

Using Microsoft Excel 2010

Unit Objectives

This unit includes the knowledge and skills required to analyze information in an electronic worksheet and to format information using functions specific to spreadsheet formatting (as opposed to Common Elements discussed in Unit 3). Topics include the ability to use formulas and functions, sort data, modify the structure of an electronic worksheet, and edit and format data in worksheet cells. Elements also include the ability to display information graphically using charts, and to analyze worksheet data as it appears in tables or graphs.

Lesson	Topic
28	Getting Started
29	Manipulating the Information
30	Working with Formulas
31	Formatting a Worksheet
32	Using Miscellaneous Tools
33	Working with Charts
34	Getting Ready to Print

Lesson 28

Getting Started

Objectives

In this lesson, you will learn the basics of a spreadsheet program, and create some documents. On completion, you will be able to:

- understand and recognize basic terminology
- create a new workbook
- open a workbook
- save a workbook
- close a workbook
- enter numeric and text information
- move around in the worksheet



Skills

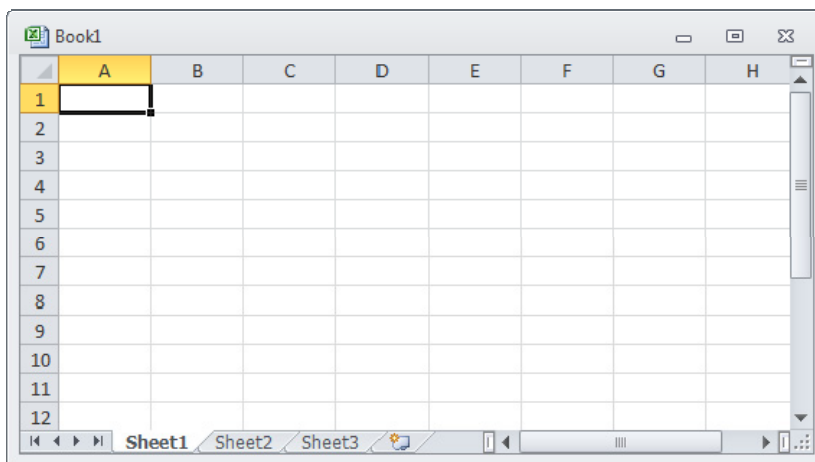
- 2-1.1.3 Navigate around open files
- 2-1.2.1 Create files
- 2-1.2.2 Open files
- 2-1.2.3 Switch between open documents
- 2-1.2.4 Save files in specified locations/formats
- 2-1.2.5 Close files
- 2-1.3.1 Insert text and numbers into a file
- 2-3.1.1 Identify how a table of data is organized in a spreadsheet
- 2-3.1.2 Identify the structure of a well-organized, useful worksheet
- 2-3.1.3 Insert and modify data
- 2-3.1.10 Identify common uses of spreadsheets (such as creating budgets, managing expense reports, or tracking student grades) as well as elements of a well-organized, well-formatted spreadsheet

Understanding Basic Terminology



2-3.1.1 2-3.1.10

An Excel worksheet is similar to a very large sheet of paper divided into rows and columns. Rows are numbered from 1 to 1,048,576; columns are assigned letters or letter combinations from A to Z, and then AA to ZZ, then AAA to AZZ, and so on up to XFD.



Workbook | A single Excel file containing one or more worksheets (Sheet1, Sheet2, Sheet3).

Worksheet | A single report or tab in a workbook; each new workbook includes three worksheets.

Cell	The intersection of a row and a column; can contain one single value (text or number), or formula.
Cell Address	The column-by-row intersection designated by the column letter and the row number, such as A1 in the picture above.
Active Cell	The cell currently displayed with a thick border, such as cell A1 in the picture above.

Use worksheets whenever you need a report or document that tracks numerical information. You might use Excel to create budgets, cash flow analysis reports, revenue and expense reports, financial reports, an inventory analysis, or a document tracking such data as employee vacation time or student grades.

Organize the information on the worksheet in a way that will be clear to you and anyone else who may be using or analyzing the content. Include appropriate labels and descriptions in the reports so the audience understands what they are reviewing. As there are a large number of rows and columns available, you can structure your report to show individual data blocks. For example, you may want to set up an inventory report to track stock levels that change every month, but you may also want to view a two-year period at one time. To do this, you can set up columns to show levels for each of 24 months with each row as an individual inventory item. You can also hide every month but the last six months of the previous year, or use a filter command to display information about specific inventory items.

You can use design elements to emphasize data areas such as labels, increases in sales or expenses, profit margins, highest or lowest grade, and so on. However, use discretion with design elements to ensure the report does not become difficult to read. Too much color and shading may be hard to read if it is printed on a black-and-white printer.

Working with Workbooks



2-1.2.1 2-1.2.2 2-1.2.3 2-1.2.4 2-1.2.5

When Excel starts, you are ready to begin entering data into a worksheet of a new workbook. You can also choose to open an existing workbook. A file in Excel is a workbook that, by default, contains three worksheets; this is similar to having a binder for a specific topic which then contains reports for this topic.

Creating a New Blank Workbook

When you start Excel, a new workbook displays and is automatically named Book1. Each time you create a new workbook during the same session, Excel will number it sequentially as Book2, Book3, and so on. When you exit Excel and start it later, the numbering begins at 1.

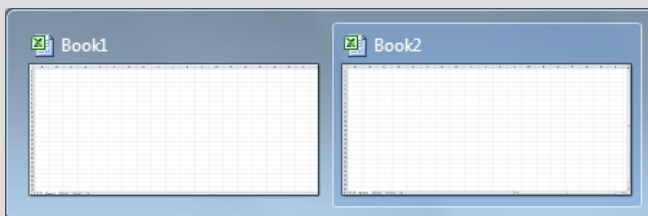
To create a new blank workbook, use one of the following methods:

- Click the **File** tab, click **New**, and then in the **Available Templates** area, click **Blank workbook**, and click **Create**; or
- press **Ctrl+N**.

Exercise

- 1 Start Microsoft Excel and press **Ctrl+N**.

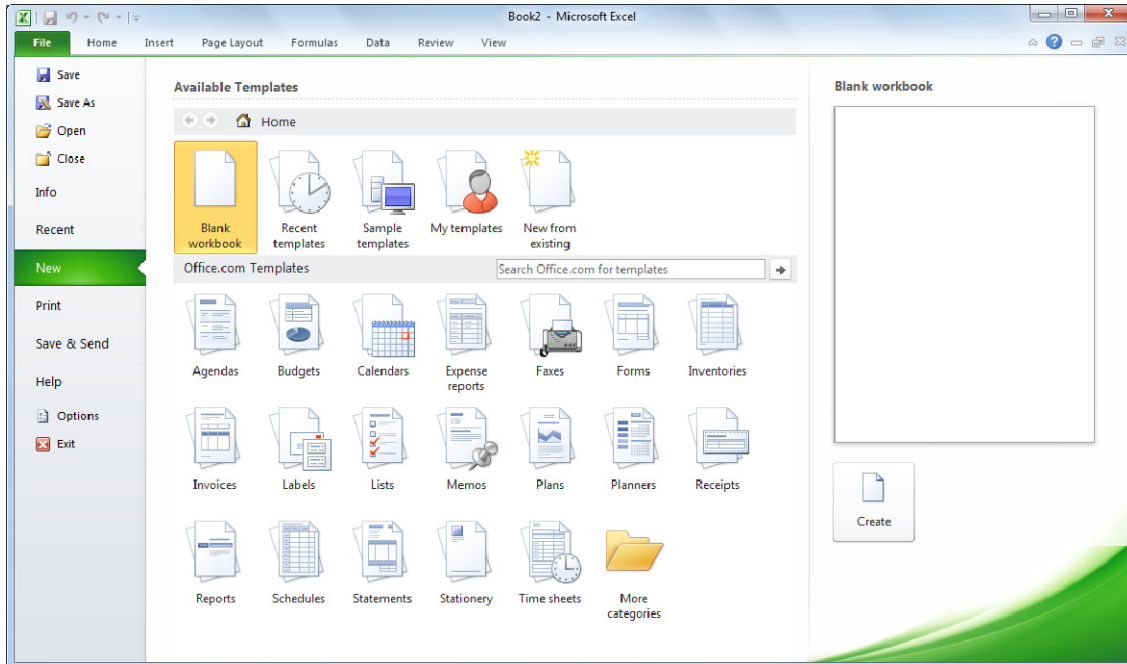
Notice that your document title bar now displays the name Book2 rather than Book1, and that there are windows for both of these workbooks when you point at Excel on the taskbar.



Creating a New Workbook from a Template

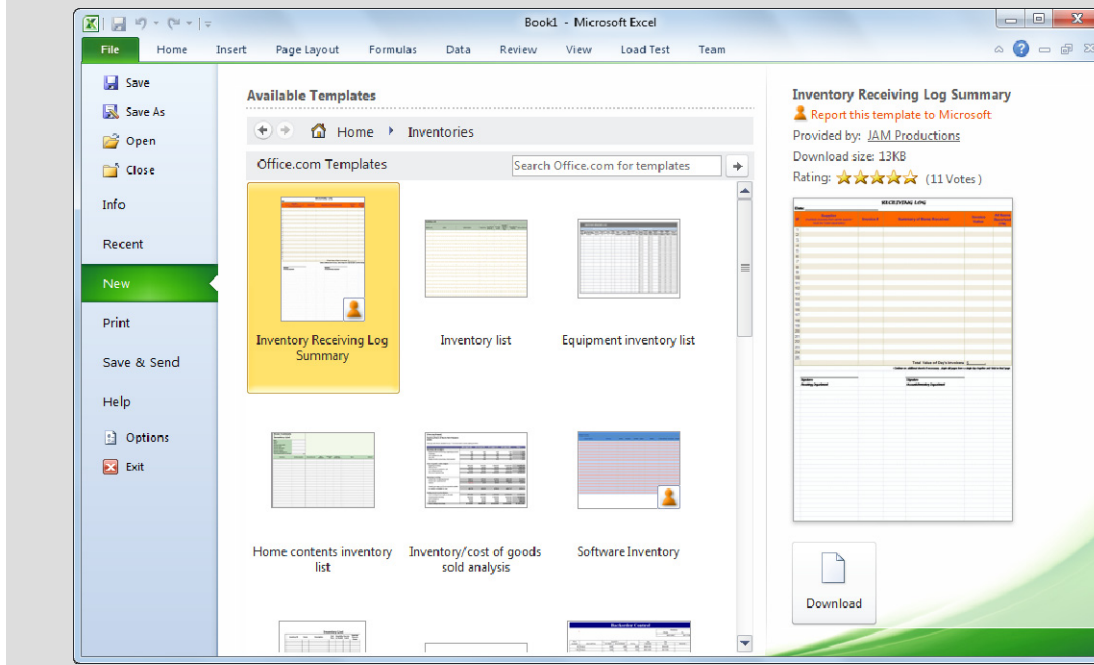
You can create a workbook using a template or pre-designed worksheet provided by Microsoft. This provides a consistent look for specific types of reports. The number of templates on your screen may vary, depending on whether an earlier version of Excel was installed previously.

To create a new workbook using a template, click the **File** tab, and then click **New**.



Exercise

- 1 Click the **File** tab and then **New**.
Note that a preview of any selected template displays in the right-hand pane.
- 2 In the Office.com Templates pane, click **Inventories**.



- 3 Click **Home contents inventory list** and then click **Download**.

Excel now displays a blank inventory form.

You can also select from your own templates, Microsoft's Web site, or other Web sites. To use templates from Microsoft's Office.com site, select one of the items from the list in the **Office.com Templates** section of the Available Templates pane.

- 4 Leave the three workbooks open on the screen for the next exercise.

Opening Workbooks

To work with an existing workbook, you must first open it. You can have more than one workbook open in Excel at the same time.

To open a file, use one of the following methods:

- Click the **File** tab, then click **Open**. Select the file you want and click **Open**; or
- press **Ctrl+O**; or
- click the **File** tab to display the most recently used files, and then click the file name to open it. You can change the number of files that display in the list using the option at the bottom of the list of files, or via **Options**.

You can also open a file from within the file management tool or the desktop; the operating system must recognize this file type as one that Excel can open.

Exercise

- 1 Click the **File** tab, and then click **Open**.
- 2 Navigate to where the student data files are located and select the *CO2 Emission Estimates* workbook.
- 3 Click **Open**.

Switching Between Workbooks

When you have multiple documents open on the screen, you can switch between documents quickly and easily using one of the following methods:

- On the **View** tab, in the **Window** group, click **Switch Windows**; or
- click the button for the required document on the taskbar; or
- if the Document window is in Restore Down view, the open documents may display in a cascading layout; if so, click the title bar for the appropriate document to switch to that document.

Closing Workbooks

When you no longer want to work with the current workbook, save the changes and then close it to protect it from accidental changes, or to free up system resources for other files. Once closed, Excel displays other open workbooks, or a blank background screen if no other workbooks are open.

Exercise

- 1 On the **View** tab, in the **Window** group, click **Switch Windows**, then click the *Book2* workbook.
- 2 Press **Ctrl+W** to close it.
- 3 On the **View** tab, in the **Window** group, click **Switch Windows**, then click the *Home contents inventory list1* workbook.
- 4 Click the *CO2 Emissions* file on the Windows taskbar to display it.
- 5 Click **Close Window** to close this file.


Saving Workbooks

To use a file again, you must save the workbook. It is a good practice to save work frequently during a session, especially if the workbook is large, or if you are using a process you have not tried before.

There are two types of save commands:

- Use **Save As** to save a new or existing file with a new name, location, or file format.
- Use **Save** to save changes in the active file, thereby replacing the contents of the existing file in this location.

To save the changes made to an existing file, use one of the following methods:

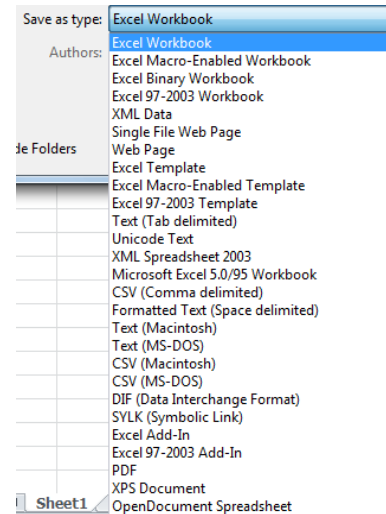
- Click the **File** tab and then **Save**; or
- on the Quick Access toolbar, click  (**Save**); or
- press **(Ctrl)+(S)**.

The first time you save a file, you will always see the Save As dialog box so that you can give the new workbook a distinct name and select the location where it will be stored, such as the hard drive, network drive, or portable media drive. By default, Excel navigates to the Documents folder as the location to save the file. You can choose this location or navigate to another location using the **Save in** field. You can also create new folders within Excel during the save process.

To save the changes made to an existing file and save it with a new name or in a different file format, click the **File** tab and then click **Save As**.

To save the file in another file format, click the arrow for the **Save as type** field to select the appropriate file type.

One example of a file format you may need to use is .xltx (Excel Template), which will save the file as a template. A template is a combination of pre-designed formats and styles that you customize for a specific type of report and save for future use. Another example of a file type you may need is the .csv (Comma Delimited), which makes it possible for the file to be exported into another program, such as Access. Or you may simply need to save a file to be compatible with an earlier version of Excel, such as Excel 2003.



Exercise

1 If necessary, select the *Home contents inventory list1* workbook.

2 Click the **File** tab and then **Save**.

Excel presented the Save As dialog box as this is the first time you are saving this workbook. Notice also that the file name highlights in the File name field; whenever a file name is highlighted as seen here, you can type a new name to replace the existing text. You do not have to click the mouse anywhere in the file name area.

3 In the **File name** field, type: Home Inventory - Student.

4 Click **Save**.

The title bar now displays the name *Home Inventory - Student*.

To save the file in a new location other than the default, which is generally \Documents, you can move to a different location or create a new folder. In this exercise, you will create a new folder in the same location as your student data files and save the file with the same name.

5 Click the **File** tab and then **Save As**.

- 6 Click **New folder** in the Command Bar.
- 7 Type: Forms as the name of the new folder and click **Open**.
- 8 Leave the file name as is and click the **Save** button.
You now have a copy of the same file in the default folder as well as the new folder just created.
- 9 Press **Ctrl+W** to close this file.

Entering Data in the Worksheet



2-1.1.3 2-1.3.1 2-3.1.1 2-3.1.2 2-3.1.3

You can insert three types of data into worksheet cells:

Labels	Text entries appear in the cells exactly as you enter them; default as left aligned.
Values	Numeric values; default to right aligned.
Formulas	Composed of cell references, arithmetic operators, and functions that operate on data.

Entering these types of data into a single workbook with multiple worksheets allows you to organize the data into a three dimensional structure. For example, when you open a file the main worksheet may summarize company expenses from all departments for one year, but each individual entry may be a total of values from subsequent sheets for each department. Excel provides the flexibility to enter data into different worksheets that link to other worksheets in the same or other workbooks.

Entering Text or Labels

To enter information, click on the cell to select it and then type the entry. Use the **Backspace** key or **Delete** key to correct any input errors. When you finish typing, press **Enter** to move to the next cell below. You can also click another cell or press any arrow key to accept the input in the current cell.

The best way to begin any worksheet is to enter labels that identify the values, or an outline of the relationships you will later represent mathematically. For example, the report shown here has a label indicating one of four quarterly intervals. Each row beneath the column labels shows the results for that quarter in the noted region. You can then see how the revenue figures increase or decrease for Region 1 as you follow from Q1 to the Total column.

	A	B	C	D	E	F
1	ABC Company					
2		Q1	Q2	Q3	Q4	Total
3	Region 1	541,000	275,000	280,000	310,000	\$1,406,000
4	Region 2	125,000	127,000	122,000	126,000	\$500,000
5	Region 3	96,000	100,000	102,000	105,000	\$403,000
6	Total	\$762,000	\$502,000	\$504,000	\$541,000	\$2,309,000

When entering information, consider the following:

- You can enter or edit data directly in the active cell, or use the Formula bar for long data entries.
- Labels can be up to 32,767 characters long.
- If a label is longer than the width of the cell, it will display past the column border as long as the adjoining cells are empty. Entries in adjoining cells cut off the display at the column border. The long text label may not be visible, but it is still in the cell where it was entered.
- You can easily change the appearance and alignment of any label in any cell.
- The maximum length of formula contents is 8,192 characters.

Entering Numbers or Dates

Numbers are constant values such as dollars and percentages; by default, they align to the right side of a cell. If you enter characters other than numbers, Excel treats the entry as a label. Excel displays values with no formatting, allowing you to format them yourself.

When entering dates, you can enter them in a numeric form (i.e., 2-26-05) or as text (i.e., Month day, year). When entering dates, note the following:

- The default format of the date value is m-d-yy, although you can change this using the **Region and Language** in the **Control Panel**.
- The date value does not have to be the full day, month, and year. It can be just the day and month (formatted mmm-dd), or the month and year (formatted mmm-yyyy).



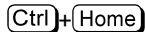
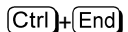
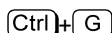

When entering a date, Excel does its best to interpret what you enter, as with these acceptable date values:

September 13, 2002 (include the comma and one space)
 Sep 13, 02
 13-Sep-02
 09/13/02 (month, day, year sequence)
 9-13-02
 Sep 2002
 Sep 13



If Excel cannot interpret the date value, it will appear as a text label and potentially cause problems in the worksheet if this date value is to be included in any formulas.

Moving Around the Worksheet

You can move around the cells of a worksheet using one of the following methods:

Scroll Bars	Click the arrow buttons at either end to move one row or column at a time. Click and drag the scroll box to display another location in the worksheet.
	Press one of the direction keys to move one cell at a time.
	Move to column A in the current row.
	Move to cell A1.
	Move to the last cell in your data.
	Display the Go To dialog box to move quickly to a cell reference, range name, or bookmark, or use the Special button to find specific types of information.
	

Exercise

- 1 Click the **File** tab and then **Open**.
Notice how Excel displays the last location you used to save or open a file.
- 2 Navigate to the level for your student data files and then open *Home Inventory - Student*.
- 3 Click the **File** tab and then **Save As**.
- 4 Type: Home Inventory JM - Student as the new name for this workbook, and then click **Save**.
- 5 With the cursor in cell **C3**, type: Jane Martinez as the name of the owner.
- 6 Click cell **B14** and type: Family Room for the **Room/area**.
- 7 Click cell **C14** and type: Big screen TV for the **Item description**. Press  three times to move to the **Date purchased** column and type: March 23, 2010. Press  once more.
Notice how Excel has changed the date to the format this form uses for dates. At this point, you would continue to enter the information you know or have for this particular inventory item. For the purpose of this exercise, you will enter some basic information.
- 8 Enter the remaining values as shown in the following:

Room/area	Item/description	Make/model	Date purchased
Family Room	Big screen TV		3/23/10
Family Room	Gaming system		4/7/10
Family Room	Gaming system		2/22/09
Family Room	Blu-ray player		3/23/10
Kitchen	TV/DVD Combo		7/23/09
Kitchen	Food processor	Kitchen Aid	
Kitchen	Coffee maker	Mr. Coffee	

Notice how as you enter the similar values, Excel automatically displays the item so you can press **Enter** or **Tab** to accept this value. This is known as the AutoComplete feature where Excel will try to help you with data entry if it detects the entry shares characters in another cell.

- 9 Save and close the workbook.

Summary

In this lesson, you learned the basics of a spreadsheet program, and created some new documents. You should now be able to:

- understand and recognize basic terminology
- close a workbook
- how to create a new workbook
- enter numeric and text information
- open a workbook
- move around in the worksheet
- save a workbook

Review Questions

1. There is no difference between a workbook and a worksheet.
 - a. True
 - b. False
2. A cell is:
 - a. Any box in the worksheet
 - b. The grey boxes at the top or left of the worksheet identifying the columns or rows
 - c. The intersection of a column and a row
 - d. All of the above
 - e. a or c
3. Which command would activate the Template dialog box to create a new workbook?
 - a. On the Quick Access toolbar, click New.
 - b. Click the File tab, click New.
 - c. Press **Ctrl+N**.
 - d. Click the Blank Workbook link on the Getting Started task pane
4. Use the Save command when you want to save changes made to an existing document, and the Save As command when you want the file to have a different file name.
 - a. True
 - b. False
5. It is important to identify the data in the worksheet by using labels to describe what the values represent, such as monthly values, department expenses, and so on.
 - a. True
 - b. False

Lesson 29

Manipulating the Information

Objectives

In this lesson, you will learn to select items in a worksheet for the purpose of making changes or manipulating the data. On completion, you will be able to:

- select cells or ranges of cells
- make changes to the cell contents
- use Undo and Redo
- copy and move data
- change column widths and row heights
- insert and delete rows and columns
- fill cells with contents automatically
- manage worksheets



Skills

- 2-1.3.2 Perform simple editing
- 2-1.3.3 Use the Undo, Redo and Repeat commands
- 2-3.1.3 Insert and modify data
- 2-3.1.4 Modify table structure

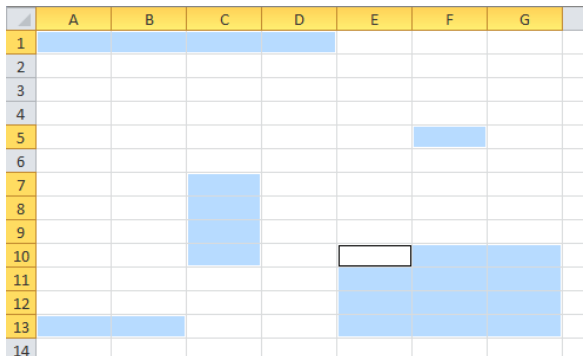
Selecting Cells



2-1.3.2

Prior to performing an action, you must indicate what *range* or part of the spreadsheet to affect with that action. A range can be a single cell, several cells, or the entire spreadsheet. These cells remain selected or highlighted until you click a cell or press an arrow key. The selected range appears in reverse color to the cells. The active cell in the selected range appears in normal color. You can highlight individual cells or any range of cells as follows:

A single cell	Click the cell.
Extend the selection	Click the first cell and drag to the end of the required range; or click the first cell, hold the (Shift) key, and click the end cell in the range.
An entire row	Click the row header when you see the ➔ (row heading symbol).
An entire column	Click the column header when you see the ⬇ (column heading symbol).
The entire worksheet	Click the Select All button.
Non-adjacent columns, rows, or cells	Click the cell, column, or row, hold the (Ctrl) key, then click to select the next cell, column, or row; you can also drag to select multiple cells.
Multiple rows	Click the first row number and drag for the number of rows you want to select.
Multiple columns	Click the first column letter and drag for the number of columns you want to select.



Making Changes to the Contents



The easiest way to change cell contents is to enter the entire new content, press **Enter** and have Excel replace the old information with the new entry. To correct errors as you type, press **Backspace** or **Delete** prior to pressing **Enter** or moving to another cell.

If you want to add, delete, or change less than the entire contents of the cell, you can activate Excel's Edit mode by pressing **F2** or double-clicking on the cell; Excel will display the insertion point and you can proceed in one of the following ways:

- Select the text in the cell, type in the replacement text, and press **Enter** to exit the Edit mode; or
- press the **Insert** key to turn on Overtyping mode, and replace existing text with whatever you type; or
- use the **Delete** key to remove any unwanted characters from the cell contents.

Using Undo, Redo, or Repeat

Excel has an Undo function that enables you to undo commands executed in the worksheet.

Excel can undo up to a maximum of 100 commands recently used. This “undo history” displays when you click the down arrow beside the **Undo** button. The Undo command can only be performed in the reverse sequence of the changes done to the worksheet; you cannot reverse the changes in a sequence of your choosing. Undo does not work for some commands such as saving the file.

If you need to reverse an undo, you can redo (“un-undo”) it. The Redo function is only available if one or more commands were undone.

Excel keeps a history of the last 100 actions that were undone for the Redo feature. To display the redo history, click the down arrow beside the **Redo** button. Like the **Undo** command, the **Redo** commands must be performed in the reverse sequence of the actions that were undone.

You can also repeat the most recent action by using the **F4** key.

Copying and Moving Data

Excel enables you to copy or move cell contents from a different part of the same worksheet, another worksheet in the same workbook, or a worksheet in a different workbook.

Cut	Removes the contents of a cell or a range to the Office Clipboard.
Copy	Copies the contents of a cell or a range of cells to the Office Clipboard.
Paste	Pastes any or all contents from the Office Clipboard in one or more cell locations.
Paste Special	Modifies the effects of the paste option, such as by pasting the contents or format only.

Before you can activate the copy or cut command, you need to select a range; when you do, a *marquee* (moving dotted rectangle) will appear around the selection, identifying what you want to cut or copy. To remove the marquee, use one of the following methods:

- Press **Esc**; or
- type the first letter, number, or symbol on a new entry; or
- press **Enter** to paste the cut or copied item into this location only.





Note that when you press **Delete** or use the Cut command, the information is removed, but any formatting applied to that data will still exist in that location. You must use the Clear command for more choices regarding deletion. The **Clear** command is on the **Home** tab, in the **Editing** group.


Using the Office Clipboard

You can cut or copy more than one cell range, and keep up to 24 cell ranges in the Office Clipboard at one time. You can then paste any or all these items in any sequence.

Activate the commands for cut, copy, and paste using the **Home** tab, in the **Clipboard** group, or with the keyboard shortcuts. Display the Office Clipboard at any time by clicking the **Dialog box launcher** in the **Clipboard** group of the **Home** tab.

Exercise

- 1 Press **(Ctrl)+(N)** to create a new blank workbook and save this as TEC Executive Team - Student.
- 2 Open the *TEC Employee List* workbook and then select cells **A1** to **C1**.
- 3 On the **Home** tab, in the **Clipboard** group, click .
- 4 Switch to the new workbook and then in cell **A1**, on the **Home** tab, in the **Clipboard** group, click **Paste**.
- 5 Switch to the *TEC Employee List* workbook.
The headings for the first three columns in the report should no longer appear.
- 6 As you did not want to move the headings from this report, on the Quick Access toolbar, click  (**Undo**).
Notice how Excel automatically removes the headings from the blank report and keeps this displayed.
- 7 Switch to the *TEC Employee List*.
The headings appear again in this report and the marquee appears around the selected cells.
- 8 On the **Home** tab, in the **Clipboard** group, click .
- 9 Switch to the new workbook and then in cell **A1**, on the **Home** tab, in the **Clipboard** group, click **Paste**.
- 10 Switch to the *TEC Employee List* to see if the headings still appear here as well.
Using the Copy command keeps the original information intact whereas the Cut command physically removes the information from the location and places it in the new location.
- 11 Click cell **A2** and drag to select from here to cell **C4**.
- 12 On the **Home** tab, in the **Clipboard** group, click .
- 13 Switch to the new workbook and then in cell **A2**, on the **Home** tab, in the **Clipboard** group, click **Paste**.
- 14 Switch to *TEC Employee List*, and select cells **A20** to **C20**. Press **(Ctrl)** and then select cells **A24** to **C24**.
- 15 Press **(Ctrl)+(C)** to copy these cells and then switch to the new workbook.
- 16 In cell **A5**, press **(Ctrl)+(V)** to paste the cells in this location.

	A	B	C	D	E	F
1	First Name	Last Name	Position			
2	Sid	Taylor	President			
3	Richard	Reeves	Vice President – Sales			
4	Heidi	Krause	Vice President – Business Development			
5	Blair	Miller	Vice President – Global West			
6	Edward	Tanaka	Vice President – Sales			
7				 (Ctrl) ▾		
8						

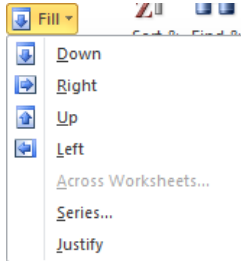
- 17 Switch to the *TEC Employee List* and close this workbook without saving.
- 18 Save the *TEC Executive Team - Student* workbook again.

Using Fill

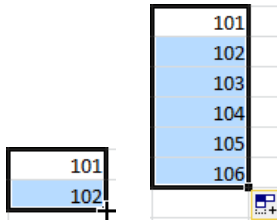
Use the Fill feature to automatically fill in data based on the original contents; this could be data in a single cell, or a range of cells where a specific pattern or trend exists in that range.

To use the Fill option, use one of the following methods:

- On the **Home** tab, in the **Editing** group, click the  button; or

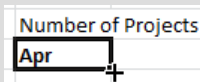


- select the cell range with the data to fill, position the mouse pointer at the lower right corner of the range, and when you see the thick crosshair, drag to the required number of cells.

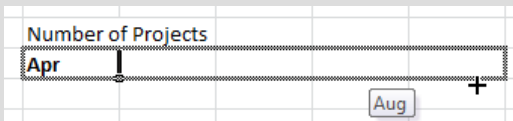


Exercise

- Open the *TEC Project Consultants Report* and save as *TEC Project Consultants Report - Student*.
- In cell **D2**, type: Number of Projects.
- In cell **D3**, type: Apr and press **Enter**.
- Click cell **D3** to select it and then point the cursor at the lower right corner, where the small black box appears.



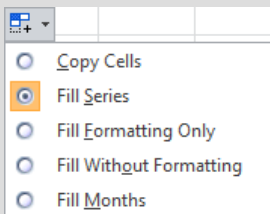
- With the small crosshair symbol active, click and drag to the right to cell **H3**.



The headings should then appear similar to the following:



- Click the **Auto Fill Options** button to view the options.




Excel recognizes that you used the Fill command to quickly insert the data for these cells. You could choose any of the options here to change the information as required.

- 7 Click anywhere away from the button to close this option.
- 8 Save the workbook.

Now try using the Auto Fill option in different ways.

- 9 Click the **Estimates** tab to go to this worksheet.
- 10 Select cell **C1**, then position the cursor at the lower right corner of cell **C1** and drag to **G1**.

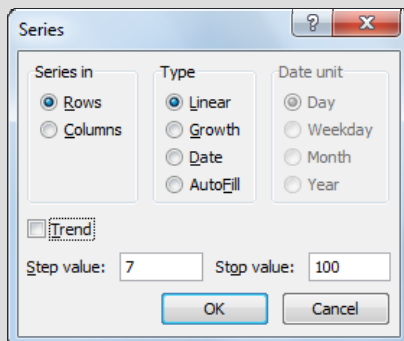
Notice how this time the years did not change for you. This is because Excel did not recognize a pattern or a known trend in the original cell. As a result, Excel only copied the contents from cell C1 through to cell G1.

- 11 On the Quick Access toolbar click  (**Undo**).
- 12 Click cell **D1** and type: 2013.
- 13 Select cells **C1** to **D1** and then with the cursor on the Auto Fill symbol at the lower right corner of cell D1, drag to cell **G1**.

The years should now be correct.

Now try setting up a series where each location is estimated to grow the number of projects by seven each year. This is a rough estimate based on potential market trends; we want to determine where we may need to increase staff should the number of projects exceed what we can currently manage.

- 14 Select cells **B2** to **G7**. Then on the **Home** tab, in the **Editing** group, click **Fill** and then **Series**.
- 15 Select the following options:



- 16 Click **OK**.

	A	B	C	D	E	F	G
1	Location	Current	2012	2013	2014	2015	2016
2	Cape Town	36	43	50	57	64	71
3	London	44	51	58	65	72	79
4	New York	55	62	69	76	83	90
5	Shibuya-ku	72	79	86	93	100	
6	Sydney	61	68	75	82	89	96
7	Toronto	53	60	67	74	81	88

Excel has now entered in the values based on the series you used to determine a linear growth. Notice also how the Shibuya-ku location does not have a value for the 2014 year, which is a clear indicator we need to ensure we hire more staff for that location by 2012.

- 17 Save and close the workbook.

Changing the Column Widths


You can adjust column widths to display more characters. When an entry in a cell is longer than the standard column width, Excel displays the label by overflowing the entry into the next cells if they are empty. However, if there are entries in the adjoining cells, the entry is truncated at the column boundary, as seen in the following:

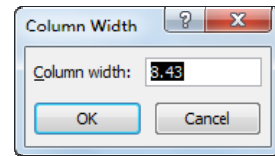
	A	B	C	D	E
1	Tolano Employees' Salaries - Confidential				
2	First Name	Last Name	SSN	Position	Salary
3	Sid	Taylor	1.23E+08	President	#####
4	Richard	Reeves	3.22E+08	Vice Presi	#####
5	Heidi	Krause	9.88E+08	Vice Presi	#####
6	Jeff	Chou	1.47E+08	Human Re	#####
7	Shauna	Adams	7.42E+08	Marketing	#####
8	Joseph	Kowalski	6.59E+08	Accountar	#####

Column widths can be set between zero and 255 characters. When you change a column width, the stored contents of the cells do not change, only the number of the characters displayed.

If you enter values that exceed the column width, Excel stores the data but displays the number in scientific format. If the data is a text or date value, it appears with # symbols. Once you change the width of the cell sufficiently, Excel shows the full value properly using the assigned cell formatting.

To change the width of a column, use one of the following methods:


- On the **Home** tab, in the **Cells** group, click **Format**, and then **Column Width**; or
- position the mouse pointer on the line at the right edge of the column header to be adjusted; when you see  (thick horizontal double-headed crosshair), click and drag to the required width for the column.

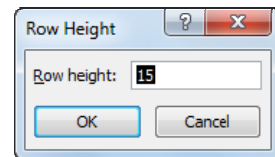


To check the width of a column, click the right edge of the column header. The width will be displayed in a screen tip above the mouse pointer.

Adjusting the Row Height

When you need to adjust the row height so the row is smaller or larger than others in the worksheet, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click **Format**, and then **Row Height**; or
- Place the mouse pointer at the bottom edge of the row header to be adjusted. When it changes to , click and drag to the height required.



Using AutoFit

The *AutoFit* feature automatically adjusts the width of a column or the height of a row so that it will accommodate the longest value in the column or the text height or number of lines of text, in the row.

To adjust the width of a column using AutoFit, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click **Format**, and then **AutoFit Column Width**.
- Double-click the line at the right edge of the column header to adjust.

To adjust the height of a row using AutoFit, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click **Format**, and then **AutoFit Row Height**.
- Double-click the line at the bottom edge of the row header to adjust.

Exercise

- 1 Ensure the *TEC Executive Team - Student* workbook is active.
- 2 Click the column heading for column **A** and drag across to include column **B**.
- 3 Place the cursor on the vertical line between columns A and B.

	A	B	
1	First Name	Last Name	Posit
2	Sid	Taylor	Presi

- 4 Click and drag until the width in the ScreenTip shows as **11.00**.

- 5 Place the cursor on the vertical line between columns **C** and **D** and then double-click.

Notice in this case Excel automatically made the column wide enough to fit the longest content in this column.

	A	B	C
1	First Name	Last Name	Position
2	Sid	Taylor	President
3	Richard	Reeves	Vice President – Sales
4	Heidi	Krause	Vice President – Business Development
5	Blair	Miller	Vice President – Global West
6	Edward	Tanaka	Vice President – Sales

- 6 Save the workbook.

Inserting or Deleting Rows, Columns, or Cells

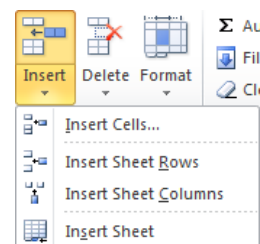
Insert new rows, columns, or cells when you need to add information or separate parts of the worksheet. Delete rows, columns, or cells of data that you do not need in the worksheet.

Inserting Rows, Columns, or Cells

You can insert a new row above the current row, and a new column to the left of the current column. You can insert one or more rows or columns at the same time.

You can also insert cells in specific areas of the worksheet; use caution when activating this option as it can alter the structure of your worksheet.

Be careful using these commands as they affect the entire worksheet and may affect areas of the worksheet you are not viewing on the screen. For example, if you want to insert a row but only have one cell in the row selected, click the arrow for the Insert command to insert the row; do not click the Insert command on its own as Excel will insert a cell in the current cursor location only for that one column.



To insert a column to the left of the selected column, use one of the following methods:

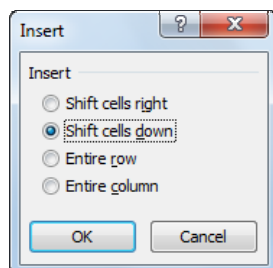
- On the **Home** tab, in the **Cells** group, click the arrow for **Insert**, and then **Insert Sheet Columns**; or
- press **(Ctrl)+(+)** from the numeric keyboard, select **Entire column** and click **OK**; or
- right-click the selected column and then click **Insert**, select **Entire column** and click **OK**.

To insert a row above the selected row, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click the arrow for **Insert**, and then **Insert Sheet Rows**; or
- press **(Ctrl)+(+)** from the numeric keyboard, select **Entire row** and click **OK**; or
- right-click the selected row and then click **Insert**, select **Entire row** and click **OK**.

To insert one or more cells in the current location, on the **Home** tab, in the **Cells** group, click the arrow for **Insert** and then click **Insert Cells**.

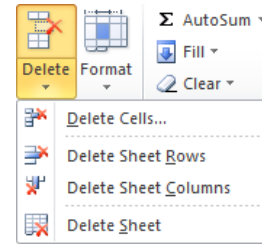
Note: If you select the entire row using the row heading or the entire column using its column heading, you can just click **Insert** on its own. Excel automatically recognizes what to insert based on the selection of the entire row or column.



Deleting Rows, Columns, or Cells

You can delete one or several rows or columns, or shift cells over in place of deleted cells. Deleting the contents of a cell only affects the contents, not the structure of the worksheet as it would if you were to delete the cell.

Be careful when deleting entire rows or columns to ensure you do not accidentally delete valuable data not currently displayed on the screen.

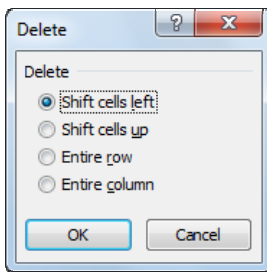


To delete the selected column, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click the arrow for **Delete**, and then **Delete Sheet Columns**; or
- press **(Ctrl)+(-)** from the numeric keyboard, select **Entire column** and click **OK**; or
- right-click the selected column and then click **Delete**, select **Entire column** and click **OK**.

To delete the selected row, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click the arrow for **Delete**, and then **Delete Sheet Rows**; or
- press **(Ctrl)+(-)** from the numeric keyboard, select **Entire row** and click **OK**; or
- right-click the selected row and then click **Delete**, select **Entire row** and click **OK**.



Note: If you select the entire row using the row heading or the entire column using its column heading, you can just click **Delete** on its own. Excel automatically recognizes what to delete based on the selection of the entire row or column.

To delete one or more cells in the current location, on the **Home** tab, in the **Cells** group, click the arrow for **Delete**, and then click **Delete Cells**.

Exercise

- 1 Ensure the *TEC Executive Team - Student* workbook is active.
- 2 Click cell **A1**. On the **Home** tab, in the **Cells** group, click the arrow for **Insert** and then click **Insert Sheet Rows**.
- 3 Press **(F4)** to repeat the process of inserting a new blank row in this location.
- 4 In cell **A1**, type: Tolano Executive Team Members and press **(Enter)**.

The blank row between the title and the data provides more space between the two sets of data. However, the spacing is too much. You can change this by adjusting the height of this row.

- 5 Position the cursor on the bottom of the row 2 heading.

	A	B	C
1	First Name	Last Name	Position
2			
3	Sid	Taylor	President
4	Richard	Reeves	Vice President – Sales
5	Heidi	Krause	Vice President – Business Development
6	Blair	Miller	Vice President – Global West
7	Edward	Tanaka	Vice President – Sales

- 6 Click and drag upwards until you see **6.00** in the ScreenTip.

	A	B	C
1	First Name	Last Name	Position
2			
3	Sid	Taylor	President
4	Richard	Reeves	Vice President – Sales
5	Heidi	Krause	Vice President – Business Development
6	Blair	Miller	Vice President – Global West
7	Edward	Tanaka	Vice President – Sales

Suppose you decide you no longer need this blank row.

- 7 With the cursor still in row 2, on the **Home** tab, in the **Cells** group, click the arrow for **Delete** and then click **Delete Sheet Rows**.

	A	B	C
1	Tolano Executive Team Members		
2	First Name	Last Name	Position
3	Sid	Taylor	President
4	Richard	Reeves	Vice President – Sales
5	Heidi	Krause	Vice President – Business Development
6	Blair	Miller	Vice President – Global West
7	Edward	Tanaka	Vice President – Sales

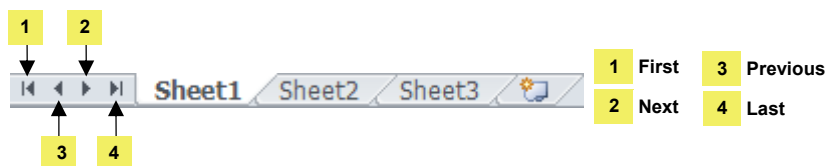
- 8 Save the worksheet.

Managing Worksheets



A workbook is a collection of worksheets. While each worksheet can be treated as an independent spreadsheet, information on the worksheets is typically inter-related.

Worksheets can be renamed, added, deleted, copied, and moved within a workbook. Use the tab scrolling buttons to display more worksheet tabs as required.



Naming Worksheets


Sheet1, Sheet2, Sheet3, and so on help to identify different sheets as you create them, but do not describe their contents, which can make it difficult for you to find what you want. Renaming tabs with more descriptive names makes navigation easier. Worksheet tabs can be up to 31 characters long.

To rename a worksheet tab, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click **Format**, and then **Rename Sheet**; or
- double-click the sheet tab and then type the new name.

Inserting or Deleting Worksheets

Excel automatically includes three worksheets with a new workbook, but you can add more. To insert a new worksheet, use one of the following methods:

- On the **Home** tab, in the **Cells** group, click **Insert**, and then **Insert Sheet**; or
- in the sheet tabs area, click  (**Insert Worksheet**) to automatically add a worksheet at the end of current worksheet tabs; or
- press **(Shift)+(F11)**; or
- right-click the tab where you want to place the new sheet, click **Insert, Worksheet**, and then click **OK**.


Use the tab scrolling buttons to display more worksheet tabs, or adjust the length of the horizontal scroll bar.

Deleting worksheets that you no longer need can help keep your workbook easy to use, but consider saving the workbook before deleting a worksheet in case you need to revert to the previous version of the file. Note that the Undo command does not work for a deleted worksheet. Also, check every worksheet for any errors in case there were formulas that affect the values in the rest of the worksheets.

To delete a worksheet, select the sheet and then use one of the following methods:

- On the **Home** tab, in the **Cells** group, click the down arrow for **Delete**, and then **Delete Sheet**; or
- right-click the sheet tab and click **Delete**.

Exercise

- 1 Ensure the *TEC Executive Team - Student* workbook is active.
- 2 Double-click the **Sheet1** tab, type: Executives and press **Enter**.
- 3 Double-click the **Sheet2** tab, type: Managers and press **Enter**.
- 4 Double-click the **Sheet3** tab, type: Project Consultants and press **Enter**.
- 5 Click  (**Insert Worksheet**).
- 6 Double-click the **Sheet4** tab, type: Staff and press **Enter**.

Executives | Managers | Project Consultants | **Staff**

This report will contain the names only of the Executive Team and Managers. You need to delete the last two worksheets.

- 7 Right-click the **Staff** tab and then click **Delete**.
- 8 Right-click the **Project Consultants** tab and then click **Delete**.
- 9 Save and close the workbook.

Summary

In this lesson, you learned to select items in a worksheet for the purpose of making changes or manipulating the data. You should now be able to:

- | | |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> select cells or ranges of cells | <input checked="" type="checkbox"/> change column widths and row heights |
| <input checked="" type="checkbox"/> make changes to the cell contents | <input checked="" type="checkbox"/> insert and delete rows and columns |
| <input checked="" type="checkbox"/> use Undo and Redo | <input checked="" type="checkbox"/> fill cells with contents automatically |
| <input checked="" type="checkbox"/> copy and move data | <input checked="" type="checkbox"/> manage worksheets |

Review Questions

1. When you activate the Cut or Copy command, a marquee appears around the selected cell(s). How can you remove the marquee?
 - a. Press **Esc**.
 - b. Press **Enter**.
 - c. Continue entering data in new areas.
 - d. Any of the above
 - e. a or c
2. The Fill feature reviews the contents or patterns in selected cells and then fills adjacent cells with corresponding data, based on the trend or type of data in the selected cells.
 - a. True
 - b. False
3. How can you adjust the width of a column?
 - a. On the Home tab, in the Cells group, click Format, click Column Width.
 - b. On the Home tab, in the Cells group, click Format, click AutoFit Column Width.
 - c. Click and drag the line at the right of the column heading.
 - d. Any of the above
 - e. a or c
4. When you insert a new row, where does it go?
 - a. Above the current row
 - b. Below the current row
5. You cannot change the names of each of the sheets.
 - a. True
 - b. False

Lesson 30

Working with Formulas

Objectives

In this lesson you will learn to work with formulas, including creating simple formulas and using some of the built-in functions. On completion, you will be able to:

- identify formulas
- structure formulas
- use some common built-in functions
- understand what absolute and relative formulas are
- use formulas correctly



Skills

- 2-3.2.3 Demonstrate an understanding of absolute vs. relative cell addresses
- 2-3.2.4 Insert arithmetic formulas into worksheet cells
- 2-3.2.5 Demonstrate how to use common worksheet functions
- 2-3.2.6 Use AutoSum
- 2-3.2.7 Insert and modify formulas and functions
- 2-3.2.8 Identify common errors people make when using formulas and functions

Creating Simple Formulas



2-3.2.3 2-3.2.4 2-3.2.5 2-3.2.6 2-3.2.7

A formula is a calculation using numbers (or other data) in a cell or from other cells, such as:

- automatically calculating sums horizontally and vertically
- performing “what-if” analyses by performing a calculation based on one or more changed input value, such as estimated profit for a business during the next year
- using one or more Excel functions to perform tedious or complex calculations, such as monthly mortgage payments.

Formulas can be linked from one worksheet to another, so that when you change values or amounts in the active worksheet, dependent cells in the other worksheet will be automatically updated. You can use a single cell as the reference point, or you can create complex formulas with many cell references as well as built-in functions.

To begin a formula in any cell, you must type an equal sign (=). You can enter a cell address into a formula either by typing it directly into the cell, or by pointing to the cells to be included. The cell will then display the result of the formula; the formula itself will be displayed in the Formula bar.

Some formulas are long with many calculations. If you need to change a formula, you can use the **F2** key to change the formula in the cell, instead of entering the entire formula from scratch.

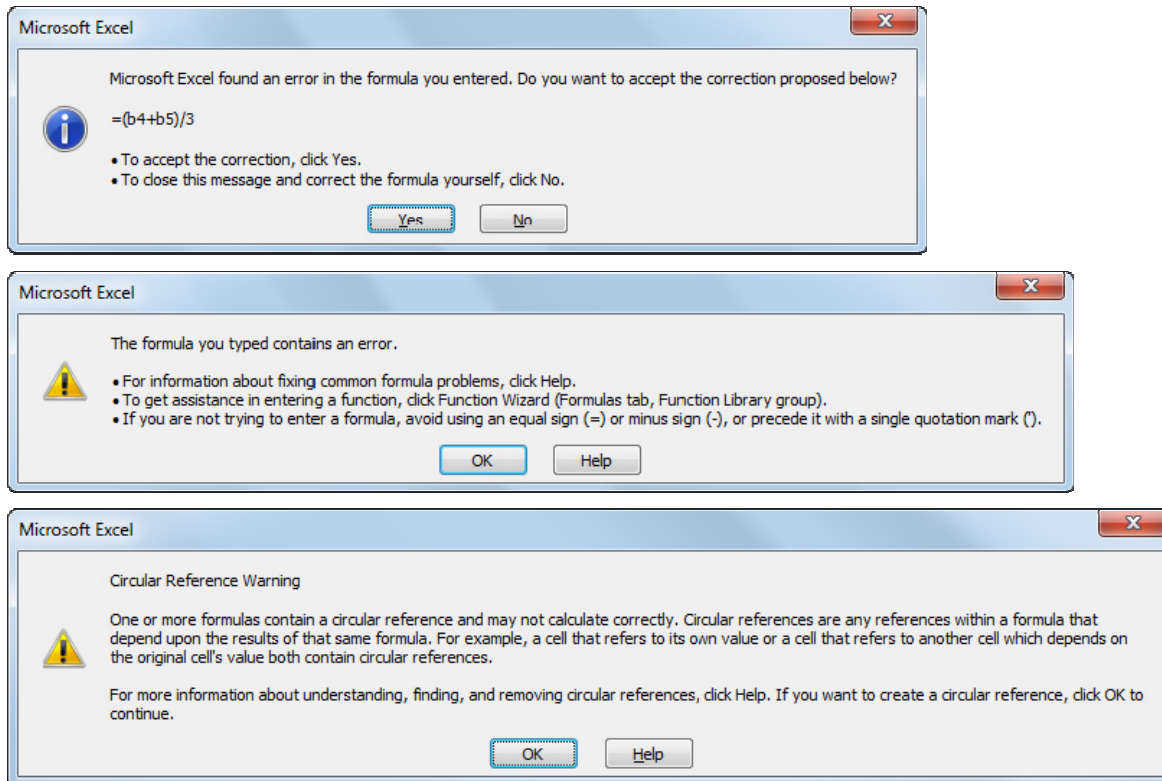
Cells containing formulas can be copied to other cells. If these formulas contain cell references, Excel will automatically adjust the cell references for you to speed up the construction of data tables.


Excel calculates formulas in “natural order”: exponents first, then multiplication and division, and then addition and subtraction. This order can be altered by inserting parentheses around portions of the formula; Excel will calculate the portions in parentheses before calculating the other items in the formula.

The following shows the symbols used in Excel to represent standard mathematical operators:

- * Multiplication + Addition
- / Division - Subtraction

When Excel detects an error or inconsistency in a formula, it displays a suggestion for fixing it. The type of error message depends on the type of error, as seen in the following examples:



Excel displays  to alert you when a formula is different from the formulas used in surrounding cells that follow a particular pattern.

Excel can help you analyze the data in your report by using formulas to identify trends or patterns in the data. For instance, when tracking sales figures over a period of time, an upward or downward pattern emerges; or in a budget, you may notice that office expenses are increasing. When Excel brings this to your attention, you can analyze when, why, and how the changes have occurred, and take action if needed.

When data is broken down for analysis or comparison, you can display that information on a chart to show where any trends or patterns exist.

Using Common Built-In Functions

Excel provides over 300 built-in functions for mathematical and data operations. Functions accept numbers, values, and cell references as *arguments* within parentheses, following this format:

`=FUNCTION(numbers or values or cell reference)`

Some common functions you will use include:

=SUM	Calculates the sum of the values in the range of specified cells.
=AVERAGE	Calculates an average of the values in the specified cells (totals the range and divides the total by the number of entries).
=MIN	Displays the minimum value in the range of specified cells.
=MAX	Displays the maximum value in the range of specified cells.
=COUNT	Counts the number of values within the specified range.

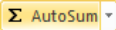
Cell ranges in a function should be set up as follows:

<first cell address>:<last cell address>

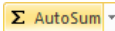
Examples:

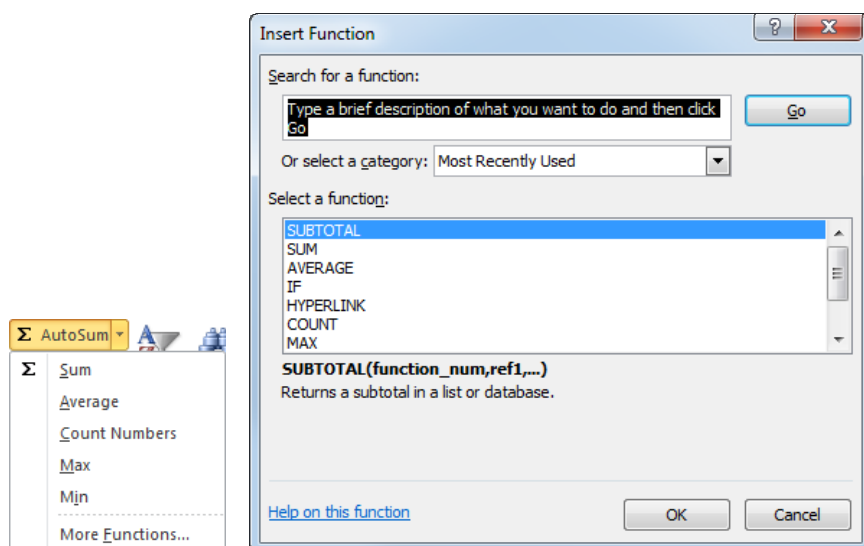
A10:B15, C5:C25

You can specify the range by typing the cell reference directly or by using the “point-to” method, where you use the mouse to click and drag to select the cell range. The latter method allows you to visually identify the cell range, which reduces the chance that you will enter incorrect cell references.


When calculating totals, you can use  on the **Home** tab in the **Editing** group. Excel then selects the range of cells immediately above or to the left of the current cell.

Be sure to verify that you have selected the correct cell range for the function. If there is even one blank cell between cells, the range may not include all cells.

Use the arrow next to the  tool to display other common built-in functions, or use **More Functions** to choose a different function.

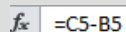


Exercise

- 1 Open the *North America GHG Report* workbook and save as North America GHG Report - Student.
- 2 In cell **D5**, type: =c5-b5 and press .

Excel now calculates the value and displays it in the cell. As you entered the cell addresses, Excel also highlighted these cells in different colors as a visual indicator to which cells are used or referenced in the formula.

- 3 Click cell **D5** and view the contents in the Formula bar.

 =C5-B5

Remember that Excel always displays the results of the formula in the cell of the worksheet although the contents of the cell contain the actual formula, as shown in the Formula bar. Notice also how the cell addresses are not case sensitive.

Try setting a formula using the point and click method instead of typing the formula in directly.

- 4 In cell **D6**, type: = to begin the formula and then click cell **C6**.

- 5 Type: - (dash to indicate the subtraction operator) and then click cell **B6**. Press **Enter**.

	A	B	C	D	E
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
2	Economic Sector	GHG Emissions			
3		1990	2006	Chg	Chg
4		(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a	(%)
5	Fossil fuel industries	103	158	55	
6	Electricity	97	118	21	
7	Transportation ^b	121	159		
8	Heavy industry and manufacturing	123	113		

The result now appears in cell D6.

The two preceding formulas were examples of simple formulas you can create. They are considered simple as they are relatively small and only involve the use of arithmetic operators with no functions. Now try using some built-in functions to calculate a larger set of cells.

- 6 In cell **B12**, on the **Home** tab, in the **Editing** group, click **Σ AutoSum**.

	1990	2006	
	(Mt CO2 eq)a	(Mt CO2 eq)a	(M
	103	158	
	97	118	
	121	159	
ufacturing	123	113	
	40	55	
	51	49	
	57	69	
	=SUM(B5:B11)		
	SUM(number1, [number2], ...)		

Notice how Excel displays a marquee to indicate which cells will be included in the formula, as well as displays the formula. Whenever multiple cells are used in a formula, they display a colon between the first cell in the range and the last cell in the range.

- 7 Press **Enter** to accept the formula.

You can also use the point and click method, if preferred, with built-in functions.

- 8 In cell **C12**, type: =sum(to begin the formula. Be sure to include the open bracket to tell Excel you will now be indicating the cell range.
- 9 Starting at cell **C5**, click and drag to cell **C11**.

	1990	2006	Chg
	(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a
	103	158	55
	97	118	21
	121	159	
	123	113	
	40	55	
	51	49	
	57	69	
	592	=sum(C5:C11)	
	SUM(number1, [number2], ...)		

Notice Excel provides a very similar display as if you used the Sum function as in step 6.

- 10 Press **Enter** to accept the formula.

The formula should have had a closing bracket ")" at the end. When you pressed the **Enter** key, Excel knew it was needed and added it for you. You should try to enter all closing brackets manually to ensure that Excel does not add them in the wrong places for you.

- 11 In cell **E5**, type: =(c5-b5)/b5 and press **Enter**.

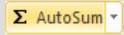
The formula you are now calculating is the percentage change from 1990 to 2006, or $=(2006-1990)/1990$.

	A	B	C	D	E
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
2	Economic Sector	GHG Emissions			
3		1990	2006	Chg	Chg
4		(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a	(%)
5	Fossil fuel industries	103	158	55	0.533980583
6	Electricity	97	118	21	
7	Transportation ^b	121	159		
8	Heavy industry and manufacturing	123	113		
9	Service industries	40	55		
10	Residential ^b	51	49		
11	Agriculture	57	69		
12	Total	592	721		

- 12 Save the workbook.

Now try creating the formulas for another worksheet so you can eventually create a new worksheet that shows a summary of the changes for North America from 1990 to 2006.

- 13 Click the **US** tab.

- 14 In cell **B10**, on the **Home** tab, in the **Editing** group, click .


Notice how the sum formula includes the year cell in the range—you do not want this option.

- 15 Starting with cell **B3**, click and drag to select to cell **B9**.

- 16 Press when the formula shows as =SUM(B3:B9).

While there are other years in the US report, we only want to compare 1990 and 2006 figures as those are the only years available in the Canada worksheet.

- 17 In cell **F10**, type: =sum(f3:f9) and press .

- 18 On the navigation bar across the bottom of the workbook, click  (**Insert Worksheet**).

- 19 Double-click the **Sheet1** tab, type: Summary and press .

- 20 Type the following information:

	A	B	C	D	E	F
1	Summary of North America					
2		2006 Average	Minimum	Maximum	1990	
3	Canada					
4	US					

- 21 In cell **B3**, type: = to begin the formula.

- 22 Click the **Canada** sheet tab, then click in cell **C12** and then press .

- 23 Click cell **B3** again to view the contents in the Formula bar.

=Canada!C12

This is an example of how you can set up 3D worksheets by using cell addresses in other worksheets of the same report. You can also use cell addresses from another workbook, as required, but the workbook needs to be open and active on the screen to accomplish this. Excel will include the name of the worksheet and the workbook in the formula as a guide for you to see where the original data exists.

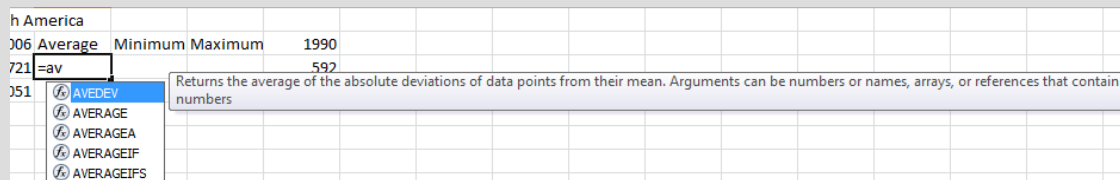
- 24 In cell **B4**, type: = to begin the formula. Click the **US** tab, click in cell **F10**, and then press .

- 25 Complete the other two formulas for the 1990 year.

	A	B	C	D	E	F
1	Summary of North America					
2		2006 Average	Minimum	Maximum	1990	
3	Canada	721				592
4	US	7051				6098.7

Now try using some other common built-in functions with the Canadian and US statistics for 2006.

- 26 In cell **C3**, type: =av to begin the Average function.



Excel provides a hint for you as you type the first few characters of the formula, as well as displays a brief explanation of how each function works.

- 27 Double-click the **AVERAGE** option and then click the **Canada** tab.
 28 Select cells **C5** to **C11** and then press **Enter**.

	A	B	C	D	E	F
1	Summary of North America					
2		2006 Average	Minimum	Maximum		1990
3	Canada	721	103			592
4	US	7051				6098.7

- 29 Click cell **C3** and review the formula in the Formula bar.

=AVERAGE(Canada!C5:C11)

Notice how Excel references the worksheet with this formula as it did with the simple formula in cell B3.

- 30 Use the same cell range for the next two formulas using the =MIN and =MAX functions.
 31 Repeat steps 26 to 30 using the **US** worksheet and cells **F3** to **F9**.

	A	B	C	D	E	F
1	Summary of North America					
2		2006 Average	Minimum	Maximum		1990
3	Canada	721	103	49	159	592
4	US	7051	1007.286	62.3	2375.5	6098.7

- 32 Save the workbook again.

Using Absolute and Relative Addresses

Most formulas entered into an Excel worksheet are *relative*, which means that if you copy a formula with a relative cell address and paste it to another cell, Excel will automatically adjust that address to reflect the new location. For example, suppose you have a formula that adds three rows together within one column; you can copy this formula to another column to add the same three rows in the new column. Thus, the formula is relative to the column in which you place it.

On the other hand, an *absolute* cell address refers to an exact or fixed location on the worksheet.


To change a relative cell address to an absolute (fixed) cell address in a formula or function:

- Enter a dollar sign before the row number and/or column letter; or
- press **F4** once you enter the cell address.

The **F4** key provides several options for absolute references: pressing **F4** the first time on a cell address makes both the column and row reference absolute; pressing it again results in only the row reference being absolute; pressing it a third time results in only the column reference being absolute; and a fourth press removes the absolute references on both the column and row.


Cell addresses can be a combination of relative and absolute cell references. An absolute column reference means the column reference (\$E) will be constant when the formula is copied while the row reference will adjust for the new location. An absolute row reference means the row reference (i.e., \$5) will be constant when you copy the formula, while the column reference will adjust for the new location.

Exercise

- 1 Ensure the *North America GHG Report - Student* workbook is active. Click the **Canada** tab to go back to this worksheet.
- 2 Click cell **E5**. Then on the **Home** tab, in the **Clipboard** group, click .
- 3 Select cells **E6** to **E11**, and then on the **Home** tab, in the **Clipboard** group, click **Paste**.
- 4 Click cell **E6** and view the Formula bar.




`=(C6-B6)/B6`

Notice how the formula calculation remains the same as cell E5; what changed were the cell references. This is an example of relative addressing.

- 5 Copy the formula in cell **D6** to the cell range of **D7** to **D11**.
- 6 In cell **F3**, type: 2006 and then in cell **F4**, type: % Total.
- 7 In cell **F5**, type: =C5/C12 and press .
- 8 Click cell **F5** once more and copy this formula into cells **F6** to **F11**.

	A	B	C	D	E	F
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006					
2	Economic Sector	GHG Emissions				
3		1990	2006	Chg	Chg	2006
4		(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a	(%)	% Total
5	Fossil fuel industries	103	158	55	0.533980583	0.21914
6	Electricity	97	118	21	0.216494845	#DIV/0!
7	Transportation ^b	121	159	38	0.314049587	#DIV/0!
8	Heavy industry and manufacturing	123	113	-10	-0.081300813	#DIV/0!
9	Service industries	40	55	15	0.375	#DIV/0!
10	Residential ^b	51	49	-2	-0.039215686	#DIV/0!
11	Agriculture	57	69	12	0.210526316	#DIV/0!
12	Total	592	721			

Notice how the formula values are incorrect. As the Total for 2006 should remain constant in the formula, you need to turn this cell address into an absolute address.

- 9 Click cell **F5** and then press  to turn on the Edit mode.
- 10 With the cursor at the end of the **C12** cell address, press  so the cell address appears as **\$C\$12**. Then press  to accept the change to the formula.
- 11 Copy this formula once more to cells **F6** to **F11**.

	A	B	C	D	E	F
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006					
2	Economic Sector	GHG Emissions				
3		1990	2006	Chg	Chg	2006
4		(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a	(%)	% Total
5	Fossil fuel industries	103	158	55	0.533980583	0.21914
6	Electricity	97	118	21	0.216494845	0.163662
7	Transportation ^b	121	159	38	0.314049587	0.220527
8	Heavy industry and manufacturing	123	113	-10	-0.081300813	0.156727
9	Service industries	40	55	15	0.375	0.076283
10	Residential ^b	51	49	-2	-0.039215686	0.067961
11	Agriculture	57	69	12	0.210526316	0.0957
12	Total	592	721			

- 12 Save and close the workbook.

Proper Use of Formulas



Worksheets are popular in business where almost every analysis includes at least one. The results are accepted at face value and decisions are made based on these worksheets.

Because worksheets are so heavily relied upon, it's important to always take time to verify that you have entered your formulas correctly. This can be crucial when major decisions will be based on your analysis of the data. Be diligent in double-checking every formula, including selecting every cell and looking at the Reference Area to verify it is correct, or performing an independent check of the calculations using a calculator.

When correcting a formula, watch where the insertion point is at the time you edit the formula, and be sure to check the cell references in the formulas. Some common errors when working with formulas include:

Circular Reference

The cell where the formula was entered is included as part of the formula.

	A	B	C
1	CO2 Emission Estimates		
2	Top 10 by Country (million metr		
3		Emissions	
4	Country	Total	Per Cap
5	China	6017.69	4
6	USA	5902.75	19
7	Russia	1704.36	
8	India	1293.17	1
9	Japan	1246.76	9
10	Germany	857.6	1
11	Canada	614.33	18
12	UK	585.71	9
13	South Korea	514.53	10
14	Iran	471.48	7
15		=sum(b5:b15)	

#DIV/0!

The formula contains a reference that is divided by 0.

	Last Year	Year-to-D	%Change
Fuel	1250	1000	-0.25
Parking	275	0	#DIV/0!
Maintenai	285	350	0.185714

#VALUE!

The formula contains an incorrect data reference.

	Last Year	Year-to-D	%Change
Fuel	1250	1000	-0.25
Parking	275	n/a	#VALUE!
Maintenai	285	350	0.185714

Operand

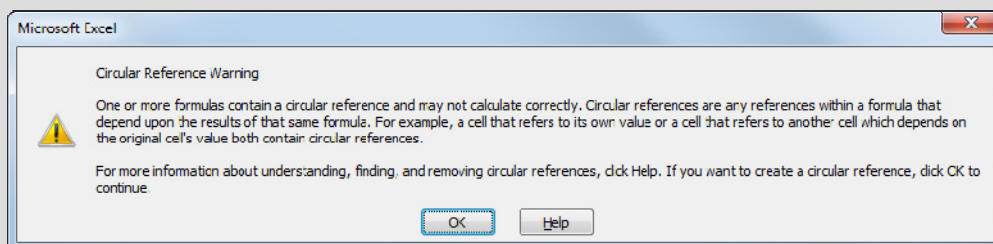
Something is wrong in the formula, as noted here where the calculation format is correct but the cell addresses have been entered incorrectly (should be =(C2-B2)/B2):

	Last Year	Year-to-D	%Change
Fuel	1250	1000	=(D4+C4)/D4

As you enter (or edit) formulas, review your worksheet to see what trends appear. Depending on the information in the worksheet, the results can identify areas where more information is needed (such as actual sales figures versus total sales for each region).

Exercise

- 1 Open the *CO2 Emission Estimates* workbook and save as *CO2 Emission Estimates - Student*.
- 2 In cell **B15**, type: =sum(b5:b15) and press **Enter**.



- 3 Click **OK** in the message box.
- 4 Read the information in the Excel Help window that discusses what circular references are. Then close the Excel Help window.
- 5 In cell **B15**, press **(F2)** to go into Edit mode and change the last cell address to **B14** instead of B15. This fixes the circular reference.
- 6 In cell **A16**, type: # Countries and press **(Tab)**.
- 7 In cell **B16**, type: =counta(b4:b15) and press **(Enter)**.
There is a value shown in cell B16 but the value is incorrect. The formula is correct in that it counted all the entries in the cell range you specified in the formula. The error lies in that the result you wanted was the number of countries listed in your report. The cell range needs to change if you want an accurate count of the number of countries in your report.
- 8 In cell **B16**, press **(F2)** and then change the range to be **B5:B14**.
What results do you have now? The correct number should be 10.
- 9 Save and close the workbook.

Summary

In this lesson you worked with formulas, including creating simple formulas and using some of the built-in functions. You should now be able to:

- | | |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> identify formulas | <input checked="" type="checkbox"/> understand what absolute and relative formulas are |
| <input checked="" type="checkbox"/> structure formulas | <input checked="" type="checkbox"/> use formulas correctly |
| <input checked="" type="checkbox"/> use some common built-in functions | |

Review Questions

1. How can you enter a cell address into a formula?
 - a. You can type it in manually.
 - b. You can select the cell and continue typing the formula.
 - c. You can point at the cell to be included in the formula instead of typing its address.
 - d. Any of the above
 - e. a or c
2. Look at the following table of information, and then indicate what conclusion you can make from the data:

Production				
	Week 1	Week 2	Week 3	Week 4
Widgets	80	85	90	80
Gadgets	150	175	200	180

- a. It takes longer to produce widgets than gadgets in the month.
 - b. The greatest amount of production occurred during the first three weeks of the month.
 - c. Approximately twice as many gadgets are being produced than widgets.
 - d. Any of the above
 - e. b or c
3. Change a cell address to be absolute when you want the cell address to stay constant as you copy the formula to other cells.
 - a. True
 - b. False
 4. A circular reference is when you repeat the same cell several times in a formula.
 - a. True
 - b. False
 5. It is important to double-check every formula in your worksheet to ensure that they are correct before distributing your report.
 - a. True
 - b. False

Lesson 31

Formatting a Worksheet

Objectives

In this lesson, you will look at what formatting means and how it can be used in a worksheet. On completion, you will be able to:

- format numbers and text
- change the alignment for data
- use borders and shading in cells
- apply automatic formatting styles
- use the Format Painter



Skills

- 2-1.3.6 Perform simple text formatting
- 2-3.1.4 Modify table structure
- 2-3.1.5 Identify and change number formats
- 2-3.1.6 Apply borders to cells
- 2.3.1.7 Specify cell alignment
- 2-3.1.8 Apply table AutoFormats

What Does Formatting Mean?



2-1.3.6 2-3.1.4 2-3.1.5 2-3.1.6 2-3.1.7 2-3.1.8

Formatting refers to changing the appearance of data to draw attention to parts of the worksheet, or make the numbers presented easier to read. You do not alter any underlying values.

You can format a cell or range of cells at any time, either before or after you enter the data. A cell remains formatted until you clear the format or reformat the cell. When you enter new data in the cell, Excel will display it in the existing format. When you copy or fill a cell, you copy its format along with the cell contents.

You can apply formatting using one of the following methods:

- On the **Home** tab, click the command to apply formatting from the appropriate group; or
- on the **Home** tab, in the appropriate group, click the **Format Cells: Dialog box launcher**; or
- press **(Ctrl)+(1)**; or
- right-click and then click **Format Cells**; or
- press the appropriate keyboard shortcut for specific formatting features, such as **(Ctrl)+(B)** for bold; or
- click the appropriate formatting option from the Mini toolbar, if active.

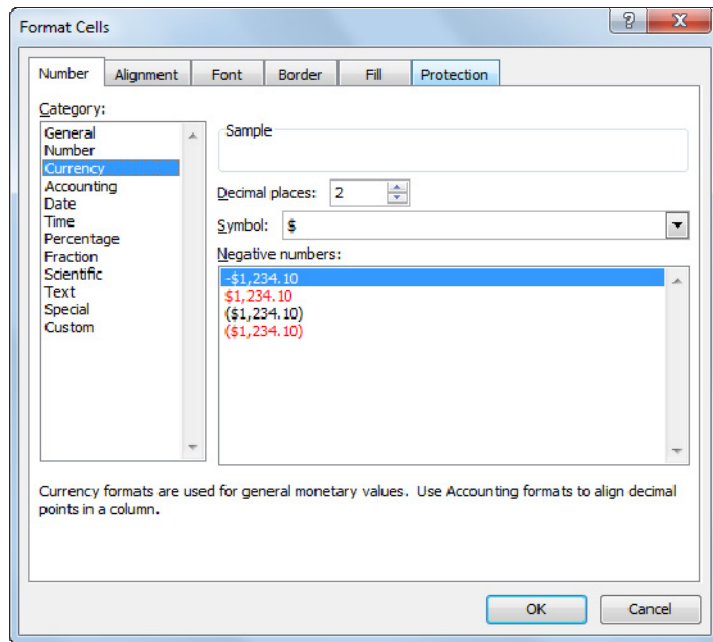
Formatting Numbers and Decimal Digits

When you enter numbers, Excel displays them exactly as you entered them except for any trailing zeros. Also, numbers larger than the width of the cell will display as scientific notation format.

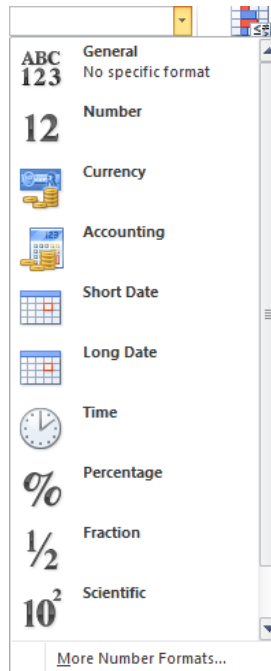
Excel provides a rich set of standard formats with customizable options. Excel also provides a **Special** format category for commonly used formats.

To format selected cells with values, use one of the following methods:

- On the **Home** tab, in the **Number** group, click the **Format Cells: Number Dialog box launcher**, and then choose the appropriate option from the **Category** list; or



- to use the default options for values, on the **Home** tab, in the **Number** group, click the arrow for **Number Format**, and click the format required.



Exercise

- Open the *Final North America GHG Report* workbook and save as *Final North America GHG Report - Student*.
- Select **E5** to **E12**. Then on the **Home** tab, in the **Number** group, click (**Percent Style**).
- On the **Home** tab, in the **Number** group, click the **Format Cells: Number Dialog box launcher**.
- Click the incremental button for **Decimal places** and change this to **3**. Then click **OK**.

Hint: You could also have used (**Increase Decimal**) in the **Number** group of the **Home** tab.

- Save the workbook.

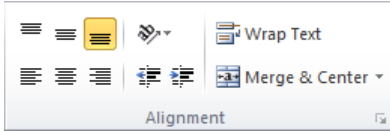
Changing Cell Alignment

Alignment refers to the position of data within a cell. You can align cell contents horizontally (column width) and vertically (row height). By default, new values entered into a worksheet use the **General** alignment option: numbers and dates automatically right-align, while text labels automatically left-align.

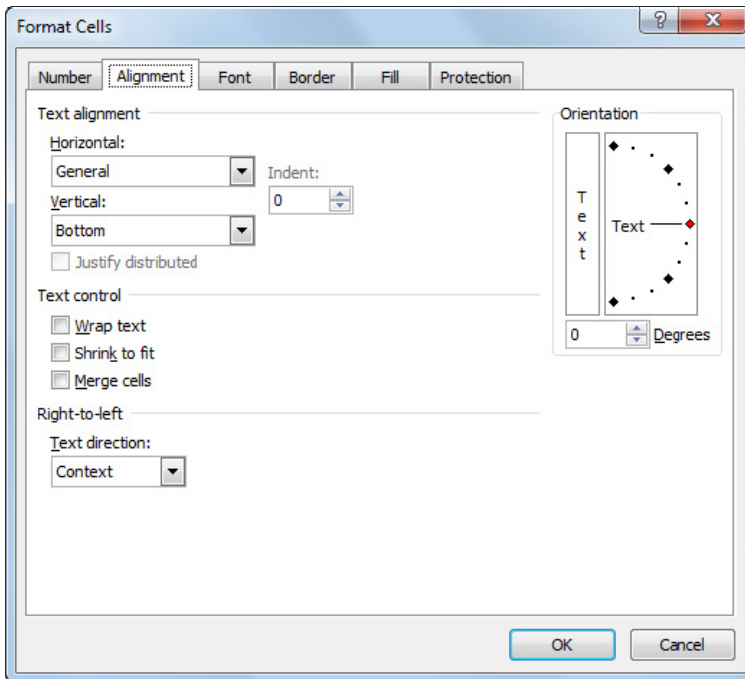
Use Merge & Center to center a text label across several cells. You can also wrap text in a cell or rotate it.

To change the alignment for selected cells, use one of the following methods:

- On the **Home** tab, in the **Alignment** group, click the alignment option required; or



- on the **Home** tab, in the **Alignment** group, click the **Format Cells: Alignment Dialog box launcher** and then choose the alignment option from the **Alignment** tab as shown:



Horizontal - General, Left (Indent), Center, Right (Indent)	Changes the alignment of the contents of any cell to general (default), left, right, or center.
Horizontal - Fill	Duplicates the cell contents to completely fill the cell's width.
Horizontal - Justify	Justifies the text on both the left and right sides of the cell. Excel automatically wraps the text when justify is used.
Horizontal - Center Across Selection	Centers a title across multiple columns for headings.
Indent	Indents labels from the left of the cell.
Vertical - Top, Center, Bottom, Justify, or Distributed	Aligns cell contents at the top, middle (center), or bottom of the cell, regardless of the horizontal alignment. Using the Justify command will justify the contents between the top and bottom of the merged cell whereas using Distributed will distribute the cell contents evenly from top to bottom in the merged cell.
Orientation	Rotates the values to any angle from 90° up to -90° down, or displays the entry vertically in the cell. Excel adjusts the cell height automatically.

Wrap text	Fits a label in the existing column by creating additional lines and expanding the height of the row. This feature is also available on the Home tab in the Alignment group.
Shrink to fit	Automatically adjusts the text size to fit the available space.
Merge cells	Removes the borders between cells and treats the “new” cell as one large cell. Cells can be merged horizontally, vertically or both. This feature is also available on the Home tab in the Alignment group.
Text Direction	Displays characters from right to left when entering text in Hebrew, Arabic, etc.

Exercise

- 1 Ensure *Final North America GHG Report - Student* is active. Select cells **A1** to **E1**.
- 2 On the **Home** tab, in the **Alignment** group, click the **Format Cells: Alignment Dialog box launcher**.
- 3 For **Horizontal**, click the arrow and then click **Center**.
- 4 For **Vertical**, click the arrow and then click **Top**.
- 5 In the **Text control** area, click **Merge cells**. Then click **OK**.

Hint: You can also change the alignment using the appropriate button from the **Alignment** group of the **Home** tab.

- 6 Select cells **B2** to **E2**, then on the **Home** tab, in the **Alignment** group, click **Merge & Center**.
You have now centered this text over the columns of data.
- 7 Place the cursor on the vertical line between column headers **A** and **B**. Then drag this to the left to reduce column A to have a width of **22.00**.
- 8 Click cell **A8** and then on the **Home** tab, in the **Alignment** group, click **Wrap Text**.
- 9 Select cells **A2** to **A4**. Then on the **Home** tab, in the **Alignment** group, click the arrow for **Merge & Center** and then click **Merge Cells**.

	A	B	C	D	E
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
2	GHG Emissions				
3		1990	2006	Chg	Chg
4	Economic Sector	(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(%)
5	Fossil fuel industries	103	158	55	53.398%
6	Electricity	97	118	21	21.649%
7	Transportation ^b	121	159	38	31.405%
8	Heavy industry and manufacturing	123	113	-10	-8.130%
9	Service industries	40	55	15	37.500%
10	Residential ^b	51	49	-2	-3.922%
11	Agriculture	57	69	12	21.053%
12	Total	592	721	129	21.791%

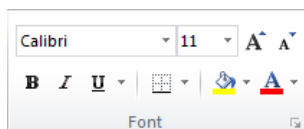
- 10 Save the worksheet.

Changing Fonts and Sizes

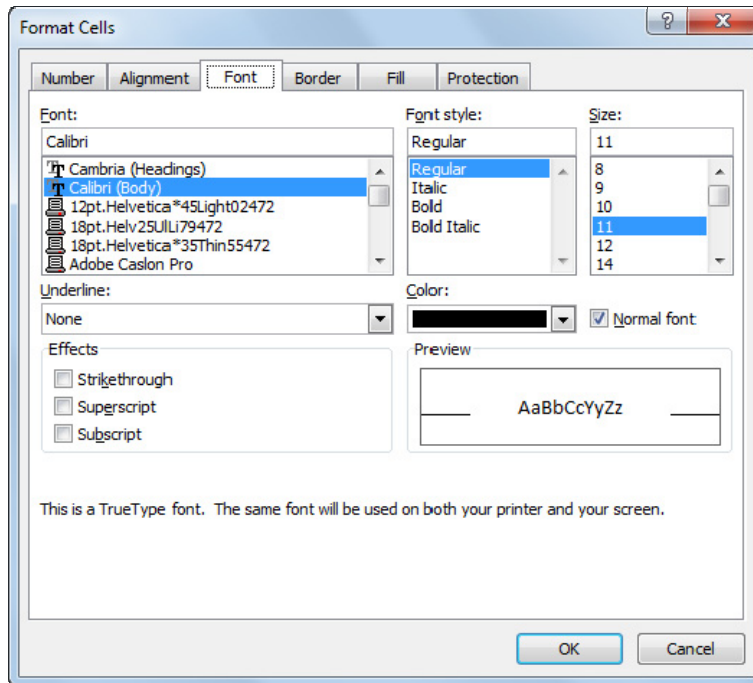
A font is a typeface or text style. Changing fonts alters the way text and numbers appear. Keep the number of fonts in a worksheet to one or two, as too many fonts can be distracting.

To format selected cells, use one of the following methods:

- On the **Home** tab, in the **Font** group, click the format required; or



- on the **Home** tab, in the **Font** group, click the **Format Cells: Font Dialog box launcher**, and then choose the appropriate option from the **Font** tab; or
- press **(Ctrl)+(Shift)+(F)** and choose the appropriate option from the **Font** tab:



Exercise

- 1 Ensure *Final North America GHG Report - Student* is active. Select cells **A1** to **E4**.
- 2 On the **Home** tab in the **Font** group, click **B** (**Bold**).
- 3 Click the cell with the title. Then on the **Home** tab, in the **Font** group, click the arrow for **11** (**Font Size**) and change this to **16**.
- 4 On the **Home** tab, in the **Alignment** group, click **Wrap Text**.
- 5 Adjust the height of this row so you can see all of the title (we set ours to 45.00).

	A	B	C	D	E
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
2		GHG Emissions			
3		1990	2006	Chg	Chg
4	Economic Sector	(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a	(%)
5	Fossil fuel industries	103	158	55	53.398%

- 6 Select cells **B4** to **E4**, and then on the **Home** tab, in the **Font** group, click the arrow for **11** (**Font Size**) and then click **10**.

	A	B	C	D	E
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
2		GHG Emissions			
3		1990	2006	Chg	Chg
4	Economic Sector	(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a	(%)
5	Fossil fuel industries	103	158	55	53.398%

- 7 Select cells **A14** to **A16**. Then on the **Home** tab, in the **Font** group, click the arrow for **11** (**Font Size**) and then click **9**.

- 8 In row **16**, merge the cells from column **A** to column **E**. Then on the **Home** tab, in the **Alignment** group, click **Wrap Text**, and then adjust the row height (we set ours to 39).


	A	B	C	D	E
1	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
2		GHG Emissions			
3		1990	2006	Chg	Chg
4	Economic Sector	(Mt CO2 eq)a	(Mt CO2 eq)a	(Mt CO2 eq)a	(%)
5	Fossil fuel industries	103	158	55	53.398%
6	Electricity	97	118	21	21.649%
7	Transportation ^b	121	159	38	31.405%
8	Heavy industry and manufacturing	123	113	-10	-8.130%
9	Service industries	40	55	15	37.500%
10	Residential ^b	51	49	-2	-3.922%
11	Agriculture	57	69	12	21.053%
12	Total	592	721	129	21.791%
13					
14	Sources:				
15	a. Environment Canada, Greenhouse Gas Division, 2008.				
16	b. No GDP has been attributed to the residential or transportation sectors. GDP for the entire economy is inclusive of every economic sector, including revenue-generating transport and waste. Therefore, numbers provided in this table will not add exactly to the totals given.				

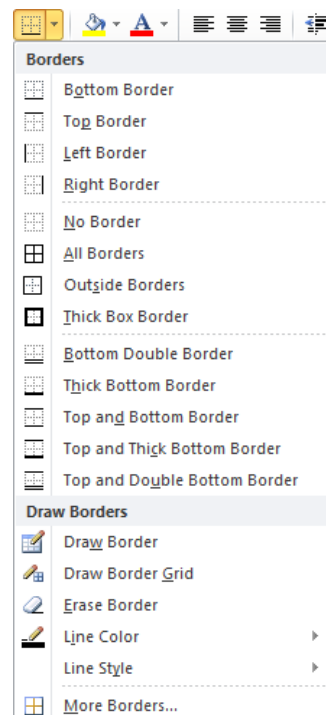
- 9 Click cell **B4**, then in the Formula bar, select the 'a' at the end of the text. On the **Home** tab, in the **Font** group, click the **Format cells: Font Dialog box launcher**. Click Superscript.
- 10 Repeat step 5 for cells **C4** and **D4**.
- 11 Save the workbook again.

Applying Cell Borders

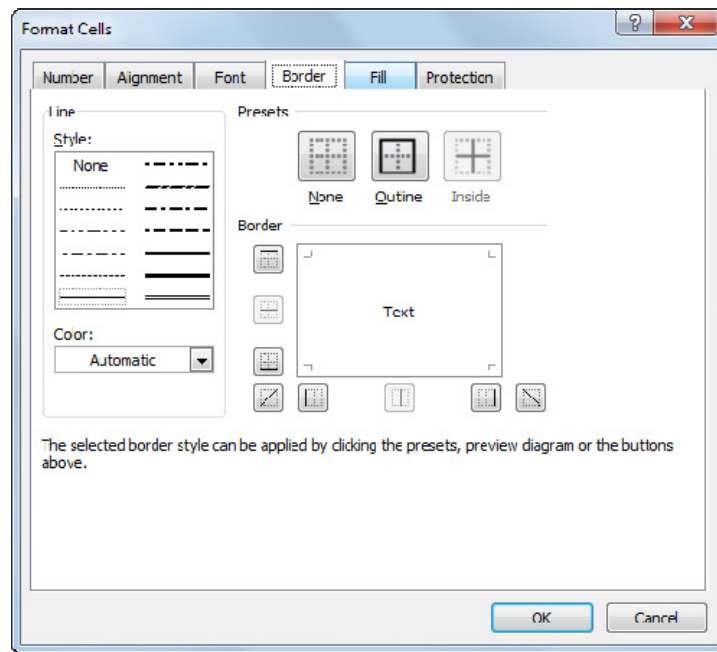
Borders separate groups of data to improve legibility, especially when the worksheet contains a large volume of numbers. This feature enables you to draw lines around any or all edges of a cell or range of cells. You can choose presets, line thickness, color/style options, and location of borders.

To apply a border to a cell, use one of the following methods:

- On the **Home** tab in the **Font** group, click the arrow for  (**Borders**). This command also contains the **Draw Border** option to add the border around the cells you now select. This is useful when you want to draw lines or borders around several non-adjacent cells; or



- on the **Home** tab, in the **Font** group, click the **Format Cells: Font Dialog box launcher**, click the **Border** tab, and then choose the option you prefer, as follows:



Line	Chooses a line style or color for the border. For different border lines or colors, select the style or color, and then click in the Border area for the appropriate border.
Presets	Selects a pre-designed option for the borders of the selected cells.
Border	Adds or removes lines for the selected cells.


Exercise

- Ensure *Final North America GHG Report - Student* is active. Select cells **A1** to **E12**.
- On the **Home** tab, in the **Font** group, click the arrow for (**Borders**) and then click **More Borders**.
- Change the line style to be the thicker solid line (third one from the bottom of the second column of styles).
- Change the color to be **Red, Accent 2, Darker 25%**.
- In the **Presets** area, click **Outline** for the outside border.
- In the **Line: Style** area, click the single solid line (last one in the first column) and then in the **Presets** area, click **Inside**. Click **OK** to accept these border options.

	A	B	C	D	E
	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
1					
2		GHG Emissions			
3		1990	2006	Chg	Chg
4	Economic Sector	(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(%)
5	Fossil fuel industries	103	158	55	53.398%
6	Electricity	97	118	21	21.649%
7	Transportation ^b	121	159	38	31.405%
8	Heavy industry and manufacturing	123	113	-10	-8.130%
9	Service industries	40	55	15	37.500%
10	Residential ^b	51	49	-2	-3.922%
11	Agriculture	57	69	12	21.053%
12	Total	592	721	129	21.791%

Suppose you want the line around the column headings to be a bit stronger to separate this area.

- On the **Home** tab, in the **Font** group, click the arrow for (**Borders**) and then click **Line Color**. Select **Red, Accent 2, Darker 25%**.

- 8 On the **Home** tab, in the **Font** group, click the arrow for  (**Borders**), click **Line Style** and then the thick line about half way down the menu. This should be the same line style you chose in step 3.

Notice how the mouse pointer changed to a pencil shape.

- 9 Position the pencil at the upper left corner of cell **B2** and drag across to cell **E4** to draw an outline box around this piece of data.

	A	B	C	D	E
	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
1		GHG Emissions			
2		1990	2006	Chg	Chg
3		(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(%)
4	Economic Sector				
5	Fossil fuel industries	103	158	55	53.398%
6	Electricity	97	118	21	21.649%
7	Transportation ^b	121	159	38	31.405%

- 10 Press the **Esc** key to change back to the normal mouse cursor.
- 11 Save the worksheet.

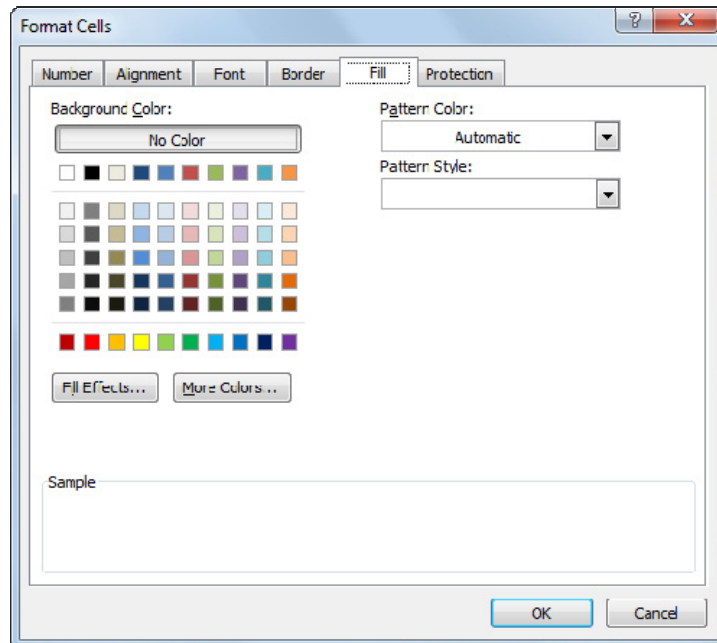
Applying Colors and Patterns


The Fill option sets the background color and pattern for a cell. Patterns and colors draw attention to certain parts of your worksheet, and can act as a visual divider of information.

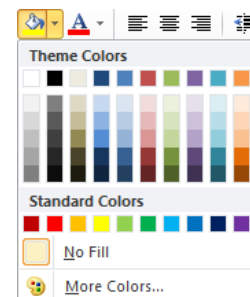
Patterns and colors are different features. Patterns can make it harder to read the data than using a solid color; whenever possible, avoid dark colors and dense patterns that can hide the information in the cells.

To apply a color or pattern to a cell, use one of the following methods:



- On the **Home** tab, in the **Font** group, click the **Format Cells: Font Dialog box launcher**, and then click the **Fill** tab; or



- on the **Home** tab, in the **Font** group, click the arrow for  (**Fill Color**).



Exercise

- 1 Ensure *Final North America GHG Report - Student* is active. Select cell **A1**.
- 2 On the **Home** tab, in the **Font** group, click the arrow for  (**Fill Color**) and then click **Red, Accent 2, Lighter 60%**.
- 3 Select cells **A12** to **E12**. Then on the **Home** tab, in the **Font** group, click  (**Fill Color**) to apply the same color to these cells.

Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
Economic Sector	GHG Emissions			
	1990 (Mt CO2 eq) ^a	2006 (Mt CO2 eq) ^a	Chg (Mt CO2 eq) ^a	Chg (%)
Fossil fuel industries	103	158	55	53.398%
Electricity	97	118	21	21.649%
Transportation ^b	121	159	38	31.405%
Heavy industry and manufacturing	123	113	-10	-8.130%
Service industries	40	55	15	37.500%
Residential ^b	51	49	-2	-3.922%
Agriculture	57	69	12	21.053%
Total	592	721	129	21.791%

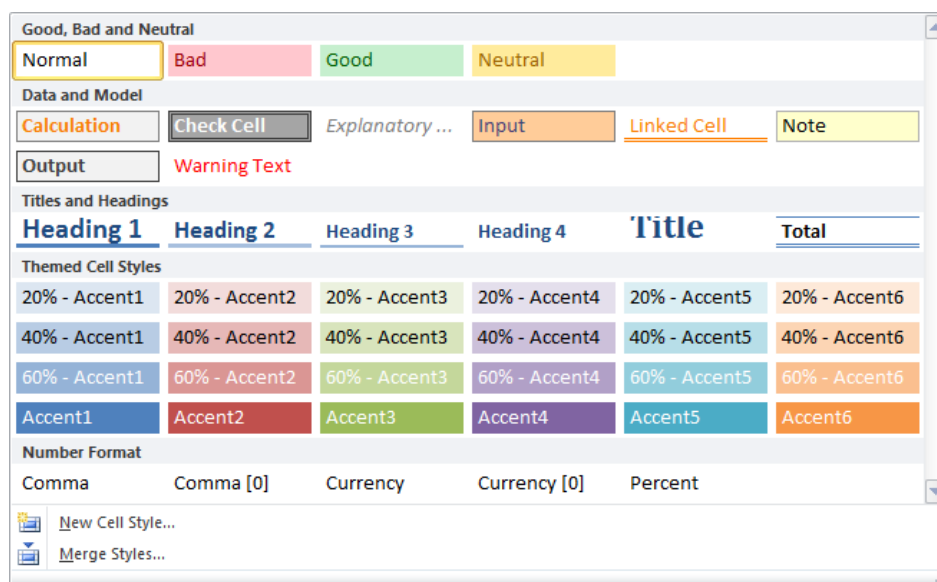
- 4 Save the workbook.

Using Styles

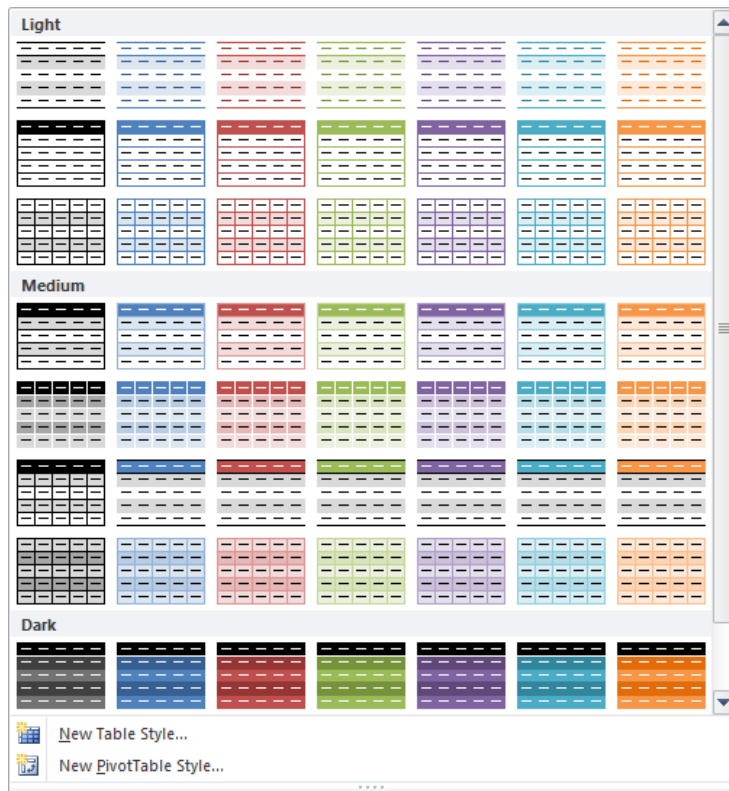
Excel provides two different sets of predefined styles you can apply to the worksheet:

Cell Styles	Applies the chosen style to the selected cells only.
Table Styles	Applies the chosen style to a specified range of cells, now considered a table that treats the data as a list of values.

To apply a cell style, select the cells for the style and then, on the **Home** tab, in the **Styles** group, click **Cell Styles**.



To apply a table style, click anywhere within a range of data and then, on the **Home** tab, in the **Styles** group, click **Format as Table**.



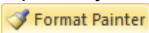
Exercise

- 1 Ensure *Final North America GHG Report - Student* is active. Select cells **A2** to **E4**.
- 2 On the **Home** tab, in the **Styles** group, click **Cell Styles** and then click **20% - Accent2**.

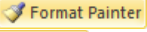
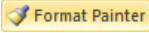
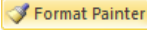
	A	B	C	D	E
	Summary of Emissions and Economic Activity by Sector, 1990 and 2006				
1					
2	GHG Emissions				
3		1990	2006	Chg	Chg
4	Economic Sector	(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(Mt CO2 eq) ^a	(%)
5	Fossil fuel industries	103	158	55	53.398%
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7	Transportation ^b	121	159	38	31.405%
8	Heavy industry and manufacturing	123	113	-10	-8.130%
9	Service industries	40	55	15	37.500%
10	Residential ^b	51	49	-2	-3.922%
11	Agriculture	57	69	12	21.053%
12	Total	592	721	129	21.791%

- 3 Save the workbook.


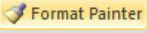
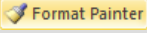
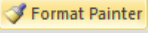

Using the Format Painter

Once you have set up the formatting options you want to use, you can duplicate the formatting options on the other parts of your spreadsheet using .

Apply the **Format Painter** using one of the following two methods based on the amount of text to be formatted. First select the cell(s) with the source formatting and then:

- Click** On the **Home** tab, in the **Clipboard** group, click the  once, then click on the cell you want to format with the same features. The  turns off as soon as you click the target cell.
- Double-click** On the **Home** tab, in the **Clipboard** group, double-click the  to turn this feature on so that you can apply the formatting to several cells. When finished, click the button to turn the Format Painter off, or press **(Esc)**.

Exercise

- 1 Ensure *Final North America GHG Report - Student* is active. Click cell **A1** and then on the **Home** tab, in the **Clipboard** group, click .
- 2 Click the **US** tab and click cell **A1** here.
Notice how the majority of the formatting options applied in the Canada worksheet for the title are applied here. The only difference is that the width of the report in the Canada worksheet is smaller than the one for the US worksheet.
- 3 Press **(Shift)** and click **G1** to select the cells from **A1** to **G1**.
- 4 On the **Home** tab, in the **Alignment** group, click **Merge & Center** and then click this button again.
Clicking the Merge & Center button once turned the feature off and when clicked the second time, reapplied it to the selected cells.
- 5 In the **Canada** worksheet, click cell **B3**. Then on the **Home** tab, in the **Clipboard** group, double-click the .
- 6 Click the **US** tab, and then click cells **A2** to **G2**, and then **A12** to **G12**.
- 7 Press **(Esc)** to turn off the Format Painter.
- 8 In the **Canada** worksheet, click cell **B6** and then double-click the .
- 9 In the **US** worksheet, click cells **A3** to **G9**, and then **A11** to **G11**. Press **(Esc)** to turn off the Format Painter.
- 10 In the **Canada** worksheet, click cell **B12** and then click the .
- 11 In the **US** worksheet, click cells **A10** to **G10**.
- 12 In the **US** worksheet, select cells **A1** to **G12**. Then on the **Home** tab, in the **Font** group, click the arrow for  (**Borders**) and then click **More Borders**.
- 13 Change the line style to be the thicker solid line (third one from the bottom of the second column of styles). Ensure the color is **Red, Accent 2, Darker 25%**.
- 14 In the **Presets** area, click **Outline**. Then click **OK**.

Implied Sectors	1990	1995	2000	2005	2006	2007
Electric Power Industry	1859.1	1989	2329.3	2429.4	2375.5	2445.1
Transportation	1543.6	1685.2	1919.7	1998.9	1994.4	1995.2
Industry	1496	1524.5	1467.5	1364.9	1388.4	1386.3
Agriculture	428.5	453.7	470.2	482.6	502.9	502.8
Commercial	392.9	401	388.2	401.8	392.6	407.6
Residential	344.5	368.8	386	370.5	334.9	355.3
U.S. Territories	34.1	41.1	47.3	60.5	62.3	57.7
Total Emissions	8088.7	8458.3	9008.2	9113.6	9057	9157
Land Use, Land-Use Change, and Forestry (Sinks)	-841.4	-851	-717.5	-1122.7	-1050.5	-1062.6
Net Emissions (Sources and Sinks)	8930.1	9309.3	9725.7	10236.3	10107.5	10219.6

- 15 Save and close the workbook.

Summary

In this lesson, you learned what formatting means and how it can be used in a worksheet. You should now be able to:

- format numbers and text
- change the alignment for data
- use borders and shading in cells
- apply automatic formatting styles
- use the Format Painter

Review Questions

1. Numbers can only be formatted with dollar signs, commas, and two decimal places.
 - a. True
 - b. False
2. Alignment refers to the placement or position of the data within the cell, which means you can adjust the alignment horizontally as well as vertically for the contents of the cell.
 - a. True
 - b. False
3. Once you set up borders around the entire cell, you cannot adjust the style or appearance of any of the sides.
 - a. True
 - b. False
4. Adding colors or patterns to a cell can be useful when you want to emphasize a specific area of the worksheet.
 - a. True
 - b. False
5. You must select the range of cells that you wish to automatically format before activating the Cell Styles command.
 - a. True
 - b. False

Lesson 32

Using Miscellaneous Tools

Objectives

In this lesson, you will look at some miscellaneous tools you can use to reorganize data, and to check or proof the data in the worksheet. On completion, you will be able to:

- use the spell checker
- sort data
- filter data



Skills

- 2-1.3.5 Check spelling
- 2-3.2.1 Sort worksheet data
- 2-3.2.2 Filter data

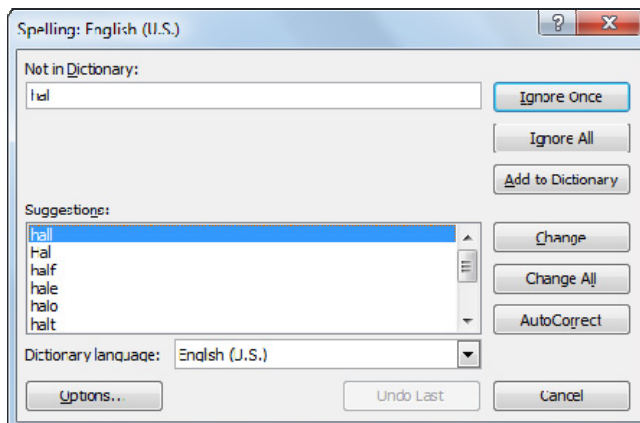
Using the Spell Checker



2-1.3.5

Use the spell check feature on text labels as Excel cannot automatically verify the accuracy of numbers, dates, and time values. Note that using the spell checker does not eliminate the need for you to proof your worksheet.

When the spell checker runs, it displays any words it does not find in its dictionary. You can then choose one of the following options:

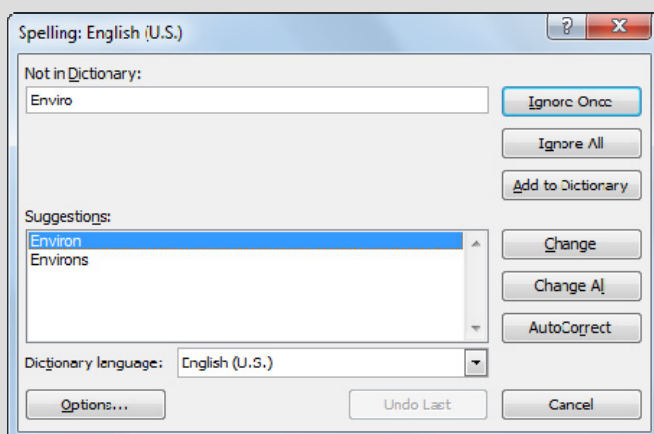


To activate the Spelling feature, use one of the following methods:

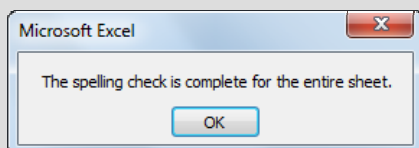
- On the **Review** tab, in the **Proofing** group, click **Spelling**; or
- press **F7**.

Exercise

- 1 Open the *TEC Budget for Enviro 2014* workbook and save as *TEC Budget for Enviro 2014 - Student*.
- 2 On the **Review** tab, in the **Proofing** group, click **Spelling**.



- 3 Click **Ignore Once** as this is the name of the event.
- 4 If necessary, select "hall" in the **Suggestions** list and then click **Change**.
- 5 Continue with the spell check and make changes as appropriate.



- 6 Click **OK**.

Excel has completed the spell check in the document; however, it has missed a word that is not misspelled but is the wrong spelling for this situation. This is an example of why you should still proof your worksheet even though Excel may have found the obvious spelling errors.

- 7 Click cell **A31** and then press **F2** to edit the contents. Change "Stationary" to "Stationery".
- 8 Save and close the document.

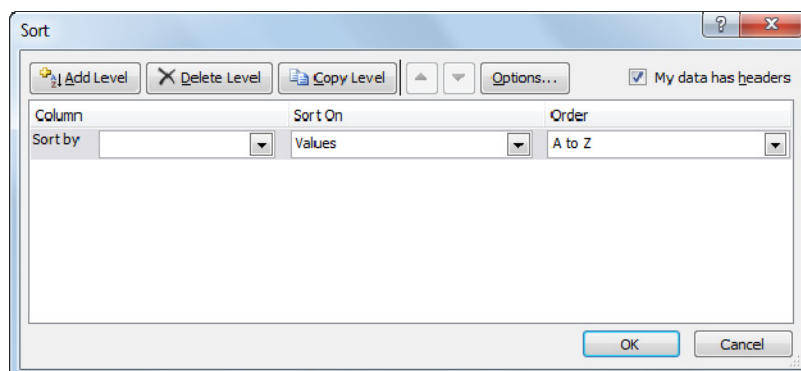
Sorting Data



Excel provides a sorting tool that enables you to organize data in a worksheet based on the values in the selected columns or rows. Sorting makes data more readable. You can sort and re-sort data as many times as required, using different sort criteria each time. You can sort data by columns or rows. You may only need to sort by one column. Excel has two ready-to-use buttons for this:

- On the **Data** tab, in the **Sort & Filter** group, click **Sort A to Z** or **Sort Z to A**; or
- on the **Home** tab, in the **Editing** group, click **Sort & Filter**.

To activate the Sort dialog box for more than one sort option, on the **Data** tab, in the **Sort & Filter** group, click **Sort**.




Add Level, Delete Level, Copy Level	Adds, deletes, or copies sort columns or rows. Note that the topmost sort key is the highest (primary) sorting level, followed by the remaining levels in descending order.
Move Up/Move Down	Moves the selected sort level higher or lower in the sorting sequence.
Options	Allows you to sort by columns or rows, and choose whether your sort criteria will be case sensitive.
My data has headers	Instructs Excel to treat the first row/column as labels. This is for the display only and does not affect any print output.
Column	Identifies the column to be used for a sort level.
Sort On	Allows you to choose cell data on which to sort, including Values, Cell Color, Font Color, or Cell Icon.
Order	Selects whether you want the data to be sorted in ascending (A to Z, Smallest to Largest) or descending (Z to A, Largest to Smallest) order.
Sort by	Choose the first column Excel will use to sort the database (the primary sort level).
Then by	Choose the next columns for sorting. When multiple rows match the primary sort key, this selection determines the sort order within the first column grouping.

You can choose up to 64 columns or rows as sort levels if the primary sort level includes repeating values. The data in each sort level sorts in ascending or descending sequence. Each sort level can also be sorted using the cell data, fill color, font color, or cell icon.

If the range of cells being sorted does not contain column or row headers, turn off the **My data has headers** option. Use this option to prevent the header data from being included with the data; they will remain in their places as headers.

Exercise

- Open the *TEC Employee List* workbook and save this as TEC Employee List - Student.
Notice that the names are currently sorted by the location for each employee. Suppose you want to sort these by the last names.
- Click any cell in column **B**, and then on the **Data** tab, in the **Sort & Filter** group, click  (**Sort A to Z**).
The names now appear in alphabetical order by last name.

Suppose you want to sort the employees alphabetically by their location and then by the last name.

- On the **Data** tab, in the **Sort & Filter** group, click **Sort**.
Excel now not only displays the same sort used in the previous step but also selects the entire worksheet to be sorted. Notice the first row of data is not selected as these cells are considered the data headers, or the columns that identify the type of data contained in that column.
- Click the arrow for the **Sort by** field and then click **City**.
- Click **Add Level**.
- Click the arrow for the **Then by** field and then click **Last Name**.
- All other fields should remain the same. Click **OK**.

	A	B	C	D	E	F
1	First Name	Last Name	Position	E-mail Address	Address	City
2	John	Flores	Customer Service Representative	jflores@tolano.com	#47 212 Pine Road	Cape Town
3	Danie	Inex	Project Manager	dinex@tolano.com	#47 212 Pine Road	Cape Town
4	Kay	McAllister	Project Consultant	kmcallister@tolano.com	#47 212 Pine Road	Cape Town
5	Henry	Warburn	Project Consultant	hwarburn@tolano.com	#47 212 Pine Road	Cape Town
6	Brittany	Cooke	Customer Service Representative	bcooke@tolano.com	21 Maple Street	London
7	Stephen	Davis	Project Consultant	sdavis@tolano.com	21 Maple Street	London
8	Blair	Miller	Vice President – Global West	bmiller@tolano.com	21 Maple Street	London
9	Sandy	Patel	Project Consultant	spatel@tolano.com	21 Maple Street	London
10	Shauna	Adams	Marketing Manager	sadams@tolano.com	300 171st Street	New York
11	Jeff	Chou	Human Resources Manager	jchou@tolano.com	300 171st Street	New York

- Save the workbook.

Filtering Information



Finding information in a large or unorganized worksheet can be simplified by sorting; however, you still have to look through all the records in the database. Another way to locate information quickly is to use a filter to hide the records you are not interested in. Filtering does not change the content of your worksheet or the sequence of the information, only what you see.

The quickest and easiest way to filter data in Excel is to use the AutoFilter tool. When you activate this tool, Excel places AutoFilter icons on the right side of each column or field name. Use these icons to select the conditions for the records you want displayed. Initially all information is shown.

The AutoFilter can find rows where a cell is equal to a specific value or set of values. Other selection criteria give you the flexibility to find almost anything you need, including values that are not equal, greater than, less than, greater than or equal to, less than or equal to, and between. Certain types of fields have additional selection criteria (discussed later):

Numbers	Includes top 10, above/below average.
Dates	Includes today, tomorrow, yesterday, this/next/last week, this/next/last month, this/next/last quarter, this/next/last year, year to date.
Text	Includes begins/ends with, contains, does not contain.

Excel tables automatically include the AutoFilter feature. However, you can apply this feature to any range of data in a worksheet.

To activate the filter command, on the **Data** tab, in the **Sort & Filter** group, click **Filter**.

	A	B	C	D	E
1	First Name	Last Name	Position	E-mail Address	Address
2	John	Flores	Customer Service Representative	Jflores@tolano.com	#47 212 Pine Road

Excel now places arrows on each column heading that you can use to filter the information in the worksheet.

Exercise

- 1 Ensure the *TEC Employee List - Student* workbook is active and then click any cell within the data area.
- 2 On the **Data** tab, in the **Sort & Filter** group, click **Filter**.
Notice there is now a filter arrow for each column.
- 3 Click the filter arrow for **E-mail Address** and then click **Sort A to Z**.
All employees now appear alphabetically by this content. Notice also that the arrow changes in appearance (↓↑) to remind you a filter has been applied.
- 4 Click the filter arrow for **City** and then click **(Select All)** to turn this off. Then click **Sydney** and click **OK**.
You should now be viewing only those employees who work in Sydney, and the names are also listed alphabetically by the e-mail address. Notice the filter for City to indicate there is a filter applied.
- 5 Click the filter arrow for **City** again and then click **Clear Filter From "City"**.

Hint: You could also have cleared the filter by using **Clear** on the **Data** tab, in the **Sort & Filter** group.

- 6 Save and close the workbook.

Summary

In this lesson, you learned about some miscellaneous tools to reorganize data, and how to check or proof the data in the worksheet. You should now be familiar with the following:

- use the spell checker
- filter data
- sort data

Review Questions

1. You can activate a sort key by clicking on the column heading for that column of data.
 - a. True
 - b. False
2. The row header is the text that appears across the top of every page in the printed report.
 - a. True
 - b. False
3. Why would you want to set the Last Name field as the primary sort key and the First Name field as the secondary sort key?
 - a. This is the order in which you want the names to appear in the final sorted list.
 - b. It's the natural order for sorting names.
 - c. You want to alphabetize people with the same last name.
 - d. It gives you extra practice at sorting.
 - e. Any of the previous
 - f. a or b
4. Sorting changes the order of the data in ascending or descending order, whereas filtering enables you to find specific records by hiding the rest.
 - a. True
 - b. False
5. You can use the AutoFilter tool to select conditions that must match for the records to display.
 - a. True
 - b. False

Lesson 33

Working with Charts

Objectives

In this lesson, you will learn how to turn your numerical data into a chart as well as what options are available with charts. On completion, you will be able to:

- identify charts and how they interpret numerical data
- create a chart
- to select the correct chart type for your data
- make changes to a chart



Skills

- 2-3.2.9 Insert and modify simple charts in a worksheet
- 2-3.2.10 Draw conclusions based on tabular data or charts in a worksheet

Understanding Charts



2-3.2.9 2-3.2.10

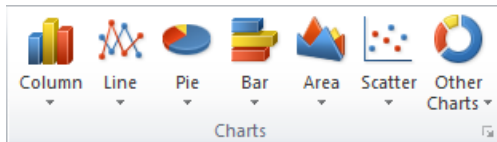
A chart is a pictorial representation of data in a worksheet. A chart can be a more descriptive way of representing your data, as it can clearly illustrate trends or patterns in the data.

You can create a chart by selecting data from the worksheet, and then follow the commands on the **Chart Tools** ribbon. Once you have created the chart, you can save it with the workbook. You can also create an embedded chart that displays on the same sheet as the data, or you can create charts on their own sheets.

Each set of data in a chart is a series. The chart's horizontal line is the **X-Axis**, and the chart's vertical line is the **Y-Axis**. You can apply labels for both axes. If the information contains several data series, you can add a **Legend** to explain the meaning of each series.

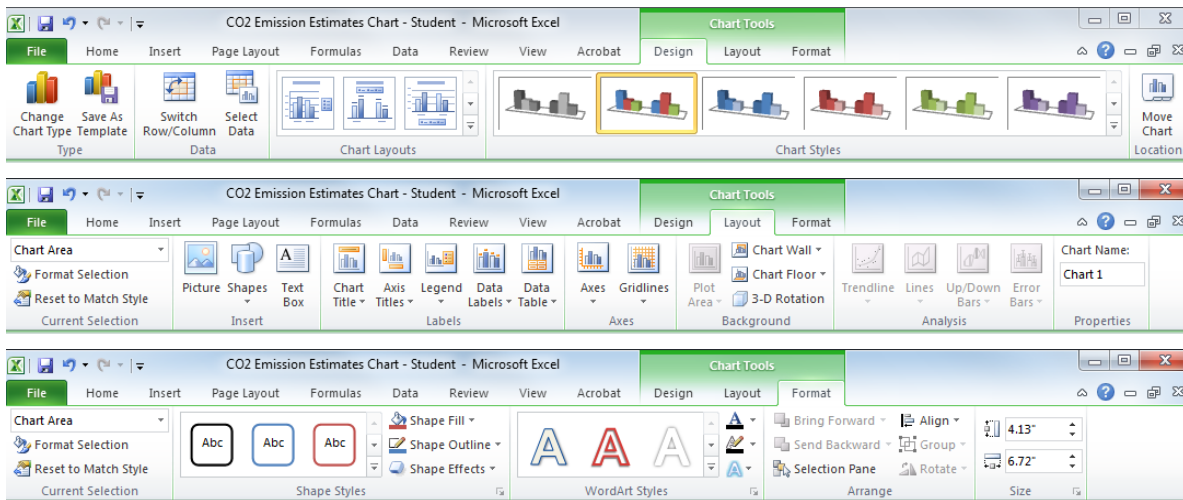
To ensure you get the best results when printing charts on a black-and-white printer, try using gray shades, monochrome, or the black/white options to differentiate the data on your chart

To create a chart, select the cells for the chart and then, on the **Insert** tab, in the **Charts** group, click the chart type.



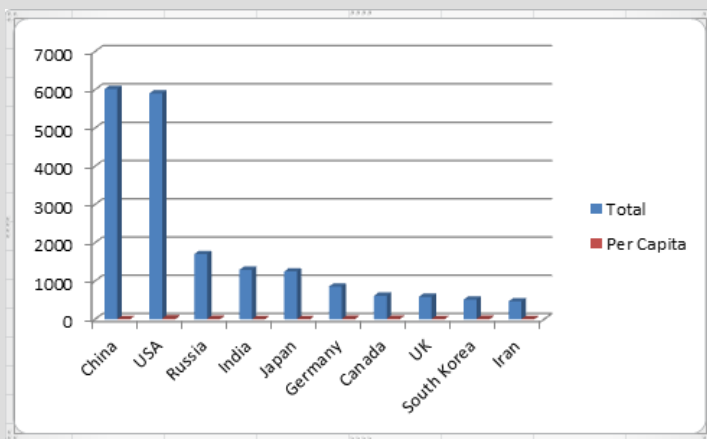
Once the chart has been created, it should accurately reflect any patterns or trends in the worksheet and now show that information in a picture format. Remember that the chart is created based on the cells you selected prior to activating the chart feature; if the data in the chart does not match your analysis of the data, you will need to check the series used in the chart (both the items being charted and any time intervals). It could also be a matter of changing the chart type to one that will better reflect the type of data you are trying to illustrate. For example, a line chart can show a significant increase in product sales at a glance better than a bar chart would, while a pie chart may do a better job of contrasting sales figures for the product during a specified period. A pie chart can emphasize the total revenue of each location for the year as it compares the values as a whole. A column or bar chart can display the same information as a comparison or ranking in a side-by-side format.

When a chart is on screen, you can select it to display the **Chart Tools** ribbon, which consists of three tabs with further options for modifying or customizing the chart.



Exercise

- 1 Open the *CO2 Emission Estimates* workbook and save *CO2 Emission Estimates Chart - Student*.
- 2 Select cells **A4** to **C14**. Then on the **Insert** tab, in the **Charts** group, click **Column**.
- 3 Click **3-D Clustered Column** from the list.



You now have a chart on the worksheet. The small dots around the perimeter of the chart border are handles that you can use to size the chart. You can also click anywhere on the chart and drag it to any location on the same worksheet.

- 4 Point the mouse cursor anywhere in a white area of the chart, such as near the top right corner of the chart, and then drag the chart down to cell **A20**.
- 5 If necessary, scroll the worksheet so you can see the chart.
- 6 Point at the lower right corner handle for the chart and drag down and to the right to **column J** and **row 39**.

The size of the chart should increase.

- 7 Save the workbook.

Selecting Chart Types

As noted previously, the type of chart you select will depend on what you are trying to show. Line charts are better for trends, bar charts are better for volume, and pie charts are best for showing portions of a total.

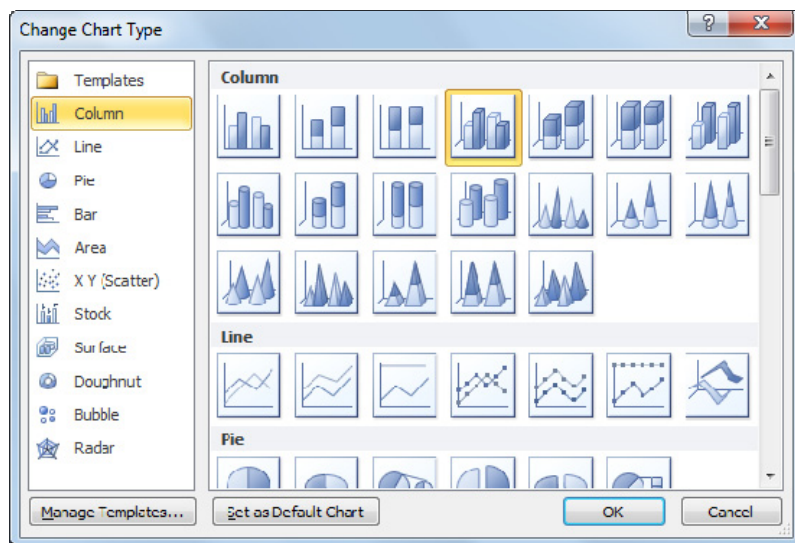
Excel provides a variety of chart types and several subtypes within each major type:

Column	Compares values over time or categories in a vertical presentation.
Line	Compares continuous trends.
Pie	Compares series that make up a whole.
Bar	Compares values over time or categories in a horizontal presentation.
Area	Compares a continuous change in volume.
Scatter	Determines data patterns.
Stock	Displays high-low-close data; requires at least three sets of data.
Surface	Displays trends in values with a three-dimensional presentation and a continuous surface.
Doughnut	Functions much like a pie chart, but for more than one set of data points.
Bubble	Compares three values displayed like a scatter chart, but represented by bubbles.
Radar	Determines patterns or trends with points matched up by lines.
Cylinder	Functions much like bar and column charts, but using a cylinder shape.
Cone	Functions much like bar and column charts, but using a cone shape.
Pyramid	Functions much like bar and column charts, but using a pyramid shape.

You can create any of these charts in two-dimensional or three-dimensional form; the latter can be more interesting to look at, but may be more difficult to interpret.

To change the chart type, click on the chart to go into chart mode, and then use one of the following methods:

- Under **Chart Tools**, on the **Design** tab, in the **Type** group, click **Change Chart Type**; or
- right-click the plot area of the chart and then click **Change Chart Type**.



Exercise

- 1 Ensure the *CO2 Emission Estimates Chart - Student* workbook is active as well as the chart.
- 2 Under **Chart Tools**, on the **Design** tab, in the **Type** group, click **Change Chart Type**.
- 3 Click **Clustered Cylinder** for a different chart appearance but still using the Column type. Click **OK**.

- 4 Under **Chart Tools**, on the **Design** tab, in the **Type** group, click **Change Chart Type**.
- 5 In the list of chart types, click **Bar**, click **Clustered Bar**, and then click **OK**.

Change the chart type to a line chart.

- 6 Under **Chart Tools**, on the **Design** tab, in the **Type** group, click **Change Chart Type**.
- 7 In the list of chart types, click **Line**, click **3-D Line**, and then click **OK**.

You can see how changing the chart type can produce different effects for the data. The line chart is a bit dramatic with the Total dropping from one country to another. However, this is not a true representation of what you want to show with the data.

- 8 Change the chart back to the original chart type, **3-D Clustered Column**.
- 9 Save the workbook.

Changing the Chart Layout

Excel generates a chart using standard defaults. Modify the layout to create exactly the look you want. Use commands on the **Chart Tools** ribbon to manipulate items on the chart.

The following are the layout components that are most commonly changed:

Chart Title	Allows you to add a title for the chart.
Axis Titles	Allows you to add titles to the horizontal and vertical axes; you can also customize items for the chart, such as the units used in the vertical axis.
Legend	Allows you to include a legend and position it in relation to the chart.
Data Labels	Allows you to include data labels on the chart.
Data Table	Displays the chart data beneath the chart.
Axes	Allows you to include labels on the horizontal and vertical axes.
Gridlines	Includes gridlines on the chart.

Excel provides a variety of pre-built layouts that you can apply to your chart. You can further modify the chart with your own layout changes.

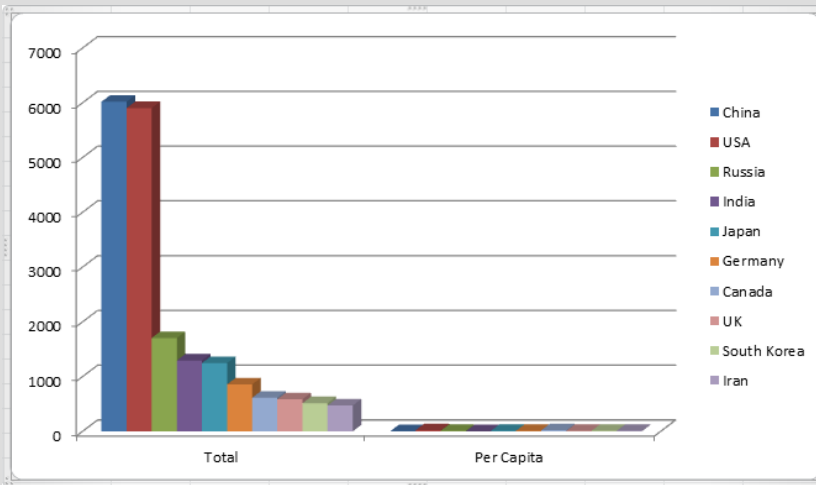
By default, Excel will place the chart in the same worksheet as its source data. You can move this chart to its own sheet, back to its original worksheet, or to a different worksheet.

Exercise

- 1 Ensure the *CO2 Emission Estimates Chart - Student* workbook is active as well as the chart.

One of the first things we need to change about the chart layout is how the data appears in the chart. You want to try changing the data series to see if that shows the data in the manner you want.

- 2 Under **Chart Tools**, on the **Design** tab, in the **Data** group, click **Switch Row/Column**.



Having tried different chart types and switching the data series around, you realize what you really want to show in the chart is per capita by country only. The values are too far apart between the total and the per capital values that it does not make sense to compare these two sets of data. You can now remove one of the data series.

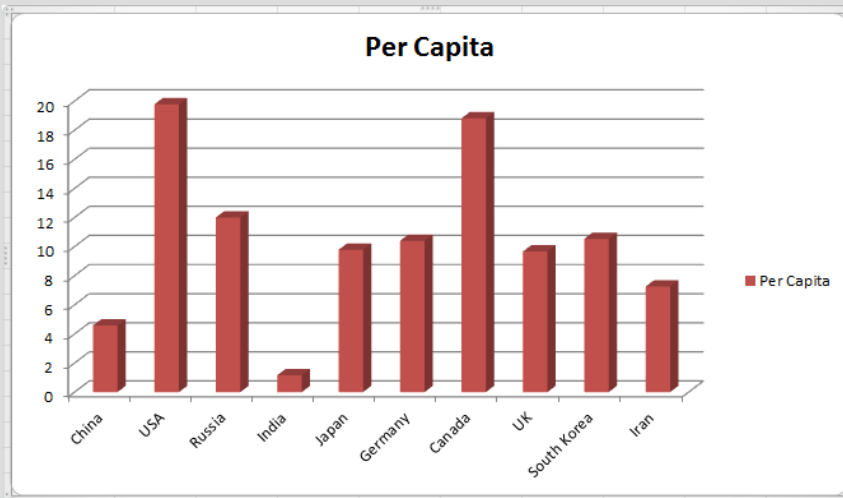
3 Under **Chart Tools**, on the **Design** tab, in the **Data** group, click **Select Data**.

Country	Total	Per Capita
China	6017.69	4.58
USA	5902.75	19.78
Russia	1704.36	12.25
India	1293.17	1.16
Japan	1246.76	9.78
Germany	857.6	10.4
Canada	614.33	18.81
UK	585.71	9.66
South Korea	514.53	10.53
Iran	471.48	7.25

First, switch the data back to showing the countries on the horizontal axis.

4 Click **Switch Row/Column**.

5 In the **Legend Entries (Series)** area, select **Total** and click **Remove**. Then click **OK**.



Your chart now only shows one set of data. As such, you decide you no longer need the legend as there is only one set of data.

- 6 Under **Chart Tools**, on the **Layout** tab, in the **Labels** group, click **Legend** and then click **None**.

Now modify the title to indicate what the total represents in this chart.

- 7 Click the *Per Capita* text in the chart to select it, and then click at the end of the title and type: by Country.



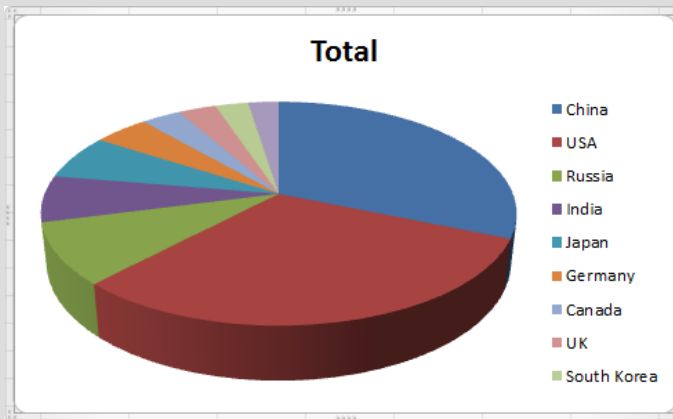
Suppose you would like to change the color of the columns in the chart.

- 8 Click one of the data bars to select all the bars. Under **Chart Tools**, on the **Format** tab, in the **Shape Styles** group, click the arrow for **Shape Fill** and then click a color of your choice.

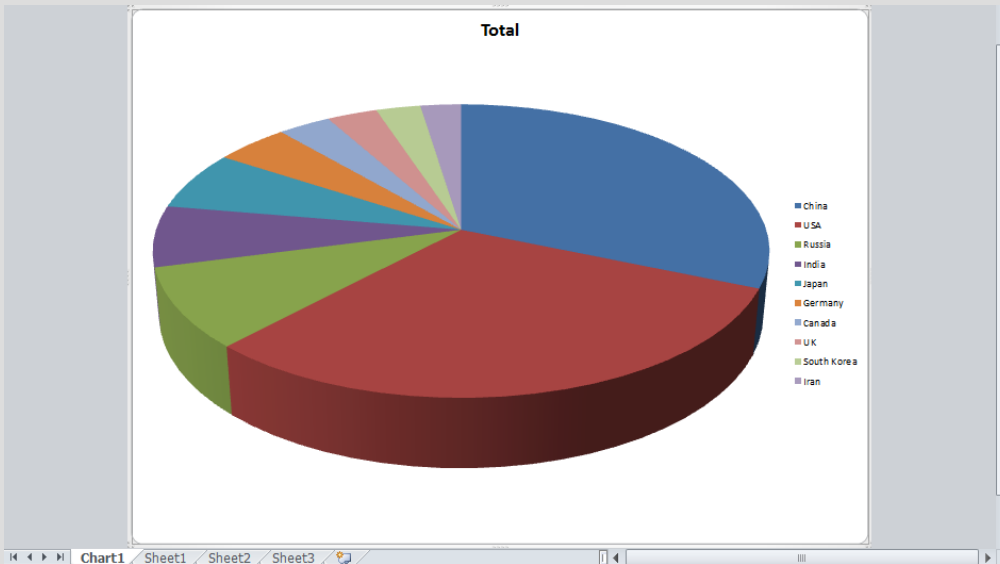
All the bars should now change to the color selected in step 8.

Another way to show data is to use a pie chart when there is only one set of data. You may also want it to be stored on a separate worksheet.

- 9 Click anywhere in the worksheet to deselect the chart.
10 Select cells **A4** to **B14**. On the **Insert** tab, in the **Charts** group, click **Pie** and then click **Pie in 3-D**.



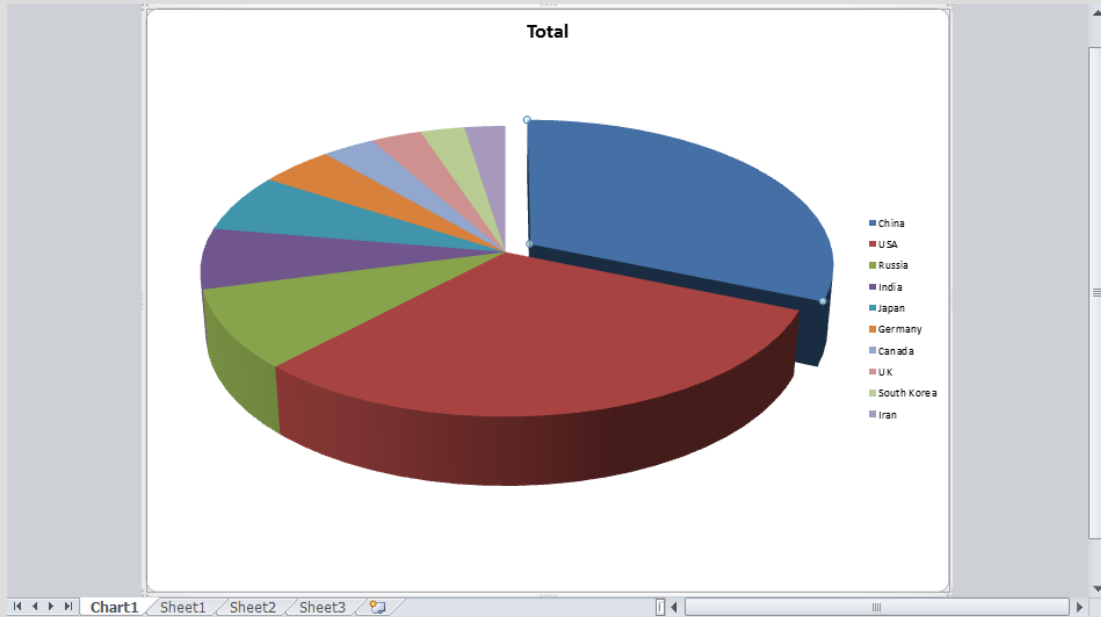
- 11 Under **Chart Tools**, on the **Design** tab, in the **Location** group, click **Move Chart**.
12 Click **New sheet** and then click **OK**.



Notice Excel has moved the chart onto a sheet of its own and resized it to fill the window.

If you want to emphasize a particular country in this chart, this is known as exploding a pie slice.

- 13 Click once to select the entire pie, and then click the slice for **China** to select it only.
- 14 Drag the slice away from the rest of the pie slightly.



- 15 Save and close the workbook.

Summary

In this lesson, you learned how to turn your numerical data into a chart as well as what options are available with charts. You should now be able to:

- identify charts and how they interpret numerical data
- create a chart
- select the correct chart type for your data
- make changes to a chart

Review Questions

1. A chart can show any patterns in the data with more impact than just viewing data in a worksheet.
 - a. True
 - b. False
2. What does the term "Series" refer to?
 - a. A set of data being used in the chart
 - b. The type of chart being created
 - c. The group of charts for the different types of data being charted
 - d. The title for the chart
3. The X and Y axes refer to the horizontal and vertical data being charted.
 - a. True
 - b. False
4. If you wanted to compare a continuous trend, which type of chart would you create?
 - a. Column
 - b. Bar
 - c. Line
 - d. Pie
5. Excel chooses the colors for the items in the chart and you cannot adjust the color of these items.
 - a. True
 - b. False

Lesson 34

Getting Ready to Print

Objectives

In this lesson, you will learn how to preview your worksheet and how to print it. On completion, you will be able to:

- preview the worksheet
- add or remove page breaks
- change page settings
- change margins and orientation
- add a header or footer
- have column titles repeat on every page
- customize other options before printing
- print the worksheet



Skills

- 2-1.4.1 Format a document for printing
- 2-1.4.2 Preview a file before printing
- 2-1.4.3 Print files, specifying common print options
- 2-3.1.9 Specify worksheet/workbook-specific print options

Previewing the Worksheet



2-1.4.2

Prior to printing your worksheet, preview it on the screen so you can make any required changes before distributing it to others.

To preview a worksheet, click the **File** tab, and click **Print**

First Name	Last Name	Position
Sid	Taylor	President
Richard	Reeves	Vice President - Sales
Heddi	Krause	Vice President - Sales Development
Jeff	Chou	Human Resources Manager
Sharon	Adams	Marketing Manager
Joseph	Kowalski	Accountant
Nicole	Locklear	Administrative Assistant
David	Singh	Information and Technology Manager
John	Woods	Sales Manager
Raymond	Wong	Project Consultant
Henry	Webb	Project Consultant
Kay	Makister	Project Consultant
Danile	Ines	Project Manager
John	Ribes	Customer Service Representative
Isa	Hansen	Equipment Site Assessor
Tess	James	Project Consultant
C.J.	Graham	Project Consultant
Jane	Martinez	Customer Service Representative
Beth	Muller	Vice President - Global West
Stephan	Davis	Project Consultant
Sandy	Potts	Project Consultant
Brittany	Coope	Customer Service Representative
Edward	Tanaka	Vice President - Sales
Francis	Hansen	Project Consultant
Richard	Martin	Project Consultant
Susan	Winters	Project Consultant
Heddi	Anderson	Project Consultant
Jonathan	Kelly	Project Consultant
Jennifer	Wilson	Project Consultant
Pat	Sandhu	Project Consultant

Excel displays both the print options as well as a preview of the worksheet with the existing print options.

The total number of pages in the printout displays at the bottom left of the preview. This total is based on the number of pages Excel needs to display the report using the default page printing sequence of top to bottom for the length of the worksheet, and then shift to the right and top to bottom for the width of the worksheet. As a result, you may need to change the page setup for your report prior to sending the document to print.

A chart in the worksheet previews or prints based on where it is in the worksheet. You can move the chart to a new worksheet, or put a page break between the data and the chart. If you are using a monochrome printer, the chart will print in varying shades of gray; it will only print in color if you have a color printer.

Exercise

- 1 Open the *TEC Employee List* workbook and save as *TEC Employee List Final - Student*.
- 2 Click the **File** tab, and click **Print**.

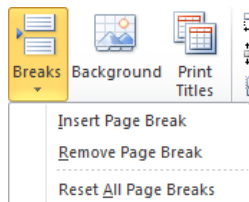
Notice how you can see the report but much of the data appears to be missing from the first page. The default setting for a worksheet is portrait orientation on the default paper size set up for your country at the time Excel was installed. In this sample, we are using Letter - 8.5x11".

- 3 Click **File** to return to the worksheet.

Adding Page Breaks




As you prepare to print a worksheet, Excel determines where the breaks will be on the printed output. Excel uses soft page breaks to determine when it has run out of print area for the height and width of the report. You can adjust these page breaks using the **Breaks** option. The position of the active cell prior to selecting this option controls where the page break occurs.



You can remove a page break by selecting the same cell, and then on the **Page Layout** tab, in the **Page Setup** group, click **Breaks**, and then **Remove Page Break**. If you want to remove all page breaks in the worksheet at the same time, use **Reset All Page Breaks**.

Excel ignores page breaks if you use **Fit to** in the **Page** tab of the **Page Setup** command when previewing on the screen or printing.

Use **Page Break Preview** for a special view of the worksheet with the page numbers highlighted on the screen. If you drag the page breaks to the area you wish to have them inserted, Excel will make the adjustments necessary. To activate this method, on the **View** tab, in the **Workbook Views** group, click **Page Break Preview**. Alternatively, click  (**Page Break Preview**) from the view buttons on the right side of the status bar.

Exercise

- 1 Ensure *TEC Employee List Final - Student* is active on the screen.

You should notice there is a dashed line at the right side of column C that was not there when the file was opened in the previous exercise. This line indicates a page break based on the current page settings.

- 2 Scroll down in the report until you see row **47** and you should see the page break for the bottom of this paper size.

Suppose you want to break the list of employees at a certain spot, in this example, above the list of employees who are in the Shibuya-ku location.

- 3 Click cell **A24**. On the **Page Layout** tab, in the **Page Setup** group, click **Breaks** and then click **Insert Page Break**.

The dashed horizontal line for a page break now appears above the row for Edward Tanaka.

- 4 Click cell **G1** to set this cell as the location for the vertical page break.

- 5 On the **Page Layout** tab, in the **Page Setup** group, click **Breaks** and then click **Insert Page Break**.

The page break now appears at the left side of column G. This is the wrong location and needs to be changed.

- 6 With the cursor still on cell **G1**, on the **Page Layout** tab, in the **Page Setup** group, click **Breaks** and then click **Remove Page Break**.

- 7 Click cell **I1** and then on the **Page Layout** tab, in the **Page Setup** group, click **Breaks** and click **Insert Page Break**.

After step 6, the vertical page break appears between columns H and I. The purpose of performing this step is to show how you can insert a page break here to force the report to print the data from column I onwards on a new page. As such, this will happen no matter what other changes you may make that impact the size or width of the report.

Notice that the page break at column C is still visible even though you set a vertical page break after column H. This is due to the paper size that limits the amount of data that can be printed to the width of that paper size.

You decide to remove all page breaks until you change other options for the report.

- 8 On the **Page Layout** tab, in the **Page Setup** group, click **Breaks** and then click **Reset All Page Breaks**.

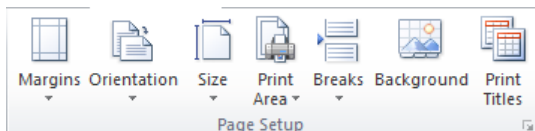
The page breaks you inserted no longer appear.

Customizing the Printout



You can change the settings using different options for the page setup. To display these options, use one of the following methods:

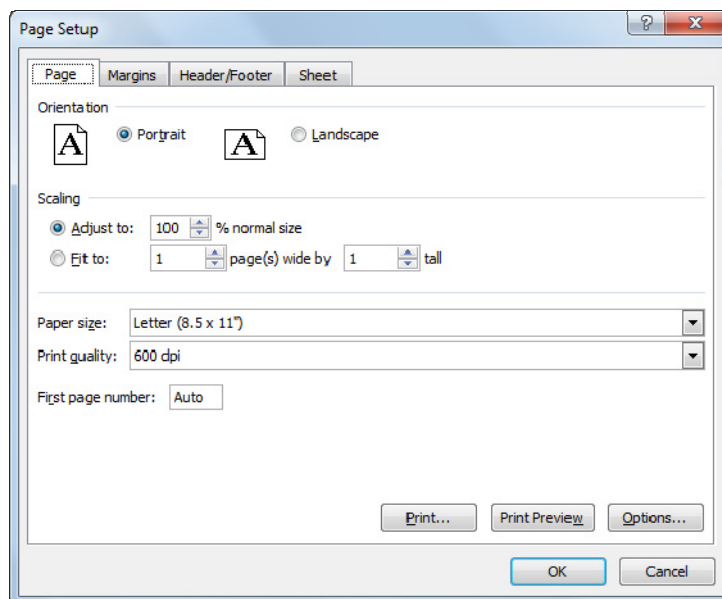
- On the **Page Layout** tab, in the **Page Setup** group, click the option to change; or



- on the **Page Layout** tab, in the **Page Setup** group, click the **Page Setup Dialog box launcher** to display the Page Setup dialog box for more options.

Page Settings

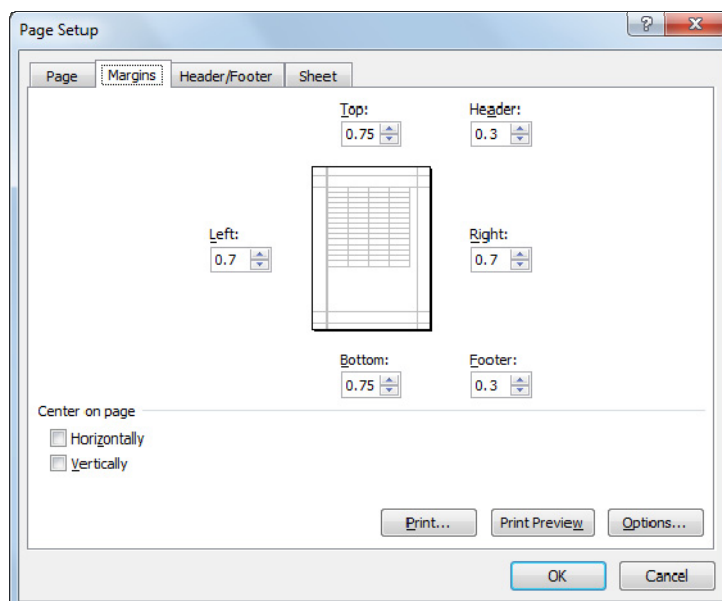
Options on the **Page** tab of the **Page Setup** dialog box enable you to change the page characteristics of your printed output.



Orientation	The page orientation options are Portrait (vertical) or Landscape (horizontal). You can also select this command in the Page Setup group of the Page Layout tab.
Scaling	This option enables you to enlarge or shrink the size of the worksheet proportionally, or to use the automatic scaling feature to fit the worksheet into a specified number of pages. You can also select this command in the Scale to Fit group of the Page Layout tab.
Paper size	This option allows you to specify paper size. The options are limited by the capabilities of your printer; also, you must remember to load the appropriate paper or select the correct tray from which to print. You can also select this command in the Page Setup group on the Page Layout tab.
Print quality	This option determines the density of the print characters. Generally, the higher the print quality, the more slowly your printer will produce the document.
First page number	You can use this option to specify the starting page number for the printed worksheet. This may be useful if you are fitting some Excel output into another printed document and you want the page numbering to follow properly. Note that this is only effective if you include a page number in a header or footer.

Margins Tab

Use the **Margins** tab on the Page Setup dialog box to set the margins and position the print output on the page.

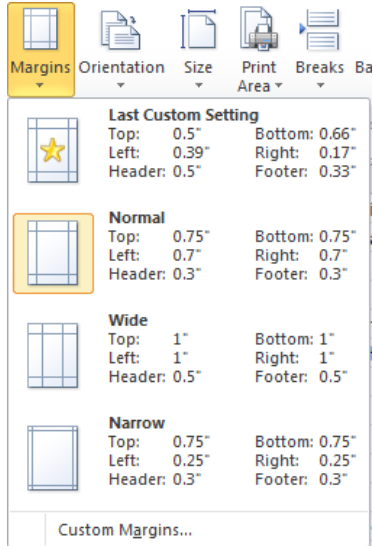


Margins | The Top, Bottom, Left, and Right options set the amount of white space (measured in inches) from the edges of the page around the printed area of the worksheet. The Header sets the distance between the Header and the top edge of the page, while footer sets the distance between the Footer and the bottom edge of the page.

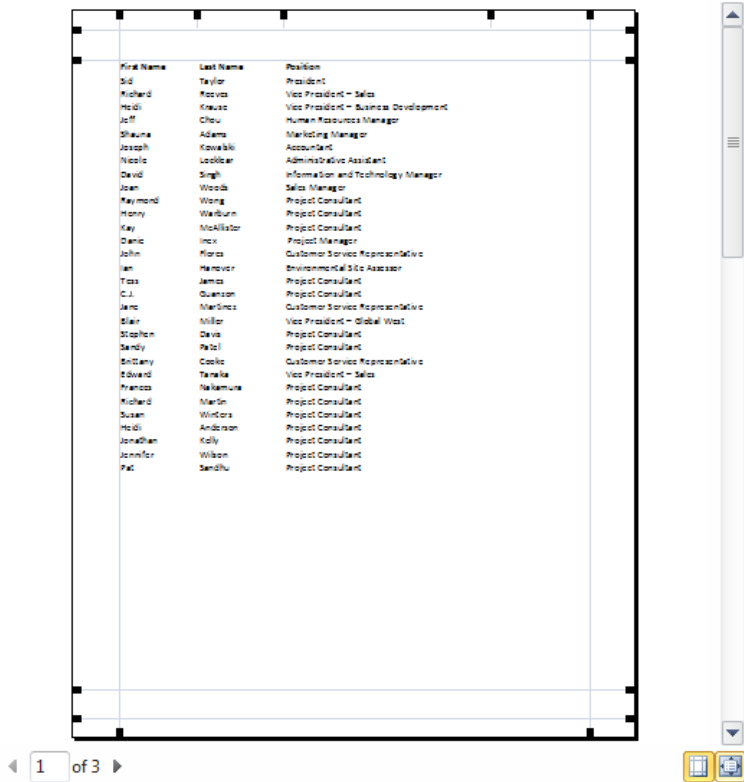
Center on page | Allows you to center the worksheet horizontally or vertically on the page, or both.

Alternatively, use one of the following methods to change the margins:

- On the **Page Layout** tab, in the **Page Setup** group, click **Margins**; or



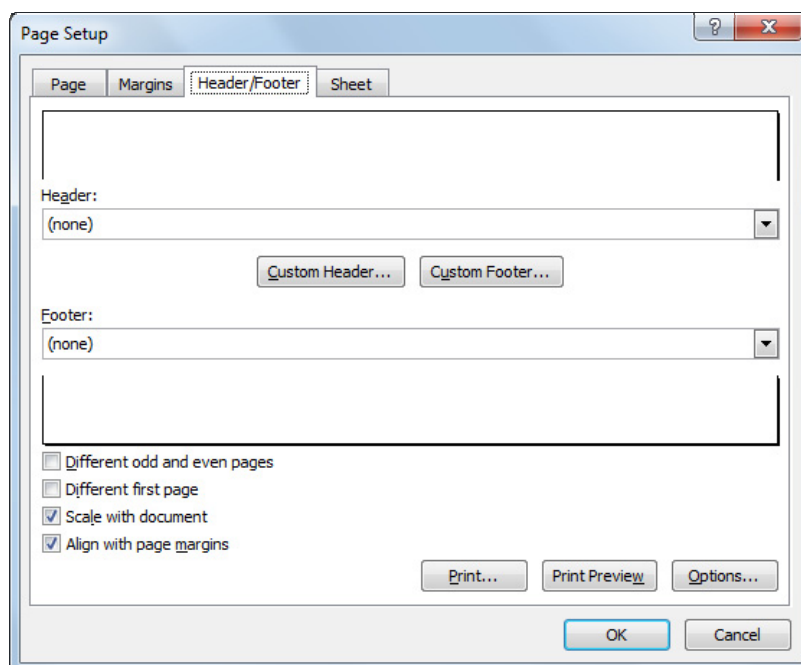
- click the **File** tab, click **Print**, click **Show Margins** and then drag the line for the margin you want to adjust.



Header/Footer Tab

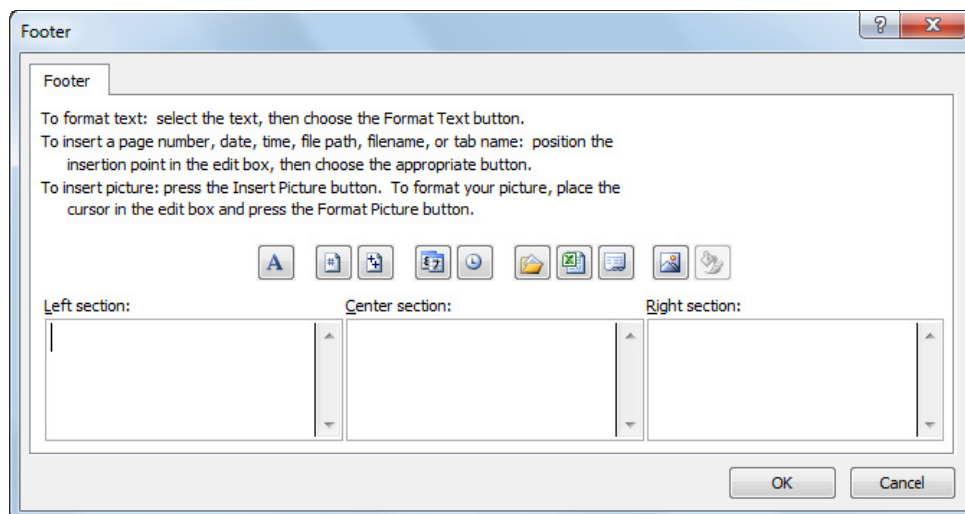
A *header* is text printed at the top of every page of the worksheet. A *footer* is text printed at the bottom of every page. By default, there is nothing in the header or footer.

The **Header/Footer** tab is located in the Page Setup dialog box.













Excel provides several standard header or footer options, or you can create your own.

When you access **Custom Header** or **Custom Footer**, you will see the following:



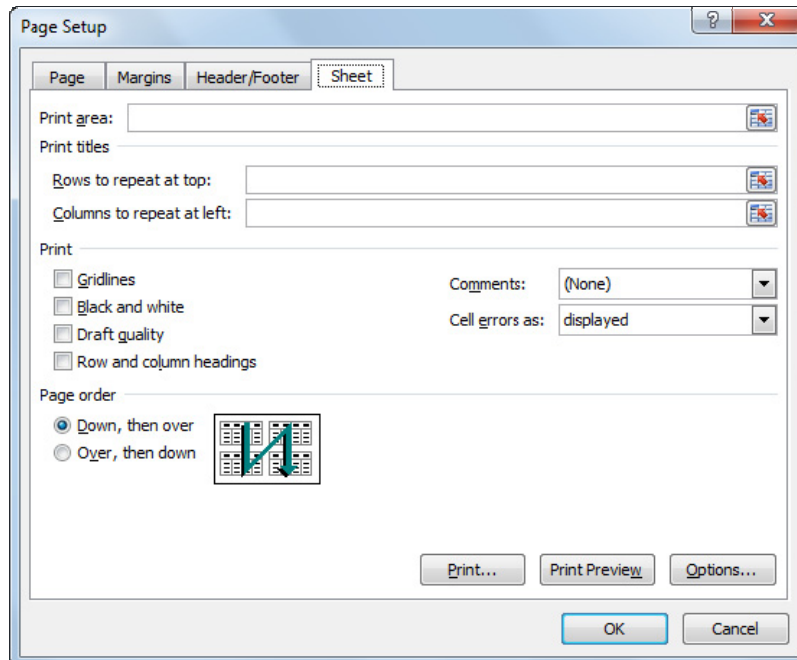
Each header or footer consists of three sections: **Left**, **Center**, and **Right**, which represent the left, center, and right parts of the header or footer. Use the buttons to insert commonly used variables into the header or footer.

	Format Text	Changes the font and size of the text entered into one of the three sections.
	Page Number	The code <code>&[Page]</code> displays in the selected section of the header or footer; page numbering automatically starts at 1 unless you change the starting page number in the Page tab.
	Number of Pages	The code <code>&[Pages]</code> displays the total number of pages in the document; this is often used with the Page number code (i.e., Page 1 of 4).

	Date	Inserts the current date into the report; displays as the code &[Date].
	Time	Inserts the current time into the report; displays as the code &[Time].
	File Path	Inserts the current path and file name into the header or footer; displays as the code &[Path]&[File].
	File Name	Inserts the name of the file into the header or footer; displays as the code &[File].
	Sheet Name	Inserts the name of the current worksheet; displays as the code &[Tab].
	Picture	Inserts a picture into the header or footer; displays as the code &[Picture].
	Format Picture	Changes the properties for the picture.

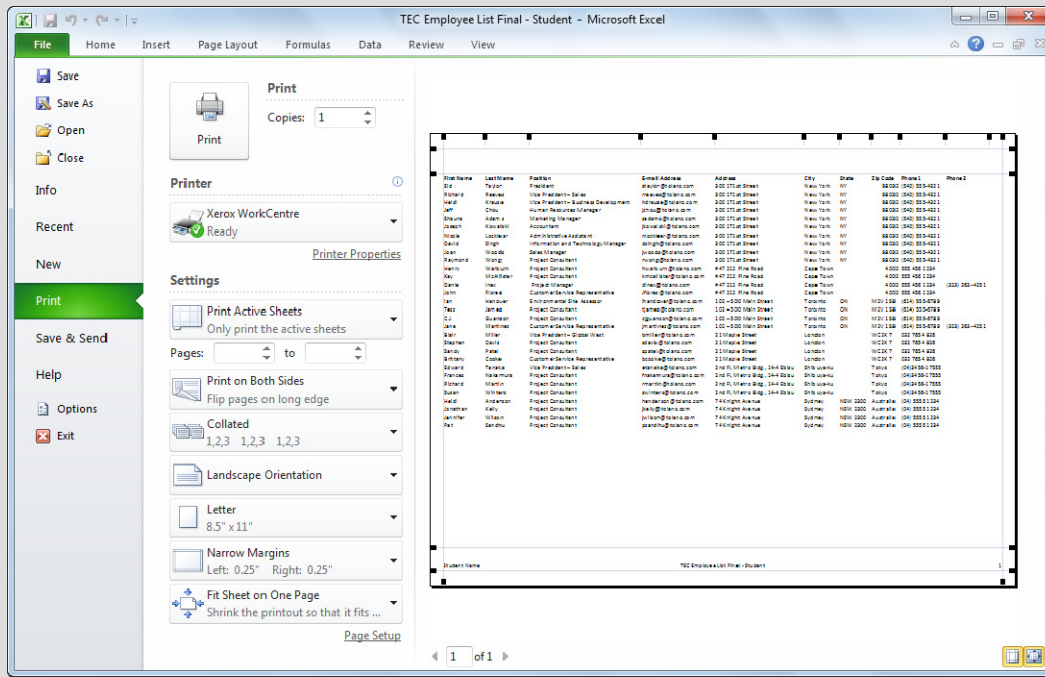
Sheet Tab

The last of the tabs in the Page Setup dialog box is the **Sheet** tab. It enables you to change various settings relating to how the worksheet will print.



Print area	Selects the portion of the worksheet you want to print; this is useful when you want to print only parts of the worksheet. If left empty, a rectangular section of the worksheet containing all data and cell formatting will be printed.
Print titles	Repeats the column or row titles on each printed page; this is useful when you have many rows and columns of data that span more than one page. You can also select this command in the Page Setup group of the Page Layout tab.
Print	Choose to include what will also print with the report, such as row and column headings, to show someone where to enter the data for a report. Note that the gridlines in this section are for printing purposes only. You can also select these commands in the Sheet Options group of the Page Layout tab.
Page order	Changes the order in which multiple pages are numbered and printed.

If you open the Page Setup dialog box from the Print Preview screen, you cannot make changes to the **Print area** or **Print titles** section of the **Sheet** tab.



Notice how as you begin adjusting the width of some of the columns that the report adjusts itself to best fit the width of the paper size selected and increases the font size of the report.

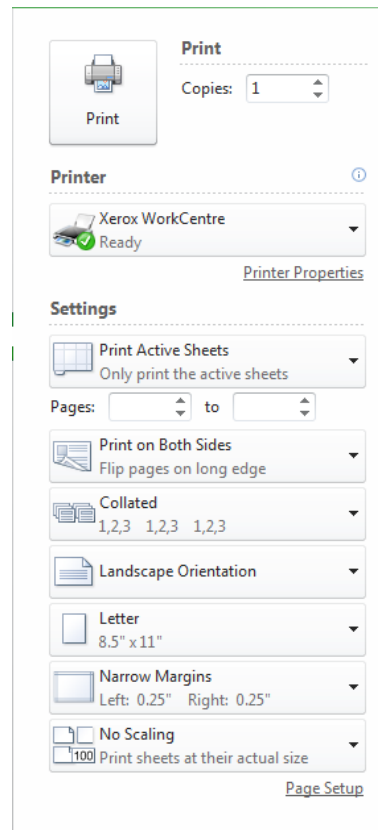
- 15 Click the **File** tab to return to the worksheet.

Printing the Worksheet



Once you have previewed the worksheet on the screen and made sure it is ready to print, you can select the **Print** option.

By default, Excel only prints the current active worksheet of the workbook. You can also choose to print all worksheets in the workbook, a selected group of worksheets, or only a selected range of cells.



Exercise







- 1 Ensure *TEC Employee List Final - Student* is active on the screen.
- 2 Click the **File** tab and then click **Print**.
- 3 Check the printer is the correct one for your location.
- 4 Leave all options as is for printing this report. Click **OK**.
- 5 Save and close the workbook.

Summary

In this lesson, you learned how to preview your worksheet and how to print it. You should now be able to:

- | | |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> preview the worksheet | <input checked="" type="checkbox"/> add header or footer |
| <input checked="" type="checkbox"/> add or remove page breaks | <input checked="" type="checkbox"/> have column titles repeat on every page |
| <input checked="" type="checkbox"/> change page settings | <input checked="" type="checkbox"/> customize other options before printing |
| <input checked="" type="checkbox"/> change margins and orientation | <input checked="" type="checkbox"/> print the worksheet |

Review Questions

1. Why would you want to preview a worksheet prior to printing?
 - a. To see how it will appear when printed
 - b. To prevent wasting paper if changes are needed
 - c. To determine whether changes are necessary for the layout of the report
 - d. Any of the above
2. How can you insert a page break?
 - a. On the Insert tab, in the Setup group, click Page Break.
 - b. On the Insert tab, in the Break group, click Page.
 - c. On the Page Layout tab, in the Page Setup group, click Page Break.
 - d. On the Page Layout tab, in the Page Setup group, click Breaks, Insert Page Break.
3. Which tab would you use in the Page Setup dialog box to change the orientation of the report?
 - a. Page
 - b. Margins
 - c. Header/Footer
 - d. Sheet
4. Which of the following buttons would you use to insert the file name into a header or footer?
 - a. 
 - b. 
 - c. 
 - d. 
 - e. 
 - f. 
5. When using the Print command, you can print:
 - a. The entire workbook
 - b. A range of cells selected in the current worksheet
 - c. Only the current worksheet
 - d. Specific pages of the worksheets selected for printing
 - e. Any of the above
 - f. a, b, or c