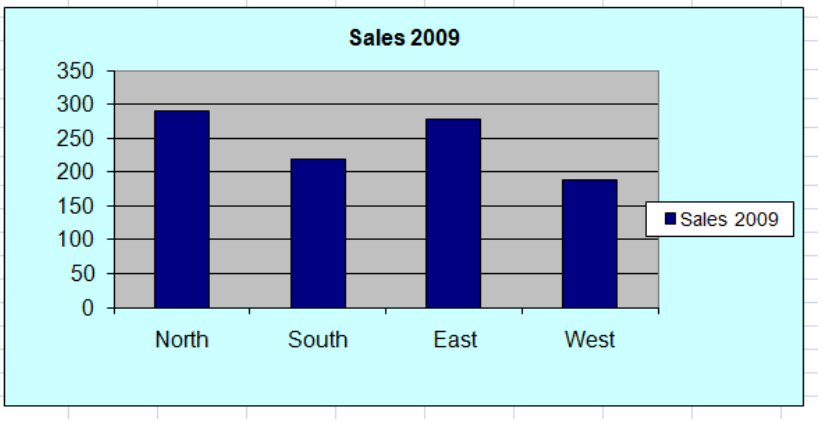


To move a data label, simple select the label and drag it to a new location. Experiment with moving the data labels so that they are displayed half way up the columns, rather than being displayed at the top of each column.

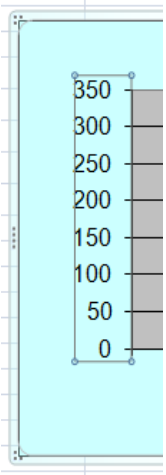
When you have finished experimenting, save your changes and close the workbook.

Modifying chart axis scales.

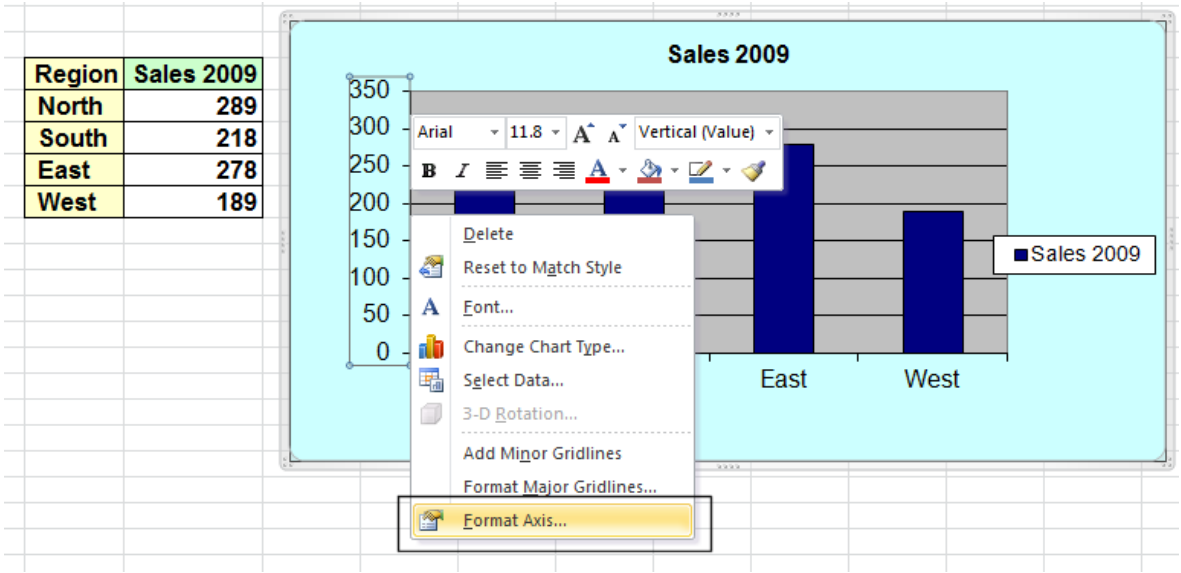
Open a workbook called **Chart axis scale**.



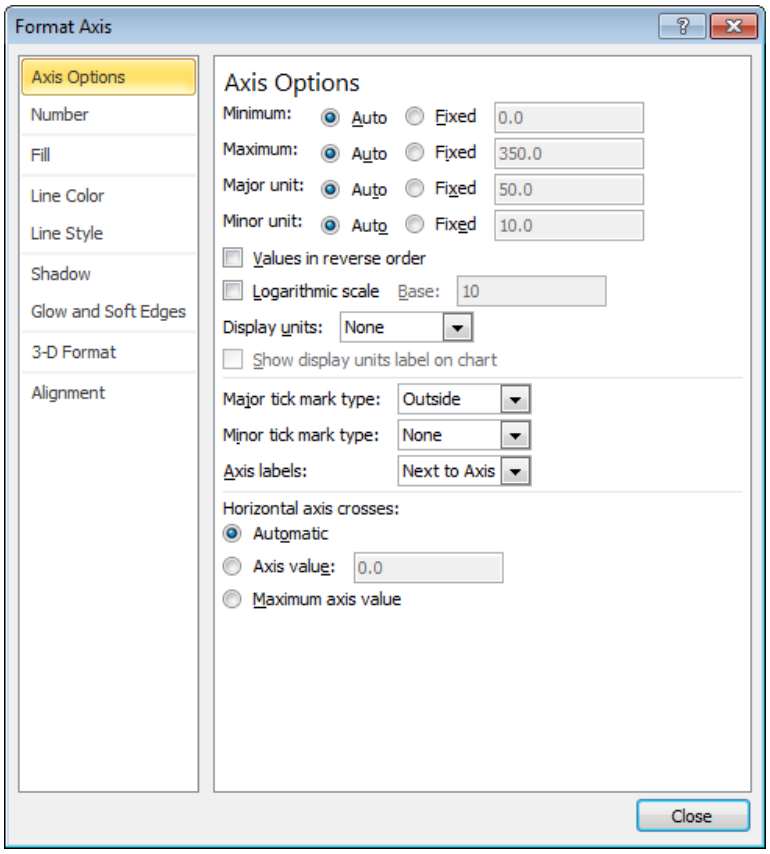
Click once on the vertical axis so that it is selected.



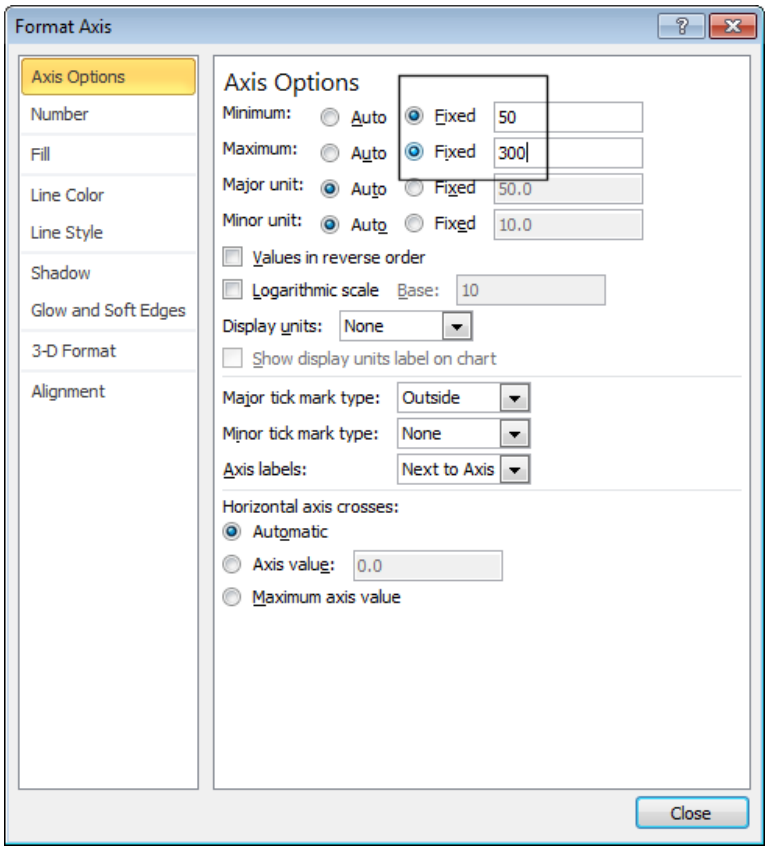
Right click on the selected vertical axis and from the pop-up menu displayed, click on the **Format Axis** command.



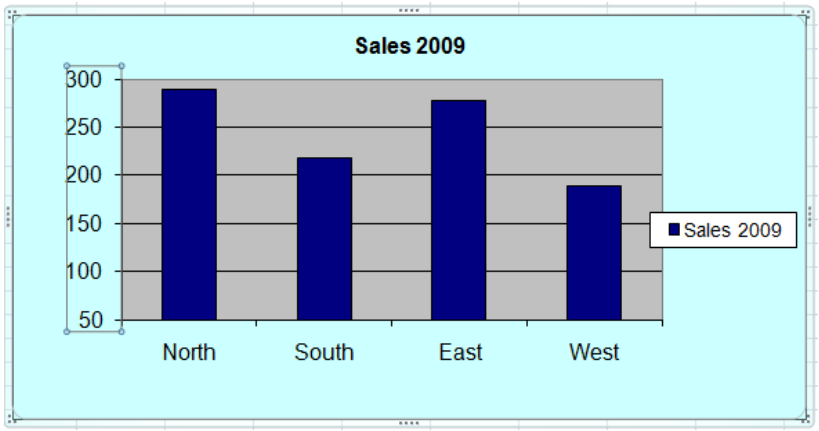
The **Format Axis** dialog box will be displayed. You can use this dialog box to set minimum and maximum axis values as well as specifying the major and minor axis scale units.



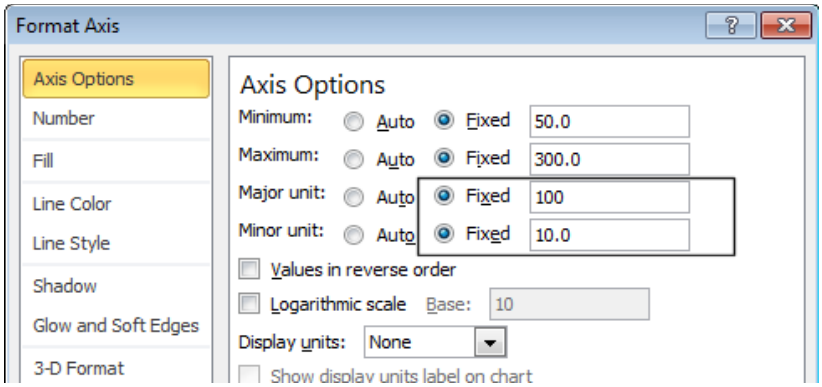
Within the **Minimum** text box, click on the **Fixed** button and enter the number **50**.
Within the **Maximum** text box, click on the **Fixed** button and enter the number **300**. The dialog box will look like this.



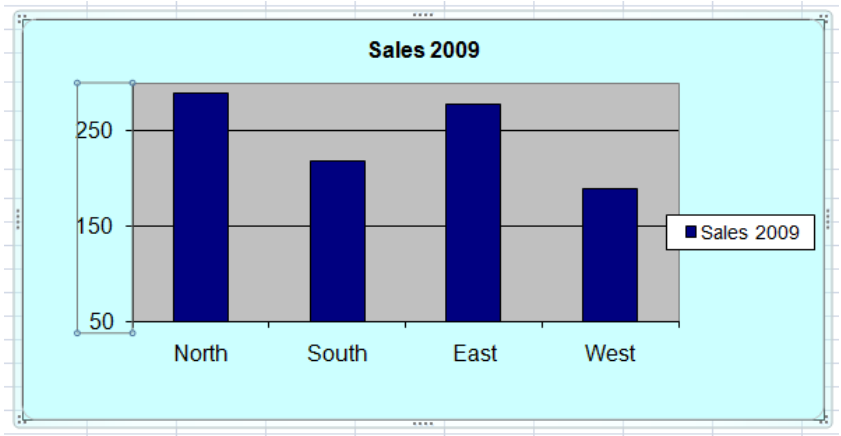
Click on the **Close** button and the chart will look like this.



Redisplay the **Format Axis** dialog box.
Within the **Major unit** section, click on the **Fixed** button and enter the number **100**.
Within the **Minor unit** section, click on the **Fixed** button and enter the number **50**. The dialog box will look like this.



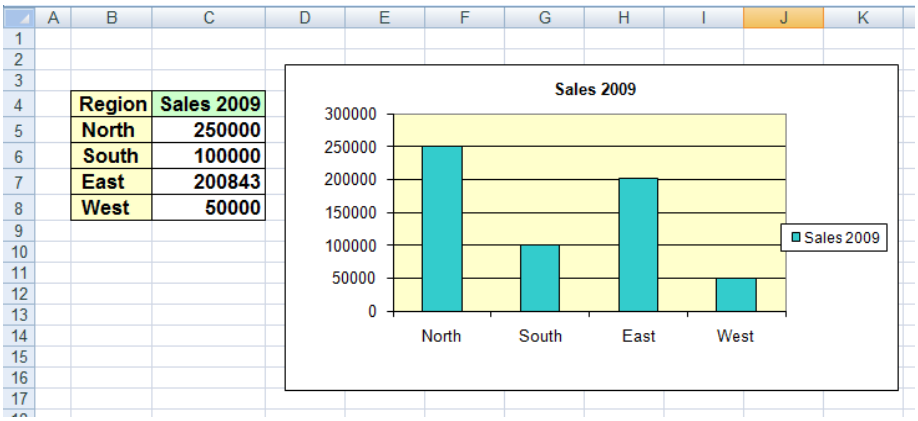
Click on the **Close** button and the chart will look like this.



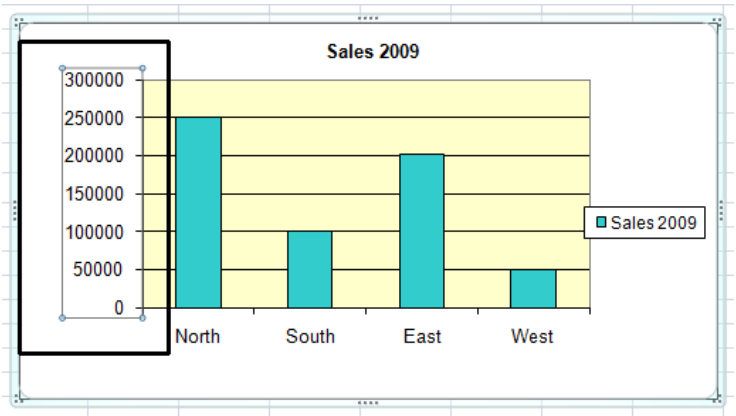
Save your changes and close the workbook.

Formatting an axis to display using commas.

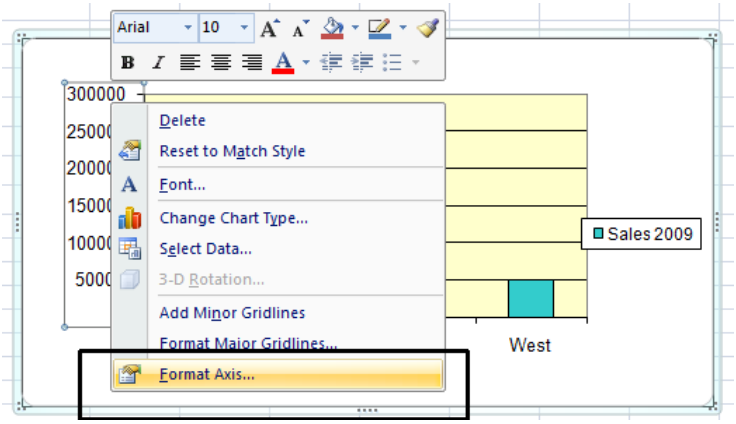
Open a workbook called **Chart axis units**. The chart looks like this. Notice that neither the data in the table, or numbers within the vertical axis, use comma formatting.



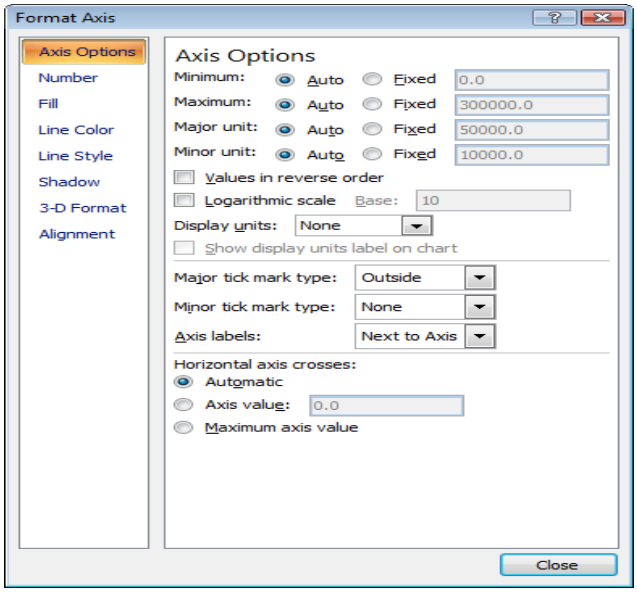
Select the vertical axis.



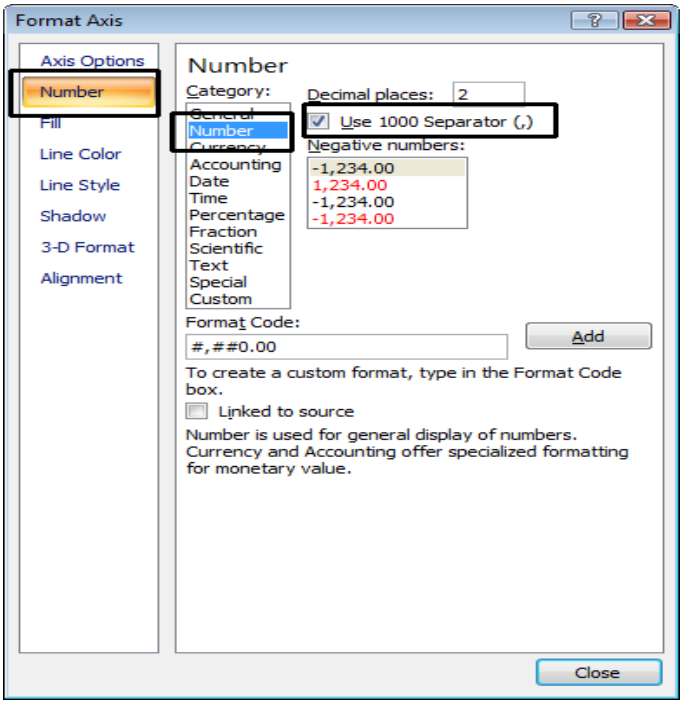
Right click on the vertical axis and from a pop-up menu displayed click on the **Format Axis** command.



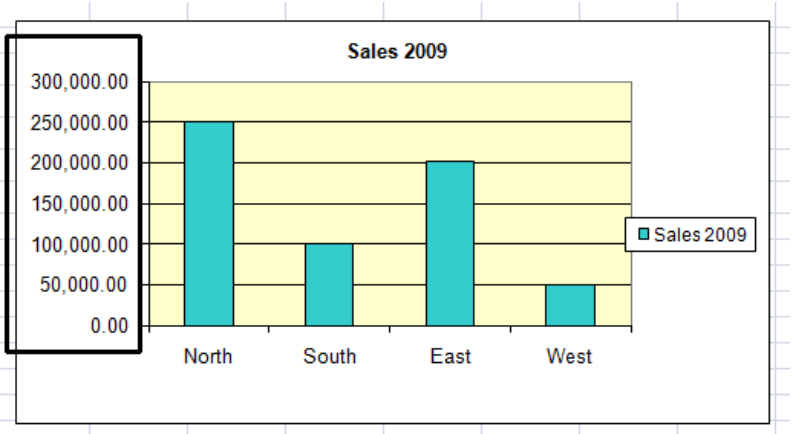
The **Format Axis** dialog box will be displayed.



Click on the **Number** button displayed within the left side of the dialog box.
Within the **Category** section, select Number.
Click on the **Use 1000** separator check box.
Within the **Decimal places** section of the dialog box, enter **2**.
The dialog box will now look like this.



Click on the **Close** button and your chart will look like this.

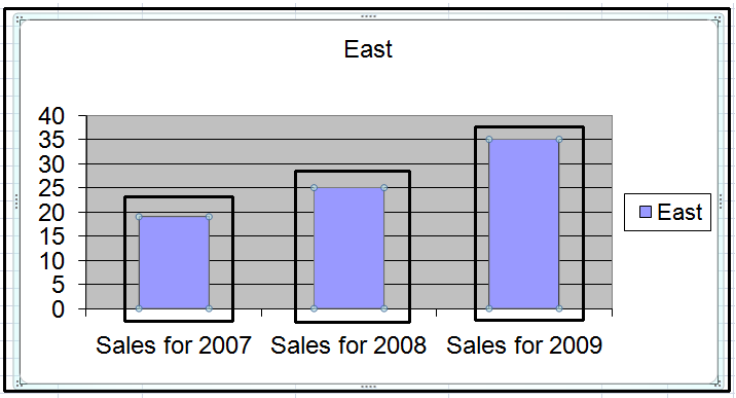


Even though the numbers within the table of data are not comma formatted, the numbers within the vertical axis do use comma formatting. This makes the chart easier to read and understand.
Save your changes and close the workbook.

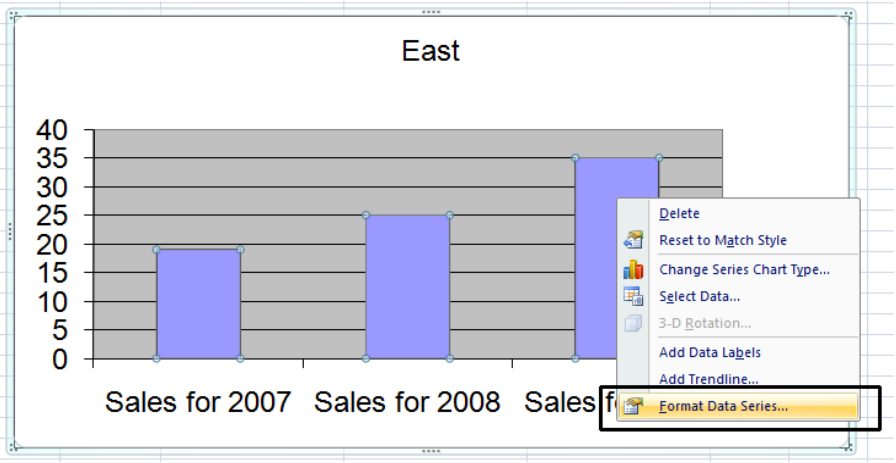
Inserting images into chart columns.

Open a workbook called Chart Columns with Images.

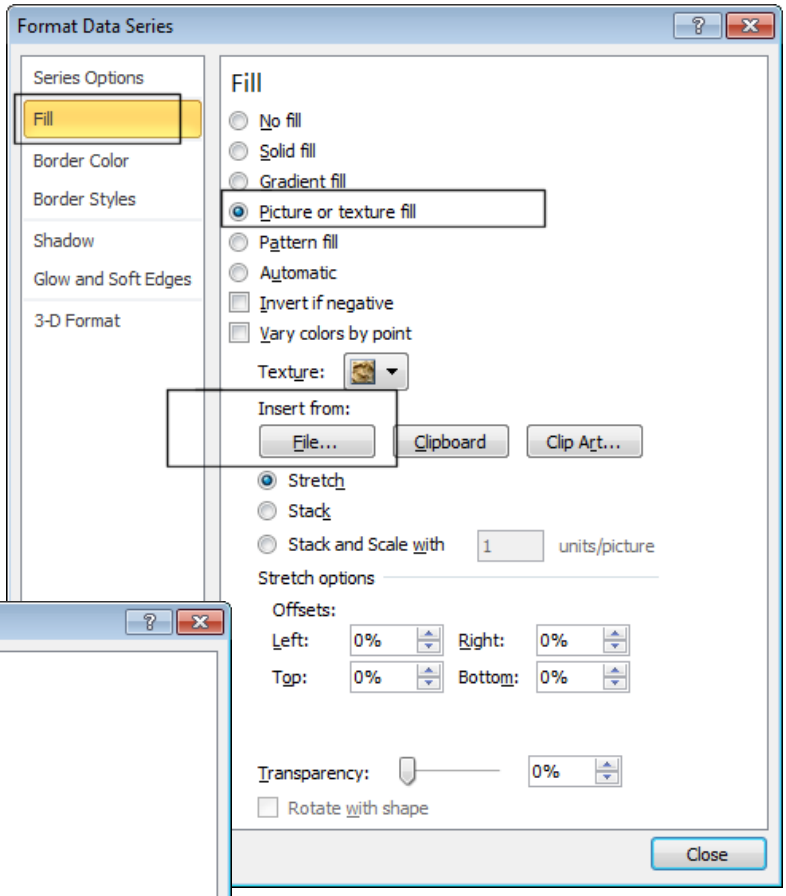
Click on one of the columns within the chart, so that all 3 columns are selected.

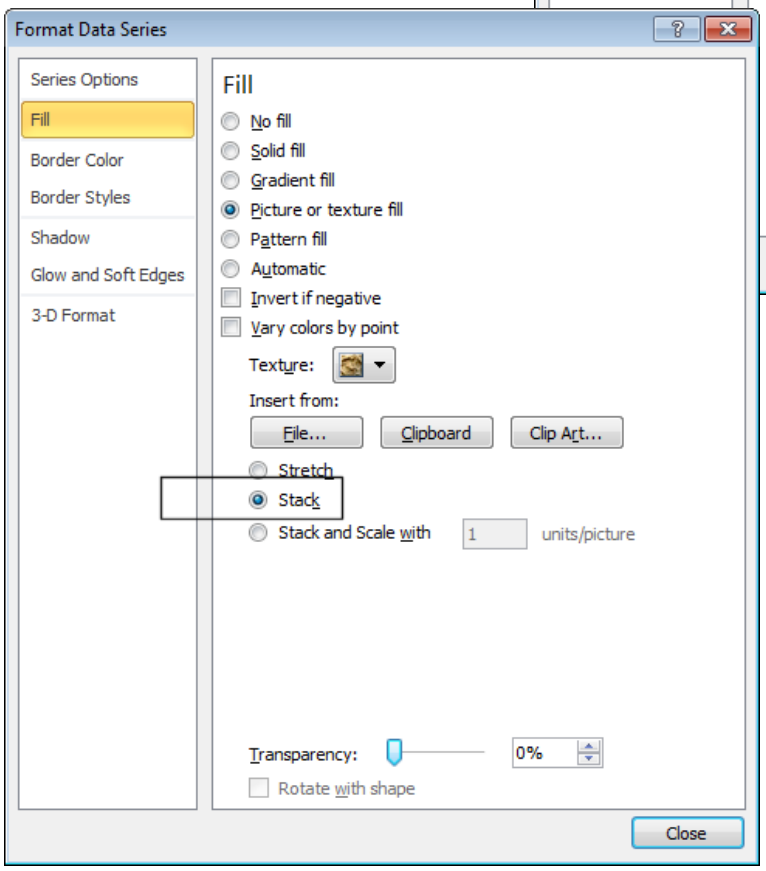


Right click over the selected columns and from the pop-up menu displayed click on the **Format Data Series** command.



This will display the **Format Data Series** dialog box.
Click on the **Fill** option.
Click on the **Picture or texture** fill button.





Basic Statistics with Excel

- Statistics is the science of collecting, organizing, presenting, analysing, and interpreting numerical data for the purpose of assisting in making a more effective decision.

- Statistical techniques are used extensively by marketing, accounting, quality control, consumers, professional sports people, hospital administrators, educators, politicians, physicians, etc...

- Descriptive Statistics: Methods of organizing, summarizing, and presenting data in an informative way.

- EXAMPLE 1: A Gallup poll found that 49% of the people in a survey knew the name of the first book of the statistical package. The statistic 49 describes the number out of every 100 persons who knew the answer.

- EXAMPLE 2: According to Consumer Reports, Whirlpool washing machine owners reported 9 problems per 100 machines during 1995. The statistic 9 describes the number of problems out of every 100 machines.

- Qualitative or Attribute variable: the characteristic or variable being studied is nonnumeric.

- EXAMPLES: Gender, religious affiliation, type of automobile owned, state of birth, eye Colour.

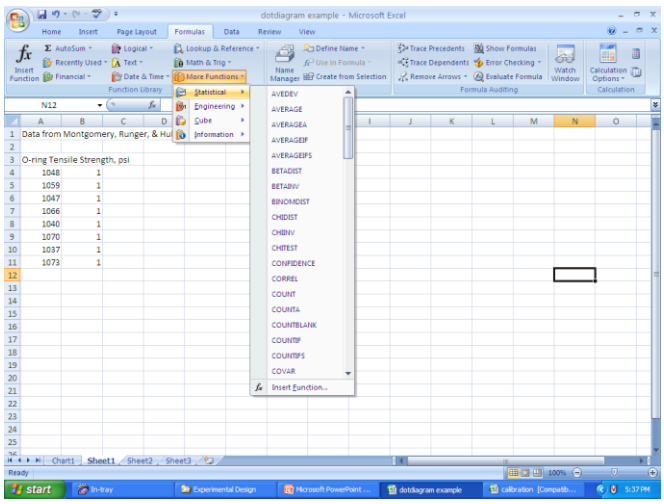
- Quantitative variable: the variable can be reported numerically.
- EXAMPLE: balance in your checking account, minutes remaining in class, number of children in a family.

- Quantitative variables can be classified as either discrete or continuous.

- Discrete variables: can only assume certain values and there are usually "gaps" between values.
- EXAMPLE: the number of bedrooms in a house. (1,2,3,..., etc...).

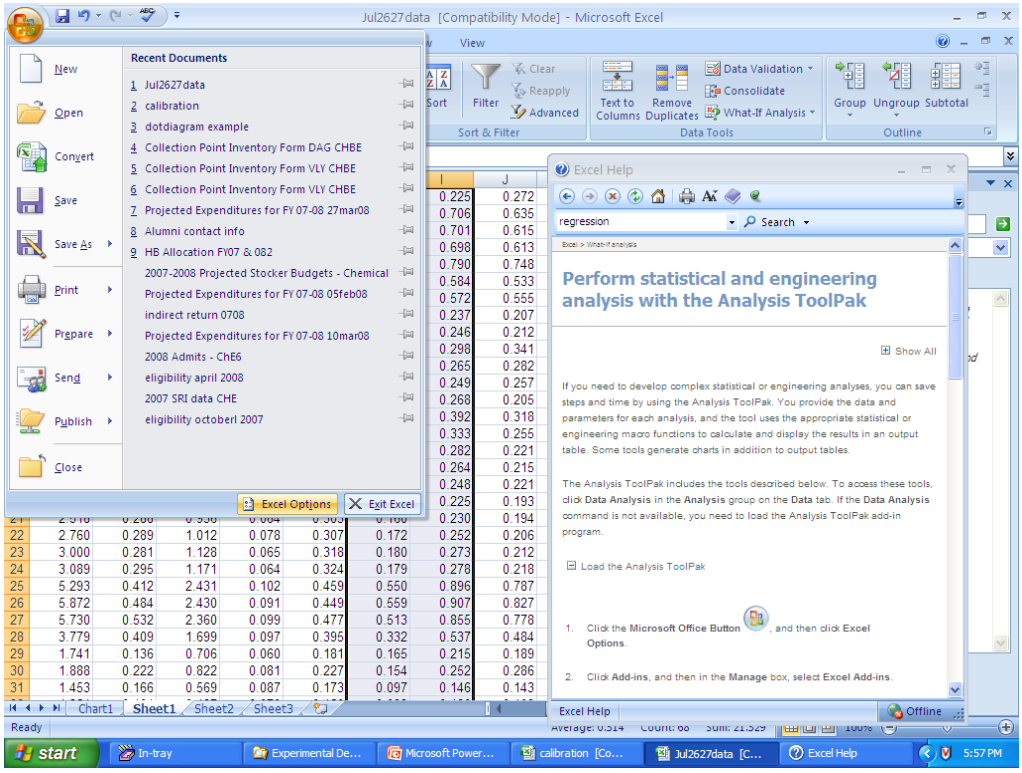
- Quantitative Variables can be classified as either discrete or continuous.
- Continuous variables: can assume any value within a specific range.
- EXAMPLE: The time it takes to fly from Toledo to New York.

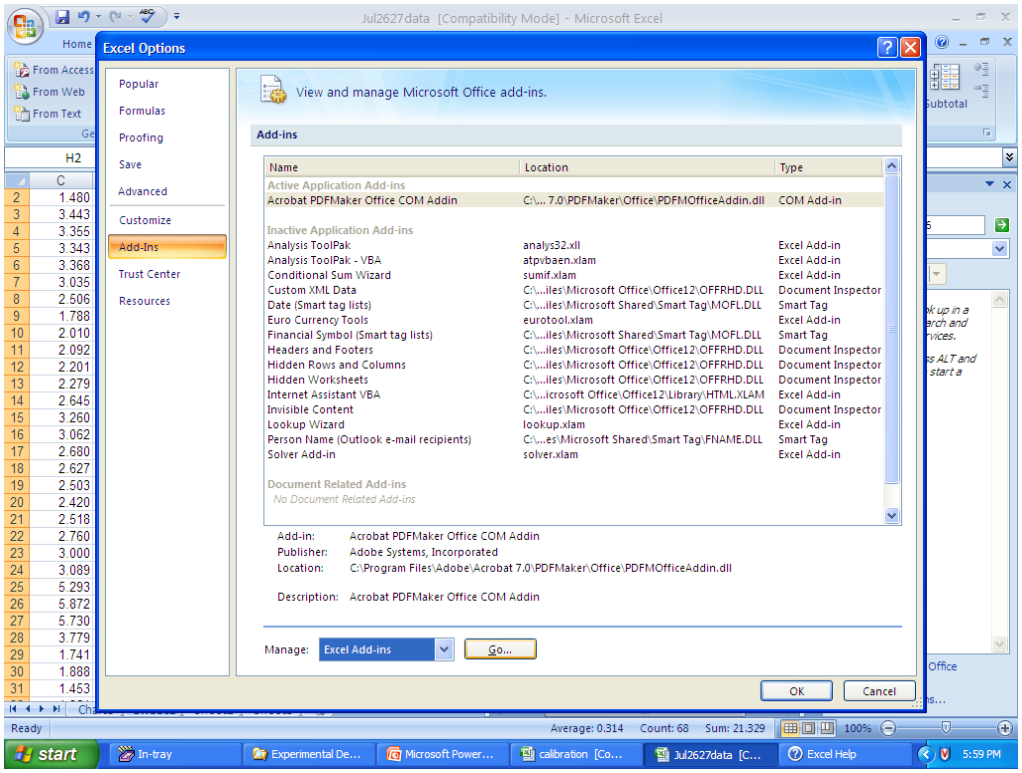
How to access Statistical Functions



Getting more statistics power from Excel

To get more statistics power from Excel, you need to add in the **Analysis Tool Pak**
Add in the **Analysis Tool Pak**
Click the Microsoft Office button, then Excel Options.



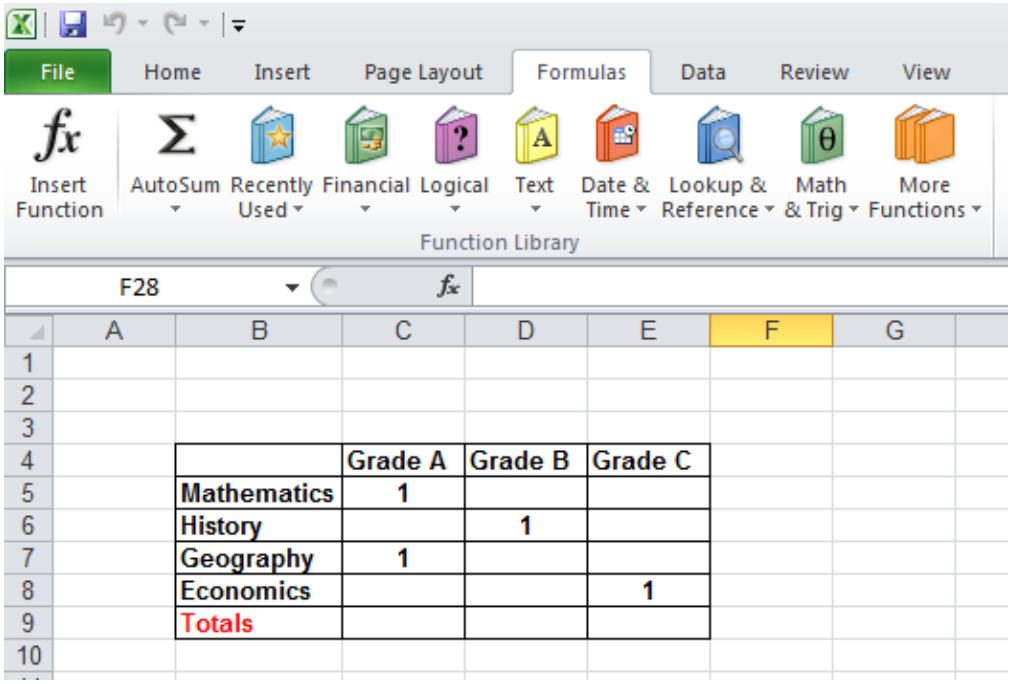


Click the checkbox for the Analysis Tool Pak, then 'OK'
Install it if it isn't installed
When you have added it in, it will appear on the 'Data' page

Statistical Functions

COUNT

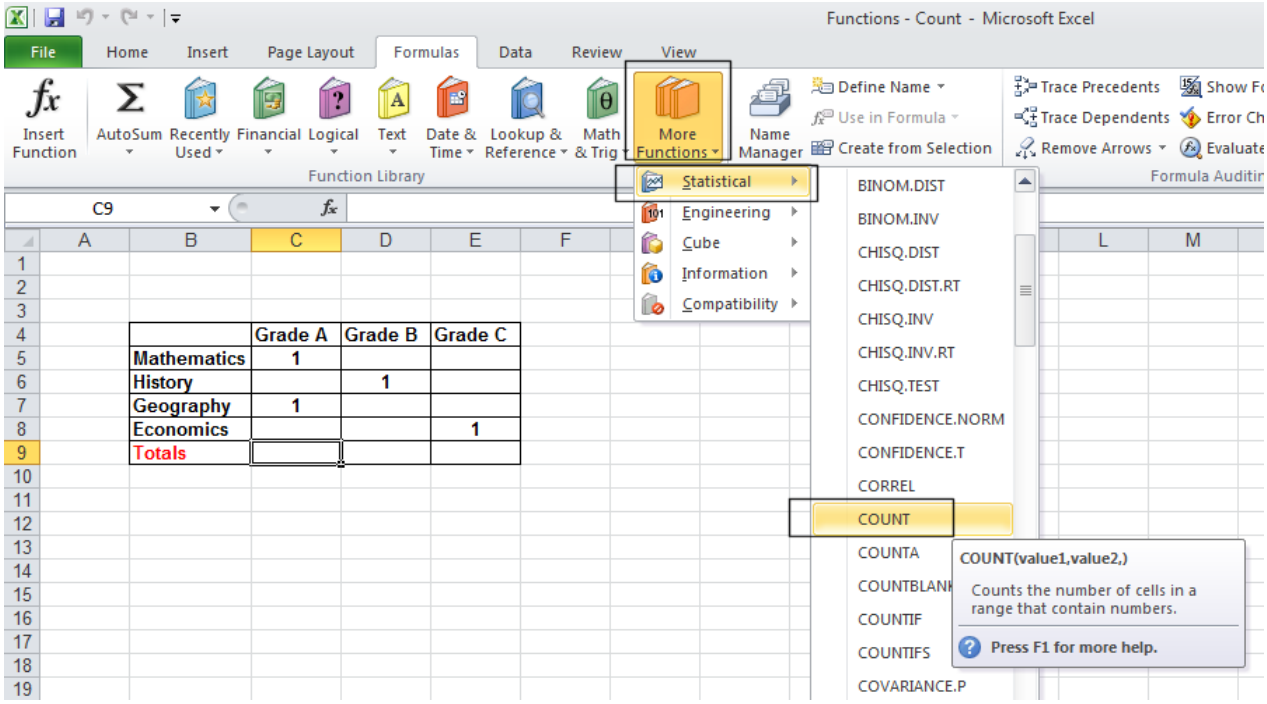
Open a workbook called **Functions - Count.** This sheet contains examination results and grades.



	Grade A	Grade B	Grade C
Mathematics	1		
History		1	
Geography	1		
Economics			1
Totals			

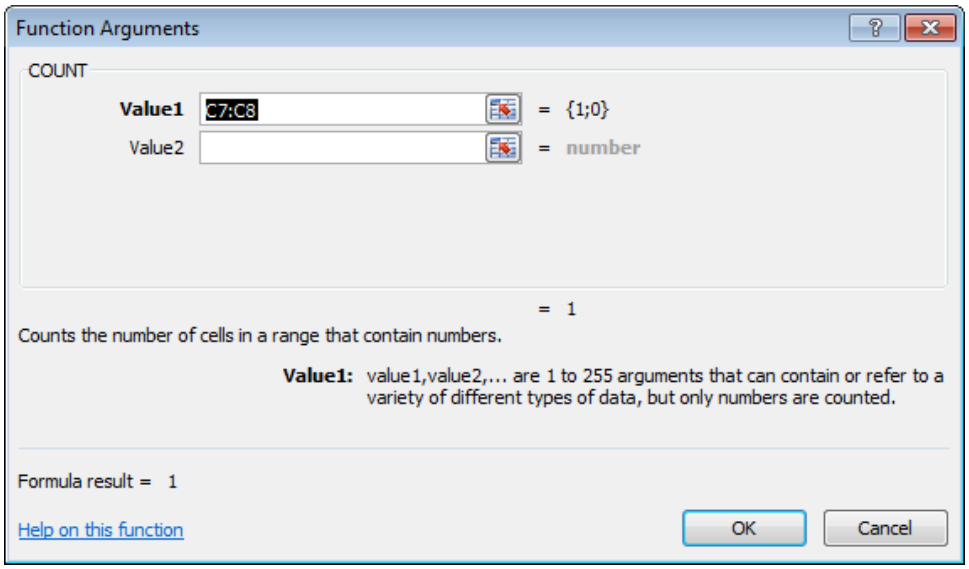
Click on cell C9.

Click on the **Formulas** tab and within the **Function Library** group click on the **More Functions** button. From the drop down list displayed click on **Statistical.** From the submenu displayed click on the **COUNT** function.

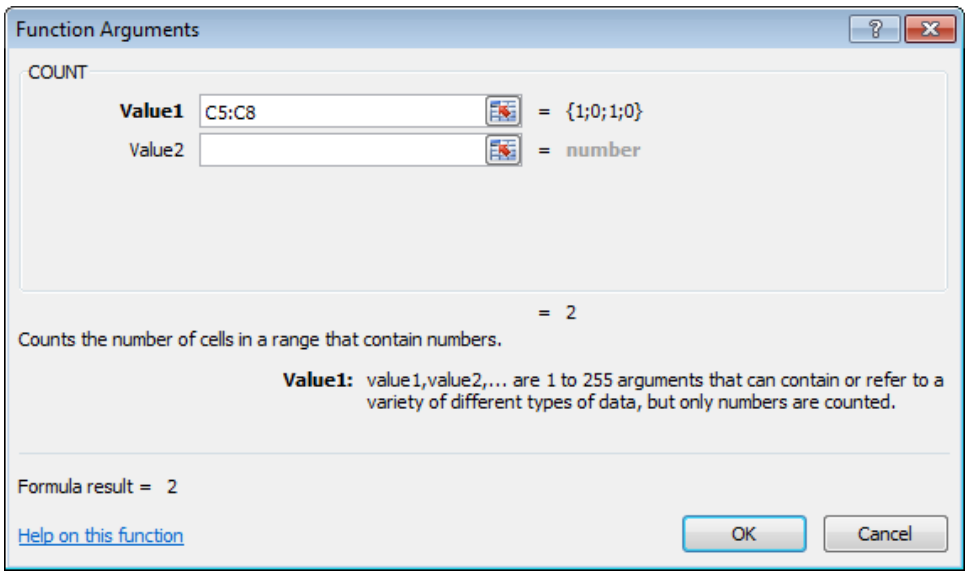


	Grade A	Grade B	Grade C
Mathematics	1		
History		1	
Geography	1		
Economics			1
Totals			

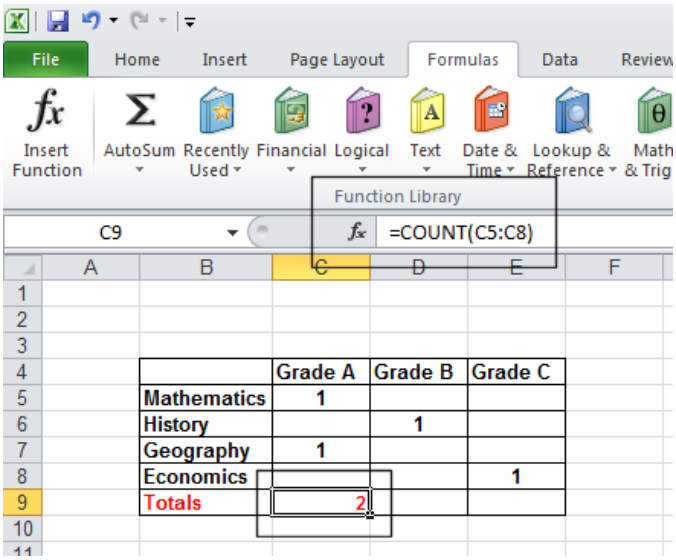
The **Function Arguments** dialog box is displayed.



In the **Value1** section of the dialog box, Enter the cell range **C5:C8**.



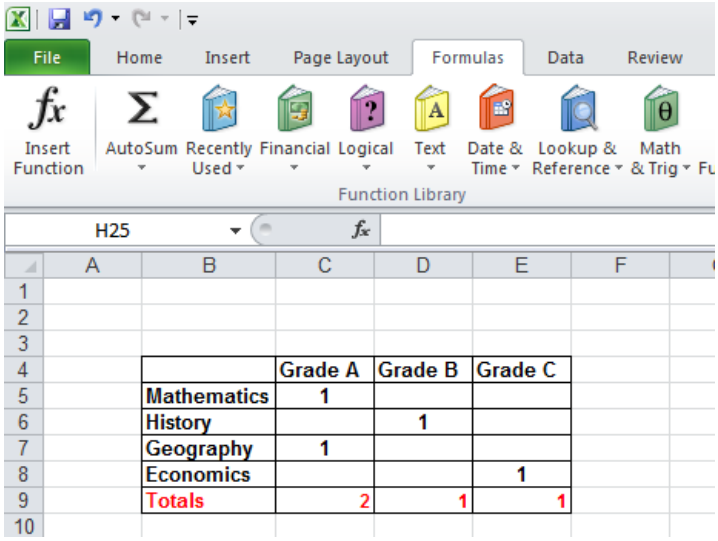
Click on the **OK** button to insert the function.
Your worksheet will now look like this.



You can see the function syntax displayed within the **Formula Bar**.

=COUNT(C5:C8)

Use the normal drag and drop techniques to copy this function to cells **D9** and **E9.** Your worksheet will now look like this.



	Grade A	Grade B	Grade C
Mathematics	1		
History		1	
Geography	1		
Economics			1
Totals	2	1	1

Save your changes and close the workbook.

RANK

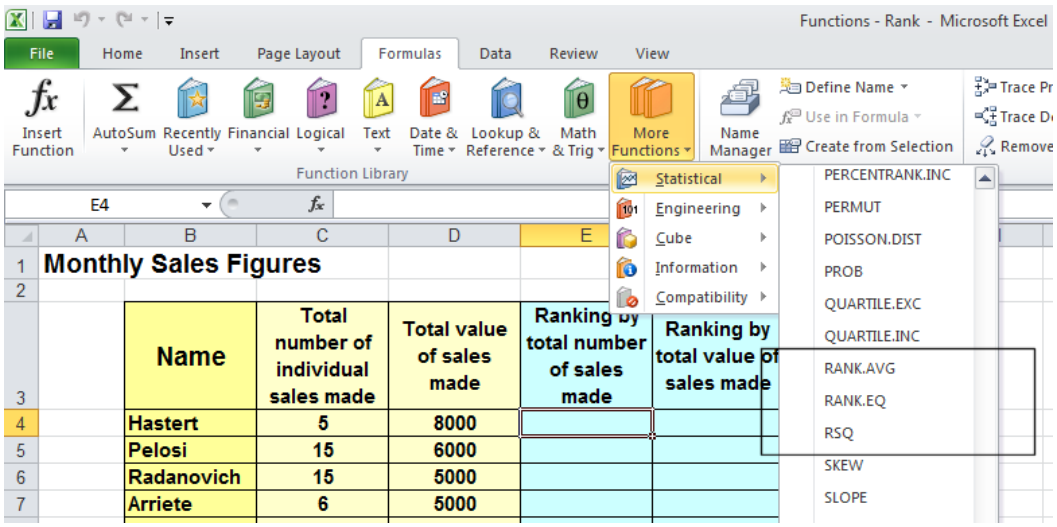
Open a workbook called **Functions - Rank.** The worksheet contains a table of sales results, including the total number of individual sales and also the total value of sales made, by all ten sales people working for a company.

Monthly Sales Figures

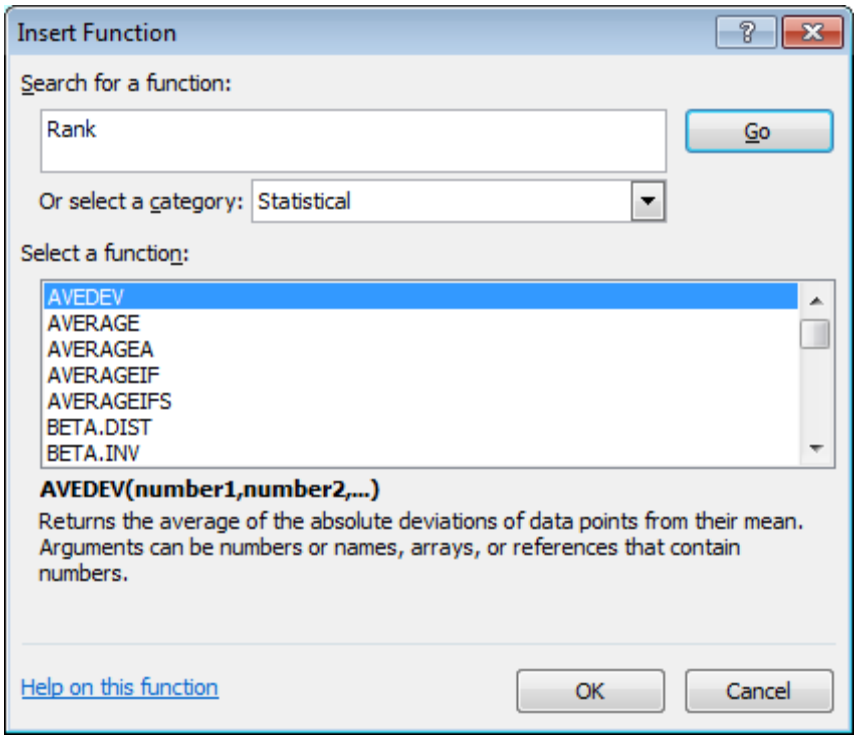
Name	Total number of individual sales made	Total value of sales made	Ranking by total number of sales made	Ranking by total value of sales made
Hastert	5	8000		
Pelosi	15	6000		
Radanovich	15	5000		
Arriete	6	5000		
Dreifuss	3	1000		
Dumas	16	1500		
Gravani	20	2000		
Wilson	18	3500		
Feeney	19	3000		
Mach	20	4500		

We want to rank each sales person by total number of sales made and also by the total values of sales made.
Click on cell **E4.**
Click on the Formulas tab and within the **Function Library** group click on the **More Functions** button. From the drop down list displayed click on **Statistical.**

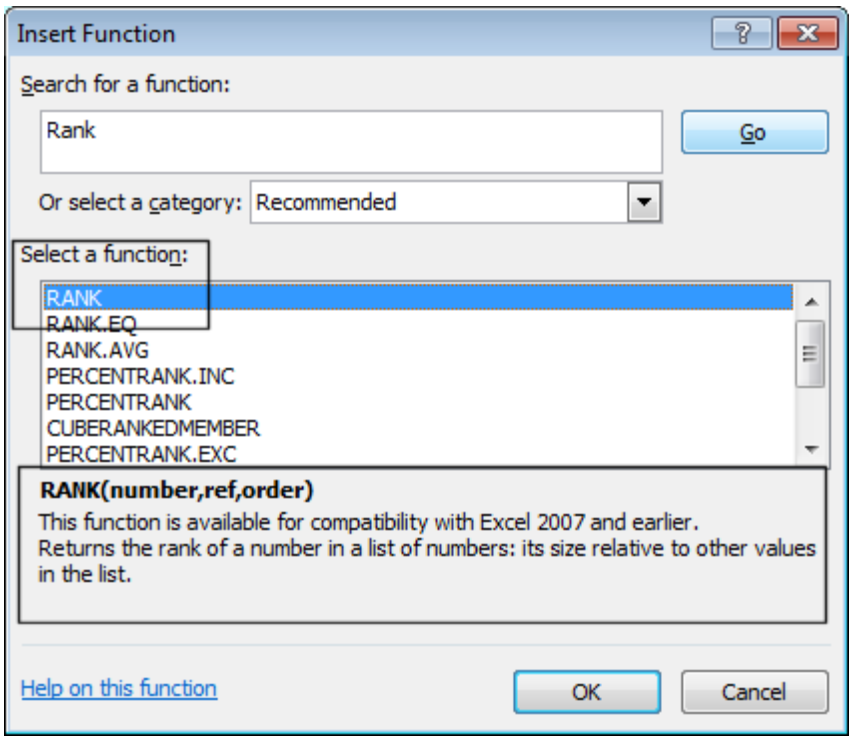
You will notice that the **Rank** function is not displayed within the list.



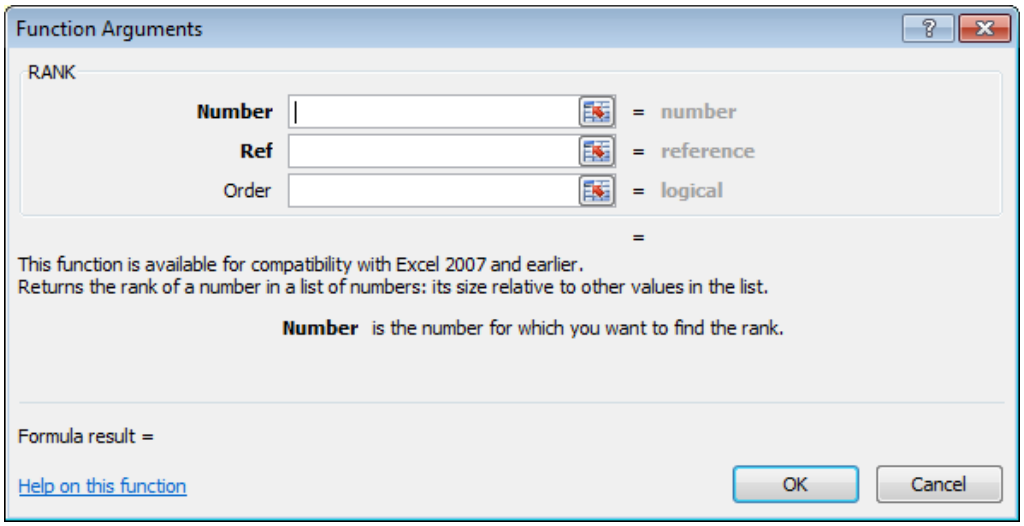
Click on the **Insert Function** button and type the word **Rank** into the search box.



Click on the **Go** button (not the **OK** button) and you will see the following dialog box.



Read the information displayed at the bottom of the dialog box.
With the **Rank** function selected, click on the **OK** button. The **Function Arguments** dialog box will be displayed.

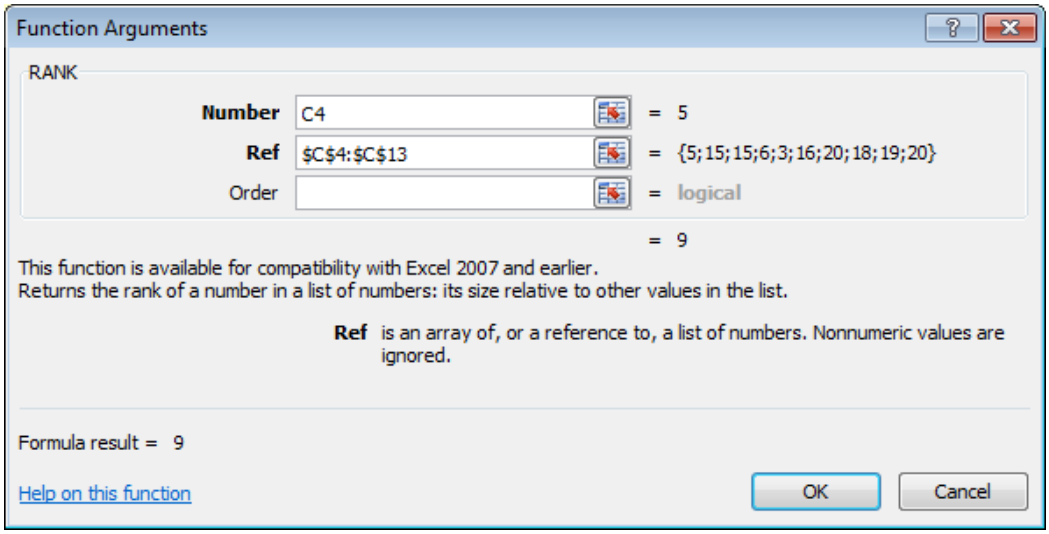


Enter the following data.

In the **Number** section we specify the item to rank, in this case **C4**.

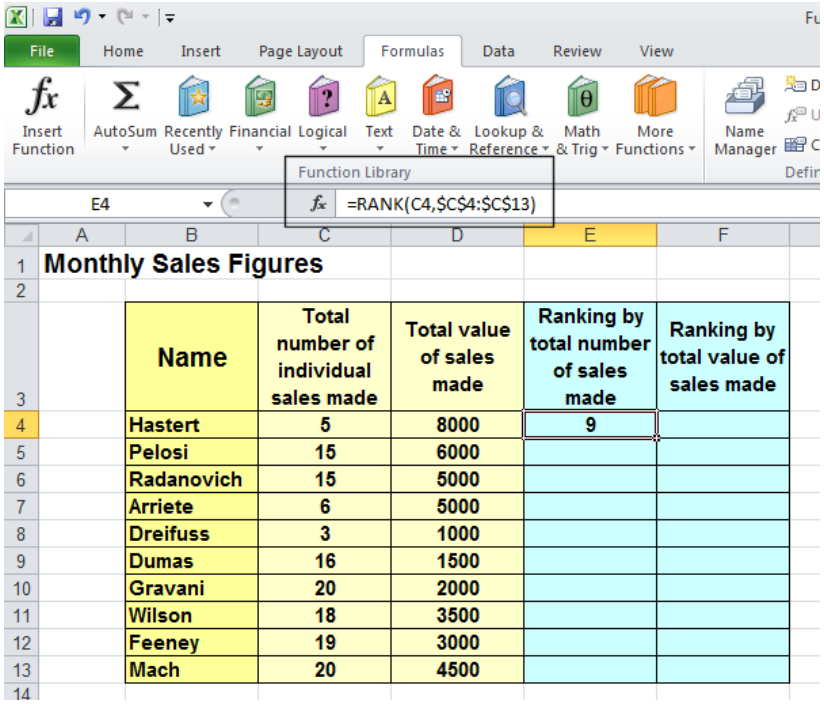
In the **Ref** section we specify the range from which to compare the ranking value, in this case: **$C$4:$C$13**.

Your dialog box will look like this.



TIP: Within the **Order** section, if we do not enter a value, or if we enter a **0**, then the rank will be sorted in descending order. If we wanted to sort in ascending order, you would enter any number other than **0**. In this example we will not enter a value, so the ranking will use the default descending order.

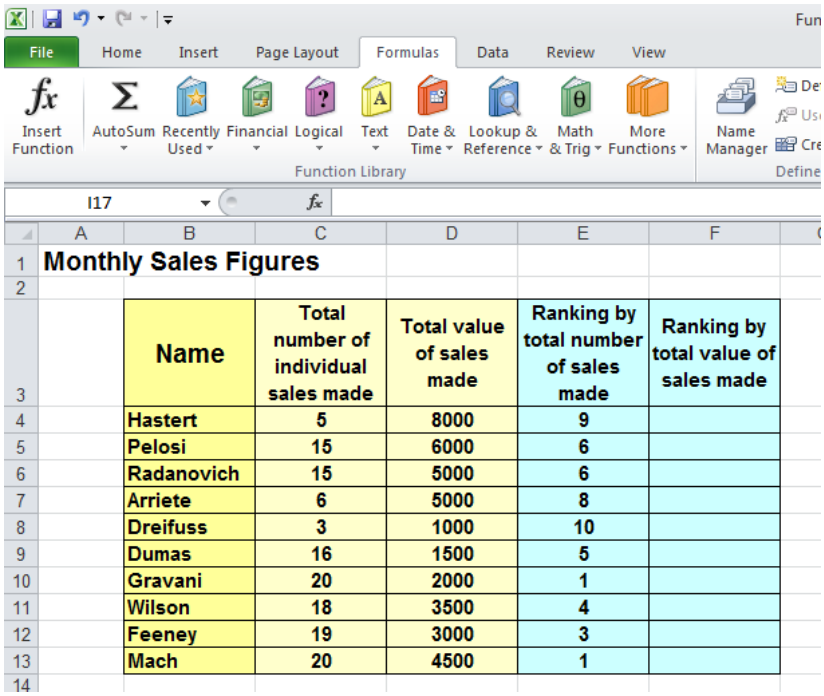
Click on the **OK** button. You will see the following. This means that **Hastert**, ranked in position **9**, compared to the other sales people, in terms of the total number of sales made.



Monthly Sales Figures

Name	Total number of individual sales made	Total value of sales made	Ranking by total number of sales made	Ranking by total value of sales made
Hastert	5	8000	9	
Pelosi	15	6000		
Radanovich	15	5000		
Arriete	6	5000		
Dreifuss	3	1000		
Dumas	16	1500		
Gravani	20	2000		
Wilson	18	3500		
Feeney	19	3000		
Mach	20	4500		

Drag the contents of cell **E4** to fill the range **E4:E13**. Your data will now look like this. If you look closely you will see that **Gravani** and **Mach** are in joint place. This explains the fact that there is no sales person listed in second place. After the two joint-first position, the next best ranking in **Feeney** in rank position **3**.



Monthly Sales Figures

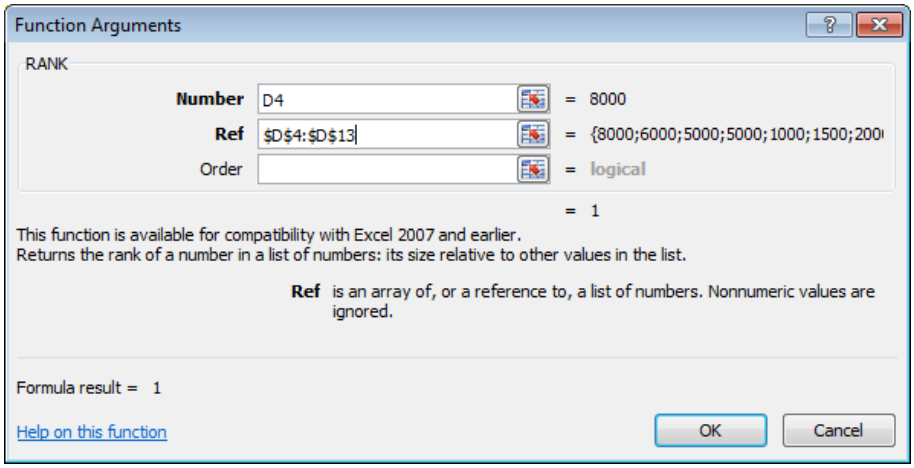
Name	Total number of individual sales made	Total value of sales made	Ranking by total number of sales made	Ranking by total value of sales made
Hastert	5	8000	9	
Pelosi	15	6000	6	
Radanovich	15	5000	6	
Arriete	6	5000	8	
Dreifuss	3	1000	10	
Dumas	16	1500	5	
Gravani	20	2000	1	
Wilson	18	3500	4	
Feeney	19	3000	3	
Mach	20	4500	1	

We will now see how the sales people rank in terms of total sales. Some sales people are very good at selling a lot of low value items, while other sales people specialise in making fewer, but higher value sales.

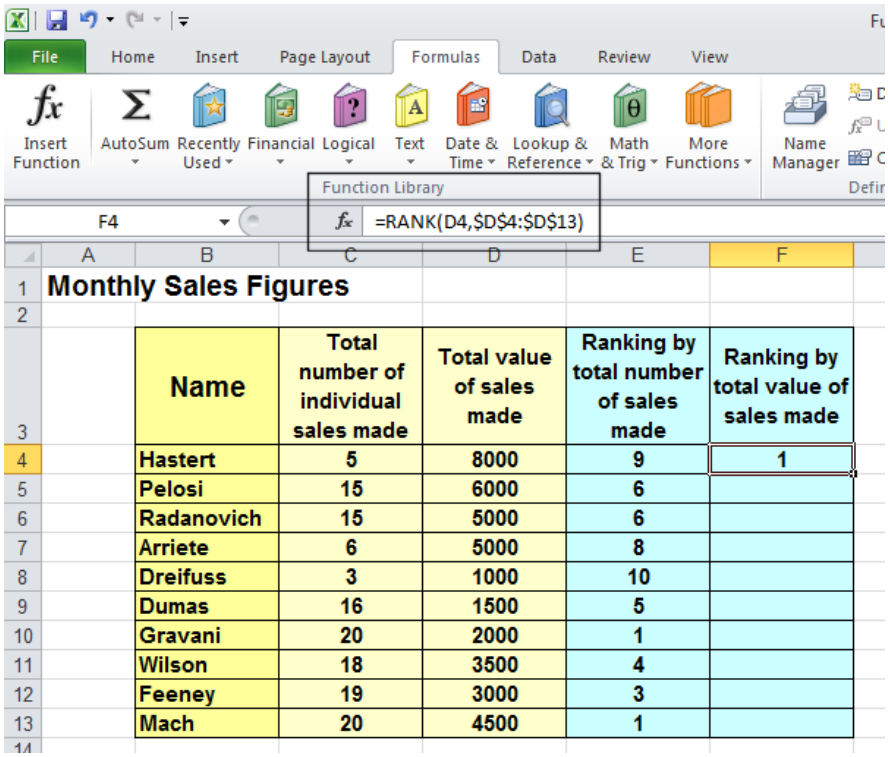
Click on the cell **F4**.

Re-display the **Function Arguments** dialog box for the **Rank** function and enter the following data.

Number: **D4**
Ref: **$D$4:$D$13**



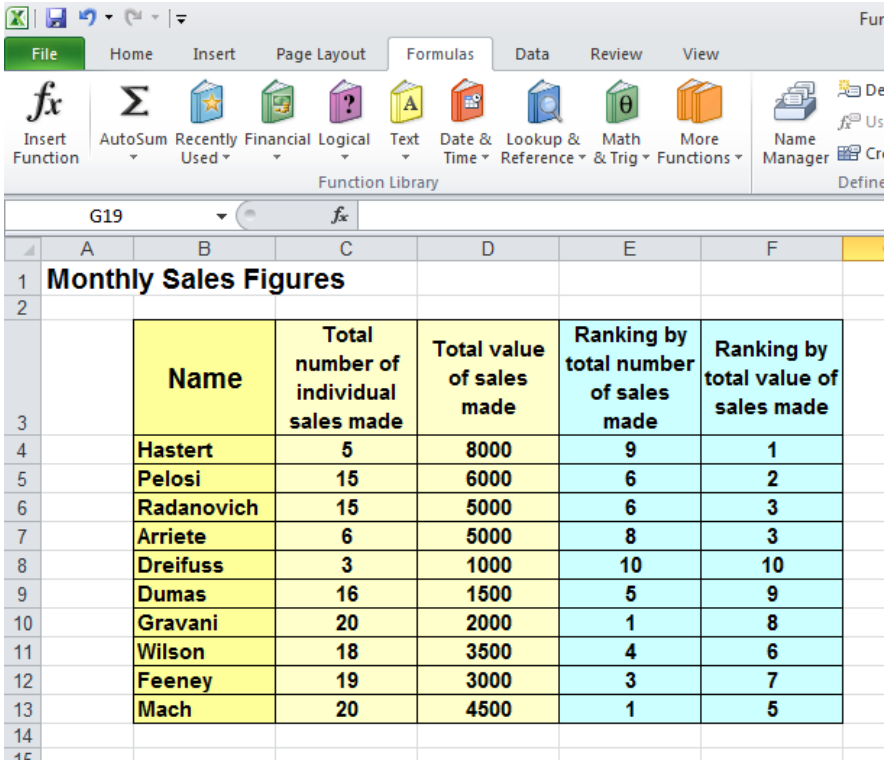
Click on the **OK** button. Your data will look like this.



Monthly Sales Figures

Name	Total number of individual sales made	Total value of sales made	Ranking by total number of sales made	Ranking by total value of sales made
Hastert	5	8000	9	1
Pelosi	15	6000	6	
Radanovich	15	5000	6	
Arriete	6	5000	8	
Dreifuss	3	1000	10	
Dumas	16	1500	5	
Gravani	20	2000	1	
Wilson	18	3500	4	
Feeney	19	3000	3	
Mach	20	4500	1	

Extend the contents of cell **F4** to fill the range **F4:F13**. Your data will now look like this.



	A	B	C	D	E	F
1	**Monthly Sales Figures**					
2						
3		**Name**	**Total number of individual sales made**	**Total value of sales made**	**Ranking by total number of sales made**	**Ranking by total value of sales made**
4		**Hastert**	**5**	**8000**	**9**	**1**
5		**Pelosi**	**15**	**6000**	**6**	**2**
6		**Radanovich**	**15**	**5000**	**6**	**3**
7		**Arriete**	**6**	**5000**	**8**	**3**
8		**Dreifuss**	**3**	**1000**	**10**	**10**
9		**Dumas**	**16**	**1500**	**5**	**9**
10		**Gravani**	**20**	**2000**	**1**	**8**
11		**Wilson**	**18**	**3500**	**4**	**6**
12		**Feeney**	**19**	**3000**	**3**	**7**
13		**Mach**	**20**	**4500**	**1**	**5**
14						

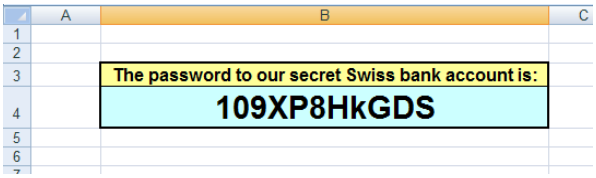
As you can see **Hastert,** despite not making very many individual sales, actually is in the top ranked position when it comes to the total value of the sales made. You will notice that there are 2 sales people with the number **three** ranking, which is why there is no sales person listed in the number four ranking spot.

Save your changes and close the workbook.

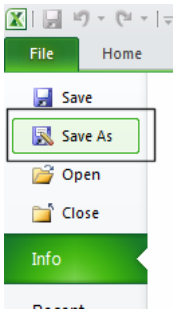
Passwords & Security Issues

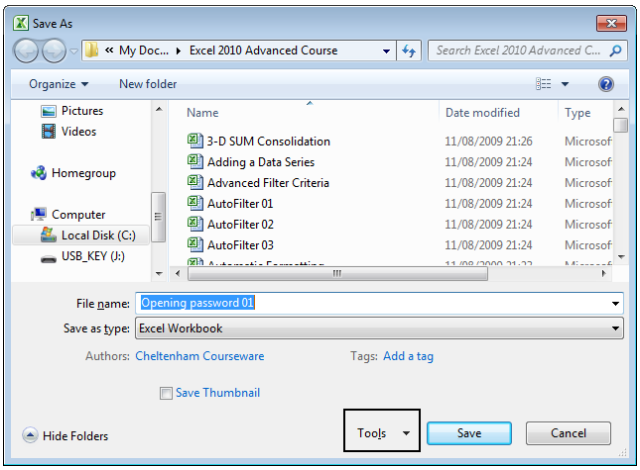
Adding password protection to a workbook.

Open a workbook called Opening password 01. We wish to add a password to prevent unauthorised access to this file.



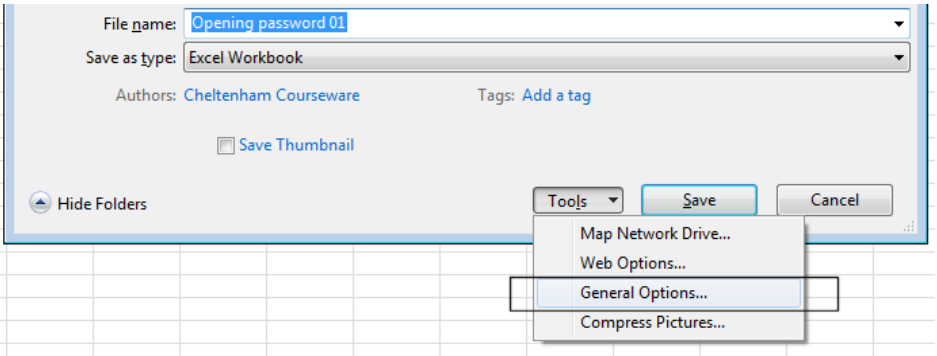
Click on the File tab and select the Save As command.



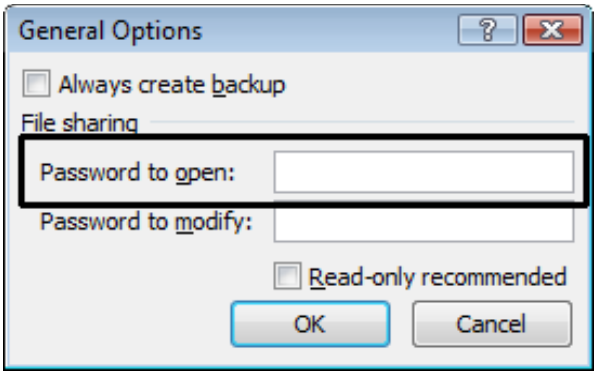


- This will display the Save As dialog box.

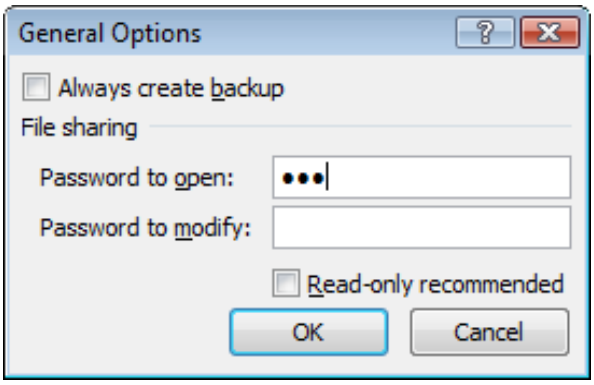
Click on the Tools link, and from the drop down list displayed select the General Options command.



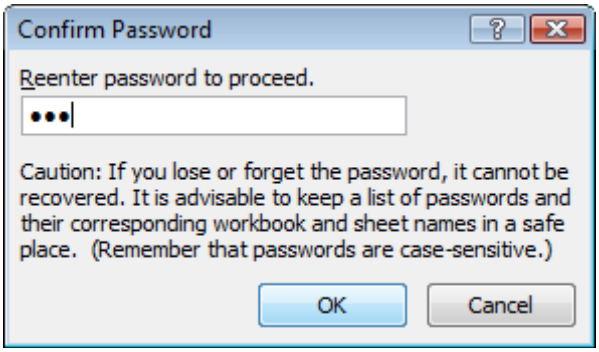
This will display the General Options dialog box.



Enter a password (in this case cct) into the Password to open text box. In future, you will be required to enter this password in order to open the file.

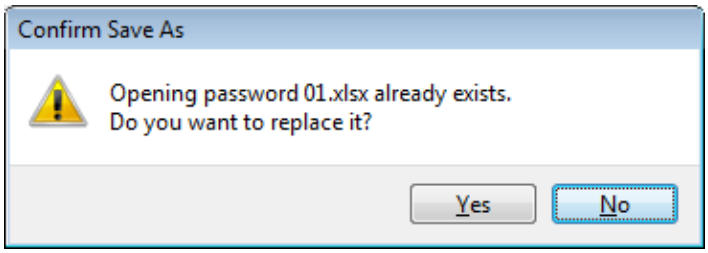


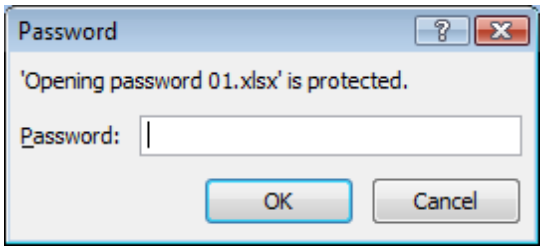
Click on the OK button. You will be asked to re-type the password.



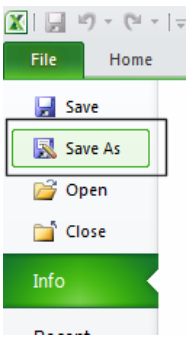
Re-enter the password, and click on the OK button to close the Confirm Password dialog box.
You will be returned to the Save As dialog box. Click on the Save button. You will be asked if you wish to overwrite the original file. Click on the Yes button

Close the workbook.
Re-open the workbook. You will see a dialog box, into which you must enter the correct password, i.e. 'cct'. Do this and the workbook should open.



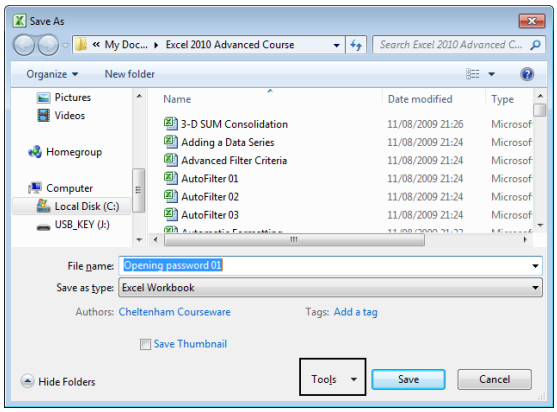


Adding 'modify' password protection to a workbook.



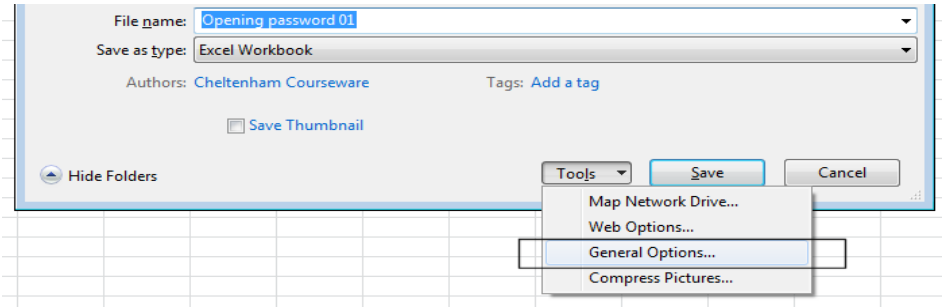
Open a workbook called Modification password 01.
We wish to save this file so that when opened it will display a dialog box, explaining that you should normally open this worksheet as a read-only file, i.e. one where modifications may be made, but where you cannot overwrite the original file. Any changes would have to be saved in a file with a different name.

Click on the File tab and select the Save As command.

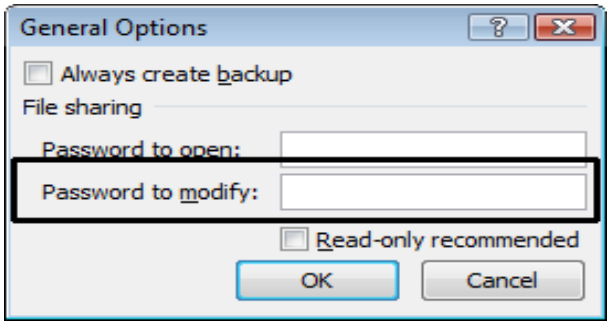


This will display the Save As dialog box.

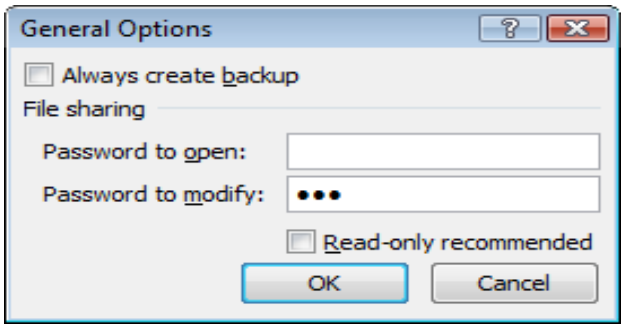
Click on the Tools link, and from the drop down list displayed select the General Options command.



This will display the General Options dialog box.

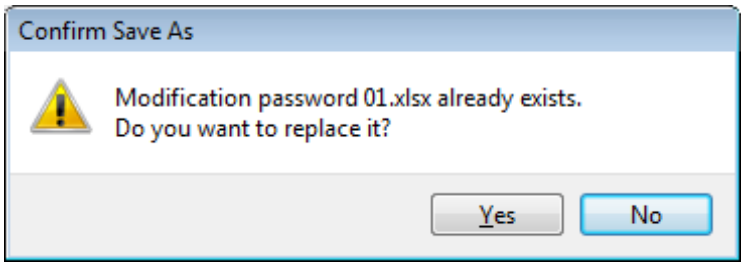


Enter a password (in this case cct) into the Password to Modify text box. In future, you will be required to enter this password in order to open and modify the file.

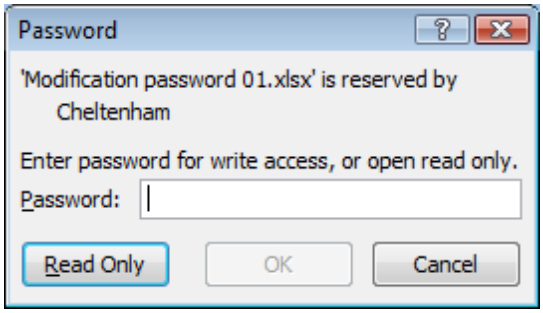


Click on the OK button. You will be asked to re-type the password.

Re-enter the password, and click on the OK button to close the Confirm Password dialog box.
You will be returned to the Save As dialog box. Click on the Save button. You will be asked if you wish to overwrite the original file. Click on the Yes button



Close the workbook.
Re-open the workbook. You will see a dialog box displayed.



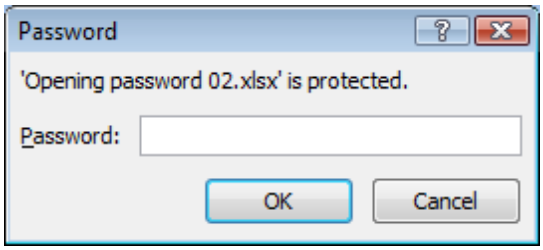
If you enter the correct password, you can open and edit the document. If you do not supply the correct password, you can only open and view the document.

NOTE: Without the password you can still open and edit the document, but you must save the workbook using a different filename. You will not be allowed to overwrite the original version of the document.

Close your workbook.

Removing an password from a workbook.

Open a workbook called Opening password 02.
This workbook has been protected with a password that prevents opening the workbook, unless you enter the correct password. You will see a Password dialog box displayed.

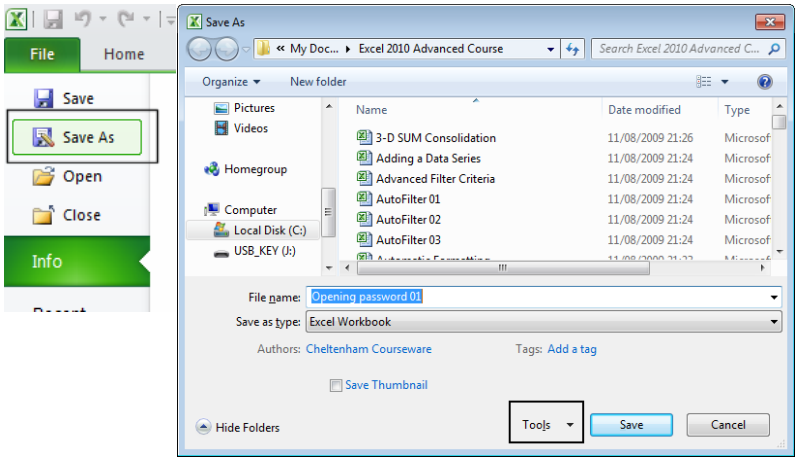


Enter the password (in lower case) which is.
cct

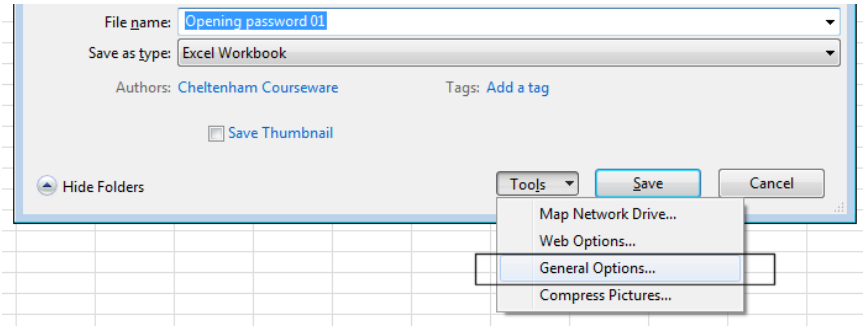
and then click on the OK button to open the file.

Click on the File tab and select the Save As command.

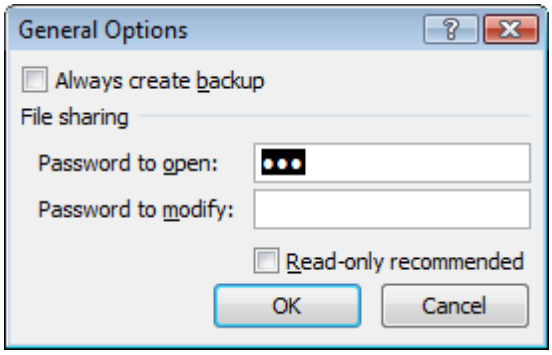
This will display the Save As dialog box.



Click on the Tools link, and from the drop down list displayed select the General Options command.



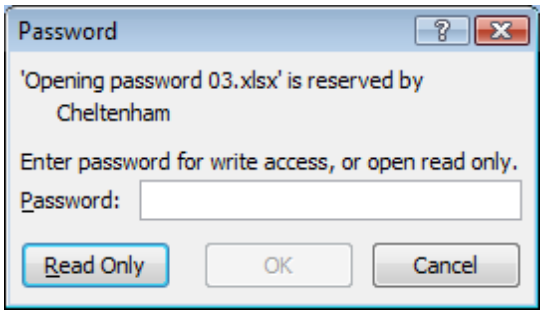
This will display the General Options dialog box.



Delete the password and then click on the OK button.
Save and close the workbook.
Reopen the workbook and you will see that the password has been removed.
Close the workbook.

Removing a 'modify' password from a workbook.

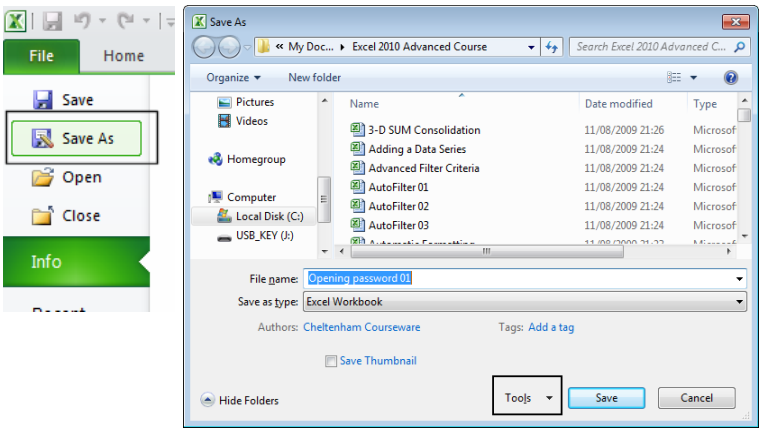
Open a workbook called Opening password 03.
This workbook has been protected with a 'modify' password. You will see a Password dialog box displayed.



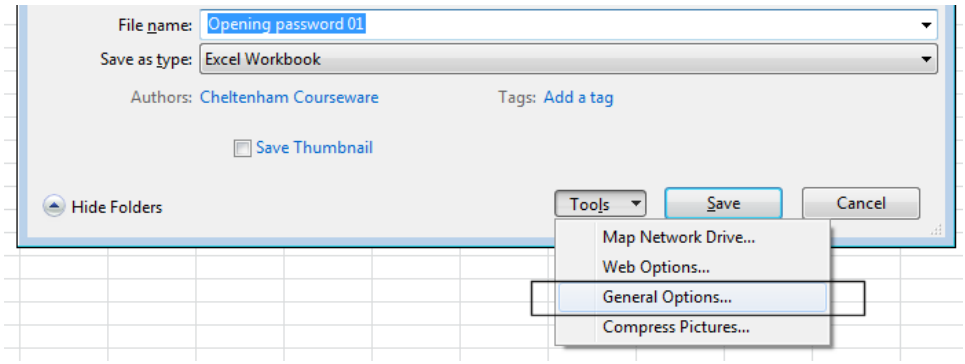
Enter the password (in lower case) which is.
cct
and then click on the OK button to open the file.

Click on the File tab and select the Save As command.

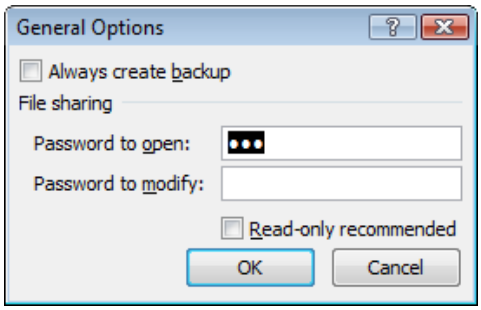
This will display the Save As dialog box.



Click on the Tools link, and from the drop down list displayed select the General Options command.



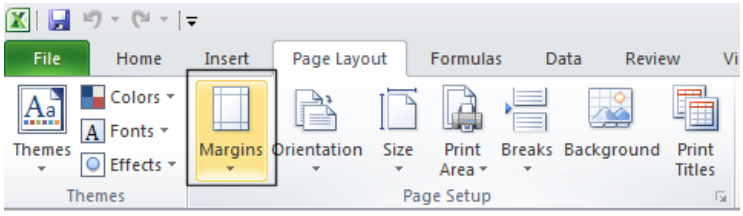
This will display the General Options dialog box.



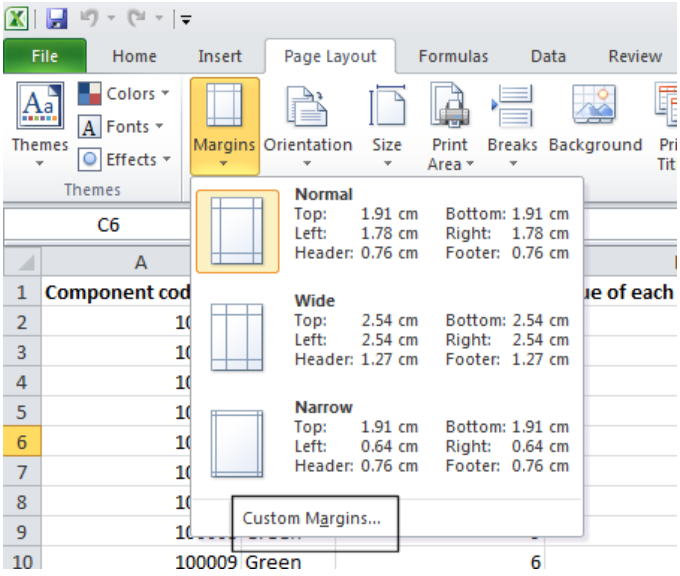
Delete the password and then click on the OK button.
Save and close the workbook.
Reopen the workbook and you will see that the password has been removed.
Close the workbook.

Setup & Printing Issues

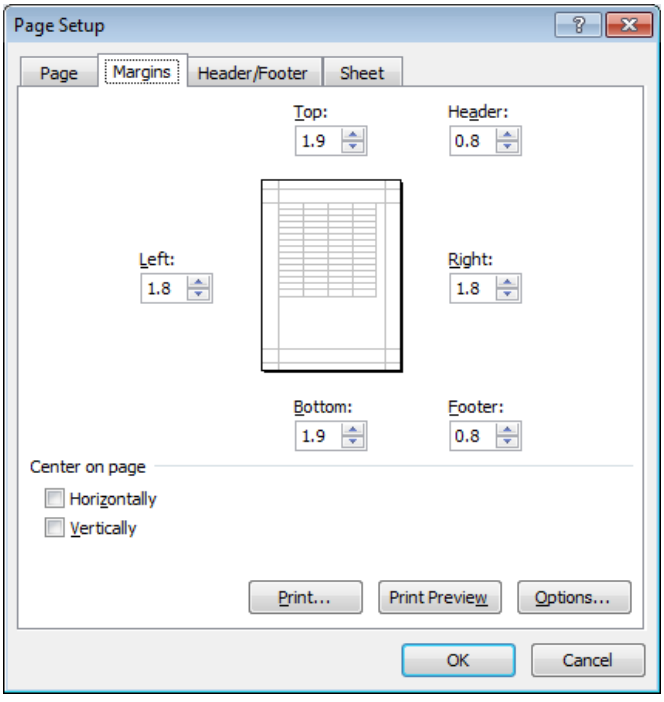
Worksheet margins
Open a workbook called **Print setup**.
Click on the **Page Layout** tab, and from within the **Page Setup** group, click on the **Margins** icon.



This will display a drop down from which you can select **Normal**, **Wide** or **Narrow**.



Clicking on the **Custom Margins** command displays the **Margins** tab within the **Page Setup** dialog box. You can use this dialog box to set custom top, bottom, left and right margins.



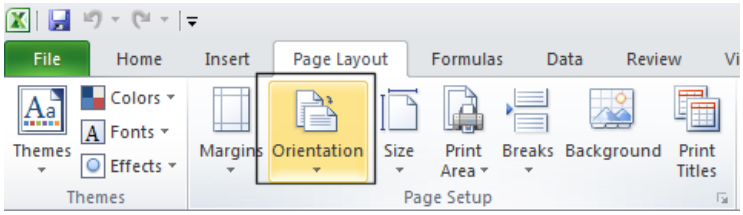
TIP: You can also use this dialog box to set Header and Footer values, as well as options to centre the table on the page vertically and/or horizontally.

Experiment with setting margins.

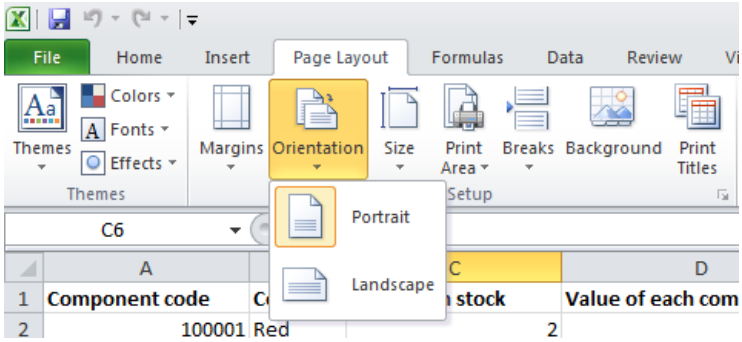
TIP: Be sure not to make the margin size too small or you may have problems printing the worksheet.

Worksheet orientation

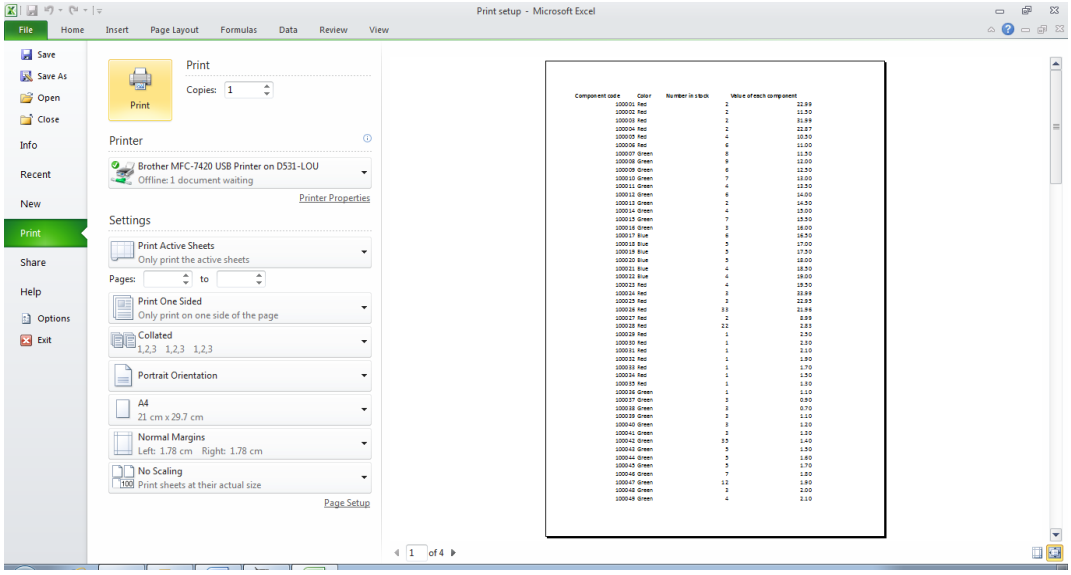
Click on the **Page Layout** tab, and from within the **Page Setup** group, click on the **Orientation** icon.



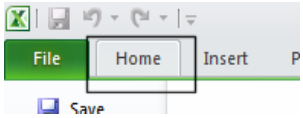
You can select either **Portrait** or **Landscape** orientation, as illustrated.



Try setting the orientation to **Landscape**. To see the effect in **Print Preview** mode, press the **Ctrl+F2** keyboard shortcut.

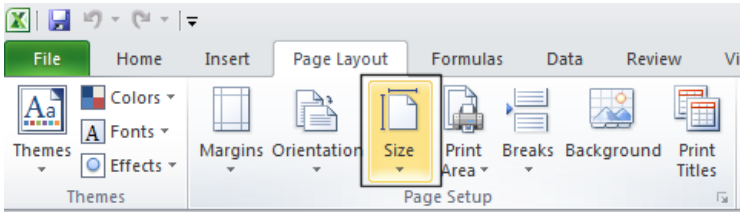


To return to the normal view, click on the **Home** tab.

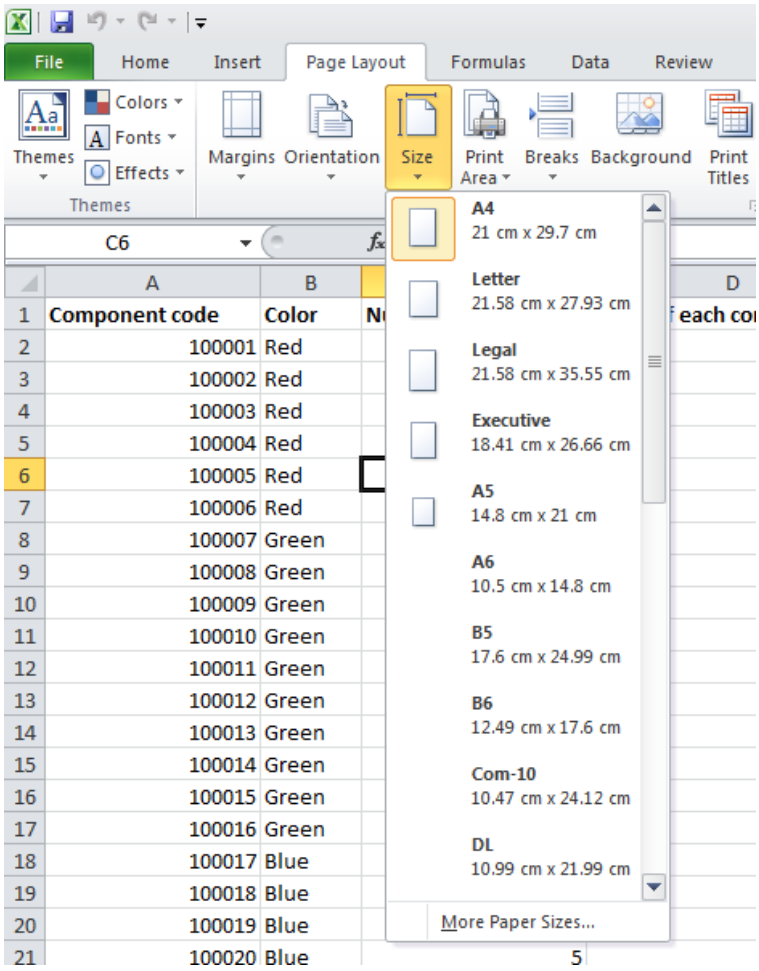


Worksheet page size

Click on the **Page Layout** tab, and from within the **Page Setup** group, click on the **Size** icon.

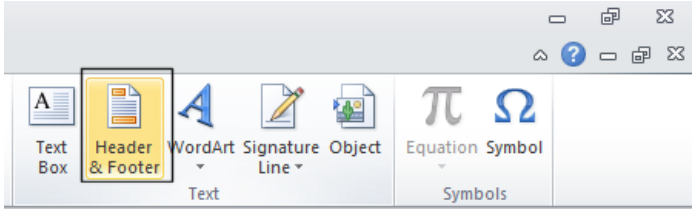


You can select the required page size from the drop down options displayed, as illustrated.

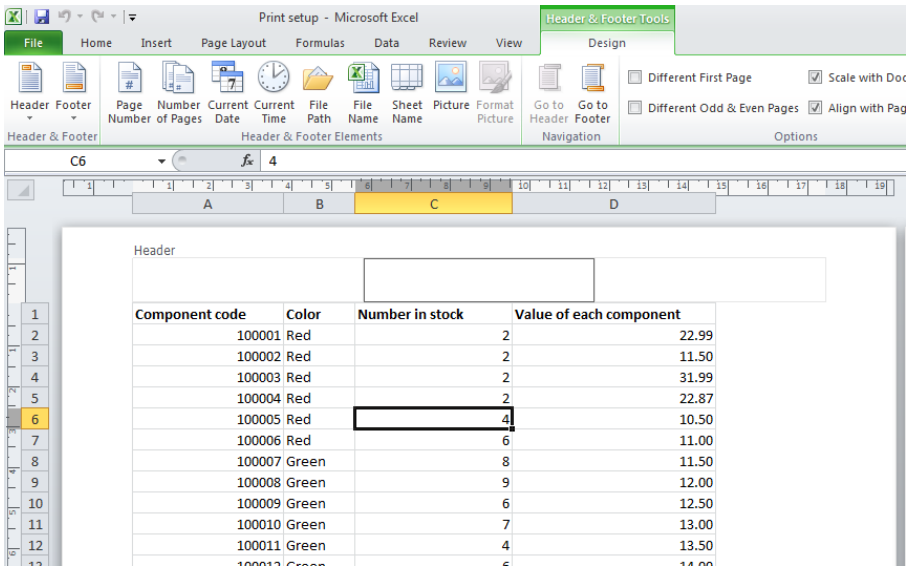


Headers and footers

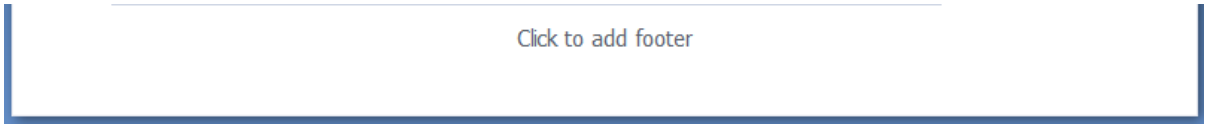
Click on the Insert tab and from within the **Text** group, click on the **Header** & **Footer** icon.



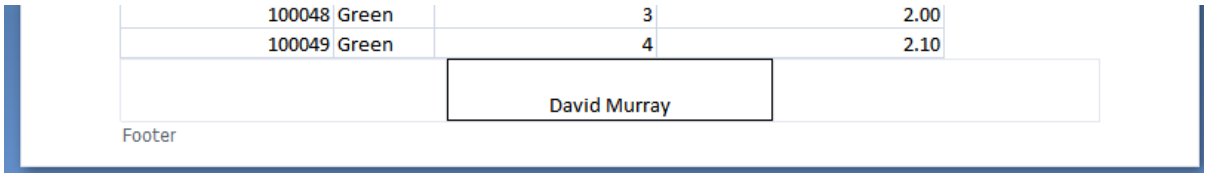
You will see the Header area displayed at the top of the worksheet, as illustrated.



Type in the text for your header, such as **Stock Levels for January**.
If you scroll down the page you will see the message **'Click to add footer'** displayed at the bottom of the worksheet.



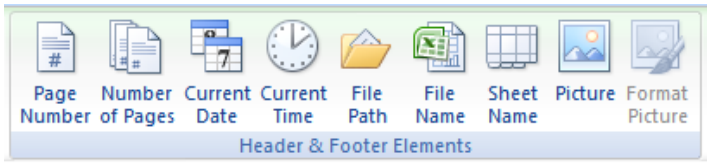
Click within the footer area and type in your name. As example is illustrated below.



To modify a header or footer at any time just click over an existing header or footer and edit as required.

Header and footer fields

When you are inserting or editing a footer or header, you will notice that you see the **Header and Footer Tools** Ribbon. Within this Ribbon is the **Header & Footer Elements** group, as illustrated below.



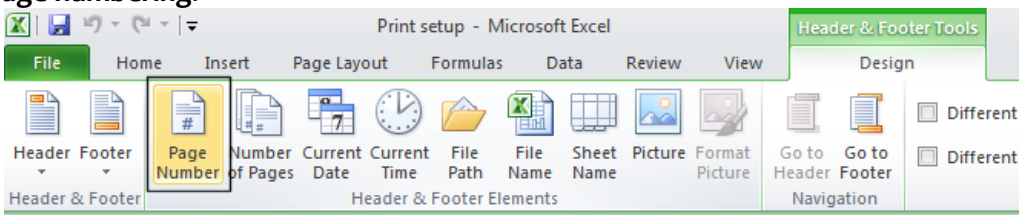
You can use the icons in this section in insert an Excel field, such as the Page Number. The great thing about fields is that they automatically update when required. For instance if you insert a **Page Number** field, then as you add more pages, the page number displayed on each page will increment.
Another very useful field is the **File Name** field. This displays the file name of the document in your header or footer, when you print, and is very useful when you have printed out a copy of a worksheet and then several months later are trying to remember the file name you used to save the worksheet as.

NOTE: When you insert a field, such as the **File Name** field, you may see the field code rather than the actual file name. When you print the worksheet however, this code is replaced by the actual file name.

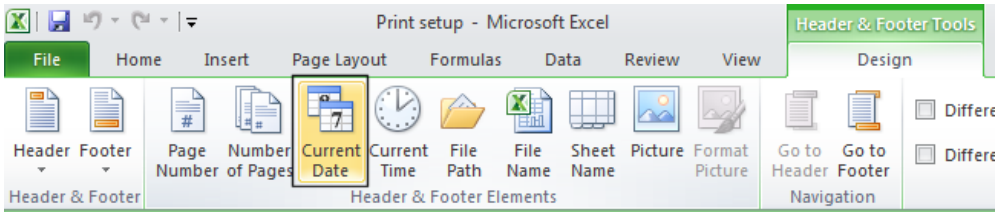
The **File Path** will display the file name and also the path to the folder in which the file is stored. Experiment with inserting different fields into your header or footer.

Make sure that you have experimented with all of the following field types:

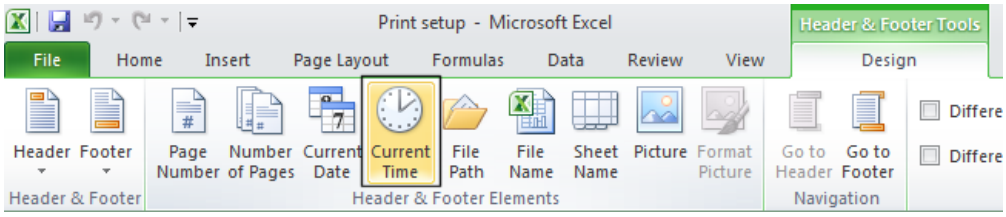
Page numbering:



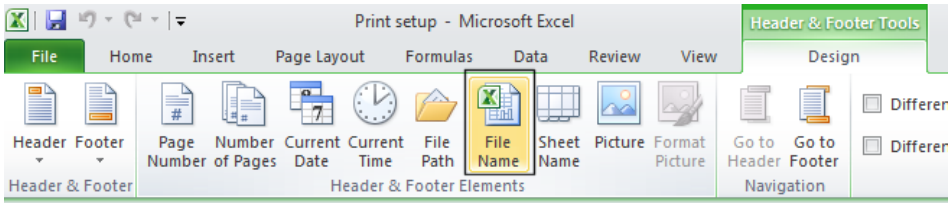
Date:



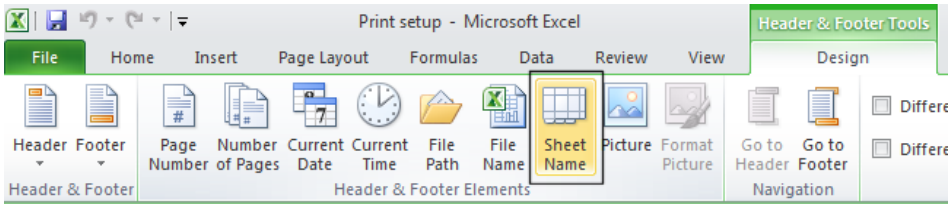
Time:



File name:



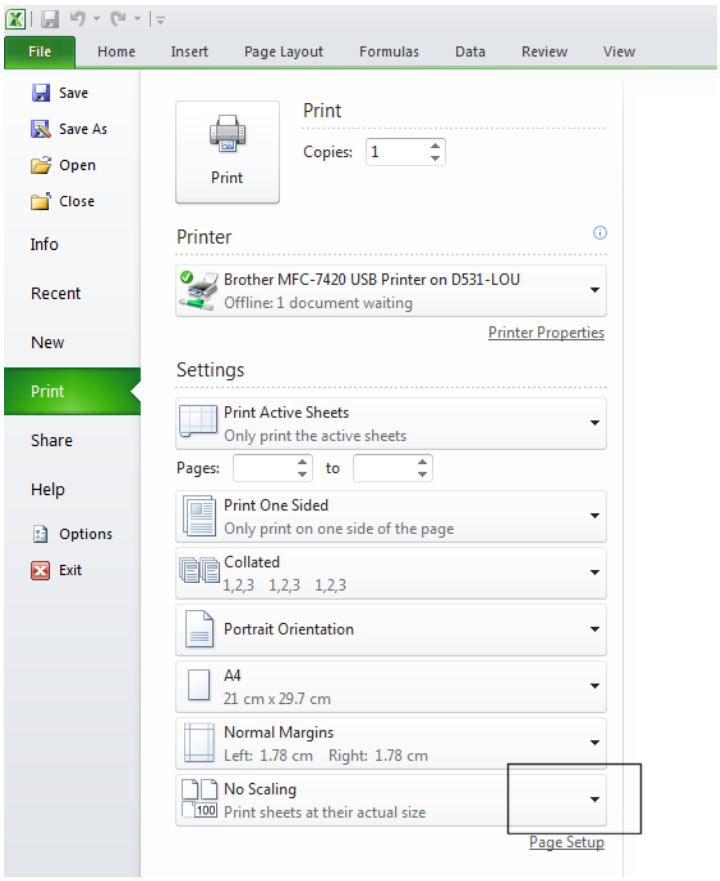
Worksheet name:



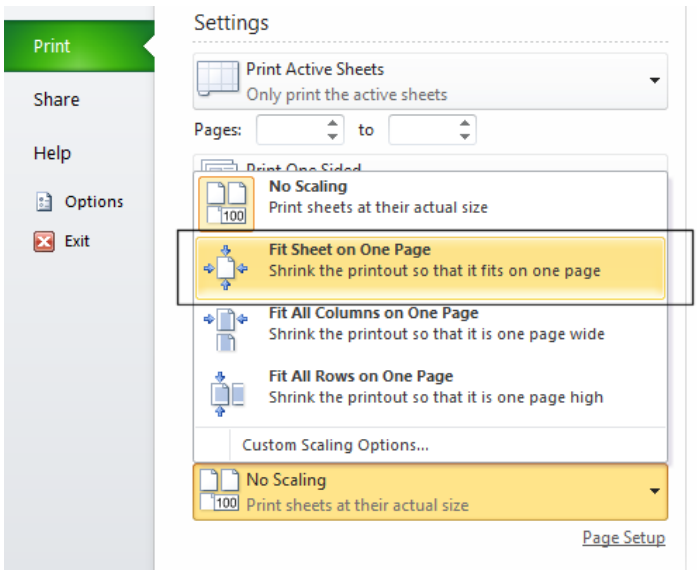
NOTE: To remove a header or footer field, select the field and press the Del key.

Scaling your worksheet to fit a page(s)

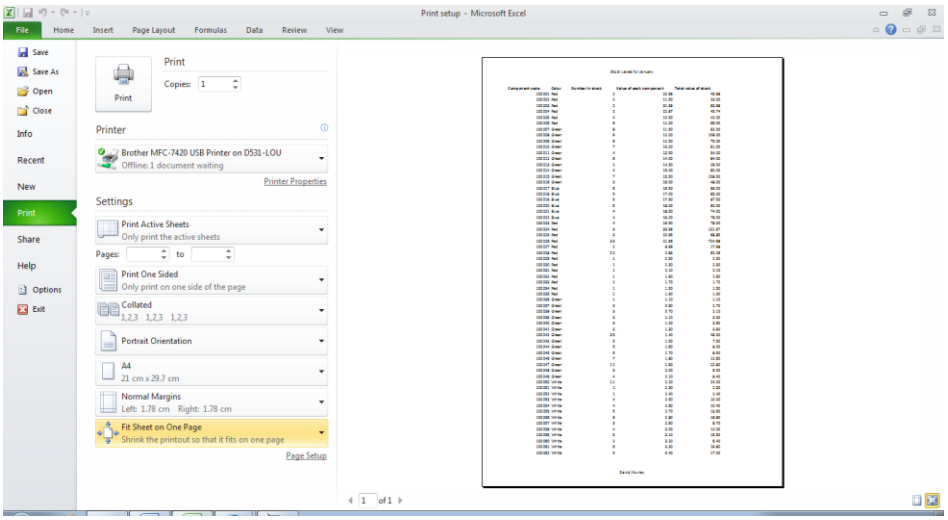
Click on the **File Tab** and then click on the **arrow** next to the **Print side** tab. Click on the **down arrow** next to the **Scaling** section.



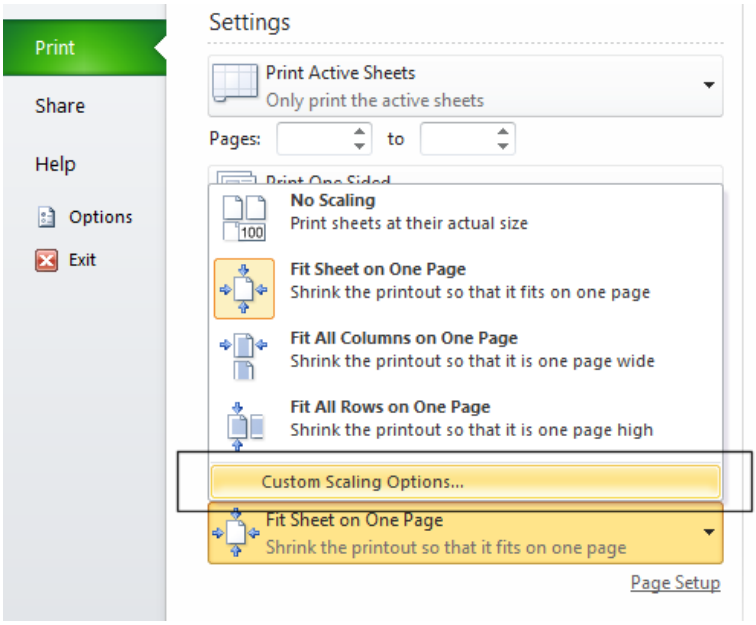
The list displayed allows you to select print scaling options, such as **Fit Sheet on One Page.**



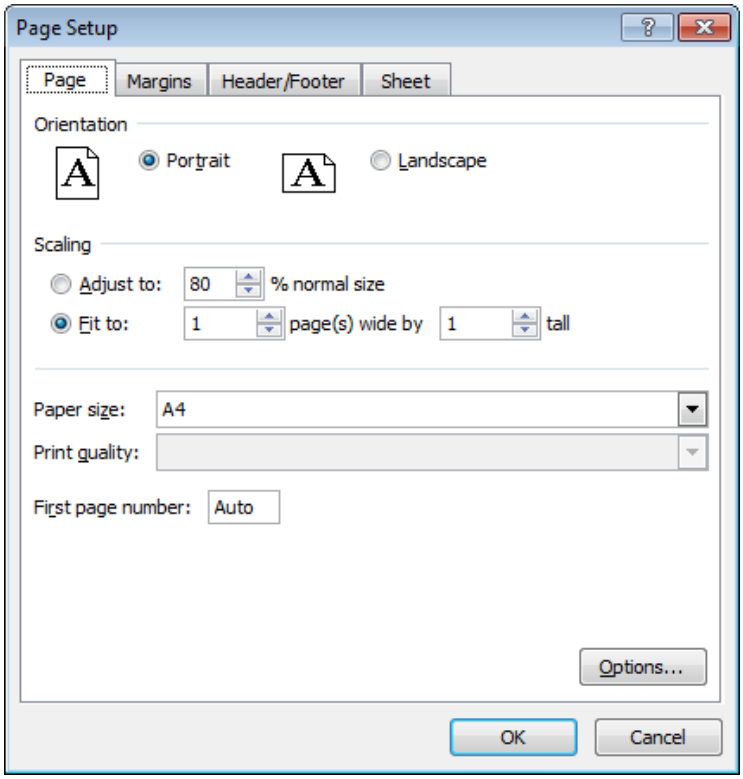
You can see that when this option is selected the sheet does, as expected, fit onto one page.



You can also customise how many pages you would want the data to fit on. To do this click on the **Custom Scaling Options** button.



This will display the **Page Setup** dialog box, which you can use to customise scaling of the printing.



Save your changes and close the workbook.

THE END OF THE TRAINING

To be continued in your routine work.


DATA FEEDBACK REPORT
DATA UTILIZATION
EKIGAKU
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NACP・JICA 2014