

Microsoft®

Excel

Associate Certification Guide



Microsoft® Office 365 & 2019 Associate Certification Guides

This courseware is one in a series prepared by CCI Learning Solutions Inc. for use by students and instructors in courses on computer software applications. CCI designed these materials to assist students and instructors in making the learning process both effective and enjoyable.

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What is the Microsoft Office Specialist Certification?

Microsoft Office Specialist (MOS) certification is the leading IT certification in the world. More than 1 million MOS exams are taken every year in over 140 countries.

The Microsoft Office Specialist Program enables students to demonstrate the knowledge, skills, and abilities to productively use Microsoft Office. The MOS Program enables students to tap into the full functionality of the Microsoft Office programs, resulting in higher levels of individual performance and confidence, which can help those with MOS certifications distinguish themselves in the workplace from those who are not certified. To learn more about these and other certifications, please visit www.certiport.com.

Microsoft Office Specialist

The Microsoft Office Specialist (MOS) certification exams validate skills within the applicable Microsoft Office programs. The Office 365 & Office 2019 exams are powerful tools for assessing student skills and preparing students for real-world application. Skill assessments include performance-based formats, revised instructions, multiple projects, and questions integrated with objective domains.

The available Microsoft Office Specialist Program 2019 exams include:

- Microsoft Office 365 & Office 2019 Word
- Microsoft Office 365 & Office 2019 Excel
- Microsoft Office 365 & Office 2019 PowerPoint
- Microsoft Office 365 & Office 2019 Outlook
- Microsoft Office 365 & Office 2019 Access Expert
- Microsoft Office 365 & Office 2019 Word Expert
- Microsoft Office 365 & Office 2019 Excel Expert

The Microsoft Office Specialist Program consists of two levels: Associate and Expert.

Students earn a certification for each exam they pass; however, if students earn any three of the four available associate certifications, they will become Microsoft Office Specialist - Associates and earn an additional credential for this accomplishment. If students want to advance even further and earn Associate certifications and any two of the three available Expert certifications, they will become Microsoft Office Specialist - Experts and achieve the highest credential within the Microsoft Office Specialist Program.*

*This certification replaces the Microsoft Office Master credential.



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Course Description

This *Microsoft® Office 365 & 2019 Excel Associate Certification Guide* teaches the skills necessary to create and edit professional-looking spreadsheets for a variety of purposes and situations.

Students who complete this course will have reviewed all the exam objectives and be prepared to take the Microsoft Office Specialist Excel Exam #MO-200. Successful completion of the certification exam validates the knowledge and skill sets for individuals seeking employment or advancement in their careers.

Suggested Course Length: 30-50 Hours

Course Series

This guide is one of seven courses in CCI's Microsoft Office 365 & 2019 series. The courses available in the series include:

- Word Associate
- Excel Associate
- PowerPoint Associate
- Outlook Associate
- Access Expert
- Word Expert
- Excel Expert

Course Prerequisites

This course is designed for students who are familiar with the Microsoft Windows operating system, personal computers, using a keyboard and using a mouse. Students should be able to:

- ☐ Start and run Windows.
- ☐ Use the taskbar.
- ☐ Use the Start button.
- ☐ Use the Help feature.
- ☐ Use Minimize, Restore Down/Maximize, or Close.
- ☐ Use the left and right mouse buttons.
- ☐ Understand file management techniques.
- ☐ Navigate between files, folders, or drives.

System Requirements

This courseware was developed using specific software and hardware configurations. To complete this courseware, you should have the following for each student:

- A desktop or laptop system running Microsoft® Windows 10 and Microsoft® Office 365 or 2019
- Mouse or comparable pointing device
- 101-key enhanced keyboard

In the materials contained in this courseware, we assume that you have met these criteria, and that you have successfully installed both Windows and Office on your computer.

Note: This course was written using Microsoft Office 365 Version 1902; if you subscribe to Office 365, features may be added or updated without notice.

Classroom Setup

The features and exercises shown in this courseware were developed using the standard installation of the Microsoft Office 365 Version 1902 Desktop applications on a system with Windows 10. If your computers have another version of Windows or Office 365 installed, you will need to adjust accordingly to accommodate for the differences in dialog boxes or command sequences.

It is likely your teacher set up the classroom computers based on the system requirements to run the software for this course. Most software configurations on your computer are identical to those on your teacher's computer. However, your teacher may use additional software to demonstrate network interaction or related technologies.

Teacher Resources are available and are produced specifically to assist an educator in preparing to deliver the course using the CCI materials. Contact your coordinator or administrator or call your CCI Account Manager for information on how to access these resources.

Downloading the Exercise Files

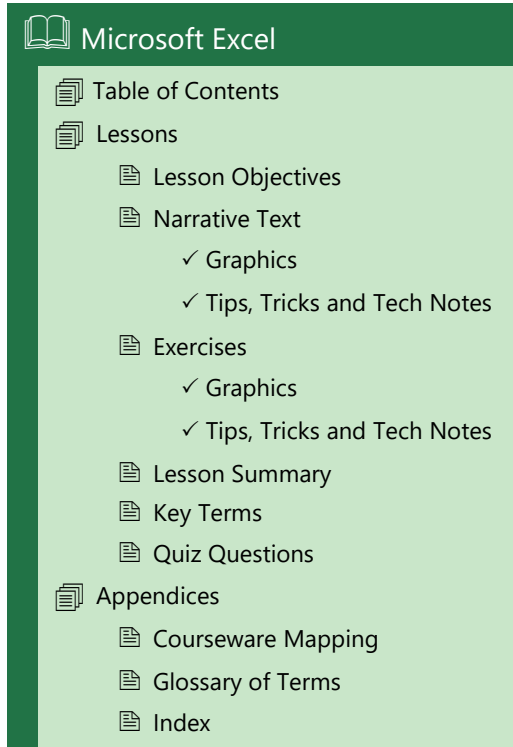
The exercises in this courseware require you to use the exercise files provided for the course. To download the exercise files for this course, perform the following steps.

1. Launch your browser and navigate to the Student Data Files page on CCI Learning's website, located at <http://www.ccilearning.com/data>.
2. Type: **3273** in the *Courseware #* field, then click **Find Data**.
3. Depending on the browser you are using, the ZIP file may be automatically saved in your Downloads folder, or you may be prompted to open or save the file. Save (or move) the downloaded ZIP file to your Desktop.
4. Right-click the **ZIP file** on your Desktop, then click **Extract All** to display the Extract Compressed (Zipped) Folders dialog box.
5. Click the **Browse** button, navigate to the Desktop, click the **Select Folder** button to confirm the Desktop as the location for extracting the files, then click the **Extract** button. A folder named *3273 Exercise Files* should now reside on your Desktop.

Within the 3273 Exercise Files folder, you will find a *StarterFiles*, *ResourceFiles*, and *MyProjects* folder. The StarterFiles folder contains data file(s) you are directed to open at the beginning of an exercise. The ResourceFiles folder contains supplemental files that you will be directed to access during an exercise. The MyProjects folder will be empty. As you perform the exercises for a lesson, you will be directed to save your work in the MyProjects folder.

Course Design

This course book was developed for instructor-led training and will assist you during class. Together with comprehensive instructional text and objectives checklists, this course book provides easy-to-follow hands-on exercises and a glossary of course-specific terms. This course book is organized in the following manner:



- Microsoft Excel
 - Table of Contents
 - Lessons
 - Lesson Objectives
 - Narrative Text
 - ✓ Graphics
 - ✓ Tips, Tricks and Tech Notes
 - Exercises
 - ✓ Graphics
 - ✓ Tips, Tricks and Tech Notes
 - Lesson Summary
 - Key Terms
 - Quiz Questions
 - Appendices
 - Courseware Mapping
 - Glossary of Terms
 - Index

When you return to your home or office, you will find this course book to be a valuable resource for reviewing exercises and applying the skills you have learned. Each lesson concludes with questions that review the material. Lesson quiz questions are provided as a study resource only and in no way guarantee a passing score on a certification exam. Appendices in the back of this course book provide additional information.

Course Objectives

This course book teaches the skills you will need to successfully complete the Microsoft Excel Exam MO-200. These skill sets are introduced using multiple types of business and personal workbooks.

After completing this course, you will be able to:

- ✎ Create workbooks and navigate within Excel.
- ✎ Manipulate cell data.
- ✎ Use formulas.
- ✎ Format worksheets.
- ✎ View and print workbooks.
- ✎ Work with charts.
- ✎ Organize data.
- ✎ Use data tools.

Conventions and Graphics

The following conventions are used in CCI learning materials.

Folder Names – Names of folders and specific locations are indicated in *italic* font style.

File Names – Names of files are indicated in **bold** font style.

Exercise Text Entry – Content to be entered by the student during an exercise appears in **Times New Roman, 10pt, bold** font.

Key Terms – Vocabulary terms that are presented in the narrative appear in ***bold, italic*** font style.

Procedures – Procedures and commands you are instructed to activate are indicated in **bold** font style.

Objective 1.1.1, 1.1.2 – This indicates the numbered objective from the Microsoft Office exam being covered in the topic. Refer to the Appendix for a complete listing of exam objectives.

Technical Notes point out exceptions or special circumstances that you may find when working through a particular process, or may indicate there is another method to complete the task.

Learn to Exercise

Learn to headings signal the start of step-by-step, hands-on exercises or other activities.

Microsoft® Excel

Associate Certification Guide

Lesson 1: Introducing Excel

Lesson Objectives

In this lesson, you will be introduced to the Excel application, learn how it works, and understand how to move around within the application. You will also learn to create a workbook, enter data into a worksheet, and work with files. Upon completion of this lesson, you should be able to:

- ☐ Explain what an electronic spreadsheet is.
- ☐ Understand what Excel is and what it can do.
- ☐ Identify elements on the Excel screen.
- ☐ Understand some basic terminology.
- ☐ Move around within Excel.
- ☐ Use keyboard shortcuts.
- ☐ Enter text, numbers, dates, and times.
- ☐ Move around within a worksheet.
- ☐ Use the Backstage view to save, create new, open, and close workbooks.
- ☐ Switch among open workbooks.
- ☐ Save in a previous version Excel format, and check for compatibility issues.
- ☐ Manage files and folders.
- ☐ Select cells.

What is Excel?

Excel is an electronic spreadsheet program developed by Microsoft, originally for the Windows environment, but is now available for the Apple Mac or any computer with a web browser. A powerful tool for analyzing and presenting information, Excel consists of three programs in one:

Spreadsheet – Entering and analyzing numeric data in applications such as financial forecasting and statistical problems. Excel performs math calculations so quickly that they appear to be simultaneous. Excel uses the term worksheet in place of spreadsheet.

Graphics – Creating charts to represent numeric data.

Database – Compiling and sorting lists of data.

Some of Excel's advantages are:

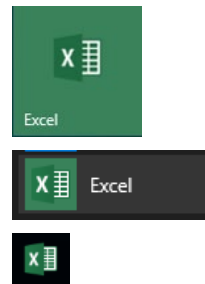
- It is relatively easy to learn. All Microsoft Office Suite programs, such as Word, Excel, and PowerPoint, operate similarly. Many of the skills you learn in one program carry over to others.
- It enables data to be exchanged easily between the different Office programs. For example, you can create a chart in Excel and insert it into a document you are writing using Word.
- Excel can produce output of print-shop quality using features such as the spelling checker and other tools that enhance your work and provide it with a professional look.
- Excel has a large selection of mathematical, financial, statistical, and database functions. It includes 14 basic chart types and each of the commonly-used chart types have four or more subtypes. There are also some tools for forecasting or analysis, and a function helper.
- Worksheets can be grouped together in a single file rather than separate files. In Excel, these files are called workbooks. Inside a workbook, there are several ways to manage the multiple worksheets such as renaming worksheet tabs.
- Excel uses AutoFill to fill selected cells with data that follows from the information in the first of the selected cells. For example, if you select four cells, and the first cell contains Qtr 1, AutoFill will fill in the next three cells with Qtr 2, Qtr 3, and Qtr 4.
- By default, edits occur directly in the cell. This includes formatting portions of text and making font changes. Alternatively, you can perform edits in the Formula bar.

Although Excel is a very large program, it is enjoyable to learn and use. Most people find it takes them less time to become competent and productive with Excel than they initially anticipated. For the purpose of this courseware, we will assume that you are using Excel on a Windows computer.

Starting Excel

In Windows 10, there are a couple of ways to start the Excel program:

- If it is present in the Start window, click or tap the Windows Start button, then select the Excel tile from the Start window.
- Click the Windows Start button, scroll through the apps, and then click Excel.
- In the taskbar, click or tap the Excel Quick Launch icon.



Looking at the Screen

When Excel starts, the startup screen (Figure 1-1) appears from which you can open a workbook, start a new blank workbook, or create a new workbook based on a template.

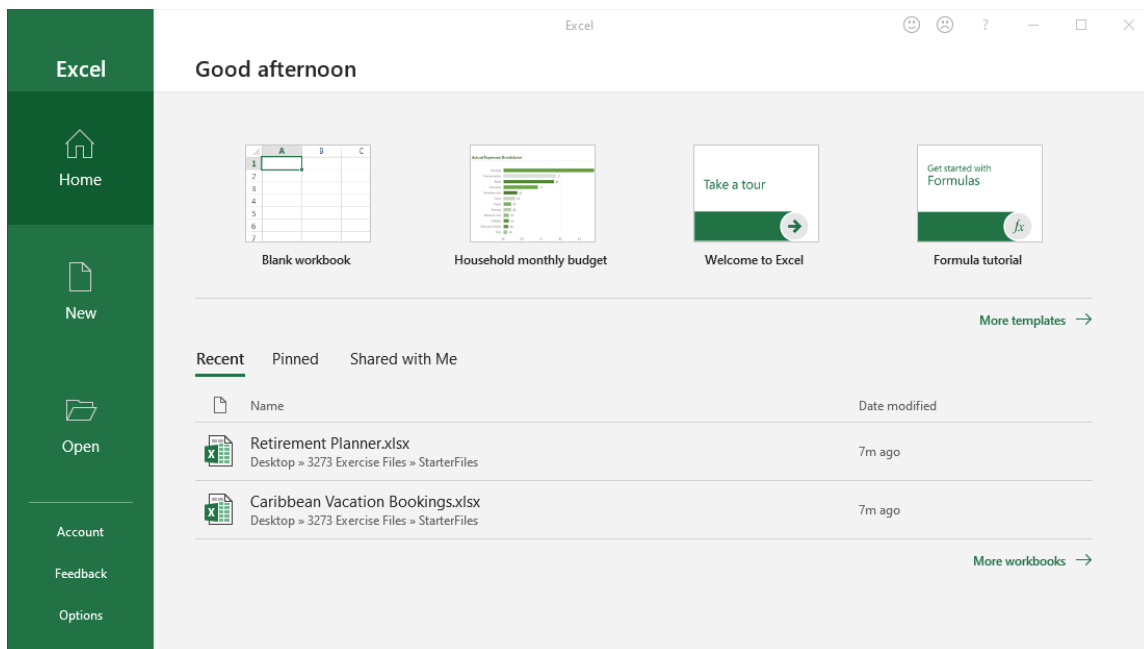


Figure 1-1: Excel startup screen

To create a new workbook, click Blank workbook. A new workbook opens and the screen displays as shown in Figure 1-2.

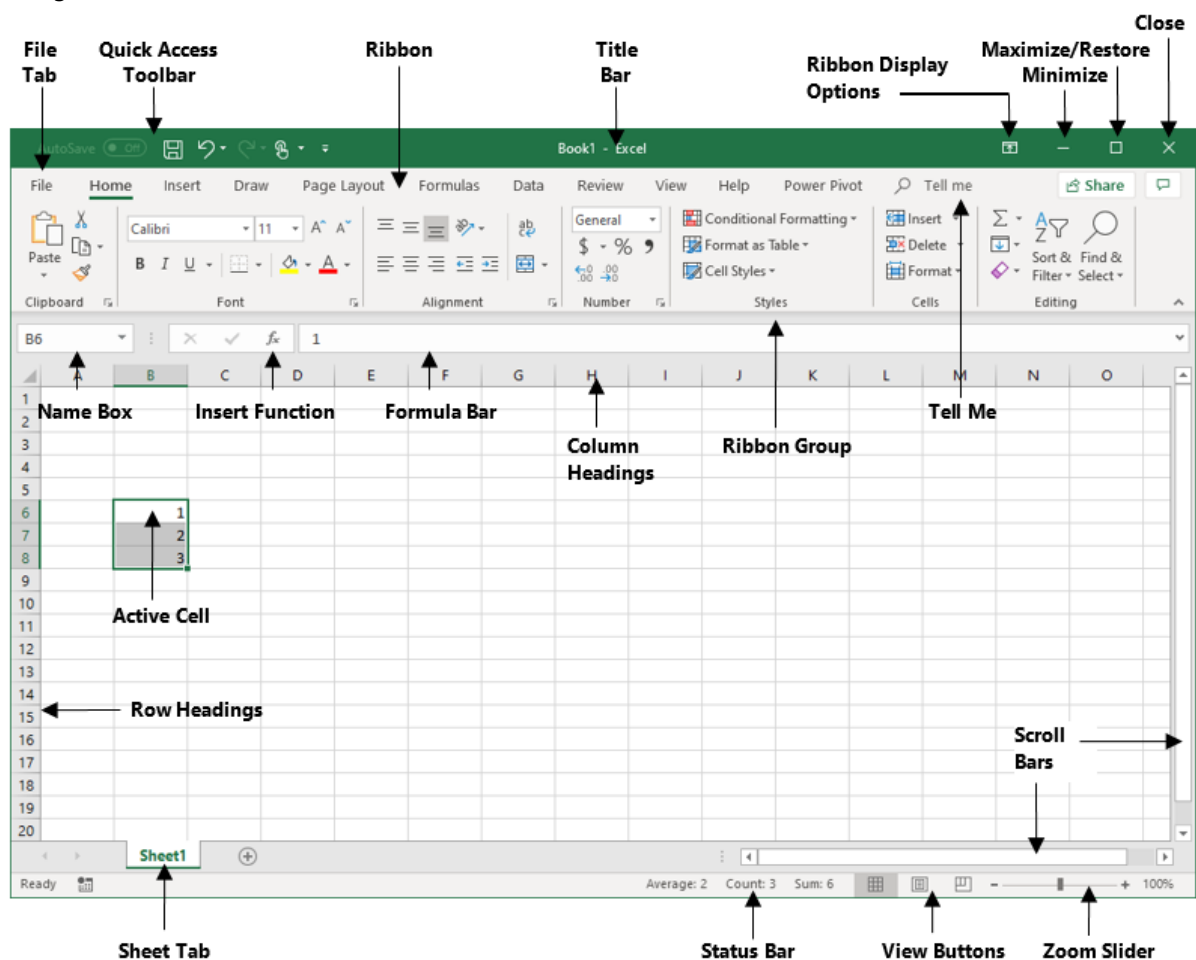


Figure 1-2: Excel application window – new workbook

File Tab – Click this tab to open the **Backstage** view from which you can select commands to manage files, such as Info, New, Open, Save, Print, Export or Options. When the Info screen is displayed in Backstage view, the right side of the page displays options you can choose to control your workbook including protect, inspect, and manage. File properties are also displayed here.

Quick Access Toolbar – Located above the Ribbon, this provides quick access to frequently used commands. You can customize the toolbar to contain commands you use regularly.

Title Bar – Located at the top of the screen, the title bar indicates the contents of the window (for example, *Book1, Department Budget*). It may also show the text *[Compatibility Mode]* if the workbook you are using has been saved to be compatible with a previous version of Excel. If more than one window is open on the screen, the one with a title bar that has a darker color or intensity is the active window.

Minimize, Maximize, Restore Down, Close – Located in the upper right-hand corner of the window, these buttons enable you to minimize (–) the application window to a button on the taskbar, maximize (□) the program to full screen, restore (□) the window to its original size, or close (×) the application window.

Ribbon – A collection of tabs (for example, File, Home, Insert, Draw, Page Layout) provides quick access to commands you need to complete a task. You can control which tabs display on the Ribbon, and your screen may contain fewer or more tabs than those shown in Figure 1-2. Each Ribbon tab relates to a type of activity such as inserting objects in a worksheet or modifying the format of data in a worksheet. In Figure 1-2, the Home tab is currently selected, and all the icons and options for that Ribbon tab are displayed.

Ribbon Group – Each Ribbon tab contains groups of related commands to edit, format, or enhance items in your documents. Some groups include a dialog box launcher button at the bottom right, which opens a dialog box or window with more commands and options.

Ribbon Display Options – Controls whether to hide or display the Ribbon with the tabs or with both tabs and command buttons.

Name Box – Located on the left below the Ribbon, this displays the cell address of the active cell. For example, if the Name Box displays A21, this indicates that A21 (the cell at the intersection of column A and row 21) is the active cell. In Figure 1-2, three cells are selected. Cell B6 is the upper left-most cell of that cell range and therefore its cell address is displayed in the Name Box to designate it as the active cell.

Insert Function – This tool opens a dialog box to help you choose and insert a built-in function.

Formula Bar – Located to the right of the Name Box, the **Formula Bar** displays the contents of the active cell. Under certain circumstances, the Formula Bar can be used to make entries into the worksheet.

Tell Me – This allows you to enter a description of what you are looking for. Unlike the simpler help feature in older versions of Excel, the Tell Me feature will display a customized menu of the commands that you are looking for.

Column Headings – Sequential letters at the top of each column enable you to track columns.

Active Cell – The cell on which the cell pointer is positioned. You enter text or other values into the active cell in the worksheet. Only one cell can be the active cell at any given time.

Row Headings – Sequential numbers on the left side of each row enable you to track rows.

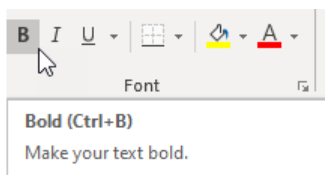
Sheet Tab – The rectangular box at the bottom of a worksheet by which the worksheet is accessed and identified. Each workbook contains one or more worksheets, and each worksheet has a unique name that appears on the worksheet tab.

Status Bar – Displays the current cell mode, auto calculations, the View buttons, and the Zoom slider. You can customize the Status bar to display keyboard locks and other features.

View Buttons – These buttons change the on-screen views for the worksheet. The views are Normal, Page Layout, and Page Break Preview.

Zoom Slider – The buttons at either side of the slider allow you to increase or decrease the zoom by 10%, or you can drag the slider button to choose a particular zoom percentage. Excel displays the current zoom percentage in the Zoom level button, at the right of the View buttons. You can also click this button to set a custom or specific zoom percentage.

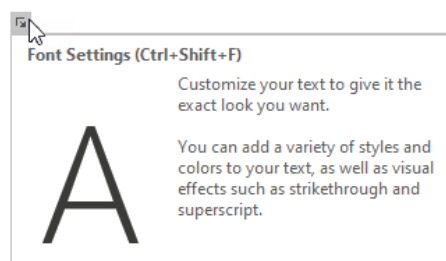
Figure 1-2 displays various commonly used areas of the Excel screen. Because you can customize the screen's appearance, not all parts always appear. For instance, some people prefer the workbook displayed as a window on the screen, while others prefer to maximize the workbook. It is also possible to change the overall color scheme for the Excel window, as well as individual components within each worksheet.



ScreenTips help identify buttons or elements on the tabs of the Ribbon and the screen. To view a ScreenTip, position the mouse pointer on the item. A tip then displays the name of the button along with a description of the purpose of this item. For some items, a keyboard shortcut may also display as an alternative for activating this feature.

Many Ribbon groups include a dialog box launcher button. By hovering the mouse pointer over it, the ScreenTip will display a summary of its purpose, as demonstrated in this example:

Several of the elements shown in this section can be set to show or hide, as you prefer. In most cases, you can change your display options by clicking the File tab, clicking Options, and then clicking the General or Advanced categories.



Understanding Basic Terminology

A worksheet is like an extremely large sheet of paper divided into rows and columns. In Excel, the rows are numbered from 1 to 1,048,576. Each of the 16,384 columns is named with a letter combination starting with A to Z, then AA to ZZ, then AAA to AZZ, up to column XFD.

Workbook – A single Excel file containing one or more worksheets (for example, Sheet1, Sheet2, Sheet3) is called a workbook. You can have more than one workbook open at any time but you can only work in one of them at any one time. The workbook that is currently open and on top of all other workbooks or other Windows programs is called the active workbook.

Worksheet – A worksheet is a two-dimensional arrangement of cells in rows and columns. When you use a workbook with multiple worksheets, you can only use one worksheet at any one time. The worksheet that is currently displayed is called the active worksheet.

Cell – Located at the intersection of every row and column, a cell holds a single value, label, or formula. It may also contain comments, formatting, and other related data. The cell where you are entering data or the current location of the cell pointer is called the **active cell**.

Cell Address – Excel has more than 17 billion cells available per worksheet (1,048,576 rows x 16,384 columns). Each cell has its own distinct address (its point of column-by-row intersection) such as B6 (column B at row 6).

Sizing – When the Excel window is not maximized, you can change its overall size and aspect ratio. By positioning the mouse over any of the four edges of the window, the mouse pointer will change to a double-headed arrow (↔ or ↑↓). You can then click and drag the edge to change the width or height of the window. If you position the mouse over any of the four corners of the window, you will see a diagonal double-headed arrow (e.g. ↖↘), which will allow you to drag both adjacent edges at the same time.

Mouse Symbols

This section introduces some of the common mouse symbols and their purposes:

-  Select a cell or range of cells in the worksheet.
-  Move or copy selected cells by dragging and dropping.
-  Select items, command buttons, and menu options.
-  Size objects.
-  Edit text within the Formula bar or a cell.
-  Indicates the use of the AutoFill feature to copy the contents of cells.
-  Provides a guide for the top left and bottom right corners when creating objects.
-  Change the column width or row height.
-  Move the split bar between the window panes.
-  Select an entire row or entire column.

It is possible to use Excel with a touchscreen; however, you will find it is generally easier to use a mouse and keyboard.

Using the Quick Access Toolbar

The **Quick Access Toolbar** (also known as QAT) is located at the left of the title bar above the Ribbon and contains buttons for frequently used commands. By default, this toolbar contains the AutoSave indicator, and the Save, Undo, Redo, and Customize Quick Access Toolbar buttons, as shown in Figure 1-3.

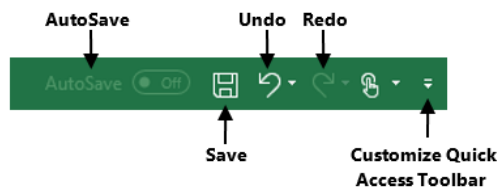


Figure 1-3: Quick Access toolbar

Office 365 subscribers can take advantage of the AutoSave feature, which will automatically save changes to files that you share with others on OneDrive or SharePoint Online. When you share files in this manner, you can also see changes from others in real time. The AutoSave indicator is located on the Quick Access Toolbar.

Note: You can enable or disable AutoSave on the Save tab of the Excel Options dialog box.

Using the Ribbon

The **Ribbon** can help you quickly find commands you require to complete a task. Commands are arranged in tabs that appear on the Ribbon, and each tab contains commands that relate to a specific type of activity such as inserting items, changing the view, or formatting text in the document. The Home tab of the Ribbon is shown in Figure 1-4.

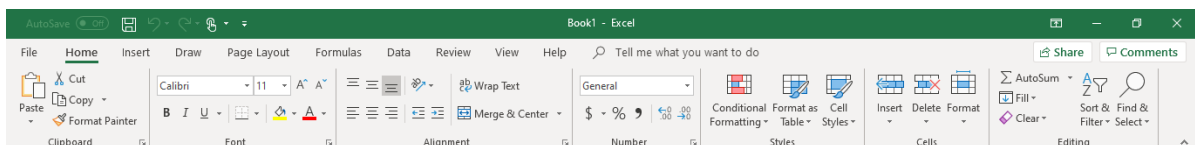


Figure 1-4: Home tab of the Ribbon

To reduce screen clutter, **contextual tabs** appear only when they are applicable. For example, the Drawing Tools Format tab shown in Figure 1-5 appears when a graphic object is selected.

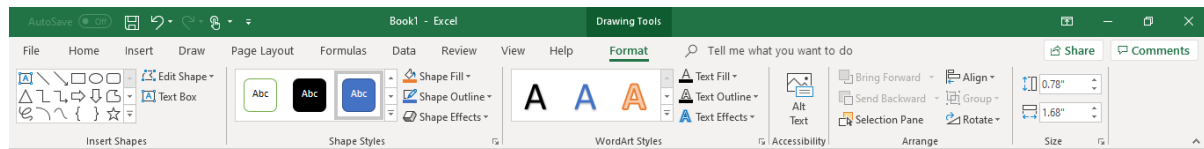


Figure 1-5: Drawing Tools Format contextual ribbon tab

When the Ribbon displays different choices (as shown in the Shape Styles list in Figure 1-5), one item has a border around it to indicate it is active. To see how the drawn object would appear with another style, point the mouse at one of the other items. Excel previews the effect that will take place if it is selected.

Each tab on the Ribbon contains groups with similar commands. For example, the Home tab has a group called Font that contains buttons for formatting text characters, and the Insert tab contains a group with different types of graphics or illustrations that can be inserted into a worksheet. As you point the mouse pointer at an option, Excel displays a Live Preview of how the selected item will appear if you apply this feature. You can turn off the Live Preview feature in the Excel Options dialog box.

If a group shows a feature with a vertical scroll bar, it also has a button below the bottom scroll button, a triangle with a bar above it, which you can click to display the full list or gallery for that option.



This is the More button and, when clicked, it displays a gallery with more options, as shown in Figure 1-6.



Figure 1-6: Gallery of more options

Click the  dialog box launcher button at the lower right of a group to show the corresponding dialog box with more options for this feature. In some cases, a task pane may appear at the left or right side of the screen instead of a dialog box. The dialog box launcher button displays the name of the dialog box or task pane window that will appear when clicked. Examples of a dialog box and a task pane are shown in Figure 1-7.

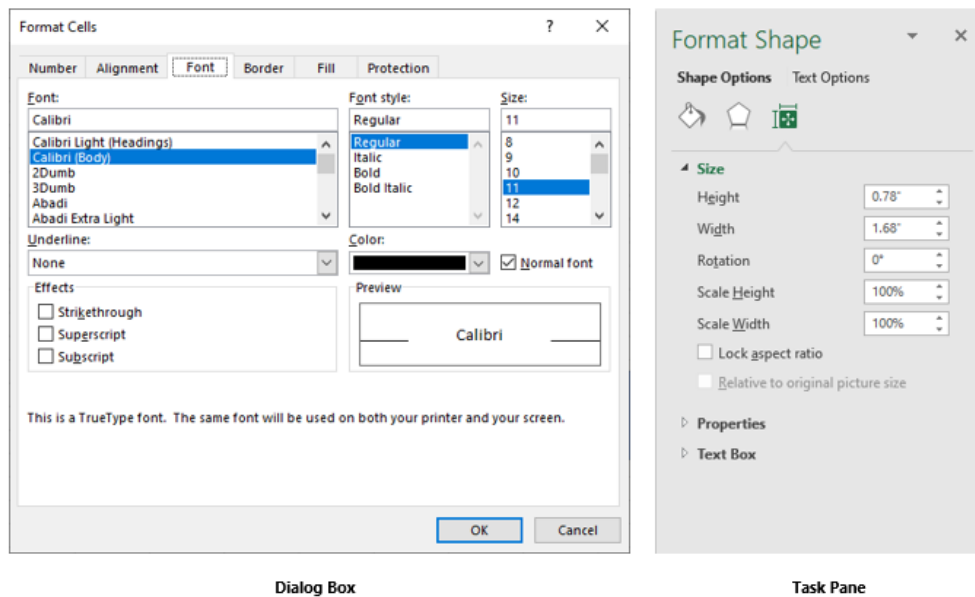


Figure 1-7: Dialog box and task pane

Within the dialog box, you can select items from the lists, use the arrow for a list box to display more choices for that list, or click a command to turn the feature on or off. It may display a preview of the changes.

A dialog box displays the various options that you can select to change a worksheet or cells within a worksheet. Once you click OK to apply the change, the dialog box closes. A task pane is like a dialog box because it is used to make changes to parts of the worksheet, except that it remains open until you close it. An example of a task pane is the Clipboard which collects and displays the items selected when the Cut or Copy command is used.

If you want to show more lines on the screen or you do not want to display the Ribbon, you can minimize it. To minimize the Ribbon, use one of the following methods:

- point at the Ribbon Display Options (📌) button at the upper right of the screen, then click Show Tabs, or
- right-click anywhere on the Ribbon and then click Collapse the Ribbon, or
- double-click on any Ribbon tab, or
- press CTRL+F1.

Using the Keyboard

You can also access commands in Excel using the keyboard. Some users consider the keyboard to be a faster method for accessing commands. There is also the benefit of consistency between Windows programs, in that many keyboard shortcuts are the same in all Windows programs such as pressing CTRL+C to copy, CTRL+S to save, or CTRL+P to print.

To access the Ribbon using the keyboard, press ALT or F10 to display the keyboard shortcut keys (Figure 1-8) for the commands in the Ribbon.

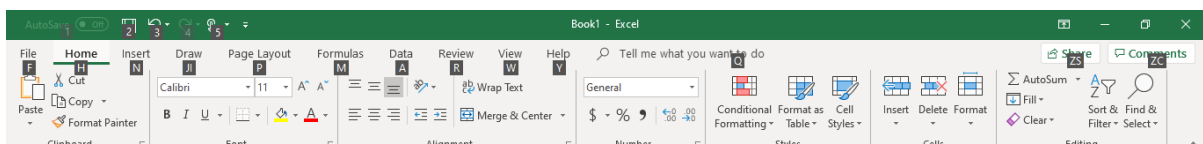


Figure 1-8: Keyboard shortcut keys

When you press the key for the appropriate feature, Excel displays the next set of keys you can use to select a command or perform an action. For example, pressing P displays the Page Layout tab, as shown in Figure 1-9.

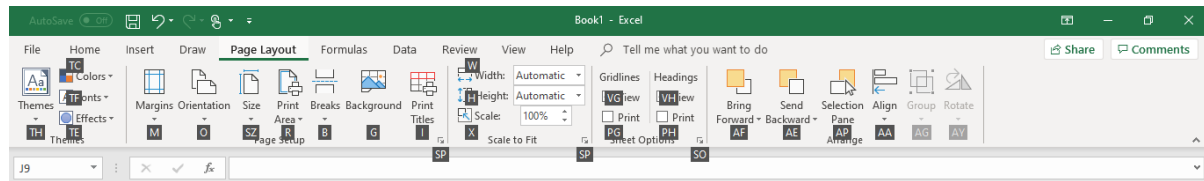


Figure 1-9: Tab-specific shortcut keys

If the Ribbon command displays more options, then you can select from those available key options as well.

Learn to use the Ribbon

In this exercise, you will start Excel and access some of the tools to see how they work.

1. Launch Microsoft Excel.

The Excel startup screen appears. From here, you can choose to open a workbook or create a new one using a workbook template.

2. Click **Blank workbook** to create a new workbook.

Now access the Backstage. The Office Backstage is used to perform the file management functions such as printing, sharing, exporting, or changing Excel options.

3. Click **File** to access the Backstage.
4. Click the  **Back** button to return to the workbook.
5. Use the mouse pointer to point to the **View** tab.

Notice how the View tab displays in darker text and is highlighted, even though you have not clicked it.

6. Click the **View** tab to activate it.

Notice that the name of the tab appears in bold and that a green line displays below the tab name, indicating it is the current tab.

7. On the View tab, in the Workbook Views group, point to **Page Layout**.

Notice how the color of the button changes.

8. Click **Page Layout** to change the view.
9. On the View tab, in the Workbook Views group, click **Normal** to switch back to the default view.
10. Move the mouse pointer to the Zoom slider at the bottom right of the screen. Click and drag the **slider** to the right until you see the zoom percentage change to approximately **200%**.
11. At the far right of the Ribbon, click the  **Collapse the Ribbon** button.

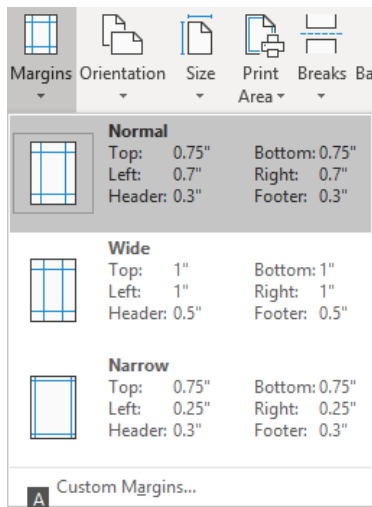
Notice how you now can see a few more rows on the screen. To display a Ribbon tab again temporarily, simply click any of the Ribbon tabs.

12. Click the **Home** tab, then click the **Formulas** tab.

13. Click a blank area of the Excel title bar to hide the Ribbon again.
14. Click and drag the slider the other way so the percentage changes to **50%**, then drag the slider to return the zoom to **100%**.

The Ribbon can be reset to remain open.

15. Click the  **Ribbon Display Options** button, then click **Show Tabs and Commands** to re-display the entire Ribbon.
16. Now move the mouse pointer to the top of the screen and click some of the tabs to see how the commands are categorized and grouped on the tabs.
17. Press **ALT** to display the keyboard shortcuts on the tab.
18. Press **P** to display the Page Layout tab.
19. Then press **M** to display the Margins options.



20. Press **ESC** to cancel this option.
Notice that the keys are still displayed on the tab, so you can continue to use the keyboard to choose another command.
21. Press **ESC** twice more until the keyboard shortcuts no longer appear.
22. Keep the workbook open for the next exercise.

Identifying Screen Symbols

Occasionally, you may see different types of symbols appear after performing a task or activating a command. These symbols are visual cues provided within Excel to help you identify a particular status or recognize that other options may be available.

Some of these symbols include:

Circular References: E13 **Circular References** – This indicator appears in the status bar if Excel finds this problem in the current worksheet. A circular reference occurs when a formula in one cell references another cell that references back to the first cell, either directly or indirectly through other cells. Excel will display the double-headed blue arrow between these offending cells. You will learn more about cell references later in this courseware.

 **Auto Fill options** – This appears when you use the AutoFill feature to copy data or formulas into adjacent cells. Excel provides you with options for this item. When you point to this button, it appears with a drop-down arrow. Click the arrow to display more options for this item.

 **Paste Options** – Excel identifies that you have pasted an item and provides other options for the paste action. When you point to this button, it appears with a drop-down arrow. Click the arrow to display more options for this item.

Entering Data in a Worksheet

If you design and build it in a logical manner, an Excel worksheet is a very powerful tool. The basic building block of every worksheet is entering data into the cells.

Types of Data

You can make three main types of entries when you insert data into worksheet cells:

Numeric – Numeric data form the core of all worksheets. This type of data consists of number, date, or time values that you enter directly into a worksheet cell. By default, numeric values align to the right in a cell.

Text – Text data consist of alphabetic and numeric characters and most printable symbols. Text data are usually labels or titles used to describe and explain the data in adjoining cells. Text is seldom included in calculations, but Excel does include several functions that apply to text data. If you enter a text value that is wider than the cell, it will flow into the adjacent cells as long as those cells are empty. By default, text data align to the left in a cell.

Formulas – Formulas, which you enter in individual cells, are composed of values, cell references, arithmetic operators, and special functions for calculating and displaying results. These results may then become part of other formulas located in other cells. The ability to use formulas is what differentiates spreadsheets from word processing software like Microsoft Word.

Entering Text

To enter data, move your pointer to the desired cell, click in it to position the cell pointer, and type the entry. If you make a typing error while still entering information in a cell, press the BACKSPACE key to erase your mistake. When you have finished entering data in a cell, press the ENTER key to move the cell pointer automatically to the next cell down. Alternatively, use your mouse to click another cell (or press any arrow key), which performs the same result of storing the data in that cell and moving the cell pointer to the new location.

The best way to begin any worksheet is to enter column and row titles that identify the purpose of the numeric data. When you enter titles for the worksheet, you are creating an outline of the relationships you will later represent mathematically.

When typing information, notice that Excel displays the text in two places:

- You can enter or edit data directly in the active cell where the cell pointer appears, or you can enter or edit it in the Formula bar. The latter method is especially useful for very long data entries. In either case, the data is displayed in both places.

- Text entries can be up to 32,767 characters, although a maximum of 255 characters are displayed. If a text entry is longer than the width of the cell, it will extend past the column border on the right after you have pressed ENTER, as long as there is nothing entered in those adjoining cells. Any value entered into the cell on the immediate right will truncate the display of the text at the border. For long entries, the entire text value will be stored in the cell, but only the portion that fits in the available space is visible. By default, Excel aligns text data on the left side of the cell. You can easily change the appearance and alignment of a text entry.

Learn to enter text data

In this exercise, you will enter text into a worksheet. The text will serve as labels or titles for other cells into which you later enter numeric data.

- In the blank workbook from the previous exercise, click in cell **A2**.
- Type: **Price Quote** and press **ENTER**.

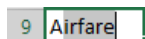
Notice the current active cell is now A3. When you press ENTER, Excel completes the entry of data in the current cell, then moves the cell pointer to the next cell down.

- Press **ENTER** twice to move down two rows.
- In cell **A5**, type: **Airfare** and press **ENTER**.
- In cell **A6**, type: **Hotel** and press **ENTER**.
- In cell **A7**, type: **Car Rental** and press **ENTER**.
- In cell **A8**, type: **Taxes** and press **ENTER**.

Note: If you entered the wrong value into a cell, simply select the cell and type the entire correct entry again to replace the incorrect value.

Now try a feature called AutoComplete, in which Excel determines whether you are repeating the same text as in a previous cell and completes it for you. If it is the text you want, you simply press ENTER to accept it.

- In cell **A9**, type: **A**.



Notice that Excel automatically offers you a text label, based on your previous entry. You can now press ENTER to accept it or continue typing the value that you want.

- Ignore the suggested label and continue typing the rest of the text: **import Fees** and press **ENTER**.

Notice that the text extends further than the default column width for this text entry. If you enter data in the next column, the part of this new label that overflows into the next column will appear to be cut off.

- In cell **A12**, type: **Airline:** and press **ENTER**.

Notice this time that the AutoComplete feature did not turn on. This is because of the blank cells (A10 and A11) that are preventing Excel from "looking up" a previous similar value in this column.

11. Enter the following in the remaining cells:

Cell	Text
A13	Hotel:
B12	Great West Airline
B13	Hotel Zathura

	A	B	C
1			
2	Price Quote		
3			
4			
5	Airfare		
6	Hotel		
7	Car Rental		
8	Taxes		
9	Airport Fees		
10			
11			
12	Airline:	Great West Airline	
13	Hotel:	Hotel Zathura	
14			

12. Leave the workbook open for the next exercise.

Entering Numbers

Numbers, such as those representing dollar and percentage values, are constant – that is, they do not change. They are typically used as part of calculations, with results appearing in other parts of the workbook.

By default, Excel aligns numeric values to the right side of a cell. They are displayed with no commas unless you enter them at the same time. Extraneous zeroes at the far left or right are not displayed, even if entered at the same time. You can format the values to your preference at a later time.

If you enter a value that contains a mixture of alphabetic and numeric digits (for example, T-1000), Excel treats the entire entry as text and aligns it to the left of the cell.

Learn to enter numeric data

In this exercise you will enter numeric data into a worksheet.

1. In the unsaved workbook from the previous exercise, click in cell **B5**, type: **450** and press **ENTER**.
2. In cell **B6**, type: **1,050** and press **ENTER**.
3. In cell **B7**, type: **225** and press **ENTER**.
4. In cell **B8**, type: **46.50** and press **ENTER**.
5. In cell **B9**, type: **9.9** and press **ENTER**.
6. Click in cell **A9**.

Notice in cell A9 that the part of the text entry that had overflowed into cell B9 is now hidden because you entered a value into cell B9. However, the formula bar shows that the data in cell A9 is unchanged.

7. Click in cell **D8**, and type: **3.1%** and press **ENTER**.

Excel interprets the entered values as numeric and aligns them on the right of their cells. However, if you enter any non-recognizable characters, or insert any commas or decimal points in the wrong position, Excel will treat the entire contents of that cell as a label and align it on the left side of the cell.

8. In cell **D9**, type: **2,2%** (including the comma) and press **ENTER**.

	A	B	C	D
1				
2	Price Quote			
3				
4				
5	Airfare	450		
6	Hotel	1,050		
7	Car Rental	225		
8	Taxes	46.5		3.10%
9	Airport Fe	9.9		2,2%
10				
11				
12	Airline:	Great West Airline		
13	Hotel:	Hotel Zathura		
14				

Notice that Excel aligns the data on the left side of the cell. Because you entered a comma instead of a period, Excel assumes that the cell entry is a text value.

9. Move back to cell **D9** and enter: **2.2%** to replace the incorrect contents of that cell.
10. Keep the workbook open for the next exercise.

Entering Dates and Times

Excel is also capable of handling date and time values. When entering dates, note the following:

- If you enter a full date value including the month, day, and year value, the date value will display as dd-mmm-yy by default.
- The date value does not have to be the full day, month, and year. It can be just the day and month (format is dd-mmm), or the month and year only (format is mmm-yy).
- If you enter only the name of a month, Excel will treat it as a text value. If you enter only a day or year value, Excel will treat it as a numeric value. In these cases, Excel will not recognize that you intended to enter a part of a date value.
- When entering the date, Excel attempts to interpret what you have entered. For example, the following are acceptable date values:
 - September 15, 2019 (you must include the comma followed by a space)
 - Sep 15, 19
 - 15-Sep-19
 - 09/15/19 (month, day, year sequence — see next bullet)
 - 9-15-19
 - Sep 2019
 - Sep 15
- If you enter the date using only numeric values (for example, 09/15/19 as shown above), the sequence of the values must match the date sequence specified in the Windows Control Panel, Region settings. For the United States, the normal date sequence is month/day/year. For Canada and the United Kingdom, the sequence is day/month/year. If Excel is not able to interpret the date value, it will appear as a text label (left aligned in the cell).

When entering time values, note the following:

- The time must consist of hours and minutes, as a minimum, in the format of hh:mm. You can also add seconds and the AM/PM indicator. The alternative to the latter is to use the 24-hour clock format.

The following are acceptable time values:

1:15 PM (be sure to add a space before the AM/PM indicator)
 13:15
 13:15:01
 1:15:01 PM
 1:15

Learn to work with dates

In this exercise, you will enter dates into a worksheet.

- In the unsaved workbook from the previous exercise, click cell **A3**, type: **As of:** and press **TAB**.
- In cell **B3** type: **01 May** and press **ENTER**.

Notice that Excel puts the date in the default format and aligns it to the right.

- In cell **D3** type: **Expires:** and press **TAB**.
- In cell **E3** type: **Jul 15, 2020** and press **ENTER**.

	A	B	C	D	E
1					
2	Price Quote				
3	As of:	1-May		Expires:	15-Jul-20
4					
5	Airfare	450			
6	Hotel	1,050			
7	Car Rental	225			
8	Taxes	46.5		3.10%	
9	Airport Fe	9.9		2.20%	
10					
11					
12	Airline	Great West Airline			
13	Hotel:	Hotel Zathura			

- Select cell **E3**.

The date value for this cell also appears in the formula bar. The date value sequence corresponds to the setting in the Windows Control Panel.

- Select cell **B3**.

Because you have not included a year in this date value, Excel assumes it is the current year and adds it for you. If you want a different year, you must enter it as part of the date.

- Keep the workbook open for the next exercise.

Moving Around the Worksheet

You can move around the cells of a worksheet very quickly by either using the keyboard or scrolling with the mouse. Use one of the following methods to move around in the worksheet:

Scroll Bars – Click the arrow buttons at either end of the scroll bars to move one row or column at a time. Click on the scroll box (the size will vary depending on the zoom percentage) and drag to display another location in the worksheet.

LEFT, RIGHT, UP, DOWN ARROW – Press one of these directional keys to move one cell at a time.

HOME – Press this key to move to column A in the current row.

CTRL+HOME – Press this key combination to move to cell A1, regardless of where you are in the worksheet.

CTRL+END – Press this key combination to move to the last cell in the data table.

CTRL+G / F5 – Display the Go To dialog box so you can move quickly to a cell reference, range name, or bookmark, or use the Special button to find specific types of information (for example, Comments, Blanks).

Working with Workbooks

As you begin using workbooks, you need to consider how to organize your files for quick and easy access. This includes considerations such as how you name the file, where you save it, whether it needs to be saved as a specific file type, and whether you want to add or change the file properties to make it easier to find later. The Save commands are located in the Backstage view, which you access via the File tab.

Saving Workbooks

To be able to recall your work later, you must save your workbook before exiting Excel or turning off your computer. The saved file also provides an excellent fallback option if you try something in your worksheet that does not work as you expected, and you are unable or unwilling to undertake all the necessary steps to correct the problem.

When naming a workbook, keep the following in mind:

- Workbook names must follow the same basic rules as naming files in Windows: a maximum of 255 characters (including the drive and folder path), and none of these characters: / \ : * ? " < > |
- File names should be descriptive so that you can identify the contents quickly.
- Excel automatically assigns a .xlsx extension or file type at the end of the file name, so you need not do this. You only have to type in the name for the workbook.
- Files can be saved with two different types of save commands:
 - Use Save to save changes to the active workbook but retain the existing name and keep the file in the existing location.
 - Use Save As to save a new document or to save an existing document with a new name or new location.
 - When the file name appears in the Save As dialog box (Figure 1-10) as highlighted text, begin typing the new file name to insert the new file name for this workbook. Use the arrow direction keys to move anywhere in the existing file name to add or delete text to the file name.

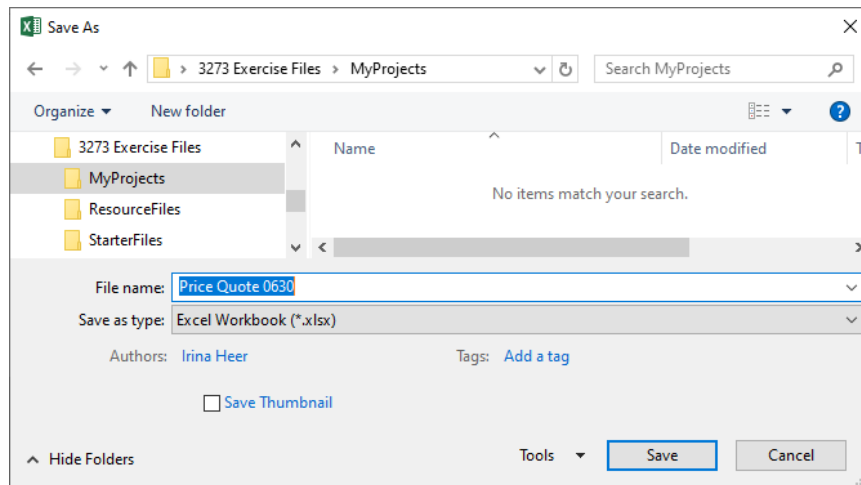


Figure 1-10: Save As dialog box

- To save a workbook as a different file type, such as an earlier version of Excel, use *Save as type* in the Save As dialog box to find the file format you need.
- By default, Windows sets up the Documents library to store files. Excel draws on this, but you are not restricted to this folder. You can:
 - Create your own folders to help organize files by clicking *New folder* on the command bar in the Save As dialog box.
 - Save in any location that you can access (hard drive, thumb drive, flash disk, network drive).

If you are unsure whether you have saved a file previously, look at the workbook name in the title bar to see if it is the default name of *Book1* (or *Bookx* where the *x* is a number). Alternatively, use *Save As* to give the workbook a different name, thereby ensuring you do not accidentally overwrite the workbook currently stored on the hard drive with the one on your screen.

Even if the file already exists in one location, you can save the same file to another location. Be careful with having files with the same name in different locations, as it may be difficult to determine which is the most current or valid version to use.

To view the file type (the extension part of the file name), you need to turn on this option using File Explorer. Click *View*, and on the *Show/hide* group, click *File name extensions* to activate it. Showing the file types can be helpful when determining which file you want to use. For example, two files may have the same name, but the file extensions show that one is in .xlsx format (Excel 2007 and later) while the other is in .xls format (Excel 2003 and earlier).

To save changes made to the current workbook using the same file name, use one of the following methods:

- click *File* and then *Save*, or
- on the Quick Access Toolbar, click *Save*, or
- press **CTRL+S**.

You can use *Views* in the *Save As* dialog box to help display the folders and files in the way you prefer (for example, list or thumbnails).

Learn to save workbooks

In this exercise, you will save the new workbook you have been creating.

1. In the unsaved workbook from the previous exercise, in the Quick Access Toolbar, click **Save**.

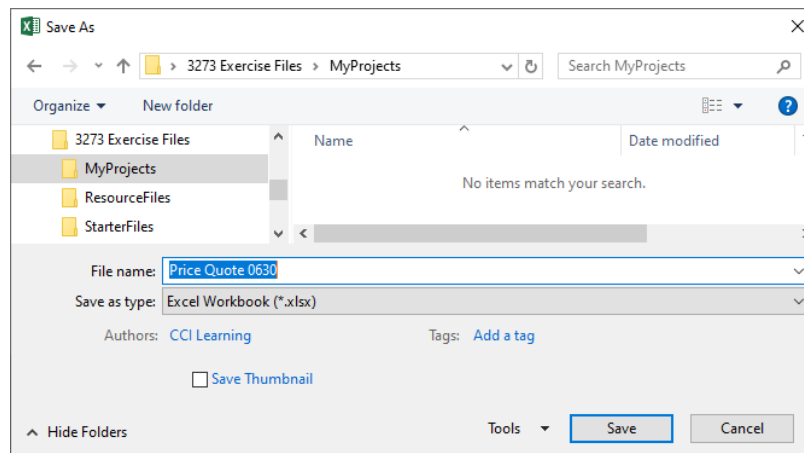
You are taken to Backstage view, and the Save As page is displayed. Even though you clicked Save, Excel will automatically skip to Save As for any new workbook that has not yet been saved. The Save As command allows you to assign the workbook a name and storage location.

2. Click the **Browse** button to open the Save As dialog box.
3. Navigate to the *3273 Exercise Files\MyProjects* folder.

Notice that Excel enters the current title of the workbook as a suggestion for the file name. You can use this name or replace it with a name of your choosing.

Whenever text is highlighted in a box, you can begin typing to replace existing text rather than deleting the characters first and then typing in the new name.

4. Click in the **File name** field, select the text if necessary, and type: **My Price Quote 0630**.



5. Click **Save**.

Note: You can also press ENTER after entering the file name to save the file.

6. Keep the workbook open for the next exercise.

Creating a New Workbook

While you are using a workbook, you can also create a new workbook at any time. You can have more than one workbook open and on the screen at any time. Each workbook is created in its own window, and each window can only have one workbook. Also, each workbook window can be placed anywhere on the Desktop, independent of any other workbook window that is open at the same time.

Each time you create a new blank workbook in a current session, Excel numbers it sequentially, starting at 1 as *Book#*, with # representing the number of new workbooks you have created up to that moment. The document numbering will begin at 1 again when you start a new session of Excel.

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

- to create a new blank document, click File, click New, then click Blank workbook, or
- press CTRL+N.

Instead of starting with a blank workbook, you can create a workbook using a **template**. A template is simply a pre-designed workbook that may already contain data, formulas, and other objects, which saves you time and effort. Examples of common templates are sales invoices, balance sheets, and loan amortization schedules. Whenever you use the New option to create a new workbook, you will be presented with many pre-made templates (in addition to the blank workbook) that you can begin using immediately. You can also search for additional templates online from the Microsoft Office.com website using the search text box at the top of the window. In reality, all of these templates are downloaded from the Microsoft Office website. The New page (shown in Figure 1-11) simply displays some examples that may be of interest to you.

Note: You can access templates from the Microsoft Office website only if you have a live, non-restricted Internet connection. If you do not, you will not see any suggested templates in the New page. You can still use templates if you obtain them from another source. Any templates required for this course will be provided to you.

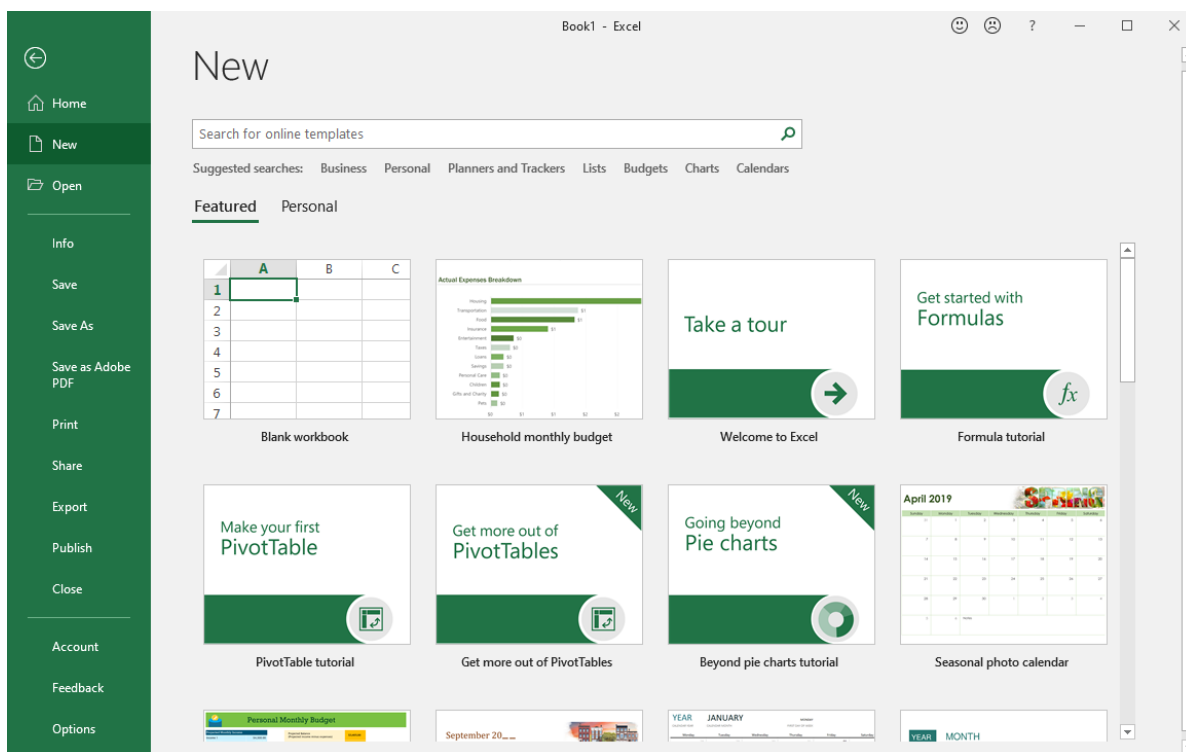


Figure 1-11: New page, Backstage view

To create a new workbook from a template, click File, click New, click a template, and then click Create.

Learn to create new workbooks

In this exercise, you will create new workbooks.

1. With the My Price Quote 0630 workbook open, press **CTRL+N**.

You should now have a new blank workbook titled as Book2 on the screen, appearing in front of the My Price Quote 0630 workbook.

- If the Excel window is maximized to the full screen, click the  (**Restore Down**) button to change it to a window.

Two workbooks are now visible on your screen.

- Click **File** to display the Office Backstage and then click **New** in the panel at the left to access the New page in Backstage view.

In addition to the Blank workbook option, several other workbook templates are also readily available.

Note: If you do not have access to templates on the Microsoft Office website, you will not be able to complete Steps 4 and 5 in this exercise; create another new blank workbook instead and skip to Step 6.

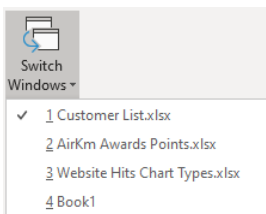
- Scroll down the screen and click one of the available templates. The preview window appears showing an image of the template and a brief description.
 - Click **Create**.
- Notice that many elements are created automatically. This demonstrates how using a template can save you time and effort when creating a workbook.
- Save your new workbook with the name **My Workbook** in the *3273 Exercise Files\MyProjects* folder.

Switching Between Workbooks

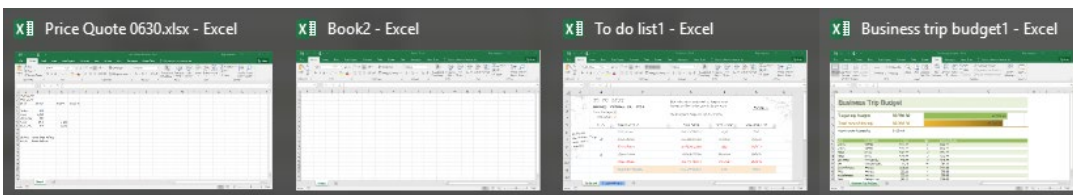
Objective 1.4.4

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

- on the View tab, in the Window group, click Switch Windows, or



- hover the mouse pointer over the Excel button on the taskbar to display a preview of each open workbook, or



Tip: In this example, there is only one Excel icon in the Windows Taskbar even though you have four workbooks currently open. You can reconfigure the Taskbar so that one Excel icon will appear for each open workbook by right-clicking the Taskbar, selecting Taskbar settings and, under the *Combine taskbar buttons* option, choosing When taskbar is full.

- press CTRL+TAB to jump to the next open workbook, or
- if the workbooks are restored down as windows on the Desktop (as shown in Figure 1-12), click the title bar for the appropriate workbook to pull it to the front.

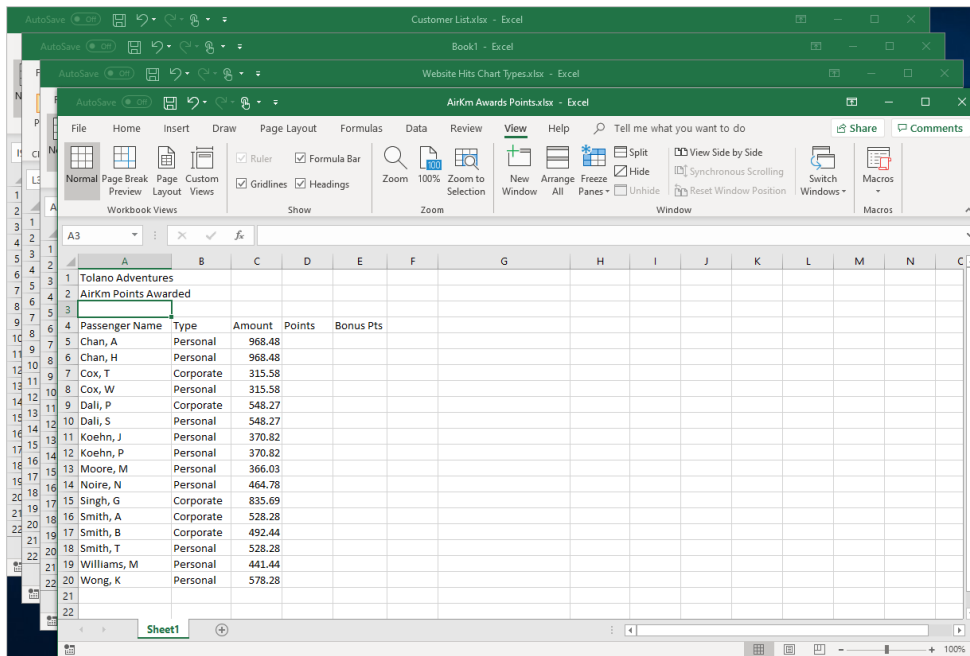


Figure 1-12: Restored windows

Learn to switch between workbooks

In this exercise, you will switch among open workbooks.

There should be three workbooks open on your screen: *MyWorkbook*, *Book2*, and *My Price Quote 0630*. The *MyWorkbook* workbook should be the active workbook; that is, it is displayed on top of the other workbooks.

1. Click the **View** tab.
2. In the Window group at the right, click **Switch Windows**.
3. Click **Book2**.

The empty *Book2* workbook should now be the active workbook and is displayed on top of the other workbooks.

4. Point at the Excel icon on the taskbar at the bottom of the screen and then click **My Price Quote 0630**.

This workbook should now be the active workbook.

5. Keep the workbooks open for the next exercise.

Opening a Workbook

If you want to work with a previously created and saved workbook, you must first open it. You can open as many workbooks as needed. The only limitation is the amount of memory available on your system to handle multiple workbooks.

If you do not recall the name or location of the Excel workbook, use the File Explorer to try to find the workbook on the computer or on the network. Alternatively, Excel displays a list of the most recently opened workbooks, which you can use if you know that the workbook was recently used on the computer you are using.

Use one of the following methods to open a workbook:

- if Excel is starting up, click the desired workbook in the Recent section of the Excel startup screen or click More workbooks, or
- right-click the Excel Quick Launch icon in the taskbar and select the recently used workbook from the Recent list, or
- with a workbook currently open, click File, click Open, and then click the file from the list of recently used workbooks (Figure 1-13), or

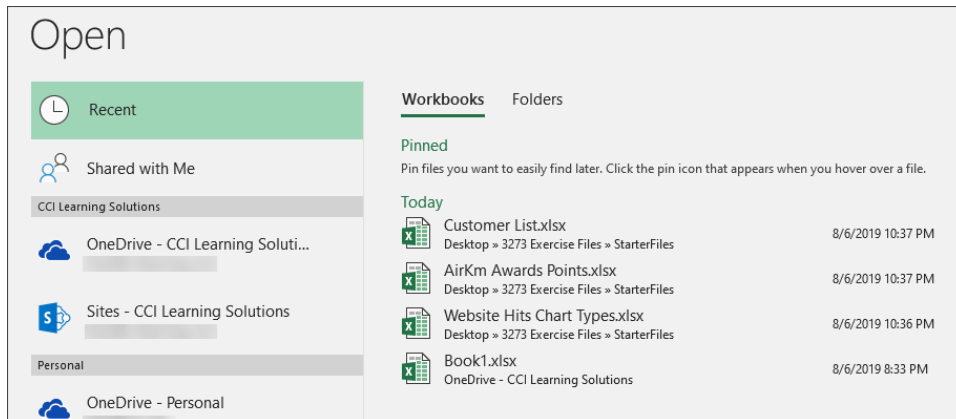


Figure 1-13: Using the Recent option in the Open screen in Backstage

As you open workbooks, Excel displays the files in the same order as you opened them, with the most recent at the top of the list. As you reach the maximum number of files that show in this list, the oldest drops from the list. You can click the pin icon at the right of the file name to make this file always available in the list until it is unpinned. By default, you can see a list of up to 50 recent workbooks at a time. This number can be customized.

- click File, click Open, click This PC and use this Open screen (Figure 1-14) as a simplified File Explorer to navigate around your PC, then click on the workbook to open, or

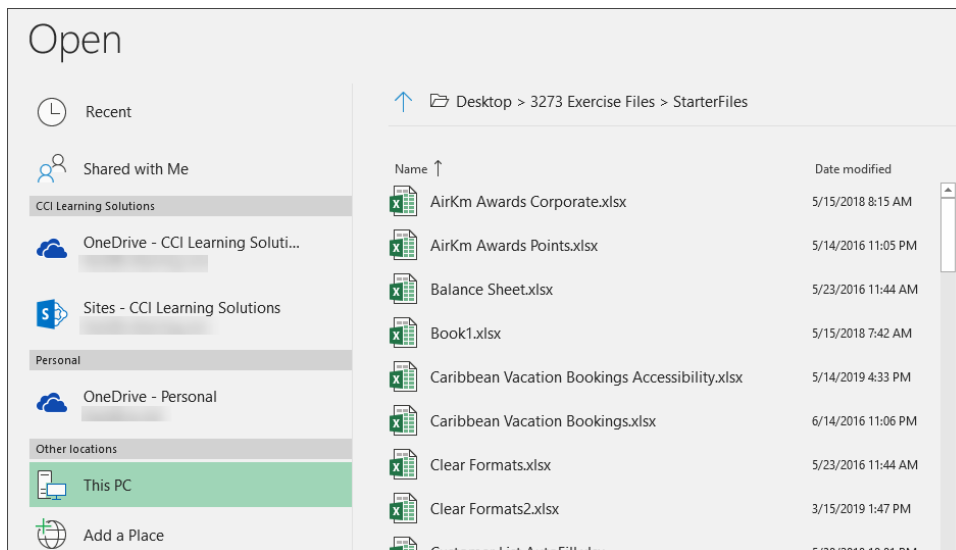


Figure 1-14: Using the This PC option in the Open screen in Backstage

- click File, click Open, then click Browse to display the Open dialog box.

The Open screen in the Backstage displays several options to look for your workbooks: your most recently used folders, a link to your OneDrive service, a link to all files and folders on your local computer, and a Browse button for you to use the Open dialog box to find your workbooks. You can also press CTRL+O to display this same Backstage view.

The Open dialog box (Figure 1-15) looks and works like the File Explorer: the navigation pane on the left side allows you to quickly jump to different storage areas connected to your computer, whether they are on your local physical drives, storage drives available on the network, or remote storage on the Internet. If you prefer using it, you can press CTRL+F12 to go directly to the Open dialog box without displaying the Backstage view.

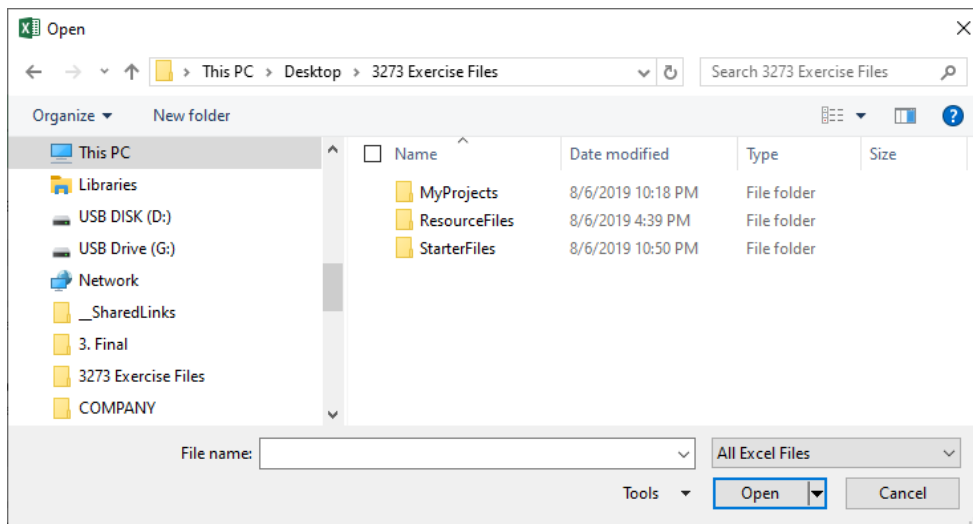


Figure 1-15: Open dialog box

In the main display pane, you can navigate using the mouse or keyboard to display the files or folders and then use one of the following methods to open a document:

- double-click the file name, or
- click on the file name to select it, and then click Open or press ENTER.

Closing a Workbook

Once you have finished creating or updating a workbook, close it to clear the screen and free up computer memory. This ensures that any unsaved data for that workbook is saved onto the hard drive, and protects the workbook from unintended changes. Closing your workbook is much like closing a book and putting it back on the shelf before opening another book.

You can use one of the following methods to close a workbook:

- click File and then Close, or
- press CTRL+W or CTRL+F4, or
- click the  Close button.

Note: Because each workbook is running in its own Excel application window, closing one workbook will not affect any other open workbooks.

If you add or change something in a new or existing document, which has not yet been saved, Excel prompts you with the option of saving the workbook before closing it. If the workbook has been open for more than 10 minutes (this time interval can be changed), an additional note is added to the message box to indicate that it will still be available even if you accidentally discard the workbook without saving it. These message boxes are shown in Figure 1-16.

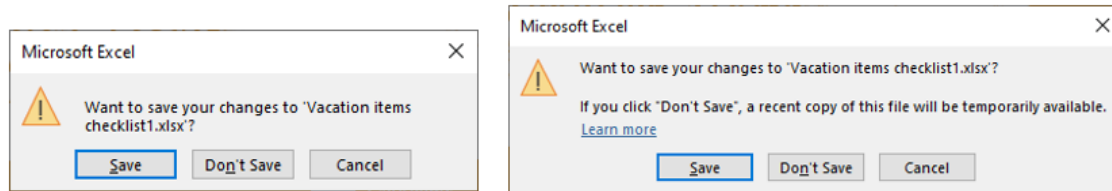


Figure 1-16: Message boxes prompting you to save changes

You can choose to close the workbook without saving the changes.

Learn to close workbooks

In this exercise, you will use several different techniques to save and close workbooks.

Begin by opening another workbook.

1. Click **File** and then **Open**.
2. Click **Browse**.
3. Navigate to the *3273 Exercise Files\StarterFiles* folder.
4. Click the **Office Expenses** file and click **Open**.

Assume that you are now finished viewing the contents of this workbook, and you want to close it.

5. Click **File**, and then click **Close**.

The Office Expenses file is no longer on the screen.

Now close another workbook using the close button.

6. On the View tab, in the Window group, click **Switch Windows**.
7. Click **Book2**.
8. Click the **Close** button in the upper right corner of this workbook.
9. If a pop-up message box appears with the question: "Do you want to save your changes to 'Book2'," click **Don't Save**.

Close another workbook but use the close button in the taskbar preview this time.

10. Point to the Excel button in the taskbar, then point to the **MyWorkbook** workbook, and click the **Close** button for that workbook.

The only remaining workbook should be the My Price Quote 0630 workbook.

11. Press **CTRL+W** to close the workbook.

All workbooks should now be closed.

Working with the Compatibility Mode

Objective 1.5.4

Excel 2007 and later versions all use the same file format for saved workbooks, which have the extension .xlsx at the end of the file name. If you have a user who is using Excel 97, 2000, 2002, or 2003, then you must save your workbook as a new and different file using the older format to enable them to open it. These workbooks use the file extension of .xls. To save a workbook in this format, click File, click Save As, and then click the *Save as type* arrow and select Excel 97-2003 Workbook.

All versions of Excel released after 2007 are able to open any files saved in the 97-2003 format. They can also make changes to the older file type's contents and save the workbook in the older format. Excel will inform you that the workbook is using an older format by displaying the words "Compatibility Mode" next to the workbook name in the title bar.

However, all versions of Excel released after 2007 have many features and capabilities that did not exist (or worked differently) in these earlier versions. Excel provides a few tools to help you check the workbook and ensure that it is compatible with earlier Excel versions. These tools are available in Backstage via the File tab and the Info category.

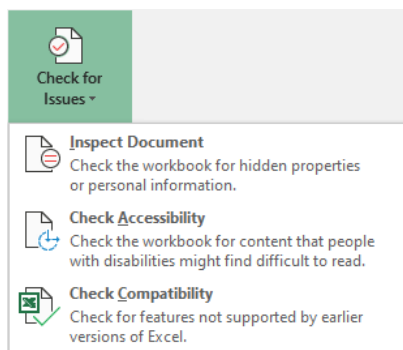
To check if there may be problems with converting your workbook to a different file format than .xlsx, click File, click Info, click Check for Issues, and then click Check Compatibility.

Any potential problems between the versions appear in the list. You then need to decide whether to continue saving the file in this file format or return to the document to make appropriate changes.

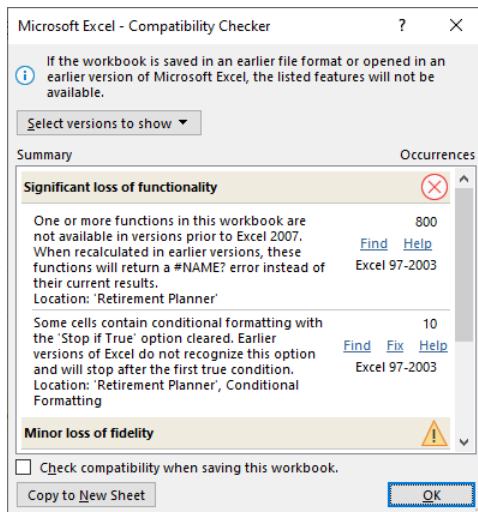
Learn to check compatibility

In this exercise, you will check a workbook for compatibility before saving it in the .xls format.

1. Click **File**, and then click **Open**.
2. Navigate to the *StarterFiles* folder and double-click the **Retirement Planner** workbook to open it. The workbook includes formulas that will calculate the required earnings and savings each year to achieve your retirement goals.
3. Click **File**.
4. Click **Check for Issues**.



5. Click **Check Compatibility**.



A quick look at the relative size of the elevator button to the length of the vertical scroll bar indicates how many compatibility issues you have when trying to save the workbook to the older format. In addition, this window shows the number of occurrences of each problem.

6. Read through the list of findings, then click **OK**.

For the purpose of this exercise, you will proceed with saving this workbook in the older format, even though there are unresolved compatibility issues.

7. Click **File** and then click **Save As**.
8. Click **Browse**, navigate to *3273 Exercise Files\MyProjects*.
9. In the Save As dialog box, click the **Save as type** arrow, and then click **Excel 97-2003 Workbook (*.xls)**.

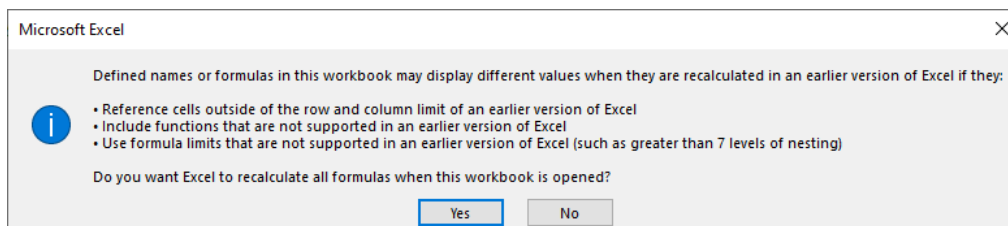
The Save As dialog box displays all other existing workbooks of the same type. There are no others in this folder.

10. Change the file name to **My Retirement Planner** and click **Save**.

The Compatibility Checker dialog box is displayed again as a warning.

11. Click **Continue**.

The message box shown here describes some of the problems you may have when opening this file in the older version of Excel.

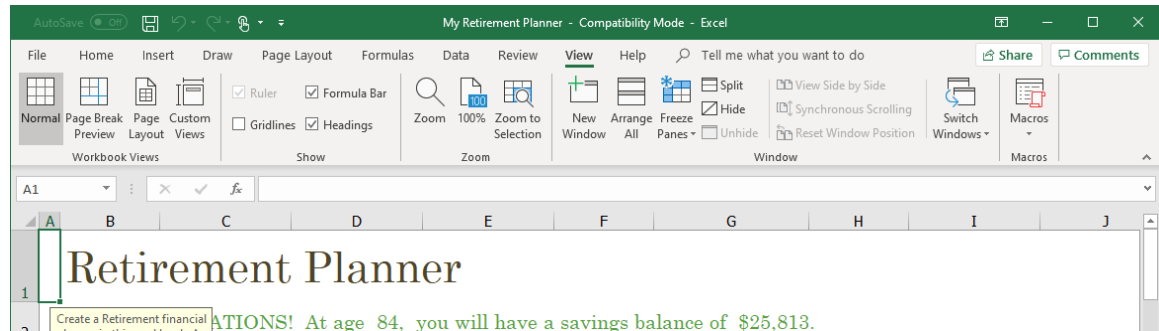


The Compatibility Checker dialog box gave you the details of the differences. Because this is a standard warning for any workbook containing formulas, these problems may not apply to this workbook.

12. Click **Yes**.
13. Press **CTRL+W** to close the workbook and keep the Excel application window open.

14. Click **File, Open, Browse** and double-click the **My Retirement Planner** workbook to open it.

The workbook name in the title bar now shows the label - Compatibility Mode - next to it. This indicates that this workbook uses the file format for an earlier version of Excel.



15. Close the workbook again by pressing **CTRL+W** and don't save any changes.

Selecting Cells

The ability to select a range of cells is a fundamental skill in Excel. Prior to issuing a command or undertaking a procedure, you must indicate what part of the worksheet you wish to affect with the command. Range selection is the means to indicate this area.

A range selection can be as small as a single cell, or as large as the entire spreadsheet. Excel keeps the cell(s) highlighted until you change or remove the selection. Clicking a cell or using an arrow key will remove the selection.

In a worksheet, you can select:

- a single cell, that is, the active cell
- a single range, for example, a rectangular section of a worksheet containing two or more cells
- multiple ranges of cells

Excel displays the selected range by reversing the color of the cells. Within the selected range, one cell appears in a normal color. This is the active cell of the range.

You can use the mouse to select different ranges as follows:

A single cell – Click the cell.

Extend the selection – Click the cell, press and hold the left mouse button, drag to the end of the desired range, and then release the mouse button.

An entire row – Click the row heading.

An entire column – Click the column heading.

The entire worksheet – Click the **Select All** button in the top left corner of the worksheet (the triangle to the left of the column headings and above the row headings).

Make a selection – Click the beginning cell in the range, then point to the ending cell in the range and press and hold SHIFT while clicking on the ending cell in the range.

Extend/shrink a selection – Press and hold SHIFT and click inside the previously selected range to shrink the selection or click outside the range to extend the selection.

Other selection techniques include:

Non-adjacent columns, rows, or cells– Click the cell, column, or row. Move the pointer to the next cell, column, or row, press and hold CTRL, then click and drag.

Extend the row selection – Click the row number, press and hold the left mouse button, and drag.

Extend the column selection – Click the column letter, press and hold the left mouse button, and drag.

In some cases, you may want to use the keyboard to select cells by using SHIFT with the arrow keys. Generally, you have better control when selecting large cell ranges with the keyboard, especially when having to scroll to other parts of the worksheet at the same time. Note that you cannot select non-adjacent rows, columns or cells using the keyboard only.

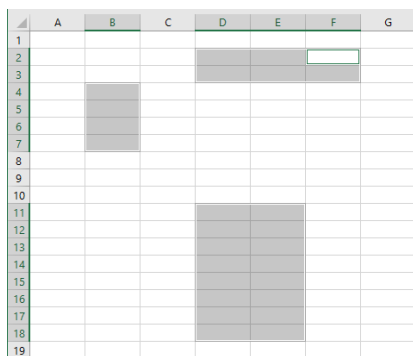
Learn to select cell ranges

In this exercise, you will select ranges of cells using the mouse in a blank worksheet.

1. Create a new blank workbook.
2. Select a single cell by clicking cell **A9**.
3. Select a range of cells by holding the left mouse button down in cell **A9**, dragging the mouse to cell **C5**, and then releasing the mouse button.
4. Select an entire column by clicking on the column **E** header at the top of the worksheet.
5. Select an entire row by clicking on the row **14** header on the left side of the worksheet.
6. Select the entire worksheet by clicking **Select All** in the top left corner of the worksheet (the gray triangle to the left of the column A header and above the row 1 header).

Now select more than one non-contiguous range of cells

7. Select the range of cells **B4** to **B7**.
8. Press and hold **CTRL** and select cells **D11** to **E18**.
9. Continue holding **CTRL** and select cells **F2** to **D3**. Release **CTRL**.



Now use the keyboard to select a range of cells.

10. Select cell **A9**.
11. Press and hold **SHIFT**, then press the appropriate arrow keys to extend the range to cell **C5**. Release **SHIFT**.

Now try selecting another range of cells using an alternate method with the keyboard.

12. Select cell **E10**.

13. Press and hold **SHIFT**, then click cell **G15**.

14. Close the workbook without saving.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- ☒ Explain what an electronic spreadsheet is.
- ☒ Understand what Excel is and what it can do.
- ☒ Identify elements on the Excel screen.
- ☒ Understand some basic terminology.
- ☒ Move around within Excel.
- ☒ Use keyboard shortcuts.
- ☒ Enter text, numbers, dates, and times.
- ☒ Move around within a worksheet.
- ☒ Use the Backstage view to save, create new, open, and close workbooks.
- ☒ Switch among open workbooks.
- ☒ Save in a previous version Excel format, and check for compatibility issues.
- ☒ Manage files and folders.
- ☒ Select cells.

Key Terms

Term	Definition
Active cell	The currently selected cell.
Backstage	A view that allows you to manage the workbook, including printing, opening and saving in different formats, and changing the metadata.
Contextual tab	A ribbon tab that appears only when applicable.
Formula bar	A field on the screen that displays the contents in the active cell. It can also be used to make entries into the worksheet.
Quick Access Toolbar	A toolbar that appears in the upper left part of the Excel window that contains buttons for frequently used commands. It is customizable to give you access to commands that you use frequently.
Ribbon	The collection of commands grouped under different tabs across the top of the Excel screen. Each tab is aimed at a type of activity, such as controlling the page layout or inserting items into a worksheet.
Template	A pre-designed workbook that may already contain data, formulas, and other objects, thereby saving you time and effort in entering these items.

Quiz Questions

For each question, select the best answer.

1. You should use an electronic spreadsheet if you want to:
 - a. Create a presentation for viewing at a kiosk.
 - b. Perform a large number of mathematical calculations and display charts and graphs.
 - c. Track extremely complex data relationships.
 - d. Create and print a full-color brochure for investment brokers.
2. What is the difference between a workbook and a worksheet?
 - a. A worksheet is a document created in Access, while a workbook is created in Excel.
 - b. A worksheet can contain numbers, text and formulas, whereas a workbook can contain only numbers.
 - c. A worksheet is a document divided into columns and rows, whereas a workbook is a single Excel file containing one or more worksheets.
 - d. A worksheet contains data for viewing onscreen only, whereas a workbook can be printed.
3. If you want to access the Ribbon using the keyboard, you should:
 - a. Press the Alt or F10 key.
 - b. Turn on Excel's built-in accessibility features.
 - c. Press CTRL+ALT+DEL.
 - d. Press the WINDOWS key.
4. The Auto-hide Ribbon, Show Tabs, and Show Tabs and Commands options are available when you click which button?
 - a. Formula bar
 - b. Ribbon display options
 - c. Quick access toolbar
 - d. Dialog button
5. Text, numeric and formula are examples of:
 - a. Types of data.
 - b. Types of cell formats.
 - c. Types of worksheets.
 - d. Types of cell addresses.
6. Which of the following entries will NOT be recognized as a date by Excel?
 - a. 9//15
 - b. 9/15-1
 - c. 9/15
 - d. 9-15

7. Amanda has just updated her Budget 2019 workbook with new values for 2020. She wants to save her revised file as Budget 2020. Which command should she use?
 - a. Save
 - b. Save As
 - c. Update
 - d. Rename
8. You should create a new workbook using a template when:
 - a. You want to enter information using your own layout.
 - b. You want to use a design and layout previously created, either to enter data or to use as a base for your own reports.
 - c. You want to create a workbook that is automatically password-protected.
 - d. You want to start out with one blank worksheet.
9. You need to share your Excel workbook that you created in Office 365 with a colleague who uses Excel 2003. What should you do?
 - a. Use the Check Compatibility tool to inspect the workbook for any compatibility issues with Excel 2003, then save your workbook in Excel 97-2003 format.
 - b. Encourage your colleague to upgrade to the latest version of Excel so he can work with your data.
 - c. You don't need to do anything – Excel 2003 can open any Excel workbook regardless of the version, with no difficulties.
 - d. Allow your colleague to use your computer when working on the file.
10. How do you select different areas of a worksheet at the same time?
 - a. Use the ALT key as you click to select other cells.
 - b. Use the WINDOWS key as you click to select other cells.
 - c. Use the F1 key as you click to select other cells.
 - d. Use the CTRL key as you click to select other cells.
11. Which keyboard combination can you use to switch among open workbooks?
 - a. CTRL+TAB
 - b. SHIFT+TAB
 - c. CTRL+N
 - d. WINDOWS+S

Microsoft® Excel

Associate Certification Guide

Lesson 2: Constructing Cell Data

Lesson Objectives

In this lesson, you will make changes to data in the worksheet, change the structure of the worksheet, and add and remove worksheets in the workbook. Upon completion of this lesson, you should be able to:

- | | |
|--|--|
| ☐ Edit cells and undo changes. | ☐ Insert and delete cells. |
| ☐ Cut, copy, and paste data. | ☐ Use AutoFill to copy and fill series. |
| ☐ Use Paste Special. | ☐ Rename worksheets. |
| ☐ Change column widths. | ☐ Insert and delete worksheets. |
| ☐ Change row heights. | ☐ Move and copy worksheets. |
| ☐ Use AutoFit with columns or rows. | ☐ Hide and unhide worksheets. |
| ☐ Hide and unhide rows and columns. | ☐ Add color to the worksheet tabs. |
| ☐ Insert and delete rows and columns. | |

Editing Cells and Undoing Changes

Once you have entered your data into a worksheet, you may want to rearrange the data or change it to suit your needs and preferences. If your “spreadsheet” is a very large piece of paper, you will waste a lot of time erasing and rewriting your data each time your requirements change. With an electronic spreadsheet, you can easily make quick changes to the display and arrangement of the data on the worksheet.

There are two ways to modify a cell that contains data:

- Enter the new value into the cell and press ENTER to replace the original contents with the new contents. This method is popular because it does not require the use of any special keys or modes.
- Activate Excel's editing mode by pressing the F2 key, then use the LEFT ARROW, RIGHT ARROW, BACKSPACE, DELETE, HOME and END keys to move inside the cell and make the changes. Note that anything you type is added to existing content. You can also type over the cell contents by pressing INSERT while you are in the editing mode. You may still have to delete any remaining characters from the previous text.

Note: You can also activate the editing mode by double-clicking on the data in a cell, or by clicking in the Formula bar.

If you are entering data into an empty cell (a cell that does not currently contain a value), you can only make corrections by pressing BACKSPACE prior to pressing ENTER. Excel allows you to use the cursor movement keys only when you are in edit mode (F2).

Excel has an **Undo** function that enables you to undo commands that you have executed in your worksheet. You can undo a maximum of the 100 most recently used commands. This history of commands is listed in reverse order (the most recent action is listed at the top, followed by the next most recent) and can be accessed by clicking the arrow next to the Undo button. The list remains available to you even if you save the workbook but will be lost once you close it.

To undo an action, use one of the following methods:

- on the Quick Access Toolbar, click Undo to reverse the last action. Alternatively, click the Undo arrow to display the history of the most recently used commands; or
- press CTRL+Z to reverse the last action. Each time you press this key sequence, you will undo a previous action.

Some actions cannot be undone—specifically any Backstage actions such as saving, opening or printing a workbook.

In addition to undoing commands, Excel enables you to redo commands. If you reverse a command, then immediately want to undo your undo, you can redo the command to put it back in your worksheet. The Redo function is available only if one or more commands were undone.

To redo an action, use one of the following methods:

- on the Quick Access Toolbar, click Redo to reverse the last undo. Alternatively, click the Redo arrow to display the list of all actions that can be reversed, or
- press CTRL+Y to reverse the last action. Each time you press this key sequence, you will redo a previous action.

Learn to edit cell content

In this exercise, you will edit cells containing text, numbers, and dates.

1. If necessary, launch Excel, then open the **World Travel Destinations** workbook located in the 3273 *Exercise Files\StarterFiles* folder.
2. Save the workbook as: **My World Travel Destinations** in the *MyProjects* folder, and then review the data.

Perhaps you notice that Egypt and France have each other's capital city. You will switch them around by replacing the cells with the correct values.

3. Select cell **B8**, type: **Cairo** and press **ENTER**.
4. Select cell **B9** and enter: **Paris**.

Now try using the editing mode to modify the contents of a cell.

5. Select cell **A2** and press **F2**.
6. Press **BACKSPACE** twice.
7. Type: **na** and press **ENTER**.

The contents of the cell should now be Argentina.

8. Select cell **C4** and enter: **30,510**.
9. Select cell **C3**, press **F2** and press **HOME**. Type: **768** and press **ENTER** so the final value shows as 7,686,850.
10. Select cell **B22**, press **F2** and press **HOME** or **LEFT ARROW** to position the cursor to the left of the month value of 5. Press **DELETE** and type: **6** to change the month to June, then press **ENTER**.
11. Use **F2**, **LEFT ARROW**, **RIGHT ARROW**, **DELETE**, **BACKSPACE** and other keyboard keys as necessary to correct the indicated cells as follows:

Cell	Should be
A5	Brazil
A10	Germany
A14	Italy
A20	United States of America
B14	Rome
B19	London
C13	3,287,590
C11	1,092

	A	B	C
1	<u>Country</u>	<u>Destination</u>	<u>Size (sq km)</u>
2	Argentina	Buenos Aires	2,766,890
3	Australia	Melbourne	7,686,850
4	Belgium	Brussels	30,510
5	Brazil	Rio de Janeiro	8,511,965
6	China	Shanghai	9,596,960
7	Cuba	Havana	110,860
8	Egypt	Cairo	1,001,450
9	France	Paris	547,030
10	Germany	Berlin	357,021
11	Hong Kong	Hong Kong	1,092
12	Iceland	Reykjavik	103,000
13	India	Mumbai	3,287,590
14	Italy	Rome	301,230
15	Netherlands	Amsterdam	41,526
16	South Africa	Cape Town	1,219,912
17	Spain	Barcelona	504,782
18	Thailand	Bangkok	514,000
19	United Kingdom	London	244,820
20	United States of America	New York	9,629,091
21			
22	List updated on:	2-Jun-19	

Suppose you change your mind at this point and need to reverse the last change made.

12. On the Quick Access Toolbar, click **Undo**.

The value in cell C11 has changed back to 101,092.

If you then decide that the change was correct, you can redo or repeat the last change made.

13. On the Quick Access Toolbar, click **Redo**.

The value in cell C11 has changed back to 1,092.

14. Save and close the workbook.

Copying and Moving Data

Cutting, Copying and Pasting Data

Excel enables you to copy or move cell contents and their formats to simplify editing tasks and streamline worksheet construction. There are very significant differences between copying the contents of a cell and moving the contents to another worksheet cell.

You can move the contents of a cell or range of cells to a different part of the worksheet, a different part of the workbook, or even a different workbook. This removes the values from the original location and places them in the new location.

Alternatively, you can copy the contents of a cell and range of cells to a different location. By copying, you do not affect the original cells. The originating data remain in their current cells.

Cut – Marks the contents of a cell or a range of cells for removal and places a copy on the **Clipboard**.

Copy – Marks the contents of a cell or a range of cells for copying and places a copy on the Clipboard.

Paste – Puts the contents of the marked cell or range of cells into the new cell location. If the previous action was Cut, then the contents of the marked cell(s) are removed. If the previous action was Copy, the marked cells remain unchanged. If the new cell location already contains data or formatting, the pasted data will overwrite the existing data and formatting.

Paste Special – Modifies the effects of the paste option (for example, you can paste the contents or format only). In comparison, the Paste command is non-selective and pastes all features of the originating cells.

When you select either the Cut or Copy command, a **marquee** (a rectangle outlined with a moving, dotted line) appears around the selected cell range. This marquee identifies the cell range that you can paste to another part of the worksheet or to another worksheet. At the same time, the contents of this cell range are also copied into an internal Clipboard, which is used as a temporary storage area to enable the subsequent Paste command. You can remove the marquee (cancelling the copying or moving action) by pressing ESC. You can also cancel the copying or moving action by typing new data into a cell. When you enter new data, Excel interprets that you want to continue the editing process on your spreadsheet, and so the marquee disappears.

- You can copy or move any kind of data – text, numbers, dates, formulas, drawing objects and charts – that you have embedded in a worksheet.
- You can copy a range of cells more than once. On the Home tab, in the Clipboard group, click Copy and click Paste as many times as necessary in several cells.
- You can also cut or copy more than one cell range and retain up to 24 cell ranges on the Clipboard at one time. You can then paste any or all these cell ranges from the Clipboard in any sequence you want.

To copy an item, select it and then use one of the following methods:

- on the Home tab, in the Clipboard group, click Copy, or
- press CTRL+C, or
- right-click the item, and then click Copy.

To cut or move an item, select it and then use one of the following methods:

- on the Home tab, in the Clipboard group, click Cut, or
- press CTRL+X, or
- right-click the item, and then click Cut.

To paste an item, move to the cell where you want to paste it, and then use one of the following methods:

- on the Home tab, in the Clipboard group, click Paste, or
- press CTRL+V, or
- right-click the destination cell, and then click Paste.

Once you paste a cell or cell range, you will see the Paste Options button appear at the bottom right of the pasted range. You can click the arrow and point to the options in the shortcut menu to preview how the pasted item will appear in the new location (Figure 2-1).

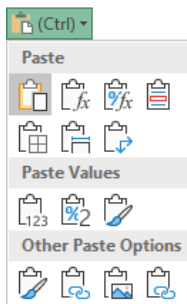


Figure 2-1: Paste options shortcut menu

Note: You will learn more about paste options in the next section.

More data can be added at any time simply by entering the data into the blank rows below, or into blank columns to the right of the existing data. In many cases, you should not leave any blank rows or columns in your data if all the data is related to each other. In some cases, you can use blank rows and columns to improve the readability of your data.

Learn to copy and paste data

In this exercise, you will copy and move the contents of cells from one part of a worksheet to another. You will also use text labels and row and column titles.

1. Open the **Office Expenses** workbook located in the *StarterFiles* folder and save it to the *MyProjects* folder as: **My Office Expenses**.
2. Enter the following new data:

Cell	Enter
A12	Utilities
B12	325
C4	February
D4	March

Now copy and paste data.

3. Click cell **B5** and drag the mouse down to select cell **B8**.
4. On the Home tab, in the Clipboard group, click **Copy**.

	A	B	C	D
1	Tolano Adventures			
2	Office Expenses			
3				
4		January	February	March
5	Rent	5000		
6	Telephone	150		
7	Internet	125		
8	Photocopier	80		
9	Supplies	250		
10	Courier	65		
11	Advertising	250		
12	Utilities	325		

Notice that the marquee appears around cells B5 down to B8 to indicate that you have copied their contents onto the Clipboard.

5. Select cell **C5** and, in the Clipboard group, click **Paste**.

Notice that Excel has copied the data from all marked cells into the correct place, even though you only chose one cell. Excel will automatically replace the contents of the existing cell(s) with the copied entries.

You can also press ENTER to paste the entries into this location. However, this technique will allow you to paste the entry only once, and then will automatically turn off the marquee.

6. Select cell **D5** and press **ENTER**.

Alternatively, you can continue using the Paste button to paste these values into as many destination cells as you want, as long as the marquee appears around the cells being copied.

7. Select cells **B9** to **B12** and click **Copy**.
8. Select cells **C9** to **D12** and click **Paste**.
9. Select cell **E9** and click **Paste**.
10. Select cell **F9** and click **Paste**.
11. Select cell **G9** and click **Paste**.
12. Click **Undo** in the Quick Access Toolbar, then click it three more times.
13. Press **ESC** to turn off the marquee, then enter the following data:

Cell	Enter	Cell	Enter
C9	95	D9	175
C10	150	D10	160
C11	325	D11	300
C12	350	D12	300

The completed worksheet should look like the following:

	A	B	C	D
1	Tolano Adventures			
2	Office Expenses			
3				
4		January	February	March
5	Rent	5000	5000	5000
6	Telephone	150	150	150
7	Internet	125	125	125
8	Photocopier	80	80	80
9	Supplies	250	95	175
10	Courier	65	150	160
11	Advertising	250	325	300
12	Utilities	325	350	300
13				

14. Save and close the workbook.

Using Paste Special

Objective 2.1.1

The standard Paste command will paste the cells you have selected with Cut or Copy into the target cell(s), including data, formulas, formatting, and any comments. In some cases, you may not want to paste the data and all its attributes together at the same time.

You can click the Paste arrow as you are performing the paste operation and select an option in the Paste menu (Figure 2-2) to specify what you would like to paste.

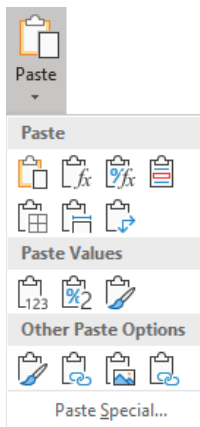


Figure 2-2: Paste menu

The Paste menu gives you the full range of all options available for pasting the selected cell contents to a target cell range. This menu enables you to selectively choose to paste only the data values, formulas, formatting, comments, or a combination of these.

At the bottom of the Paste menu is the Paste Special command. Click it to open the Paste Special dialog box, shown in Figure 2-3.

Paste – Specifies what components of the data in the Clipboard are pasted to the target cells. For example, if Formulas is specified, then only the formulas are selected and other components such as cell formatting will not be pasted. If Values is selected, then only the data (if a cell contains a formula, then the formula result is used) is pasted and other components such as cell formatting will not.

Operation – Specifies how any data in the target cells will be treated. For example, if Multiply is selected, then any existing data will be multiplied by the data pasted into the target cells.

Skip blanks – If selected, this will avoid overwriting any existing data in the target cells if there is no data from the Clipboard to be put into that cell.

Transpose – If selected, this will rotate the data. Therefore, the data in the Clipboard listed down a column will now be listed across a row in the target cells. Similarly, data listed across cells in a row will be listed down cells in a column.

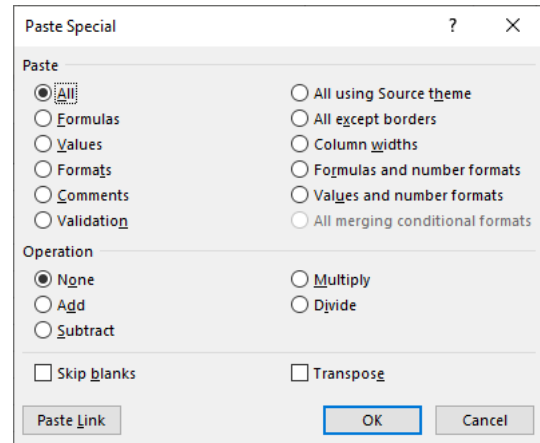


Figure 2-3: Paste Special dialog box

Learn to use Paste Special

In this exercise, you will use the Paste Special feature in a specialized worksheet that highlights its capabilities.

1. Open the **Paste Special** workbook located in the *StarterFiles* folder and save it to the *MyProjects* folder as: **My Paste Special**.

Columns A and C contain data values in the cells. Column B contains formulas that reference cells in column A. Formulas will be discussed in more detail in a later lesson in this courseware.

First, try pasting just values from columns A and B to a set of target cells.

2. Select cells **A2** to **B6**, and on the Home tab, in the Clipboard group, click **Copy**.
3. Select cell **G3**. On the Home tab, in the Clipboard group, click the **Paste** arrow.

A drop-down menu is displayed.

4. Click **Paste Special** at the bottom of the drop-down menu.
5. In the Paste Special dialog box, click **Values** and click **OK**.

	A	B	C	D	E	F	G	H	I
1	Values	Formulas	Values						
2	10.1	20.2	60.6						
3	20.20	40.40	70.7				10.1	20.2	
4	\$30.30	\$60.60	80.8				20.2	40.4	
5	4.04E+01	8.08E+01	90.9				30.3	60.6	
6	FRED	fred	JOE				40.4	80.8	
7							FRED	fred	
8									
9									

Hint: Alternatively, you can select the left-most icon in the Paste Values section of the drop-down menu. This is a faster method of accessing the feature than using the Paste Special dialog box.

Now compare the contents of each of these two sets of cells – all the data in the selected source cells were pasted into the target cells.

6. Select cell **B2**, look at the Formula bar, then select cell **H3** and look at the Formula bar again.
7. Repeat step 6 for each corresponding set of cells below **B2** and **H3**.

Because you selected Values, the formulas in column B were evaluated, and the calculated results were pasted into the target cells.

8. Select cells **B2** to **B6**, and on the Home tab, in the Clipboard group, click **Copy**.
9. Select cell **H3**. On the Home tab, in the Clipboard group, click the **Paste** arrow, and point to the left-most icon in the Other Paste Options section of the drop-down menu.

Notice that the cells in H3:H7 are displayed using the formats that are about to be pasted, even though you have not actually clicked the paste icon yet. This is a demonstration of the Live Preview capability of Excel – you can preview the effects of a formatting change as it will appear on the worksheet. If you then move your mouse pointer away without clicking, the formatting reverts. The Live Preview capability is available for most of the formatting options on the Ribbon. It is not available from any of the formatting dialog boxes.

10. Click the left-most icon in the Other Paste Options section of the drop-down menu to make the change permanent.

Now see what happens when you paste just the formulas to the target cells.

11. With cells **B2** to **B6** still selected, select cell **D2**.
12. On the Home tab, in the Clipboard group, click the **Paste** arrow to display the Paste menu.
13. Point to different icons (but do not click on any of them) in the Paste drop-down menu to see how the worksheet is affected.

The commonly used Paste Special options are available in this drop-down menu for easy selection.

14. Click the **Formulas** icon (top row, second from the left in the Paste section) in the drop-down menu.

	A	B	C	D	E	F	G	H	I
1	Values	Formulas	Values						
2	10.1	20.2	60.6	121.2					
3	20.20	40.40	70.7	141.4			10.1	20.2	
4	\$30.30	\$60.60	80.8	161.6			20.2	40.40	
5	4.04E+01	8.08E+01	90.9	181.8			30.3	\$60.60	
6	FRED	fred	JOE	joe			40.4	8.08E+01	
7							FRED	fred	
8									

The formulas in column B are now copied into column D, referencing the values in column C. This is an example of relative addressing, which is explained in more detail in a later lesson in this courseware. Notice that this option did not copy the formatting from column B.

Hint: Alternatively, you can also select the Formulas option from the Paste Special dialog box.

Now try the Transpose option.

15. Select cells **A2:B6**, and on the Home tab, in the Clipboard group, click **Copy**.
16. Select cell **C9**. On the Home tab, in the Clipboard group, click the **Paste** arrow, select **Paste Special** to open the Paste Special dialog box, then select **Transpose** and click **OK**.

	A	B	C	D	E	F	G	H	I
1	Values	Formulas	Values						
2	10.1	20.2	60.6	121.2					
3	20.20	40.40	70.7	141.4			10.1	20.2	
4	\$30.30	\$60.60	80.8	161.6			20.2	40.40	
5	4.04E+01	8.08E+01	90.9	181.8			30.3	\$60.60	
6	FRED	fred	JOE	joe			40.4	8.08E+01	
7							FRED	fred	
8									
9			10.1	20.20	\$30.30	4.04E+01	FRED		
10			20.2	40.40	\$60.60	8.08E+01	fred		
11									
12									

17. Save and close the workbook.

Copying and Moving Cells Using the Mouse

Instead of cutting and pasting cell contents, you can simply move the cell(s) directly to the new location using the drag-and-drop method.

To move a cell or group of cells to a new location using the mouse, follow these steps:

- Place the mouse pointer on the side or bottom line of the cell or group of highlighted cells. The four-pointed arrow (✚) appears.
- Drag the box to the desired location.

Note: As with the cut-and-paste method, the target cell(s) will lose all existing data and formatting.

You can also use the drag-and-drop method to copy a cell or range of cells by pressing CTRL at the same time. Using the drag-and-drop method does not involve either the Windows or Office Clipboards.

Learn to copy and move data with the mouse

In this exercise, you will copy and move the contents of cells from one part of a worksheet to another.

- Open the **Office Expenses_Moving** workbook located in the *StarterFiles* folder and save it as: **My Office Expenses_Moving** in the *MyProjects* folder.
- Select cell **A12**.
- Position the mouse pointer over any of the four edges of cell **A12**.

The pointer should change to a white pointer with a four-headed arrow at its tip. ✚

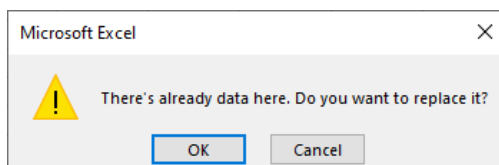
- Click and hold the left mouse button and drag the cell down to cell **C13**. Release the left mouse button.

Notice that, as you drag the data around the worksheet, the cell address of the selected cell is updated and displayed next to the selected cell.

Next, move the contents of this cell to another cell that contains data.

- Position the mouse pointer over any of the four edges of cell **C13** and drag it to cell **A6**.

A message box appears.



If you accidentally selected the wrong cell, you can cancel this operation. Otherwise, you can proceed with the move.

6. In the message box, click **OK**.

Next, try moving a group of cells to another location.

7. Select cells **C4** to **D12**.
8. Click and drag these cells down so that the upper left corner of the range of cells is in **D9**. Release the left mouse button.

Now use the drag-and-drop method for copying cells.

9. With the cell range **D9** to **E17** still selected, move the mouse pointer to one of the four edges.
10. Press and hold **CTRL**, then click and hold the left mouse button.
11. Drag the selected range to cells **B7** to **C15**.

Notice the + symbol next to the arrow while you are pressing CTRL. You can press or release CTRL at any time while you are dragging the mouse. This enables you to change your mind between moving and copying, and back again.

12. Release the mouse button and **CTRL**.

	A	B	C	D	E
1	Tolano Adventures				
2	Office Expenses				
3					
4		January			
5	Rent	5000			
6	Utilities	150			
7	Internet	February	March		
8	Photocopier	5000	5000		
9	Supplies	150	150	February	March
10	Courier	125	125	5000	5000
11	Advertising	80	80	150	150
12		95	175	125	125
13		150	160	80	80
14		325	300	95	175
15		350	300	150	160
16				325	300
17				350	300

13. Save and close the workbook.

Inserting and Deleting Rows and Columns

Inserting Rows and Columns

Objective 2.1.3

Excel can **insert** new rows and columns, even between rows or columns containing data. This feature enables you to add information to a previously created spreadsheet, or to separate parts of your spreadsheet with blank rows or columns.

Worksheet columns start at A and end at column XFD (16,384 columns). For every new column inserted between A and XFD, one column is pushed off the far-right side of the worksheet and deleted. Similarly, new rows inserted between rows 1 and 1,048,576 will result in the same number of rows being pushed off the bottom of the worksheet and deleted.

New rows or columns are added at the current cell position. That is, rows are always inserted directly above and columns are inserted to the left of the cell that you select before issuing the insert command. If you want to insert a row below the current active cell, simply move down one row to the next row and then use the Insert command. Similarly, to insert a column to the right of the active cell, shift to the right by one column before using the Insert command.

You can insert one or more rows or columns at the same time by selecting that number of rows or columns before using the Insert command. The rows or columns do not have to be next to each other. Highlight the rows or columns where you want the new rows or columns to appear and click Insert. The blank rows or columns will appear directly above or to the left of the highlighted rows or columns.

Depending upon the method you use to insert rows or columns, the Insert <Cells/Rows/Columns> dialog box (Figure 2-4) will appear, prompting you to specify whether you want to insert cells, a row or a column.

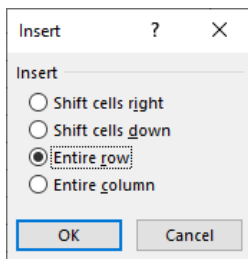


Figure 2-4: Insert <Cells/Rows/Columns> dialog box

To insert a row or column, use one of the following methods:

- on the Home tab, in the Cells group, click the Insert arrow, and click Insert Sheet Rows or Insert Sheet Columns, or
- select the row heading or column heading where the new row or column is to be inserted, and then press CTRL++(Plus) on the numeric keypad or the keyboard, or
- select the row heading or column heading where the new row or column is to be inserted, and then on the Home tab, in the Cells group, click Insert, or
- right-click a row or column heading and click Insert, or
- right-click a cell in the row or column where the new row or column is to be inserted, click Insert, select Entire row or Entire column and click OK.

Be careful when using these commands, as they affect the entire worksheet and therefore may affect areas of the worksheet that are not visible on the screen.

Deleting Rows and Columns

Objective 2.1.3

Just as Excel enables you to insert new rows and column, you can also **delete** rows and columns.

Before deleting entire rows or columns, take some time to verify that these rows or columns do not contain any valuable data in a portion of the worksheet that is not visible on the screen.

Depending upon the method you use to delete rows or columns, the Delete <Cells/Rows/Columns> dialog box (Figure 2-5) will appear, prompting you to specify whether you want to delete cells, a row or a column.

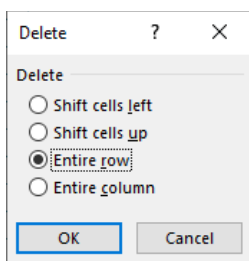


Figure 2-5: Delete <Cells/Rows/Columns> dialog box

To delete a row or column, use one of the following methods:

- on the Home tab, in the Cells group, click the Delete arrow, and then click Delete Sheet Rows or Delete Sheet Columns, or
- select the row heading or column heading for the row or column to be deleted, and then press CTRL+– (Minus) on the numeric keypad or on the keyboard, or
- select the row heading or column heading for the row or column to be deleted, and then on the Home tab, in the Cells group, click Delete, or
- right-click a row or column heading and click Delete, or
- right-click a cell in the row or column to be deleted, click Delete and then click Entire row or Entire column and click OK.

You can delete more than one row or column at a time. The selected rows or columns do not have to be next to each other.

Inserting and Deleting Cells

Objective 2.1.4

You may also choose to insert or delete one or several cells. When you insert new cells, Excel shifts the existing cells to the right or down to make space for the new cell(s). When you delete existing cells, Excel shifts the remaining cells over from the right or below to take the place of the deleted cell(s). When you delete cells, any formulas that reference the cell(s) will display an error (the topic of formulas is discussed in more detail later in this course).

Alternatively, you may delete the contents of one or more cells by simply pressing DELETE. Unlike deleting the cell itself, using DELETE will leave the structure of the worksheet intact, and formulas that reference the cell will assume the cell value is zero.

Learn to add and delete rows, columns, and cells

In this exercise, you will add and delete rows, columns, and cells in a workbook.

1. Open the **Office Expenses_Inserting** workbook located in the *StarterFiles* folder and save it as: **My Office Expenses_Inserting** in the *MyProjects* folder.
2. Select any cell in row **5**.
3. On the Home tab, in the Cells group, click the **Insert** arrow and click **Insert Sheet Rows**.

Note that if you had clicked the Insert button instead of the arrow below it, all the data below the active cell in the same column would have shifted down by one row, and the data in the surrounding columns would not have moved. When you click Insert, Excel interprets that you mean to insert cells only and not entire rows.

- Click the gray row headers for rows **7** and **8**.

Notice the ➡ row heading symbol that appears to show you that the entire row will be selected.

- On the Home tab, in the Cells group, click **Insert**.

Because you selected entire rows (two of them in this case), Excel inserts rows rather than cells.

- Click the column heading for column **B**.

Notice the ↓ column heading symbol that appears to show you that the entire column will be selected.

- On the Home tab, in the Cells group, click **Insert**.

Hint: Alternatively, on the Home tab, in the Cells group, click the Insert arrow and click Insert Sheet Columns.

- Enter the following values:

Cell	Value
A7	Janitorial
A8	Vehicle
C7	100
C8	475

- Type or copy the values in cells **C7** to **C8** across to cells **D7** through **E8**.

Now delete a row of data.

- Click the row selector button for row **8** to select the entire row.

- Right-click anywhere in row **8**, then click **Delete**.

Notice that when an entire row is selected, Excel will remove the entire row without waiting for further commands. You can do the same thing for an entire column.

- Select any cell in column **B**.

- On the Home tab, in the Cells group, click the **Delete** arrow and click **Delete Sheet Columns**.

Now delete the contents of one cell.

- Select cell **C8**.

- Press **DELETE**.

Note that this key removes the contents of the cell, but not the cell formatting (this will be demonstrated in a different lesson in this courseware). The structure of the worksheet is also unaffected.

Now try to delete the entire cell.

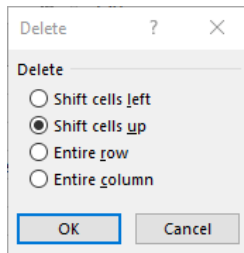
- On the Quick Access Toolbar, click **Undo** to reverse the deletion.

- On the Home tab, in the Cells group, click **Delete**.

	A	B	C	D
1	Tolano Adventures			
2	Office Expenses			
3				
4		January	February	March
5				
6	Rent	5000	5000	5000
7	Janitorial	100	100	100
8	Telephone	150	125	150
9	Internet	125	80	125
10	Photocopier	80	95	80
11	Supplies	250	150	175
12	Courier	65	325	160
13	Advertising	250	350	300
14	Utilities	325		300

Because you have selected only one cell, Excel removes only that cell and all data in the column below shifts up. If you want to see all delete cell options, open the Delete dialog box.

18. Click **Undo** to reverse the deletion.
19. With cell **C8** still selected, on the Home tab, in the Cells group, click the **Delete** arrow and click **Delete Cells**.



20. With the **Shift cells up** option selected, click **OK**.

Let's see what happens when you delete a range of cells.

21. Click **Undo** to reverse the deletion.
22. Select cells **C7** to **C8**, and on the Home tab, in the Cells group, click **Delete**.

In this situation, Excel assumed you wanted to shift the cells to the left, instead of up.

23. Click **Undo** to reverse the deletion.
24. Save and close the workbook.

Adjusting the Columns and Rows

As you work with data in Excel, you may want to improve the readability of your worksheets by adjusting the column width and row height so that you can see more or fewer characters in that column or row.

Changing the Column Widths

Objective 1.3.2

The standard column width in a new worksheet may not be enough to accommodate some of the entries you make in the cells. If the adjacent cells to the right are empty, Excel will display your entire text label by overflowing into those cells. If those adjoining cells have entries, the text labels will appear truncated at the cell boundary.

You can select between zero and 255 for the width of your column. When you change a column width, the stored contents of the cells do not change. Only the number of the characters displayed changes.

Numbers represent a special problem when there is insufficient space to display the whole number. Excel cannot simply truncate numbers as it does with text labels. If it did, the number would be misleading. For example, you would not want 1,000,000 to be displayed as 1,000 if there is not enough space to display the whole number. Excel uses several different rules to determine how to display a numeric value in a cell:

- If you enter a numeric value that is slightly larger than the current column width, Excel will automatically widen the column width to show the number with the current cell format.
- If you enter a numeric value that is much larger than the current column width, Excel automatically changes the cell format to scientific notation.
- If you reduce the width of a column that already contains numeric data, Excel may be unable to display the number. In this case, a series of pound signs (#####) will be displayed in the affected cell(s). Excel will redisplay the number when you increase the column width to accommodate the number in its current format.

A quick way of checking the width of the column is to click the vertical bar between the column headers. Excel displays the width in a ScreenTip located above and to the right of the mouse pointer.

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

- on the Home tab, in the Cells group, click Format and click Column Width, or
- place the mouse pointer on the vertical line on the right of the column heading for the column to be adjusted. When the pointer changes to the  symbol, click and drag to the appropriate width, or
- right-click the column heading for the column to be adjusted, and then click Column Width.

Adjusting the Row Height

Objective 1.3.2

Similar to column widths, the height of a row can be changed. This capability is not used as frequently as adjusting the width of columns, but there will be occasions when you need to override the default row height setting used by Excel when you re-format the data in cells.

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

- on the Home tab, in the Cells group, click Format and click Row Height, or
- place the mouse pointer at the bottom of the row heading to be adjusted. The pointer will change to a  symbol and you can then drag to the desired new height, or
- right-click the row heading for the row to be adjusted, and then click Row Height.

Using AutoFit

Objective 1.3.2

AutoFit is a time-saving feature of Excel that will automatically adjust column width for you.

To fit the contents to the column's width automatically, use one of the following methods:

- on the Home tab, in the Cells group, click Format and click AutoFit Column Width, or
- use the mouse to double-click the vertical line on the right of the heading for the column you want to adjust. The pointer will change to a  (double-headed arrow).

These two methods can produce different results. When you use the AutoFit feature from the Ribbon, Excel will change (either widen or reduce) the column width to fully display the contents of the selected cell(s). When you use the mouse method, Excel will automatically adjust the width so that it is just wide enough for the widest value in the entire column.

You can also select multiple columns and use either of these two methods. The result will be same as if you apply AutoFit to each of the columns.

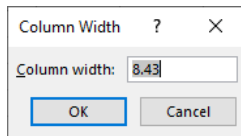
Similarly, you can set row height to fit the height of the cell contents using one of the following methods:

- on the Home tab, in the Cells group, click Format and click AutoFit Row Height, or
- use the mouse to double-click at the bottom of the row heading to be adjusted.

Learn to modify column widths

In this exercise, you will modify column widths.

1. Open the **Price Quote 0730** workbook located in the *StarterFiles* folder and save it as **My Price Quote 0730** in the *MyProjects* folder.
2. Select any cell in column **A**.
3. On the Home tab, in the Cells group, click **Format** and click **Column Width**.



4. In the *Column width* field, type: **14** and press **ENTER**.
5. Select any cell in column **C**, then on the Home tab, in the Cells group, click **Format**, click **Column Width**, type: **6** and press **ENTER**.

Now try using the AutoFit option for column B. You will choose cell B13 because it is wider than the current column width but will not make the entire column too wide for many of the cells.

6. Select cell **B13**.
7. On the Home tab, in the Cells group, click **Format** and click **AutoFit Column Width**.

You can also use the mouse to AutoFit a column.

8. Move the mouse pointer to the right edge of the column **A** header. The mouse pointer will change to a double-headed pointer.
9. Double-click that position.

Column A is now too wide to be visually appealing. Use the mouse to adjust the width.

10. Move the mouse pointer to point to the right edge of the column **A** header. The mouse pointer will change to a double-headed pointer.
11. Click and drag to the left to reduce the width.

Notice that a ScreenTip appears as you drag the column width, giving you the current column width as a visual reference.

12. Release the mouse button when the column width is just right for displaying the full contents of cell A9 (Airport Fees).

	A	B	C	D	E
1	Tolano Adventures				
2	Price Quote				
3	As of:	3-Jul	Expires:	18-Jul-19	
4					
5	Airfare	450			
6	Hotel	1,050			
7	Car Rental	225			
8	Taxes	46.5	3.10%		
9	Airport Fees	9.9	2.20%		
10					
11					
12	Airline:	Great West Airline			
13	Hotel:	Hotel Zathura			

Now adjust the height of some of the rows.

13. Right-click the row **1** header, then click **Row Height** in the shortcut menu.

The Row Height dialog box appears.

14. Type: **30** and press **ENTER**.

15. Right-click the row **4** header, click **Row Height**, type: **9** then press **ENTER**.

16. Save and close the workbook.

Hiding/Unhiding Rows & Columns

On occasion, you may need to hide one or more rows or columns in your worksheet. You may want to do this for different reasons. For example:

- You may be printing a worksheet with more columns or rows than the page width allows. If you print all the data, you will have to either break it up across multiple pages or reduce the scale – and, therefore, reduce the readability – of the data.
- The columns or rows may contain formulas used for intermediate calculations only. In some cases, you may be developing complex calculations that you cannot perform in one formula, or you may want to view how Excel is calculating the data across multiple cells containing simpler formulas.
- You may want to prevent other users from viewing these hidden rows or columns, or the formulas used in these hidden cells. Note that you will have to prevent users from unhiding the data by activating the workbook protection feature.

You can easily identify hidden rows or columns by the gaps in the row or column headers. Also, the row and column header divisions for hidden rows and columns will appear as double lines. They remain hidden until you unhide them again. Excel will continue to correctly calculate any formulas in hidden cells, or formulas in visible cells that reference hidden cells.

Hidden rows and columns will not appear, even if you print the worksheet, until you unhide them again.

To hide a row or column, select the row or column headings first, and then use one of the following methods:

- on the Home tab, in the Cells group, click Format, click Hide & Unhide, and then click Hide Columns or Hide Rows, or
- right-click the selected rows or columns and then click Hide, or
- drag the right edge of the column to the left or the bottom edge of the row upwards until it is hidden.

To unhide a row or column, select the appropriate headings on both sides of the hidden row(s) or column(s), and then use one of the following methods:

- on the Home tab, in the Cells group, click Format, click Hide & Unhide, and then click Unhide Columns or Unhide Rows, or
- right-click the double line header division that indicates hidden rows or columns and then click Unhide, or
- drag the right edge of the hidden column to the right or the bottom edge of the hidden row downwards until the desired width or height is attained.

Learn to use hide and unhide

In this exercise, you will hide and unhide rows and columns.

1. Open the **Political Contributions** workbook located in the *StarterFiles* folder and save it as: **My Political Contributions** in the *MyProjects* folder.

Notice that there appears to be a gap between columns B and D, and between rows 15 and 17.

2. Select columns **B** to **D**.

Hint: Alternatively, you can select any range of cells that include both columns B and D to indicate that you are selecting the hidden column between these two columns.

3. On the Home tab, in the Cells group, click **Format**, click **Hide & Unhide** and then click **Unhide Columns**.

A column header now appears with an intriguing description.

4. Right-click the double line header division between rows **15** and **17** (as shown here) and then click **Unhide**.

15	G. Singh
17	T. Wong

The worksheet should now look like the following:

	A	B	C
1	Political Contributions Declaration		
2	For John Goodheart		
3			
4	Contributor	Amount	Add'l Amt
5	J. Abrams	450	
6	P. Bodwick	100	
7	B. Cherry	300	
8	K. Gurmit	500	
9	M. Jenns	250	
10	T. Koehns	100	
11	A. Moham	95	
12	G. Muir	250	
13	M. Nohrs	175	
14	F. Peans	375	
15	G. Singh	150	
16	S. Smith	500	350,000
17	T. Wong	325	
18	Total	3,570	

5. Save the workbook.

Now hide the row and column again to cover your tracks.

6. Select column **C**.

7. On the Home tab, in the Cells group, click **Format**, click **Hide & Unhide** and then click **Hide Columns**.
8. Move the mouse pointer to the bottom edge of the row **16** header.
The mouse pointer will change to a double-headed pointer.
9. Click and drag the row **16** header upwards until the height is 0.00 (touching the bottom edge of row 15).
10. Close the workbook without saving.

Using AutoFill and Flash Fill

Objective 2.1.2

Entering a lot of data into a worksheet can be a tiring exercise and can lead to errors. Fortunately, Excel provides two features that can reduce some of the workload, simply by using patterns in the data that have already been entered.

The **AutoFill** feature is very useful when you have entered numbers or dates into the first one or two cells of your data series, and you are now facing entering the rest of the data into the remaining cells using the same sequential pattern. Instead of entering the rest of the data manually, use the AutoFill feature to insert the data for you. Select the cells you want to use as your data pattern and then drag the AutoFill handle (the small black square at the bottom right corner of the cell pointer) across the target cells. When you release the mouse, the cells will be filled with the new data. For example, if your source cells contain the values 1 and 2, then the AutoFill feature will continue with the next logical values of 3, 4, followed by the remaining numbers for the rest of the target cells.

The AutoFill feature will do its best to continue the pattern that it sees in the source cells to fill the target cells, such as adding 1 or some other number to calculate the next value.

Text data generally (except for special cases such as names of months or days of the week) are not used in sequential patterns. For this type of data, AutoFill will only copy the same values into the target cells. For example, if the source cells contain the values John and Joe, then the AutoFill feature will copy John and Joe to the remaining cells.

AutoFill is not only used to fill or copy cells with numeric, date, and text data, it is actually most often used to copy formulas into adjacent cells. This will be demonstrated in the next lesson of this courseware.

The **Flash Fill** feature is another labor-saving feature that will extract, combine, and/or re-sequence cell contents from one or more cells to create new values.

In order to use this feature, you must use the column to the immediate right of the column(s) from which you want Flash Fill to obtain its data. The target cells must also be empty.

After filling out the information, use the column immediately to the right to type how you want that information extracted, combined, or re-sequenced. Make sure that cell is the active cell and then, on the Home tab, in the Editing group, click the Fill arrow, then click Flash Fill. The cells underneath will then follow that same pattern using the cells on the left, as shown in Figure 2-6.

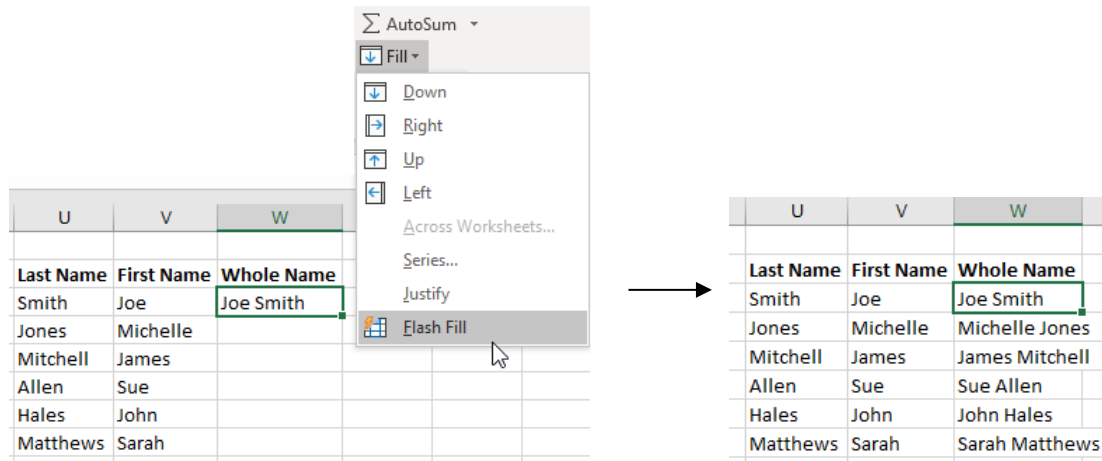


Figure 2-6: Using Flash Fill

Learn to use AutoFill and Flash Fill

In this exercise, you will use AutoFill and Flash Fill.

1. Open the **Customer List AutoFill** workbook located in the *StarterFiles* folder and save it as: **My Customer List AutoFill** in the *MyProjects* folder.

Your first task is to combine all the first, middle, and last names in columns A to C together as one name in column D. Start by entering the first name.

2. Select cell **D2** and enter: **Jayel Sasha Wylie**.

When you start entering the second name, Excel will recognize the pattern from the first row and apply it to the remaining rows.

3. Select cell **D3**, type: **B** but do not press any more keys.

The Flash Fill feature then completes the rest of the customer's name in not only this cell, but also every cell below, saving you a lot of work. At this point, the flash fill data is only tentative: it is displayed in a light gray color to show what they will look like, and you must confirm your acceptance.

	A	B	C	D
1	Last Name	Middle Name	First Name	
2	Wylie	Sasha	Jayel	Jayel Sasha Wylie
3	Haarsma	Carter	Ben	Ben Carter Haarsma
4	Swierczynski	Andreyev	Pavel	Pavel Andreyev Swierczynski
5	Lowachee		Sharin	Sharin Lowachee
6	Whitcomb	P	Isla	Isla P Whitcomb
7	Fleischer	Samuel	Paul	Paul Samuel Fleischer
8	Strohmeyer	Karen	Alison	Alison Karen Strohmeyer
9	Sijie		Dai	Dai Sijie
10	Angelini	B	Sara	Sara B Angelini
11	Ruesch	John	Patrick	Patrick John Ruesch
12	Frankel	Avril	Valerie	Valerie Avril Frankel
13	Abidi		Azhar	Azhar Abidi
14	Aubert	Leanne	Rosemary	Rosemary Leanne Aubert
15	Pearson	Peter	Ryan	Ryan Peter Pearson
16				

4. Press **ENTER** to let the Flash Fill feature complete the data entry for you.

If the flash fill data did not display for you or the names do not appear correctly, press the **ESCAPE** key twice to abandon the Flash Fill, then go back to step 2 above to check the name was entered into cell D2 correctly. Once you have done that, continue with the next step because the Flash Fill feature will not launch automatically at this point.

5. Select cells **D3** to **D15** and press the **DELETE** key to delete all the entries.
6. Select cells **D2** to **D15**, then on the Data tab, in the Data Tools group, click **Flash Fill**.

You can also use the Flash Fill feature to pick out a specific word from a text string such as a name. For example, extract out just the first name from column D.

7. Select cell **E2** and enter: **Jayel**.
8. Select cell **E3**, type: **B** and press **ENTER** to accept the Flash Fill data.

Now pick out the middle name from column D, if there is any.

9. Select cell **F2** and enter: **Sasha**.
10. Select cell **F3**, type: **C** and press **ENTER** to accept the Flash Fill data.

And finally extract the family name from column D.

11. Select cell **G2** and enter: **Wylie**.
12. Select cell **G3**, type: **H** and press **ENTER** to accept the Flash Fill data.

You can also change the pattern of the middle name to just the first letter.

13. Select cells **F2** to **F15** and press **DELETE**.
14. Select cell **F2** and enter: **S.** (uppercase letter "S" followed by the period at the end).
15. Select cell **F3**, type: **C** and press **ENTER** to accept the Flash Fill data.

This same technique can be applied in reverse to combine the contents of multiple cells together.

16. Select cells **D2** to **D15** and press **DELETE**.
17. Select cell **D2** and enter: **J. S. Wylie**.
18. Select cell **D3**, type: **B** and press **ENTER** to accept the Flash Fill data.

Numeric values can also be re-patterned as text strings, such as phone numbers.

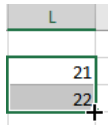
19. Select cell **J2** and enter: **(206) 485-8314**.
20. Select cell **J3**, type: **(** and press **ENTER** to accept the Flash Fill data.

	A	B	C	D	E	F	G	H	I	J
1	Last Name	Middle Name	First Name						Phone	
2	Wylie	Sasha	Jayel	J. S. Wylie	Jayel	S.	Wylie		2064858314	(206) 485-8314
3	Haarsma	Carter	Ben	B. C. Haarsma	Ben	C.	Haarsma		2533574805	(253) 357-4805
4	Swierczynski	Andreyev	Pavel	P. A. Swierczynski	Pavel	A.	Swierczynski		2067881452	(206) 788-1452
5	Lowachee		Sharin	S. Lowachee	Sharin		Lowachee		3605647884	(360) 564-7884
6	Whitcomb	P	Isla	I. P. Whitcomb	Isla	P.	Whitcomb		2064257753	(206) 425-7753
7	Fleischer	Samuel	Paul	P. S. Fleischer	Paul	S.	Fleischer		2533770435	(253) 377-0435
8	Strohmeyer	Karen	Alison	A. K. Strohmeyer	Alison	K.	Strohmeyer		2069367601	(206) 936-7601
9	Sijie		Dai	D. Sijie	Dai		Sijie		2539623056	(253) 962-3056
10	Angelini	B	Sara	S. B. Angelini	Sara	B.	Angelini		2537463077	(253) 746-3077
11	Ruesch	John	Patrick	P. J. Ruesch	Patrick	J.	Ruesch		2062175156	(206) 217-5156
12	Frankel	Avril	Valerie	V. A. Frankel	Valerie	A.	Frankel		2066066807	(206) 606-6807
13	Abidi		Azhar	A. Abidi	Azhar		Abidi		2066309230	(206) 630-9230
14	Aubert	Leanne	Rosemary	R. L. Aubert	Rosemary	L.	Aubert		2533183047	(253) 318-3047
15	Pearson	Peter	Ryan	R. P. Pearson	Ryan	P.	Pearson		2069266750	(206) 926-6750

Now let's look at how the AutoFill feature works. As a first example, you will create a sequential series of numbers. You can start with any number, so for this exercise you will use 21. To establish the pattern, you will also need to enter the next sequential number next to it, which will be 22.

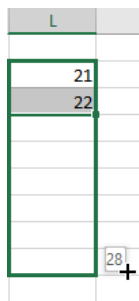
21. Scroll the worksheet to the right so that columns L to Q are fully visible on your screen.
22. Select cell **L2** and enter: **21** then select cell **L3** and enter: **22**.
23. Select cells **L2** to **L3** again and position the mouse pointer on the AutoFill handle at the bottom right corner of cell L3.

The mouse pointer will change to a + icon. You can now create the rest of the series.



24. Select and drag the mouse down to cell **L9**.

As you drag the AutoFill handle down, you will see the current AutoFill value as a ScreenTip.



You can also set the series to increment by a value other than 1, such as 5.

25. Select cell **L3** and enter: **26**.
26. Select cells **L2** and **L3** again and drag the AutoFill handle down to cell **L9**.

AutoFill is normally used on numbers and dates, which are naturally used in series with incrementing values. Words are not usually grouped in series, except for month names and days of the week.

27. Enter the following new data:

Cell	Value
M2	July
N2	Sep
O2	Tuesday

Now use AutoFill to create a series using multiple rows or columns at the same time.

28. Select the cell range **M2** to **O2** and drag the AutoFill handle down to cell **O9**.

You can see here that the series "loops back" to the first value in a series when it reaches the last value. In this case, it entered January after December, and Monday after Sunday.

When AutoFill does not recognize a word that belongs in a series, it will simply copy the cell contents into the target cells. For example, the words "one" and "two" are not recognized as being the same as the numbers 1 and 2.

29. Select cell **P2** and enter: **One** then select cell **P3** and enter: **Two**.

30. Select the cell range **P2** to **P3** and drag the AutoFill handle down to cell **P9**.

You can also use AutoFill to copy a formula to adjacent cells. This formula will calculate a new value by multiplying the value from the cell above it by two. You will learn more about formulas in the next lesson of this courseware.

31. Select cell **Q2** and enter: 3.

32. Select cell **Q3** and enter: $=Q2*2$, then select cell **Q3** again, and drag the AutoFill handle down to cell **Q9**.

	L	M	N	O	P	Q
1						
2	21	July	Sep	Tuesday	One	3
3	26	August	Oct	Wednesday	Two	6
4	31	September	Nov	Thursday	One	12
5	36	October	Dec	Friday	Two	24
6	41	November	Jan	Saturday	One	48
7	46	December	Feb	Sunday	Two	96
8	51	January	Mar	Monday	One	192
9	56	February	Apr	Tuesday	Two	384

33. Save and close the workbook.

Managing Worksheets

By default, new workbooks are created with one worksheet, which is sufficient for most purposes. However, every Excel workbook can contain multiple worksheets. Each of these worksheets can be treated as being independent of one another although typically, they are related to one another. For example, one worksheet may contain the list of expenses for a company, another worksheet may contain the revenues for each product sold, and a third worksheet may have the summary of both the revenues and expenses. Formulas can be used to refer to any cell, in any worksheet, to bring data together into one worksheet and to perform calculations.

You can rename worksheets, as well as add, delete, copy, or move them around in a workbook. You shift the display from one worksheet to another by using worksheet tabs. By default, the first worksheet is named *Sheet1*, and every new worksheet added is given the next number. For example, *Sheet2*, *Sheet3*, and higher numbers.

To navigate between the worksheets, use the tab scrolling buttons (Figure 2-7) at the bottom left of each workbook's window. If your workbook has many worksheets (for example, more than six) or the worksheet names are very long, your screen may not display all the worksheet tabs at the same time and some may become hidden behind the horizontal scroll bar. Use these buttons to shift the hidden worksheet tabs to the left or right. Alternatively, you can view more worksheet tabs by shrinking the horizontal scroll bar.

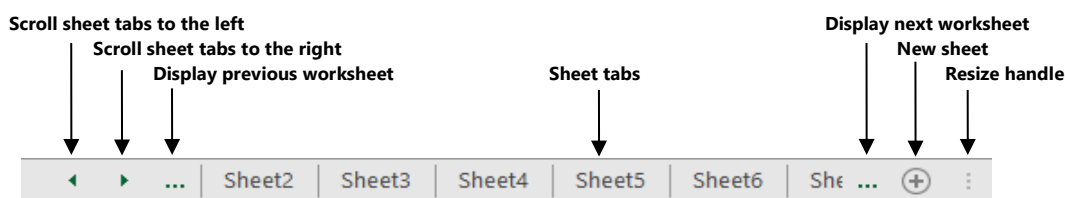


Figure 2-7: Tab scrolling buttons

Renaming Worksheets

Excel's use of *Sheet1*, *Sheet2*, *Sheet3*, and similar names is useful to identify the different sheets when you first access your workbook. However, it is not very descriptive after you have entered information on several worksheets. Assigning more descriptive names to the tabs will make navigating your worksheets much easier, particularly when you have used several sheets to enter the information.

As you rename your worksheets, Excel will adjust the size of the tabs based on the number of characters in the name. Even though Excel permits up to 31 characters per tab, it is best to keep the tab names short. If you have several worksheets with long sheet tab names, you will not be able to see very many of the worksheet tabs on the screen at one time. This will make navigating between them more difficult.

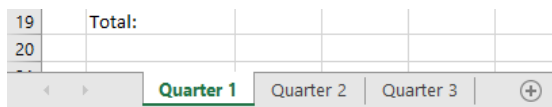
To rename a worksheet tab, use one of the following methods:

- double-click the sheet tab to put it in editing mode for renaming, or
- right-click the sheet tab and click **Rename**, or
- click the sheet tab, then on the **Home** tab, in the **Cells** group, click **Format**, and click **Rename Sheet**.

Learn to rename worksheet tabs

In this exercise, you will change sheet tab names in a workbook.

1. Open the **Department Budget** workbook located in the *StarterFiles* folder and save it as **My Department Budget** in the *MyProjects* folder.
2. Double-click the **Sheet1** tab.
The tab label for this sheet is now highlighted.
3. Type: **Quarter 1** to rename the tab and press **ENTER**.
4. Right-click the **Sheet2** tab and click **Rename**.
5. Enter: **Quarter 2** to rename this tab.
6. Click the **Sheet3** tab.
7. On the **Home** tab, in the **Cells** group, click **Format**, then click **Rename Sheet**.
8. Enter: **Quarter 3** to rename this tab.
9. Click the **Quarter 1** sheet tab.



10. Save the workbook and keep it open for the next exercise.

Inserting or Deleting Worksheets

When you create a new workbook, Excel includes one worksheet by default. You can add more worksheets to a workbook at any time. The number of worksheets that you can add to a workbook is limited only by the total amount of computer memory available. On a practical level, you should avoid using a single workbook to store all of your information. The workbook would become unwieldy to manage, take too long to load and save, and consume too many computer resources when it is open. Instead, put unrelated information – such as the list of employees for the company – in a different workbook from the one containing a list of sales office addresses.

If there are more worksheet tabs than the status bar can display at one time, you can use the tab scrolling buttons to display the other worksheet tabs.

When you no longer need worksheets, you can remove them from the workbook. You should save your workbook before deleting a worksheet because, once deleted, you cannot retrieve a worksheet with the Undo command. You should also check every worksheet for error messages after deleting it. There may be formulas in the other worksheets that depend on values in the deleted worksheet.

To insert a new blank worksheet into a workbook, use one of the following methods:

- on the Home tab, in the Cells group, click the Insert arrow, and click Insert Sheet, or
- click the New sheet button, or
- right-click the sheet tab where the worksheet is to be inserted and click Insert. In the Insert dialog box (Figure 2-8), click the Worksheet template and then click OK.

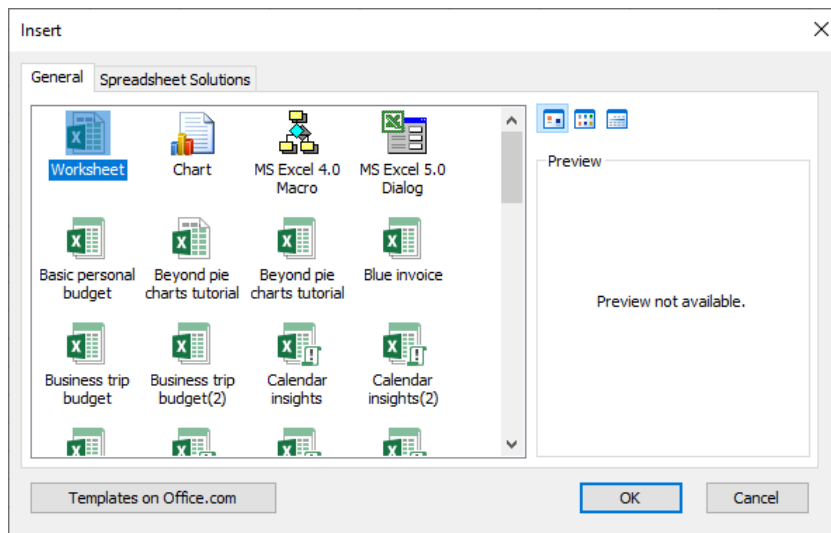


Figure 2-8: Insert dialog box

If you use the New sheet button method, Excel will add the new worksheet to the right of the active worksheet. If you use either of the other two methods, Excel will add the new worksheet to the left of the active worksheet.

To delete a worksheet, use one of the following methods:

- on the Home tab, in the Cells group, click the Delete arrow, and then click Delete Sheet, or
- right-click the sheet tab to be deleted and click Delete.

Moving or Copying Worksheets

You may occasionally want to change the sequence in which the worksheets appear in a workbook. This feature is useful in organizing multi-worksheet workbooks. For example, placing related worksheets close together enables you to switch between them without the additional step of using the tab scrolling buttons.

It is also easy to make an exact copy of an existing worksheet.

To move or copy a worksheet within a workbook, use one of the following methods:

- right-click the sheet tab to be moved or copied and click **Move** or **Copy**, or
- to quickly move a worksheet, click the sheet tab for the sheet to be moved and then drag the sheet tab to the new location, or
- to quickly copy a worksheet, click the sheet tab for the sheet to be copied, press and hold CTRL, and then drag the sheet tab to the new location.

You can also move or copy a worksheet from one workbook to another workbook by dragging the worksheet tab. To move a worksheet, place the two workbooks next to each other on the Windows Desktop, then click and drag the worksheet tab from one workbook to the other. Similarly, to copy a worksheet, press and hold the CTRL key while dragging the worksheet tab from one workbook to the other.

Learn to insert, delete, move, and copy worksheets

In this exercise, you will add, move, and delete worksheets in a workbook.

1. With the My Department Budget workbook open, click the **Quarter 1** worksheet tab to display this worksheet.
2. Click the **New sheet** button to add a new worksheet.

Note that the new worksheet is added to the right of the worksheet currently being displayed.

3. Right-click the new worksheet tab and click **Rename**.
4. Enter: **Company** to rename the tab.
5. On the Home tab, in the Cells group, click the **Insert** arrow and click **Insert Sheet**.

Notice that this procedure adds the new worksheet to the left of the active worksheet instead of the right. The worksheet should now look like the following:



With the addition of this second worksheet, the number of tabs may now exceed the space available to display them all, resulting in some worksheet tabs being hidden from view.

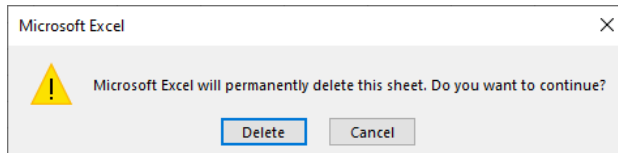
6. Position the mouse pointer over the **Resize handle** located at the left side of the horizontal scroll bar so that the mouse pointer changes to .
7. Click and drag the **Resize handle** to the right or left as necessary to fully display all the worksheet names.

Now enter data into this new worksheet and try deleting it.

8. Select the **Sheet2** worksheet if necessary and type your first name in cell **A1**.

9. On the Home tab, in the Cells group, click the **Delete** arrow and then click **Delete Sheet**.

If nothing has been entered in the worksheet, Excel deletes it without any further prompting. However, if the worksheet contains data, Excel issues a warning message regarding data contents that might affect other data in the workbook.

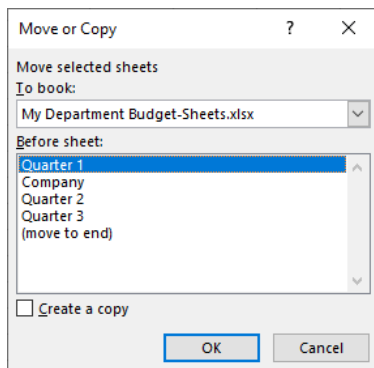


10. Click **Delete**.

The worksheet is deleted from the workbook, and the blank Company worksheet is displayed.

Now you will create the Quarter 4 worksheet by making a copy of the Quarter 1 worksheet.

11. Right-click the **Quarter 1** worksheet tab and click **Move or Copy**.



The Move or Copy dialog box now appears in front of the Quarter 1 worksheet. By default, Excel moves the current active worksheet to a new position.

At the top of the dialog box, the current active workbook is displayed in the *To book* list box. If this setting remains unchanged, the worksheet move or copy will happen within the same workbook. If you have another workbook open at the same time, you can select it in the *To book* list box so that the selected worksheet can be moved or copied to that workbook. For this exercise, you will stay in the same workbook.

Selecting the *Create a copy* check box indicates that you want the current active worksheet to be copied. You also want this worksheet at the far right.

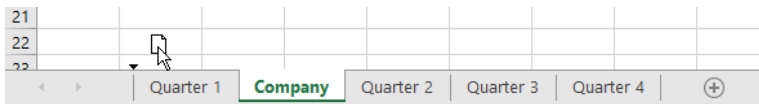
12. Click the **Create a copy** check box to activate it.
13. Click **(move to end)** in the *Before sheet* list and click **OK**.

Excel creates a copy of the current worksheet, including the worksheet name. Because no two worksheets can have the same name, Excel has appended a number at the end of the new worksheet name.

14. Double-click the **Quarter 1 (2)** worksheet tab and change the name to: **Quarter 4**.
15. Select cell **C4**. Enter: **Oct** and select cell **C4** again. Use the mouse to drag the AutoFill handle across to column **E**.

Now move one of the worksheets to a different location.

- Click the **Company** tab and drag it to a new position to the left of the Quarter 1 sheet tab, but do not release the mouse button yet.



Notice the icon and arrow indicating that you are moving a sheet into this location.

- At the new location, release the mouse button.
- Save the workbook and keep it open for the next exercise.

Hiding/Unhiding Worksheets

Similar to hiding and unhiding a column or row, you can also hide or unhide an entire worksheet. The main reason for hiding a worksheet is to prevent other users from viewing the data or formulas used there.

You can hide as many worksheets in a workbook as you want, in any sequence. However, you must have at least one unhidden worksheet in a workbook. If you need to hide all worksheets, then you likely need to apply protection to the workbook instead.

When unhiding worksheets, you will be presented with an Unhide dialog box (such as the one shown in Figure 2-9) displaying all hidden worksheets for the workbook. From this list, you can select the worksheets to unhide.

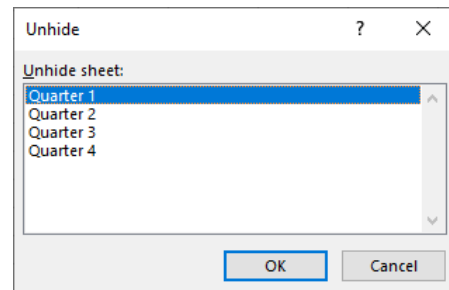


Figure 2-9: Unhide dialog box

To hide the current worksheet, on the Home tab, in the Cells group, click Format, point to Hide & Unhide, and then click Hide Sheet.

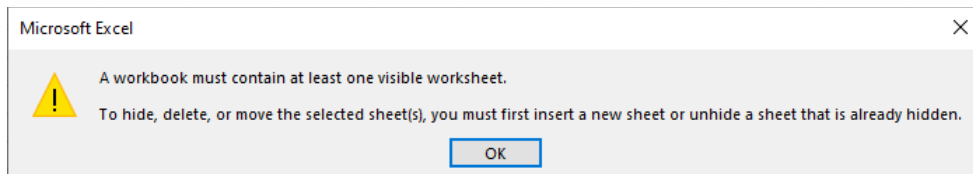
To unhide hidden worksheets, on the Home tab, in the Cells group, click Format, point to Hide & Unhide, and then click Unhide Sheet to open the Unhide dialog box.

Note: If a workbook does not have any hidden worksheets, the Unhide Sheet menu item is grayed out.

Learn to hide and unhide worksheets

In this exercise, you will hide and unhide worksheets.

- With the My Department Budget workbook open, select the **Quarter 1** worksheet.
- On the Home tab, in the Cells group, click **Format**, point to **Hide & Unhide**, and then click **Hide Sheet**.
The Quarter 1 worksheet is now hidden.
- Right-click the **Quarter 2** worksheet tab and click **Hide**.
- Right-click the **Quarter 3** worksheet tab and click **Hide**.
- Right-click the **Quarter 4** worksheet tab and click **Hide**.
- Try to hide the **Company** worksheet.



7. Click **OK** to close the message box.

Now unhide each of the hidden worksheets. Excel does not allow you to unhide more than one worksheet at a time.

8. On the Home tab, in the Cells group, click **Format**, point to **Hide & Unhide**, and then click **Unhide Sheet**.

The Unhide dialog box displays a list of all worksheets currently hidden in the workbook.

9. Select the **Quarter 1** worksheet and click **OK**.
10. Right-click the **Quarter 1** worksheet tab and click **Unhide**.
11. In the Unhide dialog box, double-click **Quarter 4**.
12. Use the method of your choice to unhide the Quarter 2 and Quarter 3 worksheets.

The workbook is now restored with all sheets showing in their original sequence.

13. Save the workbook and keep it open for the next exercise.

Adding Color to the Worksheet Tabs

You can add color to the worksheet tabs to help identify your worksheets. The selected color will appear as a background in the tab, similar to a divider tab. This can be handy if, for example, you are creating a budget for multiple departments in your company. You can use different colors for each department and then color code the budget in each worksheet tab for the corresponding departments.

The one exception is the active worksheet – the tab color will appear as a gradient shaded background behind the worksheet name. This helps you to easily identify which is the active worksheet.

Similar to background colors for worksheet cells, you can choose from the standard or various theme colors using the color palette, as shown in Figure 2-10.

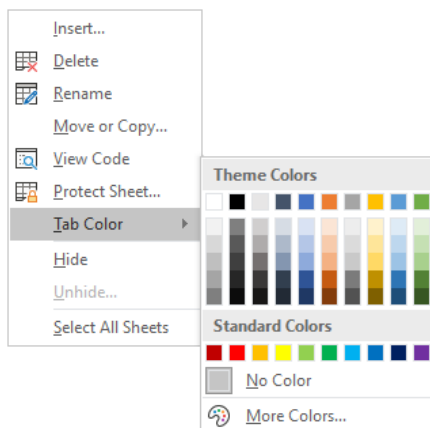


Figure 2-10: Tab color palette

To display it, click the worksheet tab and then use one of the following methods:

- on the Home tab, in the Cells group, click Format and click Tab Color, or
- right-click the worksheet tab and click Tab Color.

Learn to add color to worksheet tabs

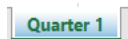
In this exercise, you will add color to worksheet tabs.

1. With the My Department Budget workbook open, select the **Quarter 1** worksheet.
2. On the Home tab, in the Cells group, click **Format** and point to **Tab Color** to display the color palette.

Note: The color palette can also be displayed by right-clicking the worksheet tab.

3. Click **Blue** in the *Standard Colors* section (third from the right) of the color palette.

Notice how the worksheet tab now shows a blue gradient shade, darker at the bottom of the tab and becoming white at the top.



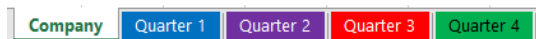
4. Click the **Quarter 2** tab.

Notice how Excel now displays the Quarter 1 tab with a full blue background. The Quarter 2 tab does not have a color, so it only shows a colored line at the bottom.



5. If necessary, select the **Quarter 2** tab, right-click, point to **Tab Color** and click **Purple** from the *Standard Colors* section.
6. Select the **Quarter 3** tab, right-click, point to **Tab Color** and click **Red** from the *Standard Colors* section.
7. Make the **Quarter 4** tab **Green**, then click the **Company** tab.

Your worksheet tabs should look similar to the following example:



8. Save and close the workbook.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- | | |
|---|---|
| ☒ Edit cells and undo changes. | ☒ Insert and delete cells. |
| ☒ Cut, copy, and paste data. | ☒ Use AutoFill to copy and fill series. |
| ☒ Use Paste Special. | ☒ Rename worksheets. |
| ☒ Change column widths. | ☒ Insert and delete worksheets. |
| ☒ Change row heights. | ☒ Move and copy worksheets. |
| ☒ Use AutoFit with columns or rows. | ☒ Hide and unhide worksheets. |
| ☒ Hide and unhide rows and columns. | ☒ Add color to the worksheet tabs. |
| ☒ Insert and delete rows and columns. | |

Key Terms

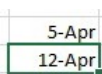
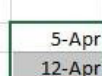
Term	Definition
AutoFill	A method of copying data and formulas or creating data series by dragging the lower right corner of a cell or range.
AutoFit	A feature that will automatically adjust the width of a column or the height of a row so that the cells are just wide or high enough to display the values in all the cells of that column or row.
Clipboard	A location used to temporarily store data that is cut or copied from an application.
Copy	An editing function used to duplicate the content in selected cells.
Cut	The editing process of transferring the contents of selected cells to the Clipboard so that you can move them from one location and place them into another.
Delete	An editing function that enables you to remove text from a worksheet, including entire columns or rows.
Flash Fill	A feature that will extract, combine, and/or re-sequence cell contents from one or more cells to create new values.
Insert	An editing function that enables you to add text between other text, including entire columns or rows.
Marquee	A rectangle outlined with a moving, dotted line that appears around a cell range that has been cut or copied and can be pasted into a new location.
Paste	The editing function of placing cut or copied data into a new location.
Undo	A feature that enables you to reverse the last command that was executed. You can undo up to a maximum of the 100 most recently used commands.

Quiz Questions

For each question, select the best answer.

- Which key/combination activates Edit mode in Excel?
 - F2
 - ALT+E
 - WINDOWS key
 - CTRL+E
- Suppose you used the Copy and then the Paste command to copy the contents of cell A1 to cell B1, but you do not want to copy the cell formatting to cell B1. What can you do to fix it?
 - Use the Paste Special command instead and select the Formats option.
 - Use the Paste Special command instead and select the Values option.
 - Use the Paste Special command instead and select the All using Source theme option.
 - Use the Paste Special command instead and select the Transpose option.

3. What is the difference between pressing DELETE to delete the contents of a cell and using the Delete Cells command?
- Deleting the contents of a cell clears all formatting from the cell. If you use the Delete Cells command, the formatting is still applied to the cell.
 - Deleting the contents of a cell places the deleted contents into the Clipboard. If you use the Delete Cells command, the cell contents are not copied to the Clipboard.
 - Deleting the contents of a cell leaves the structure of the worksheet intact. If you use the Delete Cells command, you have the option of shifting the cells after the delete action is complete.
 - Deleting the contents of a cell leaves any formatting still applied. If you use the Delete Cells command, the formatting is also cleared from the cell.
4. Ruby wants all the entries in Column D in her worksheet to display fully. What is the best method for ensuring Column D is wide enough?
- Dragging the right border of Column D to the right edge of the Excel window
 - Using the AutoFit command
 - Using the Resize command
 - Entering a very large number in the Column Width dialog box
5. Dean needs to print a worksheet for distribution at a meeting. The worksheet currently includes sensitive information that Dean needs to see, but which should not be seen by the meeting attendees. What is the easiest way for Dean to print an appropriate version of the worksheet for his meeting?
- Make a copy of the worksheet, delete the sensitive information from the new worksheet, and then print the new worksheet.
 - Use a conditional printing command that skips over the cell ranges containing sensitive information.
 - Delete the sensitive information, print the worksheet, then enter the deleted information back into the worksheet.
 - Hide the rows or columns that contain the sensitive information before printing the worksheet.
6. In which figure can you drag the AutoFill handle to create a series with 7 days between dates?

- a. 
- b. 
- c. 

7. What is the maximum length of a worksheet tab name?
- 8 characters
 - 31 characters
 - 250 characters
 - 255 characters

8. How many new worksheets can you add to an Excel workbook?
 - a. Three
 - b. One hundred
 - c. As many as the available memory of your system will permit
 - d. One thousand
9. When you insert a new worksheet using Insert, Insert Sheet on the Home tab, the new worksheet tab appears:
 - a. To the left of the current worksheet tab.
 - b. To the far left of all worksheet tabs.
 - c. To the far right of all worksheet tabs.
 - d. To the right of the current worksheet tab.
10. Sam has painstakingly created a worksheet of Sales figures for the Eastern region. His worksheet is beautifully formatted and contains accurate formulas. Now he needs to create a worksheet just like it for the Western region. How should Sam proceed?
 - a. He should open a new workbook, line his two windows up side-by-side, and create a Western worksheet from scratch, using the Eastern worksheet as a guide.
 - b. He should add a new worksheet to the current workbook, view both worksheets side-by-side, and create the Western worksheet from scratch, using the Eastern worksheet as a guide.
 - c. He should create a copy of the Eastern worksheet, rename the copy Western, and then enter the figures as appropriate.
 - d. He should rename the Eastern worksheet to Western, and then enter the figures as appropriate.
11. Which of the following is the keyboard shortcut key combination for pasting data?
 - a. CTRL+A
 - b. CTRL+P
 - c. CTRL+V
 - d. CTRL+X
12. Which key should you press in order to copy cells using drag-and-drop?
 - a. CTRL
 - b. ALT
 - c. F4
 - d. You cannot copy cells using drag-and-drop.
13. How many worksheets can you hide in a workbook?
 - a. All of them
 - b. All except one
 - c. Up to ten
 - d. You cannot hide worksheets in a workbook.

14. Which sequence of steps will allow you to change the color of a worksheet tab?
- a. Right-click the worksheet tab, then click Tab, Set color.
 - b. Click the Insert tab, then in the Text group click Tab Color.
 - c. Click the Page Layout tab, then in the Sheet Options group, click Tab Color.
 - d. Right-click the worksheet tab, then click Tab Color.
15. Which statement about inserting rows or columns into a worksheet is TRUE?
- a. You can insert only one row or column at a time.
 - b. You can insert multiple rows or columns at the same time.
 - c. If you insert more than one row, the rows must be next to each other.
 - d. When you insert a row, it affects only the data visible on the screen.

Microsoft® Excel

Associate Certification Guide

Lesson 3: Using Formulas

Lesson Objectives

In this lesson, you will learn about formulas – what they are, how they work, and how to insert simple formulas and use built-in functions to perform calculations in a workbook. Upon completion of this lesson, you should be able to:

- ☐ Describe what formulas are and how they are used.
- ☐ Create and edit simple formulas.
- ☐ Use math operators and understand the order of calculations.
- ☐ Reference other worksheets.
- ☐ Use common functions.
- ☐ Use statistical functions.
- ☐ Use the IF function.
- ☐ Use text functions.
- ☐ Use absolute and relative cell references.
- ☐ Use mixed absolute and relative cell addresses.
- ☐ Display formulas.

Using Formulas

Creating and Editing Formulas

In Excel, every worksheet cell can use a **formula**. A formula is simply a calculation involving any combination of values, **cell references**, and/or **built-in functions**.

Worksheets typically contain formulas that refer to other worksheet cells. It is to your advantage to use cell references in your formulas whenever possible rather than the actual values. When these values or amounts change, the dependent cells (the cells containing the formulas) are automatically recalculated.

A formula can be up to 8,192 characters long. Enter your formula in the cell where you want the results to appear. Formulas are easy to recognize – all of them begin with the equals sign (=).

Suppose you have a worksheet with some formulas, such as the one shown in Figure 3-1.

	A	B	C	D	E	F
1	10	10	80	16	116	
2						

Figure 3-1: Worksheet with formulas

The formulas used in this worksheet are described in Table 3-1.

Table 3-1: Formula descriptions

Cell	Formula/Value	Description
A1	10	A constant value – numeric in this case. Every workbook with formulas will usually have at least one constant value.
B1	=A1	References the current value in cell A1. No changes or calculations are done to the value in cell A1, other than copy it over. If the value in cell A1 is changed, cell B1 will automatically display the new value.
C1	=A1*8	References the value in cell A1 and multiplies it by eight.
D1	=C1/5	References the value in cell C1 and divides it by five. Digits to the right of the decimal point will also be displayed if necessary. Note that if the value in cell A1 changes, then the value in cell C1 will change, which will cause the value in this cell to change in a cascading effect.
E1	=SUM(A1:D1)	References a built-in function called SUM to calculate the sum total of all cells in the range from A1 to D1. Note that if the value in cell A1 changes, then the values in cells B1, C1, and D1 will also change at the same time, which will cause the value in this cell to change as well.

Let's change the value in cell A1. All the formulas are automatically recalculated and the worksheet will now appear as shown in Figure 3-2:

	A	B	C	D	E	F
1	11	11	88	17.6	127.6	
2						

Figure 3-2: Revised formula results

Table 3-2 shows a comparison of how these numbers were calculated using the previous value (10) and the new value (11) entered in cell A1:

Table 3-2: Revised formula calculations

Cell	Formula	Old Value	New Value
A1		10	11
B1	=A1	10	11
C1	=A1*8	80 (=10 x 8)	88 (=11 x 8)
D1	=C1/5	16 (=80 ÷ 5)	17.6 (=88 ÷ 5)
E1	=SUM(A1:D1)	116 (=10 + 10 + 80 + 16)	127.6 (=11 + 11 + 88 + 17.6)

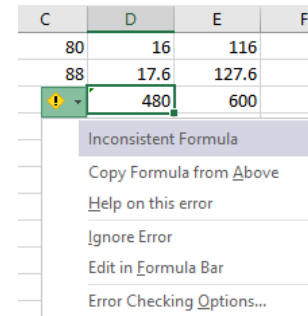
This example demonstrates that by using formulas, you can have the computer do all the work of performing the calculations for you quickly, which is a significant time savings for you. You changed the value in only one cell. Excel knows which sequence to perform all the calculations, so that all the results will be correct.

Excel does not display the formula you type into a cell in the worksheet, only the result of the formula. To view the formula, select the cell and you will see the formula and cell references in the Formula bar. You can also change a setting to display all formulas in a worksheet. This topic is covered later in this lesson.

You can also copy formulas to other cells. Excel will make a copy of the formula and the cell formatting while automatically adjusting cell references for the offset distance and direction. This may appear illogical at first, but it is actually a desirable feature in worksheets because the copied formulas are usually supposed to refer to different sets of input values.

Most worksheets have the same formulas used in multiple cells down a column or across a row. Excel will helpfully review these cells for you and displays a symbol (🚩) if it sees a formula that is different than the others in the same column or row. When you click the error indicator (🚩) (also known as a **smart tag**), a pop-up menu is displayed with the error message in the first line, followed by suggestions on how to correct it. This feature can be very handy to help review the worksheet for potential formula errors.

If you have deliberately entered a different formula, then simply ignore it or click the Ignore Error option in the menu to turn the error indicator off.



Cell References

Objective 4.1.1

A cell reference simply means copying the current value from another cell in the workbook. A formula can have as many cell references as you want. You can use one of the methods below to enter a cell reference after the equals sign (=):

- type the cell reference (or cell address) directly, or
- click on the cells being referenced.

For example, you may set up a cell with a formula to use the value from another cell and perform a calculation on it. Cells C1 and D1 in the example worksheet shown in Figure 3-2 demonstrate this. However, cell B1 is a very simple cell reference with no additional calculation.

You can also set up another cell with a formula to perform a calculation with two or more cells, such as =A1+B1, or =A1*B1+C4.

A third alternative is to create a formula that uses a **function** to operate on a range of cells. This is demonstrated in cell E1 in the example worksheet shown in Figure 3-2. A **cell range** is any rectangular block of cells, written in this format:

<starting cell address>:<ending cell address>

An example of a cell range is C11:E18. Note the use of the colon (:) to separate the two cell addresses. These cell addresses mark the two opposite corners of the rectangular group of cells. All cells inside this rectangle are used together in the formula, as shown in Figure 3-3.

	A	B	C	D	E	F
4			Oct	Nov	Dec	Total
5		Revenues:				
6		Sales	6000	6000	6000	
7		Other Revenues	50	50	50	
8		Total:				
9						
10		Expenses:				
11		Rent	5000	5000	5000	
12		Telephone	150	150	150	
13		Internet	125	125	125	
14		Photocopier	80	80	80	
15		Supplies	250	250	250	
16		Courier	65	65	65	
17		Advertising	250	250	250	
18		Utilities	325	325	325	
19		Total:				18735

Figure 3-3: Formula Bar showing cell range used in formula

Cell ranges can be used only in functions or arrays, for example `=SUM(C11:E18)`. You can't use a cell range on its own in a formula. The formula `=F9+C11:E18` will result in an error in Excel.

The cell range can be one-dimensional with all cells in the same row or column, two-dimensional with multiple rows and columns, or three-dimensional, spanning more than one worksheet.

You can enter the cell range address in any sequence, as long as you use the cell addresses from the two opposite corners. The following cell range addresses are equivalent for the same cell range: C11:E18, E11:C18, C18:E11, and E18:C11. Excel will accept every one of these range addresses and will change them to C11:E18, marking the top left and bottom right corner cells.

Cell range addresses can also include entire rows or columns. For example, the formula `=SUM(B:C)` will calculate the sum total of all values in columns B and C in the worksheet. Similarly, the formula `=SUM(3:3)` will calculate the sum total of all values in row 3 in the worksheet.

Mathematical Operators

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

- ^ Exponentiation and roots
- * Multiplication
- / Division
- + Addition
- Subtraction

You generally use formulas to perform calculations, such as ordinary arithmetic. Excel calculates formulas using the standard mathematical order of operations, as follows:

1. Brackets or parentheses
2. Negation (for example -2)
3. Exponents and roots
4. Multiplication and division
5. Addition and subtraction

Multiplication and division operators have the same level of precedence, so Excel performs them in the sequence they appear starting from the left to the right. In the same manner, the addition and subtraction operators are performed as they appear from the left to the right.

You can alter this standard order of operation by placing components of the formula within parentheses. Excel will then calculate the portion of the formula in parentheses before defaulting to calculations in the order listed above. Thus, you can control the order of calculations in your formulas with careful use of parentheses.

Learn to use formulas

In this exercise, you will create simple formulas.

1. Open the **Quarterly Income Statement** workbook located in the *StarterFiles* folder and save it as **My Quarterly Income Statement** in the *MyProjects* folder.
2. Click the **Quarter 1** worksheet, select cell **C8** and type: **=C6+C7** (but do not press ENTER yet).

Excel indicates which cell(s) you selected as part of the formula. You can use this visual tool to see what is happening on the screen when you create a formula.

4		Jan
5	Revenues:	
6	Sales	6000
7	Other Revenues	50
8	Total:	=C6+C7

3. Press **ENTER** to complete the formula.
4. Select cell **C8** again.

In cell C8, Excel displays the number 6050, which is the sum of the numbers in cells C6 and C7. Note the formula displayed in the Formula bar.

C8		✕ ✓ fx		=C6+C7	← Formula displayed in the Formula Bar
	A	B	C	D	E
4			Jan	Feb	Mar
5		Revenues:			
6		Sales	6000	6000	6000
7		Other Revenues	50	50	50
8		Total:	6050		

5. In cell **C7**, enter: **125**.

Excel automatically recalculates the displayed value in cell C8 because it contains a formula that refers to the values in cells C6 and C7, and a change in either (or both) cells will cause Excel to update the total in cell C8. This demonstrates the advantage of using formulas in a worksheet and using a cell reference rather than the cell contents.

6. In cell **D6**, enter: **6100**.

This time, the displayed value in cell C8 does not change when you change the value in cell D6. Remember that the formula in cell C8 has the cell reference to cell C6, not D6.

Once you enter a formula into the worksheet, you can copy the formula to another location if the formula operation for the new location is the same. For instance, you can use the same formula to calculate the total revenues for each of the next two months, except that you must use the respective cells for each of those two months. Rather than entering the formula in each of the two cells twice, you can simply copy the formula.

7. Select cell **C8** and, on the Home tab, in the Clipboard group, click **Copy**.
8. Select cells **D8:E8** and, on the Home tab, in the Clipboard group, click **Paste**.

If you change a value in a referenced cell, all cells that depend on that value will also change.

9. Select each of the cells in the range **C8** to **E8**.

Notice that Excel has adjusted the formula in each of these cells. This is called relative addressing.

Now enter a similar formula, this time adding across three columns.

10. Select cell **F4** and enter: **Total**.
11. Select cell **F6** and enter: **=C6+D6+E6**.
12. Select cell **F6** again and copy this formula down to cells **F7** to **F8**.

If a value is changed in one cell, Excel will recalculate all formulas that directly or indirectly reference this cell automatically.

13. In cell **E7**, enter: **80**.
14. On the Quick Access Toolbar, click **Undo** to see that the displayed values in cells E7, E8, F7 and F8 change back to their previous values.
15. On the Quick Access Toolbar, click **Redo** to re-apply the change in cell E7.

	A	B	C	D	E	F
1	Tolano Adventures					
2	Department Budget					
3						
4			Jan	Feb	Mar	Total
5	Revenues:					
6		Sales	6000	6100	6000	18100
7		Other Revenues	125	50	80	255
8		Total:	6125	6150	6080	18355

Repeat these same formulas in the other quarterly worksheets.

16. Select cell **C8** and, on the Home tab, in the Clipboard group, click **Copy**.
17. Select the **Quarter 2** worksheet, then select cells **C8:E8** and, on the Home tab, in the Clipboard group, click **Paste**.
18. Select the **Quarter 1** worksheet, then select cells **F4:F8** and, on the Home tab, in the Clipboard group, click **Copy**.
19. Select the **Quarter 2** worksheet, then select cell **F4** and, on the Home tab, in the Clipboard group, click **Paste**.

The series of steps from 16 to 19 demonstrates one way of copying formulas from one worksheet to others. The same result can be achieved faster by knowing that you can paste the same cells as many times as you need to until you do something different.

20. Select the **Quarter 3** worksheet, then select cell **F4** and, on the Home tab, in the Clipboard group, click **Paste**.
21. Select the **Quarter 4** worksheet, then select cell **F4** and, on the Home tab, in the Clipboard group, click **Paste**.

Now copy the other set of formulas.

22. Select the **Quarter 1** worksheet, then select cells **C8:E8** and, on the Home tab, in the Clipboard group, click **Copy**.
23. Select the **Quarter 3** worksheet, then select cell **C8** and, on the Home tab, in the Clipboard group, click **Paste**.
24. Select the **Quarter 4** worksheet, then select cell **C8** and, on the Home tab, in the Clipboard group, click **Paste**.

As you gain more experience in copying and pasting, you will find your own shortcuts to make this task easier.

25. Save the workbook and keep it open for the next exercise.

Referencing Other Worksheets

In addition to referencing other cells within the same worksheet, formulas can reference cells in other worksheets within the same workbook. The general format of this kind of reference is:

`'<worksheet name>!'<cell reference>`

Excel uses the exclamation mark (!) symbol to indicate that the referenced cell is in a different worksheet. The single quotation marks (') are required if the worksheet name has blank spaces in it.

Furthermore, you can also use cell references for cells located in a different workbook. This topic will be covered in the Expert level courseware.

Learn to reference cells in other worksheets

In this exercise, you will create formulas that reference cells in other worksheets.

1. With the My Quarterly Income Statement workbook open, click the **Company** worksheet tab to make it the active worksheet.
2. In cell **C4**, enter: **Qtr 1**.
3. In cell **C6**, type: = (but do not press ENTER yet).
4. Click the **Quarter 1** worksheet and select cell **F6**.

Notice that a marquee now appears around cell F6 and the Formula bar shows = 'Quarter 1'!F6 with single quotes around the worksheet name.

5. Press **ENTER**.
6. Copy the contents of cell **C6** (in the Company worksheet) to cells **C7:C8** using your preferred method, then click each of these cells and examine the contents in the Formula Bar.

Notice that Excel automatically adjusts only the cell reference part, while keeping the worksheet reference component unchanged.

7. Select cell **C4**. Then click the AutoFill handle (✚) in the bottom right corner and drag it across the worksheet to column **F**.
8. Select cell **D6**, type: =, click the **Quarter 2** worksheet, click cell **F6**, and press **ENTER**.
9. Copy the contents of cell **D6** (in the Company worksheet) to cells **D7:D8** using your preferred method.
10. Select cell **E6**, type: =, click the **Quarter 3** worksheet, click cell **F6**, and press **ENTER**.
11. In cell **F6** (in the Company worksheet), enter: ='Quarter 4'!F6 (be sure to avoid entering any blank spaces inside this formula except between the two single quotes).
12. Select cells **E6:F6** and drag the AutoFill handle (✚) in the bottom right corner down to cell **F8**.

	A	B	C	D	E	F
1	Tolano Adventures					
2	Quarterly Income Statement					
3						
4			Qtr 1	Qtr 2	Qtr 3	Qtr 4
5	Revenues:					
6		Sales	18100	22500	20000	18000
7		Other Revenues	255	105	105	150
8		Total:	18355	22605	20105	18150

Formulas referencing the appropriate worksheet cells now appear in cells E7:E8.

13. Save and close the workbook.

Using Math and Statistical Functions

Using the SUM Function

Objective 4.2.1

Typing cell addresses and plus signs is a good method when you are adding the contents of a small number of cells. However, if you need to sum up a column of 50 numbers, this method is time-consuming and will soon exceed the maximum limits on cell contents. It would be very inefficient to enter something like “=B1+B2+B3+B4+...B50” for each cell you want to include.

Excel provides a large library of built-in functions to facilitate this and other types of mathematical and data operations. These functions enable the calculation of long or complex formulas to be simplified by using a specialized function. Generally, all Excel functions follow this format:

=FUNCTION(arguments)

At first, it may appear that the number and variety of Excel functions is intimidating. The most commonly used ones are similar to each other and very easy to use.

The SUM function is an example of a commonly used function. In fact, it is so prevalent that you will find it in most workbooks. As its name implies, its purpose is to calculate the sum of all numeric values in a range of cells.

A function is not the same as a formula. As described at the start of this Lesson, a formula always has a "=" as the very first character. Functions do not need the "=". Just be aware that most descriptions include the "=" character before the function name as a reminder that it is part of a formula. But after the "=" character, you can construct your formula using as many values, operators, and functions as you want: for example, =A10+5+SUM(F2:F9)+B3+SUM(G2:G9)

The function uses arguments as input values to perform its calculations. There are some general rules to understand about arguments:

- Arguments can be values (numeric, text or date, depending on the type of function) or cell references. Each function has specifications for its arguments but the most common type of argument is a cell range. The format of the cell range is as follows:

<first cell address>:<last cell address>

Examples:

A10:B15

D25:B5

C5:C25

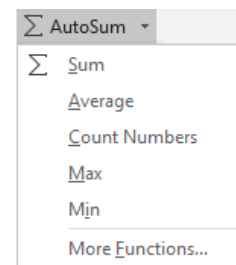
- Many functions allow you to enter a variable number of arguments. For example:
=SUM(C6:C18) – calculates the sum of the numbers in all cells from C6 to C18
=SUM(C6:C18,D6:D18,F6:F18) – calculates the sum of the numbers in all cells from C6 to C18, and D6 to D18, and F6 to F18
=SUM(C6:C18,C20) – calculates the sum of the numbers in all cells from C6 to C18, and cell C20

You can enter a cell range either by typing the cell reference(s) directly, or by using the pointing method. To use the pointing method, simply use the mouse to click on the first cell and drag to the last cell to select the cell range. The latter method has the advantage of visually identifying the cell range, which reduces the possibility of entering incorrect cell references.

An alternative to manually typing the SUM function into a cell is to use the **AutoSum** button in the Ribbon. Because the SUM function is so commonly used, Excel provides two ways of activating it:

- on the Formulas tab, in the Function Library group, click AutoSum
- on the Home tab, in the Editing group, click AutoSum as shown at the right.

Notice that there is an arrow next to AutoSum in the Ribbon. When you click the AutoSum arrow, it will display other summary functions that you can use in your formulas.



Note: Depending on screen resolution, the AutoSum command may appear as just an icon because the window is not wide enough to display the entire command button.

When using AutoSum, be sure to verify that you have selected the correct cell range. Excel will automatically select the range of cells immediately above or to the left of the selected cell and display it for you to accept or change.

Learn to calculate the sum total

In this exercise, you will calculate the sum total of a row and a column of numbers.

1. Open the **Quarterly Income Statement SUM** workbook located in the *StarterFiles* folder and save it as: **My Quarterly Income Statement SUM** in the *MyProjects* folder.
2. Click the **Quarter 1** worksheet tab and select cell **C19**.
3. On the Home tab, in the Editing group, click **AutoSum**.

Notice that the cell now shows `=SUM(C11:C18)`, with the cell range C11:C18 highlighted, and a marquee around that cell range. Excel also reminds you of other ways to enter this formula using individual data values.

10	Expenses:			
11	Rent	5000	5000	5000
12	Telephone	150	150	150
13	Internet	125	125	125
14	Photocopier	80	80	80
15	Supplies	250	250	250
16	Courier	65	65	65
17	Advertising	250	250	250
18	Utilities	325	325	325
19	Total:	=SUM(C11:C18)		
20		SUM(number1, [number2], ...)		

4. Press **ENTER** to accept the formula as displayed.

Excel always includes the cell immediately above the active cell, even if it is blank, and extends up the current column until it finds a blank cell. There are still numbers in the cells above the selected range, but they are not automatically included because there is at least one blank cell between them. You can manually extend the range to include additional cells.

5. Select cell **C19** again and copy it to cells **D19:E19**.
6. Select cell **F11** and type: `=SUM(` but do not press ENTER yet.

Note: You may enter cell references and the function name in lower- or upper-case characters. Excel will convert them all to upper case.

7. Use the mouse to select the cell range **C11:E11**. Then press **ENTER**.

In this case, Excel permits you to omit entering the last parenthesis for this function. However, Excel does not always permit this, and it is poor practice.

8. Select cell **F11** again and copy it to cells **F12:F19**.

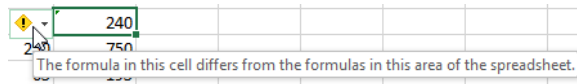
Other arithmetic operations (such as multiplication) can be performed in a formula. If a cell contains a formula that is different from the cells around it (if any), Excel displays a marker symbol.

9. Select cell **F14**.
10. Enter: `=C14+D14+E14`.

The worksheet should look like the following example:

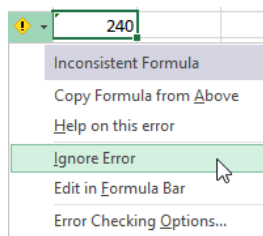
10	Expenses:				
11	Rent	5000	5000	5000	15000
12	Telephone	150	150	150	450
13	Internet	125	125	125	375
14	Photocopier	80	80	80	240
15	Supplies	250	250	250	750
16	Courier	65	65	65	195
17	Advertising	250	250	250	750
18	Utilities	325	325	325	975
19	Total:	6245	6245	6245	18735

Notice the  symbol in cell F14. This marker is a reminder that this cell contains a formula that is different from the cells around it. It is not necessarily an error symbol because the different formula may be intentional. To view the message, click in the cell and then click on the smart tag.



To remove the message, click the smart tag arrow and select a course of action.

11. Select cell **F14** again, position the mouse over the smart tag, click the arrow and select **Ignore Error**.



12. Select cell **C19** again and copy it to cells **C19: E19** in the **Quarter 2, Quarter 3,** and **Quarter 4** worksheets.
13. Select cell **F11** in the **Quarter 1** worksheet again and copy it to cells **F11:F19** in the **Quarter 2, Quarter 3** and **Quarter 4** worksheets.
14. Save and close the workbook.

Using Statistical Functions

Objective 4.2.1, 4.2.2

All Excel functions are grouped into one of 13 categories. For example, the SUM function is in the Math & Trig (trigonometry) category. However, many familiar functions are found in the Statistical category. These are described in Table 3-3.

Table 3-3: Commonly used statistical functions

Function Name	Description
=AVERAGE	Calculates the arithmetic mean average of the numbers in the specified range (sum total of the cell range, divided by the total of the number of cells containing a number).
=MIN	Finds and displays the lowest numeric value in the specified range.
=MAX	Finds and displays the largest numeric value in the specified range.
=COUNT	Counts the number of cells in the specified range that contain numeric or date values.
=COUNTA	Counts the number of cells in the specified range that contain any value (numeric, date, or text).
=COUNTBLANK	Counts the number of empty (do not contain any value) cells in the specified range.

Learn to use statistical functions

In this exercise, you will use a variety of statistical functions.

1. Open the **Weekly Expense Report Statistics** workbook located in the *StarterFiles* folder and save it as: **My Weekly Expense Report Statistics** in the *MyProjects* folder.

Use the standard SUM function to calculate the subtotal values in column C.

2. Select cell **C6** and then, on the Home tab, in the Editing group, click **AutoSum**. Verify that only cell C5 is selected as the argument for the SUM function and press **ENTER**.
3. Select cell **C9** and then, on the Home tab, in the Editing group, click **AutoSum**. Verify that only cell C8 is selected as the argument for the SUM function and press **ENTER**.
4. Select cell **C13** and then, on the Home tab, in the Editing group, click **AutoSum**. Verify that both expense values in the cells above are selected and press **ENTER**.
5. Repeat either previous step (depending on whether there is one or two values to add together) for each of the remaining subtotal cells in cells **C17, C21, C24, E6, E9, E13, E17, E21** and **E24**.

	A	B	C	D	E	F	G
1	Tolano Adventures						
2	Weekly Expense Report						
3			SUM		SUM +		SUBTOTAL
4	Office	Travel Director	Expenses		Expenses		Expenses
5	Cape Town	Jamie Gibson	122.05		122.05		122.05
6	Subtotal for Cape Town		122.05		122.05		
7							
8	London	Andrew McSweeney	234.62		234.62		234.62
9	Subtotal for London		234.62		234.62		
10							
11	New York	Madison Cowell	178.92		178.92		178.92
12	New York	Nick Klassen	199.25		199.25		199.25
13	Subtotal for New York		378.17		378.17		
14							
15	Sydney	Curtis Gorski	82.54		82.54		82.54
16	Sydney	Lawrence Jang	101.76		101.76		101.76
17	Subtotal for Sydney		184.30		184.30		
18							
19	Tokyo	Christie Akira	287.92		287.92		287.92
20	Tokyo	Kanda Yamoto	274.10		274.10		274.10
21	Subtotal for Tokyo		562.02		562.02		
22							
23	Toronto	Toby Belanger	164.29		164.29		164.29
24	Subtotal for Toronto		164.29		164.29		
25	Grand Total - All Offices						
26	Average						
27	Count						
28	Highest						
29	Lowest						
30	Count of Directors						
31	Count of Blanks						

Up to this point, both columns C and E have been identical. The subtotal values have been calculated for each travel office. You will now try to calculate the grand total for all offices.

To do this, you will deliberately create an incorrect grand total for column C, which you will use for comparative purposes.

6. Select cell **C25** and then, on the Home tab, in the Editing group, click **AutoSum**. Select cells **C5:C24** and press **ENTER**.

7. Enter the following formulas:

Cell Formula

C26 **=AVERAGE(C5:C24)**

C27 **=COUNT(C5:C24)**

C28 **=MAX(C5:C24)**

C29 **=MIN(C5:C24)**

Enter two more formulas to count the number of cells containing text (names of travel directors) and the number of cells without any data in column B.

8. Enter the following formulas:

Cell Formula

B30 **=COUNTA(B5:B24)**

B31 **=COUNTBLANK(B5:B24)**

Now enter the correct formulas for column E. The grand total of **=SUM(E6,E9,E13,E17,E21,E24)** calculates based only on the subtotal values.

9. Select cell **E25** and then, on the Home tab, in the Editing group, click **AutoSum**.

To select individual cells instead of the full range as you did in step 6, you must use the CTRL key.

10. Select cell **E6**, press and hold **CTRL**, and then click on each of the cells **E9**, **E13**, **E17**, **E21**, and **E24**. Release **CTRL** and press **ENTER**.

Notice that the grand total in column E is half of the grand total in column C. This demonstrates that the latter value is double-counting everything in column C.

Now calculate the average weekly expense for all employees using the AutoSum button in the Ribbon.

11. Select cell **E26** and then, on the Home tab, in the Editing group, click the **AutoSum** arrow and click **Average** to select this function.
12. Select cell **E5**, press and hold **CTRL**, and then click on each of the cells **E8, E11, E12, E15, E16, E19, E20,** and **E23**. Release **CTRL** and press **ENTER**.

Note that the cells in this AVERAGE function are not the same as for the SUM function above. The average is calculated using each individual person's expense amount, not the subtotal for the office.

13. Enter the rest of the summary formulas (either by entering the full formula or by using the mouse to select the cells):

Cell	Formula
E27	=COUNT(E5,E8,E11,E12,E15,E16,E19,E20,E23)
E28	=MAX(E5,E8,E11,E12,E15,E16,E19,E20,E23)
E29	=MIN(E5,E8,E11,E12,E15,E16,E19,E20,E23)

	A	B	C	D	E	F	G
1	Tolano Adventures						
2	Weekly Expense Report						
3			SUM		SUM +		SUBTOTAL
4	Office	Travel Director	Expenses		Expenses		Expenses
5	Cape Town	Jamie Gibson	122.05		122.05		122.05
6	Subtotal for Cape Town		122.05		122.05		
7							
8	London	Andrew McSweeney	234.62		234.62		234.62
9	Subtotal for London		234.62		234.62		
10							
11	New York	Madison Cowell	178.92		178.92		178.92
12	New York	Nick Klassen	199.25		199.25		199.25
13	Subtotal for New York		378.17		378.17		
14							
15	Sydney	Curtis Gorski	82.54		82.54		82.54
16	Sydney	Lawrence Jang	101.76		101.76		101.76
17	Subtotal for Sydney		184.30		184.30		
18							
19	Tokyo	Christie Akira	287.92		287.92		287.92
20	Tokyo	Kanda Yamoto	274.10		274.10		274.10
21	Subtotal for Tokyo		562.02		562.02		
22							
23	Toronto	Toby Belanger	164.29		164.29		164.29
24	Subtotal for Toronto		164.29		164.29		
25	Grand Total - All Offices		3290.90		1645.45		
26	Average		219.39		182.83		
27	Count		15		9		
28	Highest		562.02		287.92		
29	Lowest		82.54		82.54		
30	Count of Directors	9					
31	Count of Blanks	11					

As you can see, entering these sum, average, count, maximum, and minimum functions was painful — they were tedious and error-prone because you had to individually pick each of the subtotal numbers in the column.

Tip: Experienced Excel users would know that step 13 could have been accomplished more easily by converting the cell references in the AVERAGE formula to absolute cell references. You can then copy this formula from cell E26 to these cells, and just change the function name. Absolute cell references are covered later in this lesson.

14. Save and close the workbook.

Using the IF Function

Objective 4.2.3

The ability to perform different calculations based on changing values is one of the most powerful and useful features of spreadsheets. The primary function used for this is the IF function. This function tests for a condition and performs one of two different calculations based on the result of the test. The result should always evaluate to either TRUE or FALSE. In other words, either the condition being tested is TRUE or it is FALSE. This automatic evaluation provides “on the fly” conditional worksheet calculations.

The format of the IF function is as follows:

=IF(logical test,value if true,value if false)

Logical Test – Specify what the IF statement will evaluate. The result should always be binary; it should always result in either True or False.

Value if True – If the Logical Test is found to be true, then the result of the IF function will be whatever is in this section of the formula.

Value if False – If the Logical Test is found to be false, then the result of the IF function will be whatever is in this section of the formula.

The Logical Test section of the function often uses comparison operators that will help you obtain the desired result. Qualifiers are punctuation marks used to identify or define different types of data. For example, text used in a formula requires double quotation marks (") as qualifiers.

Some of the comparison operators you can use are:

- = Equal to
- > Greater than
- < Less than
- >= Greater than or equal to
- <= Less than or equal to
- <> Not equal to

The Value if True/False sections can contain a text string, values or even other functions. In fact, you can nest or embed up to 64 IF functions within one IF function. An example of a nested IF function would appear as follows:

=IF(A1=10, "text A",IF(A1=20, "text B", "text C"))

In this example, Excel will display the following values when the conditions are met:

If A1 contains	Then this will display
10	text A
20	text B
Any other value	text C

Learn to use the IF function

In this exercise, you will use the IF function and nest one function within another function.

1. Open the **AirKm Award Points** workbook located in the *StarterFiles* folder and save it as: **My AirKm Award Points** in the *MyProjects* folder.

This worksheet is designed to calculate the number of travel points given to customers based on the amount they spend. For every dollar a customer spends, the program awards 100 AirKm points. In addition, the program awards customers an additional 20 points for every dollar if the total amount is over \$500.

First, calculate the number of points per dollar.

2. Select cell **D5** and enter: **=C5*100**.
3. Select cell **D5** again and copy it down to cells **D6:D20**.

Now calculate the bonus points per dollar, but only do this where the amount is greater than 500.

4. Select cell **E5** and click the **Insert Function** button to the left of the Formula Bar to open the Insert Function dialog box.
5. In the *Or select a category* list, click the arrow and then click **Logical**.
6. In the *Select a function* list, click **IF** and click **OK**.

Excel displays the Function Arguments dialog box to help you enter the correct arguments for this function. You will base the logical test on the cost of travel, which is in cell C5, and must be over 500.

7. In the Logical_test field, type: **C5>500** but do not press ENTER.

The next section is the Value_if_true section. If the result of the conditional test (C5 > 500 in this case) is true, Excel will return the value in this box to the worksheet cell. In this case, the value has to be calculated.

8. In the Value_if_true field, type: **C5*20**.

The last part of the function is the Value_if_false section. If the result of the conditional test is false, Excel will return this value. In this case, the value would be zero.

9. In the Value_if_false field, type: **0**.

The screenshot shows the 'Function Arguments' dialog box for the IF function. It has three input fields: 'Logical_test' with the value 'C5>500', 'Value_if_true' with the value 'C5*20', and 'Value_if_false' with the value '0'. To the right of each field is a small icon with an upward arrow and a calculated result: '= TRUE' for the logical test, '= 19369.6' for the true value, and '= 0' for the false value. Below these fields, a summary line shows '= 19369.6'. A descriptive text block explains the IF function: 'Checks whether a condition is met, and returns one value if TRUE, and another value if FALSE. Value_if_false is the value that is returned if Logical_test is FALSE. If omitted, FALSE is returned.' At the bottom, it shows 'Formula result = 19369.6' and has 'OK' and 'Cancel' buttons.

10. Click **OK**.

Note that the resulting formula is **= IF(C5>500,C5*20,0)**.

Since the calculated value could result in a decimal value, you can use an additional rounding function to round the value up or down to the nearest whole number. You can accomplish this by embedding the IF function inside the ROUND function.

11. In cell **E5**, press **F2**.
12. Move the cursor inside the cell to the left, to a position between the = and IF, and type: **ROUND(**.
13. Press the **END** key, type: **,0)**.

=ROUND(IF(C5>500,C5*20,0),0)

14. Press **ENTER**.

This technique of using a function inside of another function is known as nesting. When you nest functions, Excel will perform the inner-most functions first and use those results as arguments for the next outer level of functions until the entire formula is calculated. You can nest up to seven levels of functions.

15. Copy the formula from cell **E5** to cells **E6:E20**.

Bonus points are now calculated only if the amount in column B is greater than \$500.

	A	B	C	D	E
1	Tolano Adventures				
2	AirKm Points Awarded				
3					
4	Passenger Name	Type	Amount	Points	Bonus Pts
5	Chan, A	Personal	968.48	96848	19370
6	Chan, H	Personal	968.48	96848	19370
7	Cox, T	Corporate	315.58	31558	0
8	Cox, W	Personal	315.58	31558	0
9	Dali, P	Corporate	548.27	54827	10965
10	Dali, S	Personal	548.27	54827	10965
11	Koehn, J	Personal	370.82	37082	0
12	Koehn, P	Personal	370.82	37082	0
13	Moore, M	Personal	366.03	36603	0
14	Noire, N	Personal	464.78	46478	0
15	Singh, G	Corporate	835.69	83569	16714
16	Smith, A	Corporate	528.28	52828	10566
17	Smith, B	Corporate	492.44	49244	0
18	Smith, T	Personal	528.28	52828	10566
19	Williams, M	Personal	441.44	44144	0
20	Wong, K	Personal	578.28	57828	11566

16. Save and close the workbook.

Displaying Blank Cells instead of Zeros

You can modify your IF function if you want your worksheet to be more presentable. For example, if you want the IF formula to show a blank cell instead of zeros or dashes when the amount is \$500 or less, modify the formula to appear as follows:

```
=IF(C5>500,ROUND(C5*20,0)," ")
```

The set of double quotes will cause Excel to insert a blank in any cell that evaluates to FALSE based on the argument in the Logical_test.

Remember to copy the changed formula to the other cells on the worksheet.

When you use the **Insert function** feature, Excel will insert the quotes for you when you enter text in the Value if True/False fields. When you want either of these fields to be blank, you must type both quotation marks or the word True or False will appear in the cell.

Using Text Functions

Objective 4.3.1, 4.3.2, 4.3.3

Excel includes several **text functions** that are useful for handling text strings. They are often used to manipulate data imported from other sources.

Some of the most useful text functions include:

=LEFT – Extract the specified number of characters starting from the left side of the text string. The format of this function is:

=LEFT(text_string, number_of_characters)

The text_string can be a cell reference or a text string. If the number of characters is greater than the total length of the text string, then the original text string is returned.

=RIGHT – Extract the specified number of characters starting from the right side of the text string. The format of this function is:

=RIGHT(text_string, number_of_characters)

The text_string can be a cell reference or a text string. If the number of characters is greater than the total length of the text string, then the original text string is returned.

=MID – Extract the specified number of characters starting from any position in the text string. The format of this function is:

=MID(text_string, starting_position, number_of_characters)

The text_string can be a cell reference or a text string. If the number of characters is greater than the number of characters available, then the original text string is returned.

=UPPER – Convert all characters in a text string to uppercase. The format of this function is:

=UPPER(text_string)

=LOWER – Convert all characters in a text string to lowercase. The format of this function is:

=LOWER(text_string)

=PROPER – Convert the first letter of every word of the text string, and any letter following a non-alphabetic character, to uppercase. All other characters are set to lowercase. The format of this function is:

=PROPER(text_string)

=LEN – Used to count the number of characters in a text string, including letters, numbers, special characters, non-printing characters, and spaces contained in the specified cell. For instance, if the cell A5 contains the string, "apple pie" and the cell A6 contains =LEN(A5), the length of the string "apple pie" (contained in A5) will be evaluated and 9 will be returned in A6, because there are nine characters in the string "apple pie". The format of this function is:

=LEN(text string)

=TEXTJOIN – Combine the text from multiple ranges and/or strings. It has three required arguments: delimiter, ignore_empty, and text1. The first argument, delimiter, specifies what character will separate the text. The second argument, ignore_empty, is set to TRUE or FALSE, and tells Excel whether or not empty cells/text should be ignored. The third argument is simply the text, or cell range you wish to concatenate. For example, =TEXTJOIN(",", TRUE, A1:A5) will join the text contained in cells A1 through A5 into a text string, separated by commas. In addition, because the ignore_empty field is set, only non-empty cells will be included in the new string. Only one cell range or text string is required. It is possible, however, to join up to 252 text strings, cell ranges and/or cell references, including the first one. The format of this function is:

=TEXTJOIN(delimiter, ignore_empty, text1, [text2], ...)

=CONCAT – Combine the text from multiple ranges and/or strings, but it doesn't provide the delimiter or ignore_empty arguments. Also note that CONCAT will not add space between the concatenated texts; if you wish to have spaces, you must include them in your individual text strings as desired.

The CONCAT function replaces the CONCATENATE function. The CONCATENATE function is still available but may not be available in future versions of Excel. It is suggested that users begin using CONCAT in place of CONCATENATE. CONCAT has an advantage over CONCATENATE in that the user can specify a range of cells, whereas the CONCATENATE function requires the user to specify individual cells. The format of the CONCAT function is:

=CONCAT(text string1, text string2)

=CONCATENATE – Join two or more text strings together to create one text string. Alternatively, the & operator can be used instead of the CONCATENATE function. The format of this function is:

=CONCATENATE(text_string_1, text_string_2, text_string_3, ...)

=TRIM – Remove extra spaces from the text string. This function will evaluate a text string and eliminate all spaces from the text except for single spaces between words. For example, TRIM(" I love to eat apple pie . ") will return the following: I love to eat apple pie . The format of this function is:

=TRIM(text string)

When spreadsheets are used for lists or as a database, these often-overlooked functions can save many hours of manually entering data.

Tip: The Excel Flash Fill feature may also perform many of the text conversions for you without your having to use these text functions.

Learn to use text functions

In this exercise, you will use text functions to change character strings.

1. Create a new blank workbook and save it as **My Text Functions** in the *MyProjects* folder.
2. Enter the following values (be sure to use the upper and lower characters as specified here):

Cell	Value
A1	JaNe
B1	pArkER-smiTh

3. Increase the width of columns **A**, **B**, **C**, and **D** to **22**.
4. Select cell **C1** and enter: **=CONCAT(A1," ",B1)** and be sure to place one blank space between the quotation marks.

The space between the quotation marks is required to separate first and last names.

The TEXTJOIN function is another way to string cell values together.

5. Select cell **D1** and enter: **=TEXTJOIN(" ",TRUE,A1,B1)**.

Notice you get the same result as in the CONCAT function in cell C1.

6. Select cell **A2** and enter: **=LOWER(A1)**.
7. Select cell **A3** and enter: **=UPPER(A1)**.

8. Select cell **A4** and enter: **=PROPER(A1)**.

9. Copy cells **A2:A4** to **B2:C4**.

Notice that Excel inserts capitals in all the proper locations, including after the hyphen.

10. Select cell **D3** and enter: **=MID(C4,6,4)**.

The function extracts the specified number of characters (4) in cell C4, starting at the position of the sixth character.

11. Select cell **D4** and enter: **=LEN(C4)**.

The function counts the total number of characters in cell C4.

Now use other text functions to extract parts of text strings or join them together in different ways.

12. In cell **A6**, enter: **BIRTHDAY**

13. In cell **B6**, enter: **=LEFT(A6,5)**.

14. In cell **C6**, enter: **=RIGHT(A6,3)**.

15. In cell **B7**, type: **=CONCAT(LEFT(A6,3),MID(A6,6,1))**.

	A	B	C	D
1	JaNe	pArKER-smiTh	JaNe pArKER-smiTh	JaNe pArKER-smiTh
2	jane	parker-smith	jane parker-smith	
3	JANE	PARKER-SMITH	JANE PARKER-SMITH	Park
4	Jane	Parker-Smith	Jane Parker-Smith	17
5				
6	BIRTHDAY	BIRTH	DAY	
7		BIRD		

16. Save and close the workbook.

Using Absolute and Relative Cell References

Using Absolute Cell References

Objective 4.1.1

Most formulas in an Excel worksheet use relative addressing for cells. If you copy a formula that contains a **relative cell address** and paste it to another cell, Excel automatically adjusts it for 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 adjusted set of three rows in the new column. The formula is relative to the column in which you place it.

This automatic adjustment feature is advantageous when you are creating sheets, such as budget sheets, which require the same formula to be repeated across many months or line items. However, in some cases you may not want this automatic adjustment feature.

Fortunately, Excel enables you to make cell addresses absolute or fixed. An **absolute cell address** refers to a fixed (non-moving) 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 (for example, **\$E\$5**). This ensures that when you copy a formula, Excel will not adjust the absolute cell addresses for the new location.

Using Mixed Absolute and Relative Cell References

Objective 4.1.1

Cell addresses do not have to have both absolute column and row references. You can have **mixed cell references**. The column reference can be absolute and the row reference relative (for example, \$E5). If a formula including this reference is copied to a new location, only the column reference (\$E) is constant, and the row reference is adjusted for the new location.

Conversely, if you copy a formula including a cell reference with an absolute row reference and a relative column reference (for example, E\$5) to a new location, Excel will adjust only the column reference for the new location. This adds flexibility for creating cell formulas, which will become increasingly important as your worksheets become more complex.

As a general rule of thumb: if you intend to copy the formula to other cells in the same row and keep the column reference locked, place the \$ in front of the column letter. If you intend to copy the formula to other cells in the same column and keep the row reference locked, place the \$ in front of the row number.

After you have typed a cell address, you can press F4 to insert the absolute signs for the column and row references. You can also go back to formulas you have typed previously, edit them, position the insertion point in the cell address you wish to make absolute, and press F4.

The number of times you press F4 determines which references become absolute:

- Press once to make both the column and row reference absolute.
- Press twice to make only the row reference absolute.
- Press three times to make only the column reference absolute.
- Press four times to remove the absolute references from both column and row.

Learn to use absolute cell references

In this exercise, you will use absolute cell references.

1. Open the **Quarterly Income Statement Company** workbook located in the *StarterFiles* folder and save it as **My Quarterly Income Statement Company** in the *MyProjects* folder.
2. If necessary, click the **Company** worksheet tab.

First create a new column of totals.

3. Select cell **G4** and enter: **Total**.
4. Select cells **C6:G8** and on the Home tab, in the Editing group, click **AutoSum**.
5. In cell **C11**, type: = then click the **Quarter 1** worksheet, select cell **F11** and press **ENTER**.
6. Repeat the previous step for other cells in this row.

Cell	Source
D11	Quarter 2 worksheet cell F11
E11	Quarter 3 worksheet cell F11
F11	Quarter 4 worksheet cell F11

7. Select cells **C11:G11** and on the Home tab, in the Editing group, click **AutoSum**.
8. Copy the contents of the cell range **C11:G11** down to cells **C12:G19**.

The relative addressing feature in Excel has saved you a lot of time in setting up these formulas.

9. Select cell **A21** and enter: **Profit**.
10. Select cell **C21** and enter: **=C8-C19**.
11. Copy cell **C21** across to cells **D21:G21**.
12. Select cell **A22** and enter: **Quarterly Margin**.
13. Select cell **C22** and enter: **=C21/G8**.
14. Copy cell **C22** across to cells **D22:G22**.

At first, it appears as if you can copy the formula into the other cells in row 22. However, the result is as shown in the following:

	A	B	C	D	E	F	G
2	Quarterly Income Statement						
3							
4			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
5	Revenues:						
6		Sales	18100	22500	20000	18000	78600
7		Other Revenues	255	105	105	150	615
8		Total:	18355	22605	20105	18150	79215
9							
10	Expenses:						
11		Rent	15000	15000	15000	15000	60000
12		Telephone	450	450	450	450	1800
13		Internet	375	375	375	375	1500
14		Photocopier	240	240	240	240	960
15		Supplies	750	750	750	750	3000
16		Courier	195	195	195	195	780
17		Advertising	750	750	750	750	3000
18		Utilities	975	975	975	975	3900
19		Total:	18735	18735	18735	18735	74940
20							
21	Profit		-380	3870	1370	-585	4275
22	Quarterly Margin		-0.0048	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
23							
24							

Clearly, the answers provided are incorrect – Excel displays a #DIV/0!(division by zero) error message in the other cells.

Now examine the formulas you had copied in column C.

15. Select cell **D22** and examine the formula bar.

 =D21/H8

As you can see, Excel has adjusted the cell address using relative addressing for each cell where you copied the formula. This adjustment process, which was so useful when you were creating and copying other formulas, is now causing a problem: dividing a value in cell D21 by the value in cell H8. The problem is that cell H8 is blank, which is interpreted as having the value of zero. If you divide any number by zero, you will get a "division by zero" error message.

You can resolve this problem by returning to cell C22 and editing the formula. The formula must use absolute cell referencing for the G8 cell reference. Thus, the formula in cell C22 should be **=C21/\$G\$8** or **=C21/\$G8**.

16. Select cell **C22** and press **F2** to activate the editing mode.
17. Press **F4** to put the absolute value signs around the nearest cell reference in the formula (G8).
18. Press **ENTER** to accept this formula.

Note that the amount in cell C22 does not change.

19. Copy the formula from cell **C22** to cells **D22:G22**.

Your worksheet should now look like the following example:

	A	B	C	D	E	F	G
2		Quarterly Income Statement					
3							
4			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
5		Revenues:					
6		Sales	18100	22500	20000	18000	78600
7		Other Revenues	255	105	105	150	615
8		Total:	18355	22605	20105	18150	79215
9							
10		Expenses:					
11		Rent	15000	15000	15000	15000	60000
12		Telephone	450	450	450	450	1800
13		Internet	375	375	375	375	1500
14		Photocopier	240	240	240	240	960
15		Supplies	750	750	750	750	3000
16		Courier	195	195	195	195	780
17		Advertising	750	750	750	750	3000
18		Utilities	975	975	975	975	3900
19		Total:	18735	18735	18735	18735	74940
20							
21		Profit	-380	3870	1370	-585	4275
22		Quarterly Margin	-0.0048	0.048854	0.017295	-0.00738	0.053967
23							
24							
		Company	Quarter 1	Quarter 2	Quarter 3	Quarter	

20. Check the formulas now entered in row 22:

C22 contains =C21/\$G\$8
 D22 contains =D21/\$G\$8
 E22 contains =E21/\$G\$8
 F22 contains =F21/\$G\$8
 G22 contains =G21/\$G\$8

When the reference to cell G8 is absolute, it is anchored to the total revenues cell.

21. Save and close the workbook.

Displaying Formulas

Objective 1.4.6

To see the formula in a cell, you must select that cell and examine the formula displayed in the Formula Bar or press F2 to see the formula in the cell. In some circumstances, you may want to see all the formulas in all the cells at the same time, especially when you are verifying the accuracy of the spreadsheet.

Excel has an option available to display all formulas in a worksheet at the same time. Cells that contain numeric or other values will simply display those data values.

To display all formulas in a worksheet at once, choose one of the following methods:

- On the Formulas tab, in the Formula Auditing group, click Show Formulas.
- On the File tab, click Options to open the Excel Options dialog box. Click Advanced, then under *Display options for this worksheet*, select *Show formulas in cells instead of their calculated results*, and click OK.

Excel allows you to print the worksheet with the formulas displayed. This is an excellent technique for verifying that you have entered all the formulas correctly.

Learn to display formulas

In this exercise, you will display formulas and then display formula results.

1. Open the **Quarterly Income Statement Show Formulas** workbook.
2. On the Formulas tab, in the Formula Auditing group, click **Show Formulas**.

Hint: An alternative way of activating this feature is to use the keyboard shortcut key sequence CTRL+` (Grave Accent).

3. If necessary, increase the size of the workbook window so that you can see columns A through G.

	A	B	C	D	E	F	G
1	Tolano Ad						
2	Quarterly						
3							
4			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
5	Revenues:						
6	Sales	=Quarter 1!F6	=Quarter 2!F6	=Quarter 3!F6	=Quarter 4!F6	=SUM(C6:F6)	
7	Other Revenues	=Quarter 1!F7	=Quarter 2!F7	=Quarter 3!F7	=Quarter 4!F7	=SUM(C7:F7)	
8	Total:	=Quarter 1!F8	=Quarter 2!F8	=Quarter 3!F8	=Quarter 4!F8	=SUM(C8:F8)	
9							
10	Expenses:						
11	Rent	=Quarter 1!F11	=Quarter 2!F11	=Quarter 3!F11	=Quarter 4!F11	=SUM(C11:F11)	
12	Telephone	=Quarter 1!F12	=Quarter 2!F12	=Quarter 3!F12	=Quarter 4!F12	=SUM(C12:F12)	
13	Internet	=Quarter 1!F13	=Quarter 2!F13	=Quarter 3!F13	=Quarter 4!F13	=SUM(C13:F13)	
14	Photocopier	=Quarter 1!F14	=Quarter 2!F14	=Quarter 3!F14	=Quarter 4!F14	=SUM(C14:F14)	
15	Supplies	=Quarter 1!F15	=Quarter 2!F15	=Quarter 3!F15	=Quarter 4!F15	=SUM(C15:F15)	
16	Courier	=Quarter 1!F16	=Quarter 2!F16	=Quarter 3!F16	=Quarter 4!F16	=SUM(C16:F16)	
17	Advertising	=Quarter 1!F17	=Quarter 2!F17	=Quarter 3!F17	=Quarter 4!F17	=SUM(C17:F17)	
18	Utilities	=Quarter 1!F18	=Quarter 2!F18	=Quarter 3!F18	=Quarter 4!F18	=SUM(C18:F18)	
19	Total:	=Quarter 1!F19	=Quarter 2!F19	=Quarter 3!F19	=Quarter 4!F19	=SUM(C19:F19)	
20							
21	Profit	=C8-C19	=D8-D19	=E8-E19	=F8-F19	=G8-G19	
22	Quarterly	=C21/\$G\$8	=D21/\$G\$8	=E21/\$G\$8	=F21/\$G\$8	=G21/\$G\$8	

You can also print this worksheet with all the formulas displayed.

To turn off the display of the formulas, simply click the Show Formulas button in the Ribbon again. An alternative method is to use the Excel Options dialog box.

4. Click **File**, then click **Options**.
5. Click **Advanced** in the left pane of the Excel Options dialog box.
6. Scroll down to the *Display options for this worksheet* group of options and deselect the **Show formulas in cells instead of their calculated results** check box. Click **OK**.
7. Close the workbook without saving.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- ☑ Describe what formulas are and how they are used.
- ☑ Create and edit simple formulas.
- ☑ Use math operators and understand the order of calculations.
- ☑ Reference other worksheets.
- ☑ Use common functions.
- ☑ Use statistical functions.
- ☑ Use the IF function.
- ☑ Use text functions.
- ☑ Use absolute and relative cell references.
- ☑ Use mixed absolute and relative cell addresses.
- ☑ Display formulas.

Key Terms

Term	Definition
Absolute cell address	A cell address that remains fixed (the column and row coordinates do not change) regardless of where the address may be copied and pasted in a workbook.
AutoSum	A tool that will quickly insert a SUM function into the current cell and determine the appropriate cell range to be used.
Built-in functions	Pre-programmed formulas used to perform specific calculations. You can either type these functions in or use the Insert Function wizard to assist.
Cell range	A rectangular block of cells. You refer to a cell range by listing the addresses of two cells at opposite corners of the range, separated by a colon (:).
Cell reference	The column and row coordinates which comprise a cell address. For example, the cell reference A1 indicates a cell at the intersection of column A and row 1.
Formula	A calculation involving any combination of values, cell references, and/or built-in functions. A formula begins with an equals sign.
Function	A feature designed by Microsoft that enables you to quickly perform a calculation or formula using a specialized function.
Insert Function	The feature Excel provides to help you select the desired function to perform calculations.
Mixed cell reference	A cell address where either the column or row reference is absolute, and the other reference is relative.
Relative cell address	A cell address that adjusts positionally when copied to other cells in a worksheet.
Smart tag	An indicator that recognizes specific data and offers action options based on the type of data that is recognized.
Text functions	Functions that are used for handling and manipulating text strings. Examples include CONCAT, LEFT, LEN, LOWER, MID, PROPER, RIGHT, TEXTJOIN, TRIM, and UPPER.

Quiz Questions

For each question, select the best answer.

1. What should you enter in a cell to find the difference between 9 and 5?
 - a. DIFF(9,5)
 - b. VAL(9-5)
 - c. =9-5
 - d. 9-5
2. Which of the following is the correct order of precedence for standard math operators?
 - a. Division, subtraction, multiplication, addition
 - b. Multiplication, division, addition, subtraction
 - c. Addition, subtraction, multiplication, division
 - d. Division, subtraction, addition, multiplication
3. Which of the following correctly identifies the different parts of the following reference: Tours!B4
 - a. Tours is the name of the worksheet and B4 is the cell reference.
 - b. Tours is the name of the workbook file and B4 is the cell reference.
 - c. Tours is a named range in the worksheet and B4 is the cell reference.
 - d. Tours is the name of the column and B4 is the name of the row.
4. Which of the following is not a valid formula for calculating a total value using the data in several cells?
 - a. =SUM(C6:C18)
 - b. =SUM(C6:C18,D6:D18,F6:F18)
 - c. =SUM(C6:C18,C20)
 - d. None – all are valid formulas
5. Which of the following formulas says: if the value in cell B6 is greater than 500, then display a value equal to B6*20; otherwise, display a zero?
 - a. =(B6>500,B6*20,0)
 - b. =SUM(B6>500,B6*20,0)
 - c. =MULT(B6>500,B6*20,0)
 - d. =IF(B6>500,B6*20,0)
6. Cell H7 contains the text *John Jacob Jingleheimer Schmidt*. Which of the following functions will extract the word "Jingle"?
 - a. =LEFT(H7,12)
 - b. =MID(H7,12,6)
 - c. =RIGHT((H7)/2,6)
 - d. =EXTRACT("Jingle",H7,12)

7. Which type of cell address will be adjusted in the new location based on the relative position of the original formula's input cells?
- A revolving cell address
 - A relative cell address
 - A fixed cell address
 - An absolute cell address
8. Before submitting a worksheet full of accounting formulas to his boss, Ken wants to make sure that he has entered all the formulas correctly. There are a lot of them. What is the easiest way to perform this check?
- Set the options for the worksheet to show the formula in every cell instead of the calculated results.
 - Click on each formula in the worksheet in succession and read the formula input in the formula bar.
 - Print the worksheet, then perform each mathematical operation in the worksheet on a calculator and compare the answers.
 - Set the options for the worksheet to check each formula as it is entered.
9. Monty needs to count the number of empty cells in a 35,000-cell range. Which function should he use?
- COUNTBLANK
 - COUNT
 - COUNTA
 - COUNTNULL
10. Cell A3 contains the text *mAgical MR. missToffelees*. Edgar enters the function `=LEN(UPPER(A3))` in cell A8. Which of the following values will display in cell A8?
- MAGICAL MR. MISSTOFFELEES
 - Magical Mr. Misstoffelees
 - magical mr. misstoffelees
 - 25

11. Cell range H15:L15 contains the following entries:

Cell	Entry
H15	now
I15	is
J15	
K15	the
L15	time

Which formula will display the result: **now*is**the time** in cell H19?

- `=CONCAT(H15:L15)`
- `=TEXTJOIN("","",FALSE,H15:L15)`
- `=TEXTJOIN("","",TRUE,H15:L15)`
- `=CONCATENATE(H15,I15,J15,K15,L15)`

Microsoft® Excel

Associate Certification Guide

Lesson 4: Formatting the Worksheet

Lesson Objectives

In this lesson, you will use a variety of methods to format cells in a worksheet. Upon completion of this lesson, you should be able to:

- | | |
|---|---|
| ☐ Format numbers and decimal places. | ☐ Apply background colors and patterns to cells. |
| ☐ Change the alignment of cell contents. | ☐ Use the Format Painter. |
| ☐ Merge cells and wrap text. | ☐ Clear cells and formatting. |
| ☐ Change fonts and font size. | ☐ Use cell styles. |
| ☐ Apply borders around cells. | ☐ Apply and remove conditional formatting. |

Formatting a Cell

How you present your worksheet is almost as important as the data it contains. Formatting is all about changing the appearance of the data. You are using the various features of Excel to draw attention to parts of the worksheet, or to make the data presented easier to understand. When you change the format of a cell, you do not alter its underlying value.

You should note the following important points:

- You can format a cell, or a range of cells, either before or after you enter the data. You can even format an entire row or column at one time.
- A cell remains formatted even after you clear the contents of the cell, unless you also clear the format or reformat the cell. When you enter new data in the cell, Excel displays the data in the existing format.

- When you paste or fill a cell from another cell, by default you copy the format and the contents of the originating cell. This feature enables you to save time, provided you apply the formatting before copying.

Some of the formatting features to change the appearance of your document include different fonts or sizes, bold and italic styles, borders around a cell or group of cells, and shading of cells. You will find the most commonly used formatting features displayed on the Home tab as well as on the Mini toolbar.

Certain types of formatting may not be compatible with the data values, and Excel will simply ignore that formatting until you enter the appropriate data type into that cell. For example, you may format a cell as numeric with commas and two decimal digits; but, if the cell contains a word (such as "Total"), then Excel will use only the default cell formatting that pertains to text values.

Excel provides a feature called **Live Preview** that temporarily changes the appearance of the selected cell(s) to the format that your mouse is currently pointing to on the Ribbon. If you click on that button on the Ribbon, Excel applies the formatting change. However, if you move your mouse away, the selected cell(s) revert to their current format. This useful feature allows you to preview a formatting change without having to click the Undo button if it turns out to be unsuitable. Be aware that only some formatting buttons on the Ribbon include Live Preview capability. Note that Live Preview does not function when you have a formatting dialog box open.

Figures 4-1 through 4-11 in the following sections show various options on the Numbers tab of the Format Cells dialog box.

Formatting Numbers and Decimal Digits

Objective 2.2.5

The formatting of numbers is usually the most common type of formatting applied to a spreadsheet. To meet a wide variety of needs, Excel provides a rich set of standard formats with changeable options. Except where you see it noted in each of the following sample screens, the underlying number in the active cell is 6798.52. As you select the formatting options, the sample box at the top of the dialog box (Figure 4-1) shows what the number will look like with the selected options.

To format a cell, select the cell, and then use one of the following methods:

- on the Home tab, in the Font, Alignment or Number groups, click the appropriate button, or
- press CTRL+1, or
- right-click and click Format Cells on the shortcut menu, or
- right-click and click the appropriate number formatting from the Mini toolbar, or
- on the Home tab, in the Font, Alignment or Number groups, click the dialog box launcher for the appropriate group.

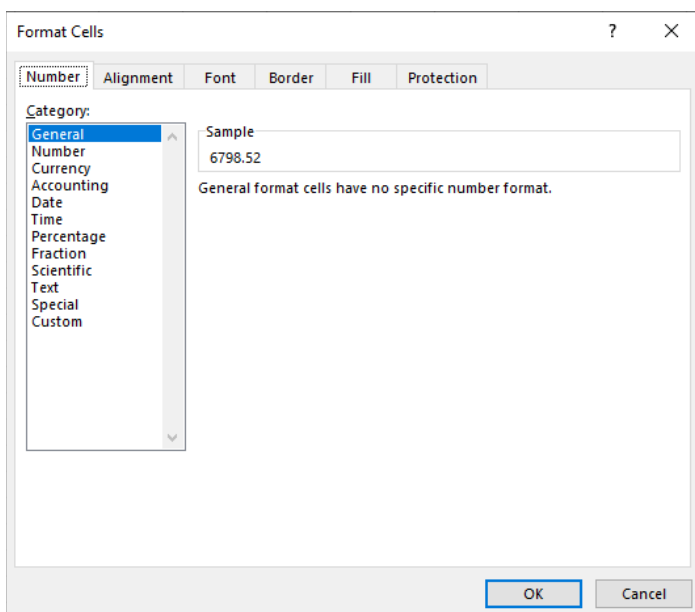


Figure 4-1: Format Cells dialog box – Number tab, General category

General –The General category is the default format for all cells. When you enter numbers into an unformatted cell, Excel displays them exactly as you entered them, except that it does not display trailing zeros after the decimal point. This can make the worksheet somewhat harder to read because the numbers in a column will not be lined up by their decimal points, as demonstrated in the example on the right. In addition, when you enter a number that is much larger than the width of the cell, Excel automatically changes the format to Scientific notation, adding another display format that is inconsistent with the other cells.

2432.635
1364
2656.316
1332.9
1177.82
1792.34
659.23
9.04E+09

Number – The Number category (shown in Figure 4-2) is a standard format for numbers with the option to show the comma (period in European countries) separator for values of 1,000 and higher. The number of digits after the decimal point must also be specified (the default is 2). If there are insufficient digits, the number will be right-filled with zeroes. Excel can show negative numbers in different ways: in red, with a minus sign, or with parentheses.

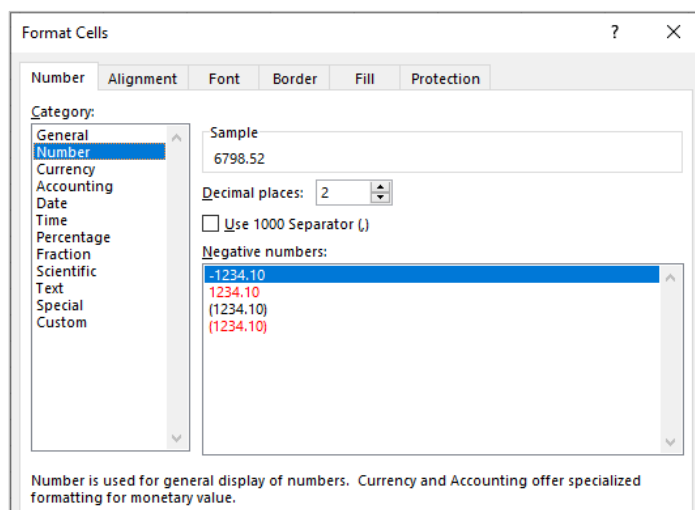


Figure 4-2: Format Cells dialog box – Number tab, Number category

If any number has more than the specified number of decimal places, the Number format will round it to the nearest decimal digit. As with all formatting, this is for display purposes only – the actual number stored in the cell does not change.

One disadvantage with the Number format is that it does not automatically display numbers with the comma separator.

Currency – The Currency format (Figure 4-3) is similar to the Number format except that a currency symbol, for example, a dollar sign (\$), is shown and the comma separator is automatically displayed.

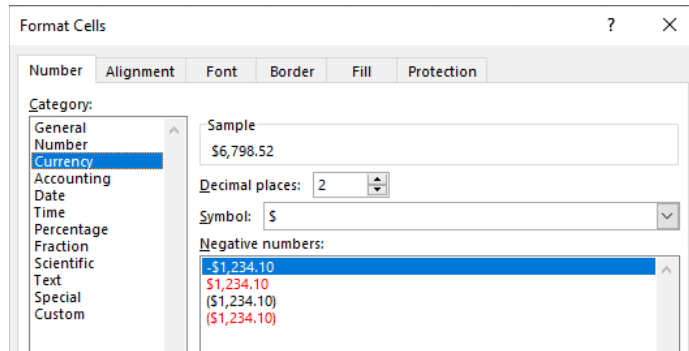
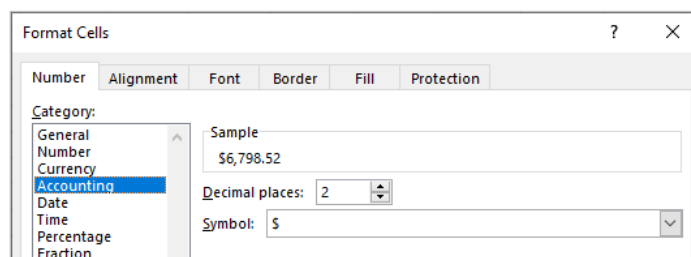


Figure 4-3: Format Cells dialog box – Number tab, Currency category

Accounting – The Accounting format (Figure 4-4) is like the Currency format except that negative numbers appear in parentheses (you cannot change this) and the currency symbol appears at the far-left side of the cell. Positive values include a space to the right of the value to ensure that decimal points always line up.



Currency format	\$1,792.34
Currency format	-\$528.45
Accounting format	\$ 3,659.23
Accounting format	\$ (248.10)

Figure 4-4: Format Cells dialog box – Number tab, Accounting category

Date – The Date format category displays date values in various ways. One complication is the region of the world to which your computer is set. For example, if you live in the United States, then your default date format would be m/d/yyyy. However, if your computer is set to the United Kingdom, your date format is dd/mm/yyyy. The d indicates that Excel will display single-digit day values as one digit—without filling in the left with a zero. A dd indicates a two-digit day value, with a leading zero for single digit values. The same format applies to the month and year values. Year values are always two or four digits.

If you enter your date value with the month as a name (for example Jan 8, 2019, 8 Jan 2019, or January 8, 2019), then Excel will display it using the custom date format (Figure 4-5) of d-mmm-yy where mmm indicates the first three characters of the month's name.

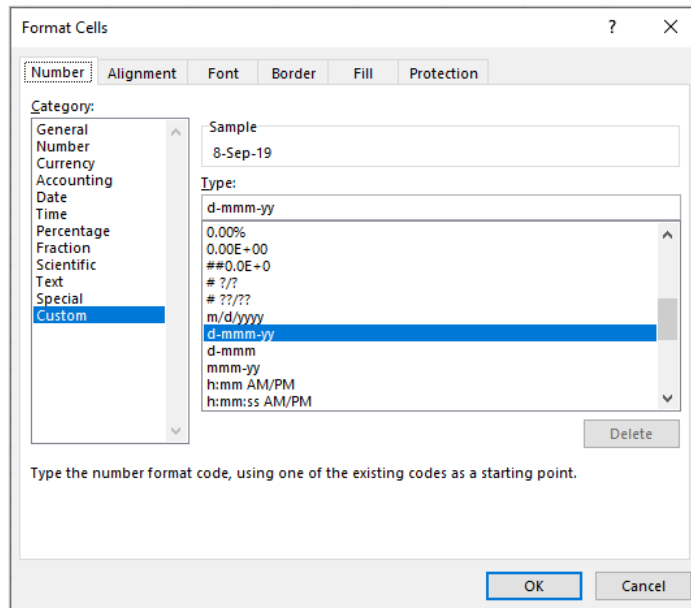


Figure 4-5: Format Cells dialog box – Number tab, Custom category for dates

However, if you enter your date value with the month as a number (for example 1/8/2019, or 2019-01-08), then Excel will display it using the date format that matches your region, as described above.

The Date category will display the alternate formats as shown in Figure 4-6.

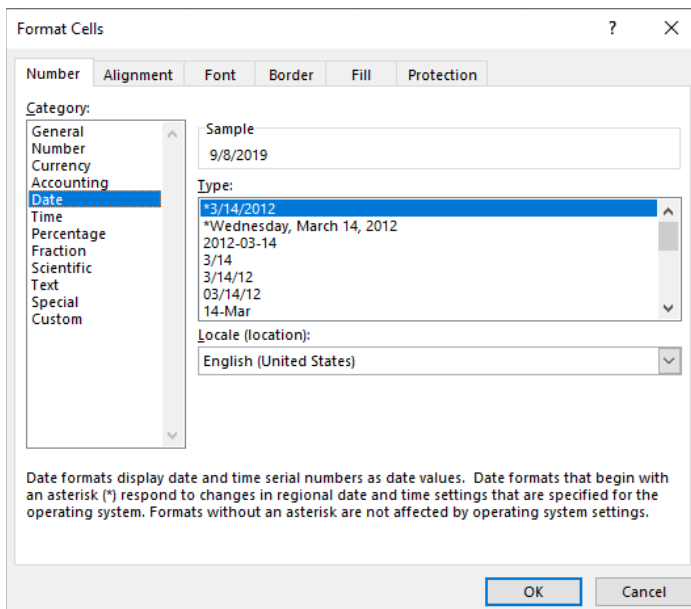


Figure 4-6: Format Cells dialog box – Number tab, Date category

Note that the asterisk (*) indicates that this format changes with the computer's region setting, as described at the bottom of the dialog box.

Time – Because of the many different ways that time values may be entered, Excel will use a custom time format based on how you enter a time, as shown in Figure 4-7.

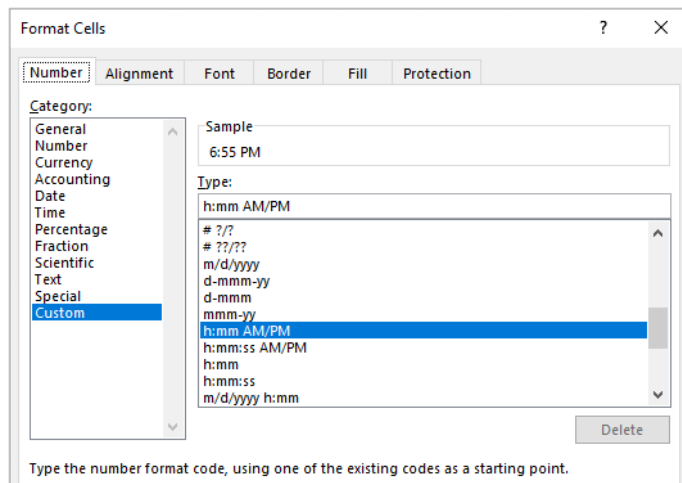


Figure 4-7: Format Cells dialog box – Number tab, Custom category for time values

You can then select an alternate time format from the Time category (Figure 4-8) or from the Number group in the Home tab of the Ribbon.

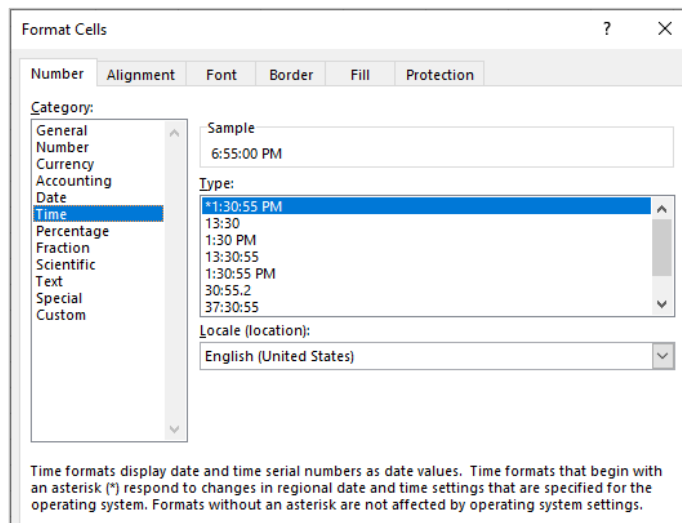


Figure 4-8: Format Cells dialog box – Number tab, Time category

Percentage – Excel always shows percentage values as 100 times the number value of a cell. For example, if a cell value is 0.1234, the cell value will appear as 12.34%, as shown in Figure 4-9. This format shows a percentage sign at the right side of the cell. You can also specify the number of decimal places (the default is 2).

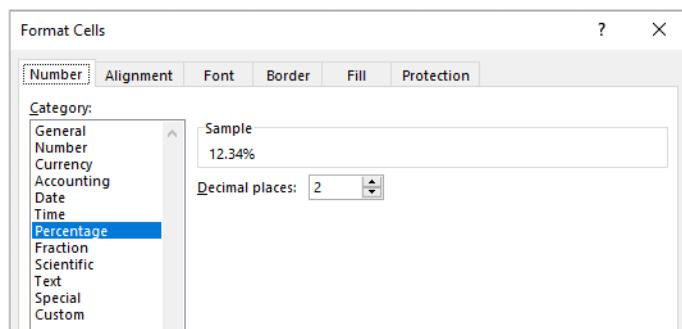


Figure 4-9: Format Cells dialog box – Number tab, Percentage category

However, if you click the Percent Style button in the Number group of the Home tab in the Ribbon, Excel will use the Percentage format with a Decimal places value of 0 (zero).

Fraction – The Fraction format converts decimal digits to fractional values based on the fraction type that you select. For example, if .25 is the value in the cell, Fraction will change it to ¼. You can specify the number of digits or fraction format under Type.

Scientific – You will usually use this format in scientific applications for very large and very small numbers. Excel shows only one digit to the left of the decimal point and you control the number of significant digits by specifying the number of decimal places.

Text – This format is used when you want what is entered to remain exactly the way it is typed, and not automatically formatted into a different category. All cells formatted as text are automatically justified to the left unless the alignment is manually changed. This format is useful when a zip code, phone number, or other number is needed as typed and not automatically formatted as a date or other category.

Note: if a number is formatted as text, it may not calculate in a formula. If a cell is formatted as text, and a formula is entered, the formula remains rather than the result. If a formula is already entered with the result showing, and the format is changed to text, the result remains.

Special – Use the Special format category (Figure 4-10) for miscellaneous items such as phone numbers and zip codes.

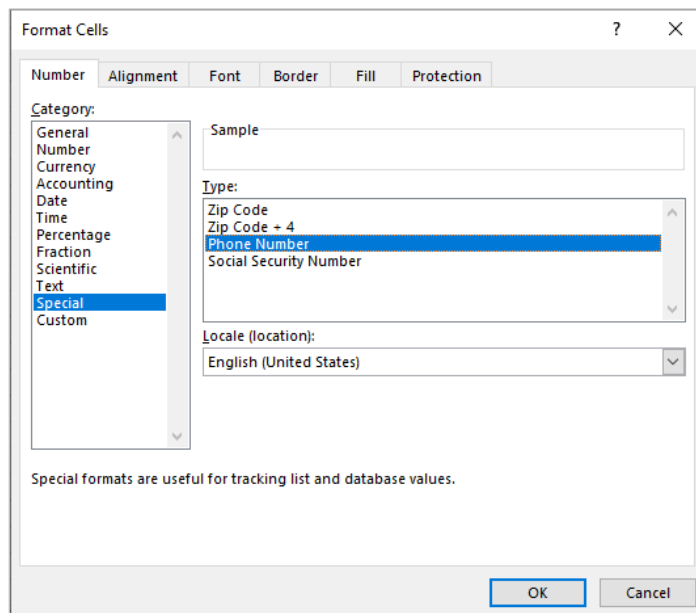


Figure 4-10: Format Cells dialog box – Number tab, Special category

Custom – If you cannot find the exact format you want in the other categories, you can create a format of your own with the Custom category, as shown in Figure 4-11. This is accomplished by modifying a copy of an existing number format. To find help with this or any number format, click the question mark in the top right corner of the title bar to open a help page explaining the options.

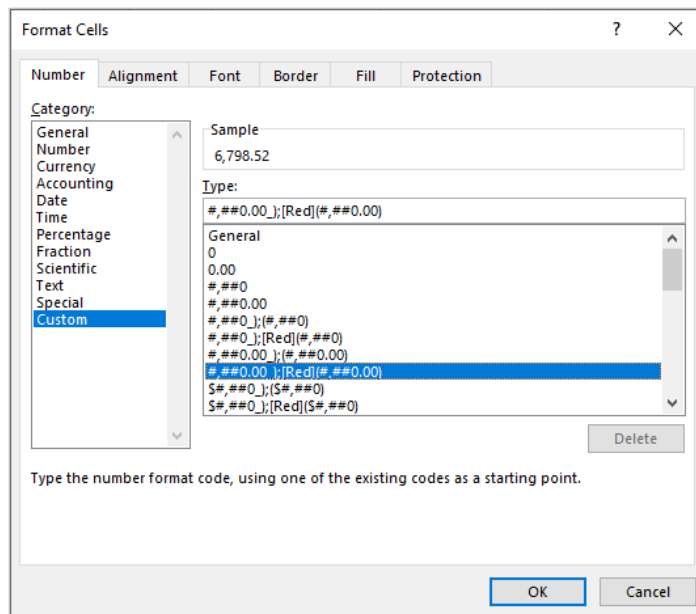


Figure 4-11: Format Cells dialog box – Number tab, Custom category

Using the Ribbon

The Ribbon enables you to select the most frequently used formatting features from a convenient location. The number formatting options are found in the Number group on the Home tab, shown in Figure 4-12.

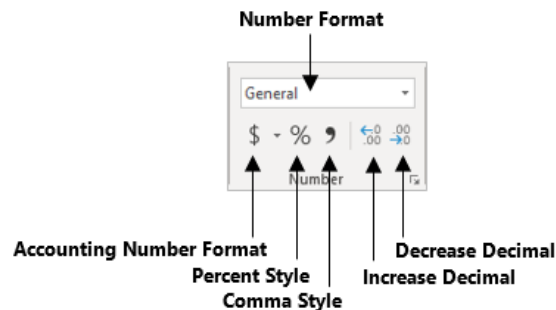


Figure 4-12: Number group on the Home tab

You can quickly format numeric cells using the Comma Style button. However, Excel interprets this formatting choice as the Accounting format with no currency symbol displayed. In addition, the Comma Style format displays negative numbers using parentheses instead of the minus sign, and positive numbers display with a slight indent to the left. The Number format is generally used more often than the Comma Style format.

Alternatively, you can display the Mini toolbar (Figure 4-13) by right-clicking on the cell.

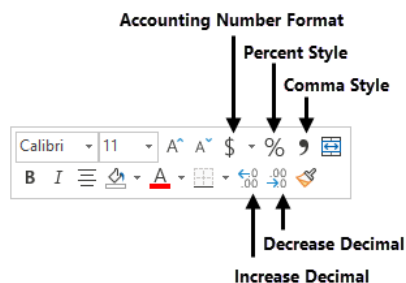


Figure 4-13: Number formatting tools on the Mini toolbar

Learn to apply numeric formats

In this exercise, you will apply numeric formats to numbers in a worksheet.

1. Open the **Travel Itinerary** workbook located in the *StarterFiles* folder and save it as **My Travel Itinerary** in the *MyProjects* folder.
2. Select the cell range **B19 to B22**.
3. On the Home tab, in the Number group, click the **Number Format** arrow.

A list appears showing the most commonly used numeric formats for a cell. Below the title of each numeric format, Excel displays the number from the selected cell (or the top left cell, if you select a range) using that format. For example, the value of 3298 in cell B18 displays as 3298.00 under the Number format, and as \$3,298.00 under the Currency format.

4. Click **Number** on the list.

19	Airfare:	3298.00
20	Hotel:	2750.00
21	Taxes & Fees:	750.52
22	Total:	6798.52

Excel applies a uniform format – two decimal digits – to all the numbers.

5. Select the cell range **B19 to B22** again, if necessary, then on the Home tab, in the Number group, click the **Number Format** dialog box launcher.

In the Format Cells dialog box, the Category is already set to Number and 2 decimal places are specified. You only need to add the comma separator.

6. Select the **Use 1000 Separator (,)** check box and click **OK**.
7. Select cell **B19**.
8. On the Home tab, in the Number group, click the **Number Format** arrow and then click **Currency**.
9. Select cell **B22** and change this number format to **Currency** as well.

Using the Ribbon, you can also quickly change the number of digits appearing after the decimal point.

10. With cell **B22** still selected, on the Home tab, in the Number group, click **Decrease Decimal** twice to remove all decimal digits.

Notice that Excel rounds the number up. You can also increase the number of decimal digits.

11. On the Home tab, in the Number group, click **Increase Decimal** twice to show two decimal digits again.

Hint: You can also right-click and then click **Increase Decimal** or **Decrease Decimal** on the Mini toolbar.

12. Select cell **B6**.
13. On the Home tab, in the Number group, click the **Number Format** arrow and click **Long Date**.

The long date format is much too wide for this cell.

14. On the Quick Access Toolbar, click the **Undo** button.

The cell containing the phone number is also numeric, but a special format needs to be applied.

15. Select cell **B4**.

16. On the Home tab, in the Number group, click the **Number Format** dialog box launcher.
17. On the Number tab, click **Special** in the Category list.
18. Click **Phone Number** in the Type list and click **OK**.
19. The customer's phone number now appears correctly formatted.

	A	B	C	D	E	F	G	H
1	Tolano Adventures							
2	Travel Itinerary							
3	Prepared For:	Williams, R						
4	Phone:	(206) 321-1234						
5								
6	Date:	8-Sep-19						
7	Depart From:	Toronto YYZ	Time:	6:55 PM	Airline:	British Air	Flight #	2409
8	Arrive:	London LHR	Time:	6:55 AM				
9								
10	Date:	15-Sep-19						
11	Depart From:	London LHR	Time:	3:25 PM	Airline:	Lufthansa	Flight #	75
12	Arrive:	Toronto YYZ	Time:	6:25 PM				
13								
14	Hotel:	Times Plaza	Address:	Stratton Street, London, England				
15	Check in Date:	9-Sep-19						
16	Check out:	15-Sep-19						
17								
18	Invoice							
19	Airfare:	\$3,298.00						
20	Hotel:	2,750.00						
21	Taxes & Fees:	750.52						
22	Total:	\$6,798.52						

20. Save the workbook and keep it open for the next exercise.

Changing Cell Alignment

Cell Alignment, Indenting, and Orientation

Objective 2.2.2

Alignment refers to the position or placement of data within the cell. In Excel, you can align the cell contents horizontally as well as vertically, although you will most commonly use one of the horizontal alignment controls.

By default, Excel assigns General alignment to new values entered in a worksheet. This means that Excel aligns numbers and dates to the right, while it aligns text labels to the left, as shown in the example on the right.

In most cases, you will not change the alignment of numbers and dates.

Also, by default, cell contents are aligned to the bottom of the cell, which is noticeable only if you increase the row height. You can also change the vertical alignment to the top or middle of the cell.

Here is some text - it is left-aligned by default
123
8-Dec-19
Top of cell alignment
Middle of cell alignment
Bottom of cell alignment

	A
1	Country: Canada
2	Province: British Columbia
3	City: Vancouver
4	City: Victoria
5	Province: Alberta
6	City: Calgary
7	City: Edmonton
8	Country: United States
9	State: Washington
10	City: Everett
11	City: Seattle
12	State: California
13	City: Los Angeles
14	City: San Francisco

Data can also be indented within the cell, as shown in the sample on the left. In this example, the country names are displayed using normal cell alignment for text values with no indenting. The cells containing state and province names are indented to the right by one position, and the city names are indented by two positions.

As is the case with the number formatting features, the most commonly-used alignment options are readily available on the Home tab in the Ribbon. These are shown in Figure 4-14.

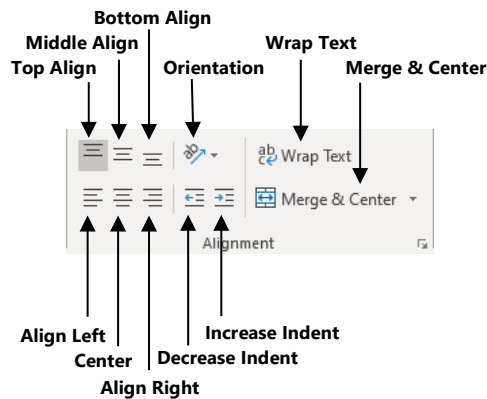


Figure 4-14: Alignment options on the Home tab

To change the alignment for the contents of a cell, select the cell and then, on the Home tab, in the Alignment group, click the appropriate alignment button.

The Orientation button allows you to change the direction of the characters in a cell in a variety of ways, as shown in Figure 4-15.

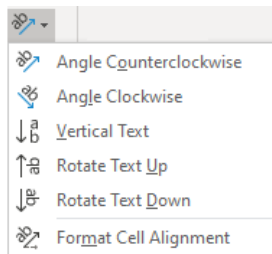


Figure 4-15: Cell orientation options

You can also set cell alignment options on the Alignment tab of the Format Cells dialog box (Figure 4-16).

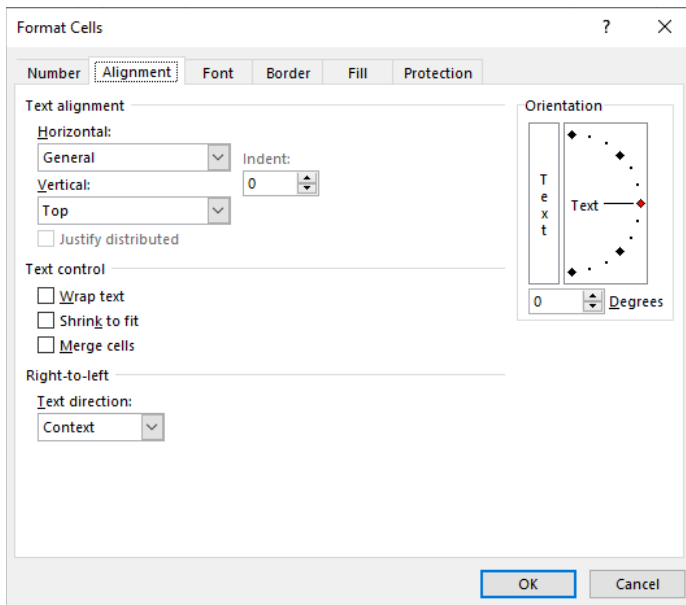


Figure 4-16: Format Cells dialog box – Alignment tab

To access the Alignment tab of the Format Cells dialog box, use one of the following methods:

- press CTRL+1 and then click the Alignment tab, or
- right-click, click Format Cells, and then click the Alignment tab, or
- on the Home tab, in the Alignment group, click the Alignment dialog box launcher.

Wrapping Text

Objective 2.2.4

As described in Lesson 1, you can enter very long text (up to 32,767 characters) into a cell. As long as the cells to the right are empty, the extra text that will not fit into the cell will display in the cells to the right.

Alternatively, you can use the wrap text feature to force the text label to stay within the left and right boundaries of the cell. Excel increases the height of that row to accommodate the full length of the text (in some cases, you may have to do this manually). If you turn off the wrap text feature for a cell, the text will revert back to displaying on one line.

A final option is to shrink the font size to fit the cell. In the Format Cells dialog box, in the Alignment tab, under Text Control, select *Shrink to Fit* to automatically get the font size that will allow the text to fit in the cell. This is best used for text that isn't extremely longer than the cell; otherwise, the font size will be too small to be legible. Figure 4-17 illustrates these three options.

	A	B	C	D
1	This is a very long text label that is too wide for one cell.			
2	This is also very long and wraps around in this cell.			
3	This is a little long and shrunk to fit.			

Figure 4-17: Displaying all the text within a cell

Merging Cells

Objective 2.2.1

Merging cells is a feature commonly used on text labels to identify a group of cells together, as shown in Figure 4-18.

	A	B	C	D	E	F	G
1	Sales Office	Quarter 1			Quarter 2		
2		Jan	Feb	Mar	Apr	May	Jun
3	New York	\$7,395	\$8,525	\$5,805	\$7,022	\$8,787	\$7,936

Figure 4-18: Merged cells

The months of January to March belong to Quarter 1. The months of April to June belong to Quarter 2. When you merge cells, Excel removes the edges separating the selected cells and treats the group as a single cell. It then becomes very easy to center text across these merged cells, as shown in this example. You can also merge cells containing numeric and date values.

Excel offers a Merge & Center button on the Ribbon, which first merges the selected cells (whether you are merging horizontally or vertically) and then horizontally centers the text across these cells. This button includes multiple options, as shown in Figure 4-19.

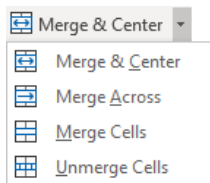


Figure 4-19: Merge & Center options

If you simply click the button, Excel will perform the Merge & Center action, but you can click the arrow and choose one of the other options.

The Merge Across option will only merge the selected cells, keeping the original alignment in the cell, though standard alignment options can be applied at any time. It will not allow you to merge cells vertically; instead, you can use the Merge Cells option to do this. In Figure 4-18, cells A1:A2 illustrate how merging vertically is used.

If merged cells need to be split apart again into their separate cells, simply click Merge & Center again in the Ribbon to turn it off, or select the Unmerge Cells option. Alternatively, you can also deselect the *Merge cells* check box in the Format Cells dialog box.

Learn to modify cell alignment

In this exercise, you will use cell alignment options.

At the top of the worksheet are two rows of text that run over the right edge of the cell. To fit the text within the width of the cell, you will use the wrap text function.

1. With the My Travel Itinerary workbook open, select cell **A1**.
2. On the Home tab, in the Alignment group, click **Wrap Text**.
3. Select cell **A2** and click **Wrap Text**.

Notice Excel now shows the text on multiple lines within the width of these cells.

4. Select cells **A1** and **A2**.
5. On the Home tab, in the Alignment group, click **Wrap Text** to turn off text wrapping in the selected cells.

Next you will center text across the width of the invoice document. To accomplish this, you will use the Merge & Center function.

6. Select cells **A1:H1**.
7. On the Home tab, in the Alignment group, click **Merge & Center**.

Notice that Excel has now merged the eight cells together and centered the title across these cells.

The Merge & Center function can work on only one row at a time. You will have to repeat the previous step for the next row.

8. Select cells **A2:H2** and, on the Home tab, in the Alignment group, click **Merge & Center**.

Remember that, although you have merged cells together and centered the data contents across these cells, you entered the data in the original cell. Therefore, to make changes to those contents, you must go back to the original cell (A1 or A2).

Cells that have been merged can be unmerged.

9. With cell **A2** still selected, click the **Merge & Center** arrow, then click **Unmerge Cells** to unmerge the cells.

You can use the orientation button to change the direction of the characters in a cell.

10. Select cell **A2**.
11. On the Home tab, in the Alignment group, click **Orientation**, then click **Angle Counterclockwise** to change the direction of the text within the cell.

You can also change default alignments.

12. Select cell **B4** and, on the Home tab, in the Alignment group, click **Align Left**.
13. Select cells **C7:C8** and, on the Home tab, in the Alignment group, click **Align Right**.
14. Select cells **C11:C12** and, on the Home tab, in the Alignment group, click **Align Right** again.
15. Select cell **E7**, press and hold **CTRL**, then select cell **E11** and release **CTRL** to select both cells.
16. On the Home tab, in the Alignment group, click **Align Right** again.
17. Select cells **G7** and **G11** using the **CTRL** key and, on the Home tab, in the Alignment group, click **Align Right** again.

Earlier, you tried to use the Long Date format, but there was not enough space in the cell to display it. You can now use it by merging across adjacent cells.

18. Select cell **B6** and, on the Home tab, in the Number group, click the **Number Format** arrow and click the **Long Date** option.
19. Select cells **B6** to **D6** and, on the Home tab, in the Alignment group, click the **Merge & Center** arrow and then click **Merge Across**.
20. On the Home tab, in the Alignment group, click **Align Left**.

21. Repeat steps 18 to 20 with cells **B10** to **D10**.
22. Select cells **B15:B16** and, on the Home tab, in the Alignment group, click **Align Left**.
23. With cells **B15:B16** still selected, on the Home tab, in the Alignment group, click **Increase Indent**.

	A	B	C	D	E	F	G	H
1	Tolano Adventures							
2	Travel Itinerary							
3		Prepared For:	Williams, R					
4		Phone:	(206) 321-1234					
5								
6		Date:	Sunday, September 8, 2019					
7		Depart From:	Toronto YYZ	Time:	6:55 PM	Airline:	British Air	Flight # 2409
8		Arrive:	London LHR	Time:	6:55 AM			
9								
10		Date:	Sunday, September 15, 2019					
11		Depart From:	London LHR	Time:	3:25 PM	Airline:	Lufthansa	Flight # 75
12		Arrive:	Toronto YYZ	Time:	6:25 PM			
13								
14		Hotel:	Times Plaza	Address:	Stratton Street, London, England			
15		Check in Date:	9-Sep-19					
16		Check out:	15-Sep-19					
17								
18		Invoice						
19		Airfare:	\$3,298.00					
20		Hotel:	2,750.00					
21		Taxes & Fees:	750.52					
22		Total:	\$6,798.52					

24. Save the workbook and keep it open for the next exercise.

Working with Fonts, Borders, and Colors

Changing Fonts and Sizes

Objective 2.2.6

A **font** is a style of text. Changing fonts will alter how the text and numbers appear in the worksheet. As a general rule, you should not use more than three different fonts in a worksheet, because too many fonts on the worksheet can be distracting. You can apply font changes to any type of data displayed in the worksheet including numbers, text, and dates.

Generally, when you make changes to the font or size, Excel applies these changes to the entire cell or range of cells that you have selected. You can also select individual characters and numbers inside a cell and change the font, size, or other formatting options.

On the Home tab, in the Font group, click the Font Settings dialog box launcher. This will display the Format Cells dialog box with the Font tab selected, as shown in Figure 4-20. This tab enables you to select the many font-related formatting options available in Excel.

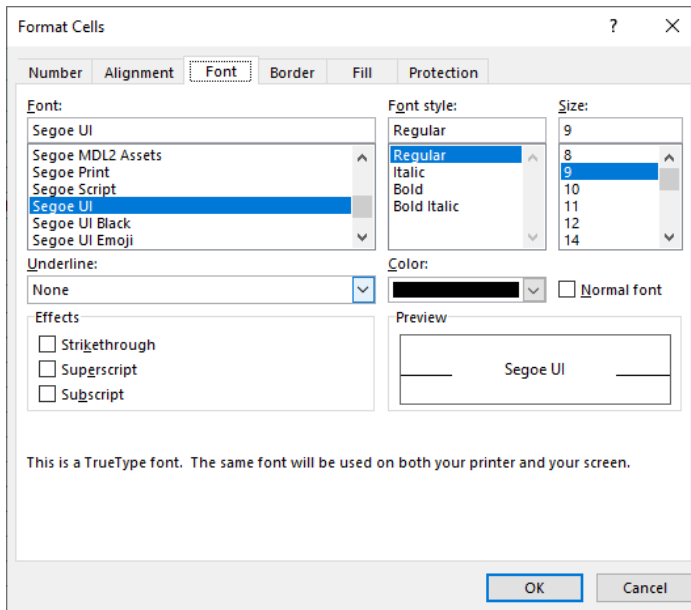


Figure 4-20: Format Cells dialog box – Font tab

Underline – You can select various underline styles such as single, double, single accounting, or double accounting. Note that an underline is not the same as a cell border – if selected, the underline appears inside the cell, whereas borderlines appear along the selected edge(s) of the cell.

Color – You can select and change the color of the characters.

Effects – You can use special character effects, such as Strikethrough, Superscript and Subscript. Note that the latter two are mutually exclusive – you can use either one, but not both at the same time on the same cell, unless you are formatting individual characters inside a cell.

As you select different options in this dialog box, the Preview box shows sample text with the options displayed.

The most commonly used font options (that is, font, font size, bold, italics, underline, and font color) can be changed directly on the Home tab, in the Font group (Figure 4-21) of the Ribbon:

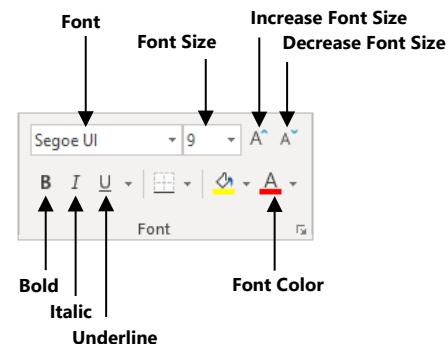


Figure 4-21: Font group on the Home tab

You can right-click a cell to display the Mini toolbar (Figure 4-22), and then click the appropriate option. You can also select text within a cell to enter editing mode to display a smaller version of the Mini toolbar.



Figure 4-22: Formatting options on the Mini toolbar

Font – This refers to the typeface of the text characters Excel displays. A set of characters in the same typeface is a font. A large selection of fonts is available with Microsoft Office. Many fonts are included with Excel and many more are available from the Cloud, if connected.

Font style – Most fonts can be formatted bold, italicized, or both.

Size – Size refers to the height of a character, with a proportionate width. Most of the fonts are scalable. That is, they have a variety of sizes. A point is equal to a seventy-second of an inch. Thus, twelve-point type is twelve seventy-seconds of an inch high, or 1/6th of an inch high.

Learn to change fonts and font styles

In this exercise, you will use font options.

1. With the My Travel Itinerary workbook open, select cell **A1**.

Note: You can select anywhere between A1 and H1 to select cell A1, as this whole range of cells has been merged.

2. On the Home tab, in the Font group, click the **Font Size** arrow and click **24**.
3. On the Home tab, in the Font group, click **Bold**.
4. Select cell **A2** and, on the Home tab, in the Font group, click the **Font Size** arrow to display the list of font sizes available.
5. Move the mouse pointer down to point to various font sizes, but do not click on any of them yet.

Notice that the Live Preview feature temporarily changes the look of the active cell using the font size at which you are pointing.

6. Click on font size **14**.
7. On the Home tab, in the Font group, click **Bold**.

Live Preview does not work with the Bold, Italics, or Underline buttons.

8. Select the cell range **A3:A22** and then, on the Home tab, in the Font group, click **Bold**.
9. Select all the rest of the cell titles together by pressing and holding **CTRL** until you have selected the last cell:

C7 to C8	Time (× 2)
C11 to C12	Time (× 2)
E7 to E11	Airline
G7 to G11	Flight #
C14	Address

10. On the Home tab, in the Font group, click **Bold** to bold all these cells at the same time.

If you miss one or more cell(s), just select those cells and click the Bold button for those cells. If you accidentally bolded an incorrect cell, select those cells and click the Bold button again to reverse the setting. These formatting buttons in the Ribbon act as toggle switches to allow you to turn the feature on and off.

Now select a different font for a cell.

11. Select cell **A18** and, on the Home tab, in the Font group, click the **Font** arrow and then select **Arial Black**.
12. With cell **A18** still selected, on the Home tab, in the Font group, click the **Font Size** arrow and select **14**.

Now select another font for all the data cells.

13. Press and hold **CTRL** and click on the gray column headers for columns **B**, **D**, **F**, and **H**. Release the **CTRL** key.
14. With these columns selected, on the Home tab, in the Font group, click the **Font** arrow and select **Arial**.
15. Save the workbook and keep it open for the next exercise.

Applying Cell Borders

Objective 2.2.6

Borders separate groups of data from each other to improve the readability of a worksheet, especially when it includes a large volume of numbers.

The border feature enables you to draw lines around any or all of the four edges of a cell or range of cells. The dialog box displays several presets and style options including line thicknesses and color. It also allows you to specify where the lines will appear. You can even add a diagonal line to cells.

The Border tab in the Format Cells dialog box (Figure 4-23) displays the various options and settings.

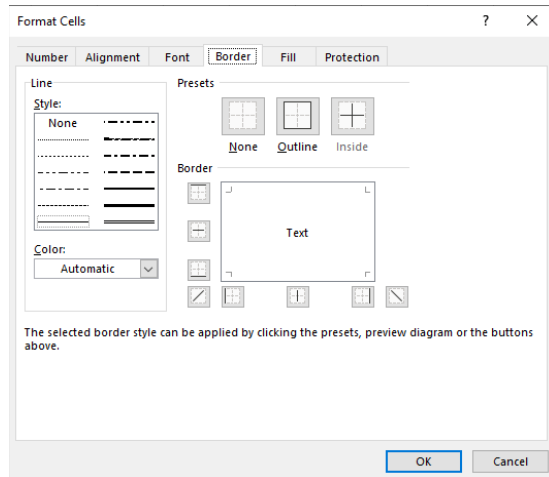


Figure 4-23: Format Cells dialog box – Border tab

Line – Choose a line style or color for the border(s). If you want different lines or colors for specific borders, you have to select the style or color and then click in the Border area for the appropriate border.

Presets – Remove all borders, apply borders on all four outside edges or apply borders on all inside edges (only applicable when a range of cells is selected) for the selected cell or range of cells using the three preset configuration settings.

Border – Use the buttons to apply or remove borders on specific edges of the selected cell or range of cells. The graphics within each button help you see which borders you are applying or removing.

To apply a border, select the cell or range of cells and then use one of the following methods:

- on the Home tab, in the Cells group, click Format, click Format Cells, and click the Border tab, or
- on the Home tab, in the Font group, click the dialog box launcher and click the Border tab, or
- right-click selected cell(s), then click Format Cells in the shortcut menu and click the Border tab, or
- press CTRL+1 and click the Border tab.

These methods display the border options in the Format Cells dialog box.

Using the Borders button on the Ribbon is a faster method of applying borders to the selected cell(s): you can click on the button to apply the border using the current border settings for this button, or you can click the arrow for it to display a drop-down menu with commonly combined borders for a cell.

By default, when you start Excel, the Borders button on the Ribbon is set to Bottom Border. As you select different border options from the drop-down menu (Figure 4-24), the icon for the Borders button changes to show that new setting. This convenient feature allows you to minimize mouse clicks while applying borders to multiple cells throughout a worksheet.

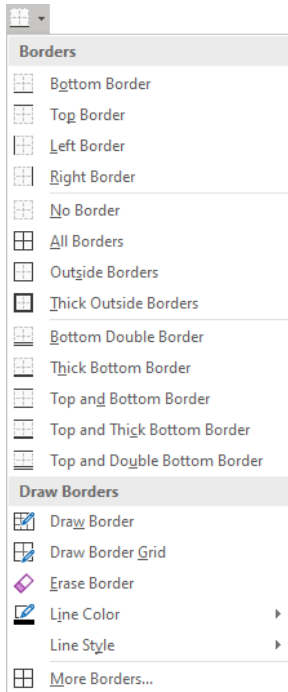


Figure 4-24: Borders menu

To apply a border from the Ribbon, select the cell or range of cells. Then on the Home tab, in the Font group, select the default border or click the drop-down menu to choose the desired border preset.

You can also select the border options from the Mini toolbar (Figure 4-25).

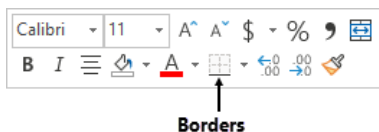


Figure 4-25: Borders button on the Mini toolbar

Learn to apply cell borders

In this exercise, you will apply borders to cells.

1. With the My Travel Itinerary workbook open, select cells **A6:H8**.
1. On the Home tab, in the Font group, click the **Borders** arrow and select **Outside Borders**.

The Borders button in the Ribbon is now set to Outside Borders. Draw borders around the other two itinerary items.

2. Select cells **A10:H12**. On the Home tab, in the Font group, click **Outside Borders** directly from the Ribbon.
3. Select cells **A14:H16**. On the Home tab, in the Font group, click **Outside Borders** directly from the Ribbon.

Select a different border for the invoice section of the worksheet.

4. Select cells **A18:C23**.
5. On the Home tab, in the Font group, click the **Borders** arrow.
6. Point to the **Line Color** option in the Borders menu, then click the **Dark Blue** color (second from the right) in the *Standard Colors* section of the menu.
7. On the Home tab, in the Font group, click the **Borders** arrow again.
8. Point to **Line Style**, and then click the medium solid line style (sixth from the bottom).

Notice that when you select either of these two border options, the pointer changes to a pencil icon. This indicates that you can manually draw the border around any cell of your choosing. For this exercise, you want borders only around the currently selected cells. Note that with the pointer changed to a pencil icon, it appears that no cells are currently selected. However, the cells selected at step 1 are actually still selected.

9. On the Home tab, in the Font group, click the **Borders** arrow once more and click **Outside Borders**.
10. Click in any other cell in the worksheet to see the results.

Now draw borders inside a range of cells, using the current line style and color.

11. Select cells **A18:C18**.
12. On the Home tab, in the Font group, click the **Borders** arrow and select **Bottom Border**.
13. Select cells **A19:A23** and, on the Home tab, in the Font group, click the **Borders** arrow and click **Right Border**.

The Borders button is now set to a new style, color and position, which will continue to apply to all worksheets and workbooks until you exit Excel. Excel then resets these options back to the default settings.

14. On the Home tab, in the Font group, click the **Borders** arrow.
15. Point to the **Line Color** option in the Borders menu and then click **Automatic**.
16. On the Home tab, in the Font group, click the **Borders** arrow again.
17. Click **Line Style**, and then click the thin solid line style (second from the top).
18. Press **ESC** to deactivate the pencil.
19. Save the workbook and keep it open for the next exercise.

Using Colors and Patterns

Objective 2.2.6

You can fill cells and ranges of cells with background colors to increase the visual appeal of the overall worksheet. Patterns and color can help draw a viewer's attention to particular parts of your worksheet, or serve to divide it visually from the rest of the information. This can prove useful when trying to highlight the sum totals row or differentiate heading information from data.

Like the Borders button, the Fill Color button in the Ribbon begins with a default color (of no fill color), and then retains your last selected color until you select a new one. The Ribbon button also displays the current color setting.

If you click the Fill Color arrow, Excel presents a color palette (Figure 4-26) which includes a No Fill option. You can choose from two sets of colors on the color palette: the bottom row of colors comprises the Standard Colors, while the Theme Colors section offers a wider range of tones based on the current selected document theme.

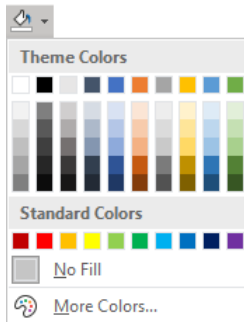


Figure 4-26: Fill Color palette

You can also click More Colors to access an even wider range of colors and tones (Figure 4-27) up to the full color spectrum.

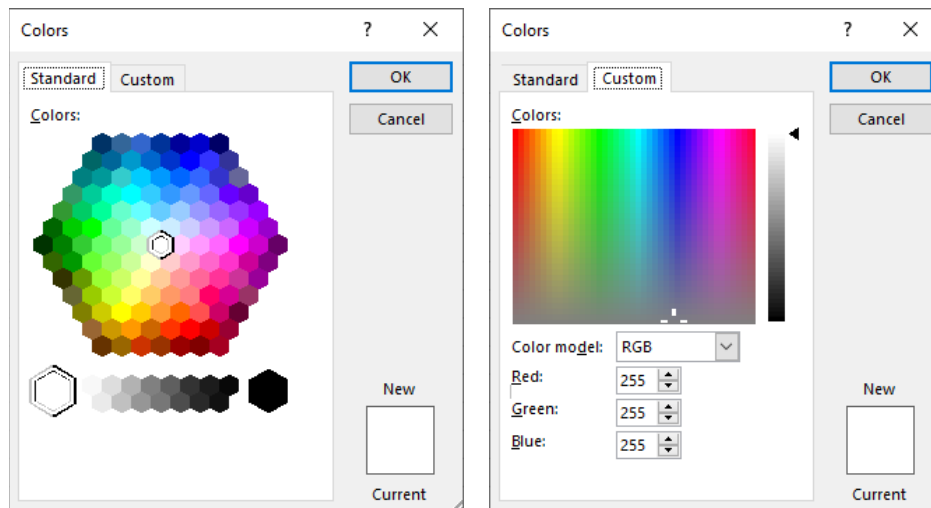


Figure 4-27: More Colors options – Standard and Custom tabs

If you click the Fill Color button, Excel applies the currently selected color to the selected range of cells.

To select a different fill color, select the cell or range of cells and then use one of the following methods:

- on the Home tab, in the Font group, click the Fill Color arrow, or
- right-click the selection and, in the Mini toolbar, click the Fill Color arrow.

In addition to filling a cell using color, you can also select different fill patterns. Excel offers several background patterns for cells. However, you should use them sparingly because the formatting can overwhelm the appearance of the worksheet. You need to open the Format Cells dialog box to access these settings.

To display the full set of options for filling a cell, select the cell or range of cells and then use one of the following methods to access the Fill tab of the Format Cells dialog box (Figure 4-28):

- on the Home tab, in the Cells group, click Format, click Format Cells, and then click the Fill tab, or
- on the Home tab, in the Font group, click the dialog box launcher, and then click the Fill tab, or

- right-click the selection, click Format Cells, and then click the Fill tab.

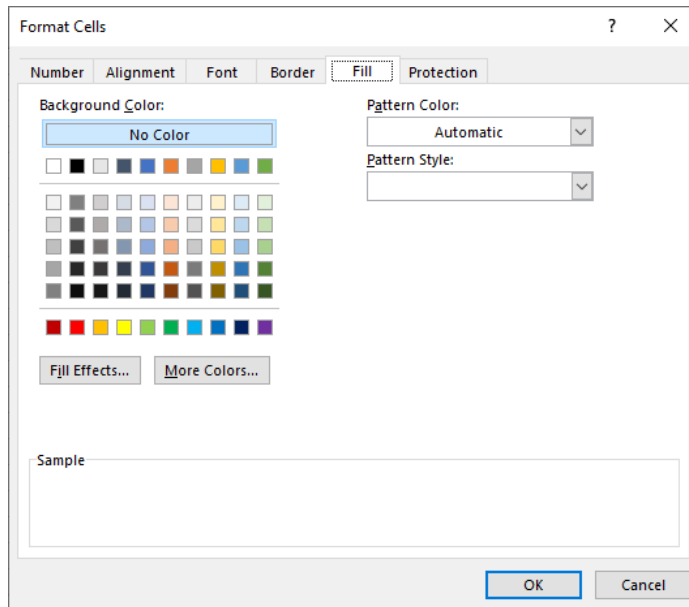


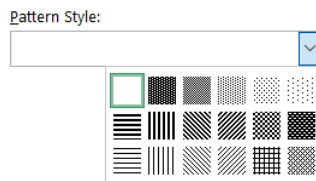
Figure 4-28: Format Cells dialog box – Fill tab

The Fill tab has four features:

Background color – Choose from a large variety of colors to fill the cell as background for the characters.

Pattern Color – This is the color of the pattern when a Pattern Style is chosen. Nothing appears if only a Pattern Color is chosen with no coinciding Pattern Style.

Pattern Style – A variety of lines or dot patterns from which to choose.



Fill Effects – A variety of ways to provide shading between two colors in each cell, as shown in Figure 4-29.

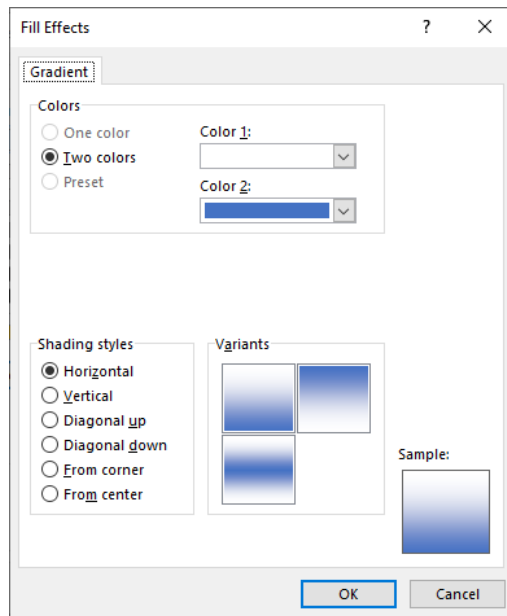


Figure 4-29: Fill Effects options

Patterns and background colors are distinctly different features. You can use either or both of them at the same time. Fill effects cannot be used with patterns or background colors.

Note: Dark colors and dense patterns may obscure the information in the cells. It is best to avoid them.

Learn to apply colors and patterns

In this exercise, you will apply patterns and background colors to cells in a worksheet.

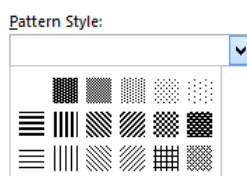
1. With the My Travel Itinerary workbook open, select cells **A1 to A2**.
2. On the Home tab, in the Font group, click the **Fill Color** arrow.

Live Preview works with the fill colors. That is, the background of the selected cells temporarily changes to display that color until you move on to another color.

3. Point to various colors to see the different effects.
4. Click **Light Green** (fifth from the left) in the *Standard Colors* section of the palette.

Now add a pattern and a background color to a range of cells.

5. Select cells **A18:C23**.
6. On the Home tab, in the Cells group, click **Format** and then click **Format Cells**.
7. In the Format Cells dialog box, click the **Fill** tab and then click the **Pattern Style** arrow.



8. Click **6.25% Gray** (far right in the top row).

9. In the *Background Color* section, click the light blue color square in the third row from the top, fifth column from the left (Blue, Accent 1, Lighter 60%). Click **OK**.

Add a background color to the hotel section of the itinerary.

10. Select cells **A14:H16** and, on the Home tab, in the Font group, click the **Fill Color** arrow and select **Yellow** from the *Standard Colors* section.

This color choice did not appear to fit with the rest of the worksheet, so remove the fill color.

11. With cells **A14:H16** selected, on the Home tab, in the Font group, click the **Fill Color** arrow and then click **No Fill**.

The completed worksheet should look like the following example:

	A	B	C	D	E	F	G	H
1	Tolano Adventures							
2								
3	Prepared For:	Williams, R						
4	Phone:	(206) 321-1234						
5								
6	Date:	Sunday, September 8, 2019						
7	Depart From:	Toronto	YYZ	Time:	6:55 PM	Airline:	British Air	Flight # 2409
8	Arrive:	London	LHR	Time:	6:55 AM			
9								
10	Date:	Sunday, September 15, 2019						
11	Depart From:	London	LHR	Time:	3:25 PM	Airline:	Lufthansa	Flight # 75
12	Arrive:	Toronto	YYZ	Time:	6:25 PM			
13								
14	Hotel:	Times Plaza	Address: Stratton Street, London, England					
15	Check in Date:	9-Sep-19						
16	Check out:	15-Sep-19						
17								
18	Invoice							
19	Airfare:	\$3,298.00						
20	Hotel:	2,750.00						
21	Taxes & Fees:	750.52						
22	Total:	\$6,798.52						
23								

12. Save and close the workbook.

Using the Format Painter

Objective 2.2.3

Once you have formatted a cell or range of cells, you may want to duplicate its formatting to the remaining parts of your worksheet. Excel provides a tool called the **Format Painter** that enables you to copy the cell formatting quickly from one area on the worksheet to another.

Before using the Format Painter, you must select the cell or range of cells that display the formatting you wish to copy. To activate the Format Painter, use either the one-click or the double-click method:

- on the Home tab, in the Clipboard group, click the Format Painter once, and then click the target cell you wish to format with the same features. The Format Painter turns off as soon as you click the target cell, or
- on the Home tab, in the Clipboard group, double-click the Format Painter to keep the tool on while you continue applying the selected formatting to several cells. When you are finished formatting the cells, turn off the Format Painter by clicking the button again or pressing ESC.

Learn to use the Format Painter

In this exercise, you will use the Format Painter.

1. Open the **RV Booking** workbook located in the *StarterFiles* folder and save it as: **My RV Booking** in the *MyProjects* folder.

Format the Invoice section first.

2. Select cells **B17:B20** and, on the Home tab, in the Number group, click the **Number Format** dialog box launcher.
3. In the Number tab, select **Number** under *Category* and if necessary, change the Decimal places to **2** and click the **Use 1000 Separator (,)** check box to select it, and click **OK**.
4. On the Home tab, in the Font group, click the **Font** arrow and click **Arial**.

Change the first number to the currency format, and then use the Format Painter to copy the format down to the bottom number.

5. Select cell **B17** so that it is the only cell selected and, on the Home tab, in the Number group, click the **Number Format** dialog box launcher.
6. In the Number tab, under *Category*, select **Currency** and click **OK**.
7. With cell **B17** still selected, on the Home tab, in the Clipboard group, click the **Format Painter** once.

The Format Painter button is now highlighted and a marquee appears around cell B17.

8. Select cell **B20** to apply the same formatting to that cell.

Notice that the Format Painter button has turned off and the marquee is no longer showing around cell B17.

Add a border for the bottom number.

9. Select cell **B20** and, on the Home tab, in the Font group, click the **Borders** arrow, then click **Top and Double Bottom Border**.

Now format the field titles.

10. Select cell **A3** and, on the Home tab, in the Font group, click the **Font** arrow, then click **Times New Roman**.
11. With cell **A3** still selected, on the Home tab, in the Font group, click **Bold**.
12. On the Home tab, in the Clipboard group, double-click the **Format Painter**.
13. Click on each of the following cells or cell ranges to apply the same formatting:

A5 to A6

C5

A8 to A10

C9 to C10

A12 to A14

C13 to C14

A17 to A20

14. On the Home tab, in the Clipboard group, click the **Format Painter** again to turn it off.

Increase the font size of two cells containing text labels.

15. Select cell **A8** and, on the Home tab, in the Font group, click the **Font Size** arrow, then click **14**.

16. With cell **A8** still selected, on the Home tab, in the Clipboard group, click the **Format Painter** once.

17. Click cell **A12** to apply the same formatting there.

Now change the font for the cells containing data using the Format Painter.

18. Select cell **B3** and then, on the Home tab, in the Font group, click the **Font** arrow, and click **Arial**.

19. With cell **B3** still selected, on the Home tab, in the Clipboard group, double-click the **Format Painter**.

20. Click on each of the following cells or cell ranges to apply the same formatting:

B5 to B6

D5

B9

D9

B13

D13

21. On the Home tab, in the Clipboard group, click the **Format Painter** again to turn it off.

You could not use the Format Painter from cells containing text to cells containing dates and times – you will have to format these separately.

22. Select cell **B10** and change the Font to **Arial**.

23. Use the Format Painter to copy that format to cell **B14**.

24. Select cell **D10** and change the Font to **Arial**.

25. Use the Format Painter to copy that format to cell **D14**.

Your sheet should now look like the following:

	A	B	C	D	E	F	G	H
1	Tolano Adventures							
2	Recreational Vehicle Booking							
3	Prepared For:	Pursers, J						
4								
5	Vehicle:	26 ft Coachmen	Unit #:	5381				
6	Sleep Capacity:	6						
7								
8	Pick Up:							
9	Location:	George's RV Center	Address:	1250 Main Street, Seattle, Washington				
10	Date:	15-Jul-19	Time:	12:00 PM				
11								
12	Drop Off:							
13	Location:	Arrow RV Rentals	Address:	9644 Memorial Drive SE, Atlanta, Georgia				
14	Date:	22-Jul-19	Time:	10:00 AM				
15								
16	Invoice							
17	RV rental:	\$1,085.00						
18	Deluxe package:	275.00						
19	Taxes:	115.60						
20	Total:	\$1,475.60						

26. Save and close the workbook.

Clearing Cell Contents and Formatting

Objective 2.2.8

The Clear feature can be used to remove the contents (or certain components that you choose) from the cell or range of cells. Because you have not deleted the cell, the structure of the worksheet stays intact. This feature is found on the Home tab of the Ribbon, in the Editing group.

After selecting a cell or range and then clicking the Clear arrow, you can choose from different options:

All – Remove all data, cell formats, hyperlinks, and comments from the selected cell(s).

Format – Remove only the formatting and hyperlinks from the selected cell(s) while the data and comments remain unchanged. The cell formatting reverts back to the default settings.

Contents – Remove only the data and hyperlinks from the selected cell(s). Because the cell formatting is unchanged, any new data entered into the same cells afterward uses that formatting again.

Comments – Remove only the comments part of the selected cell(s).

Hyperlinks – Convert any hyperlinks in the selected cell(s) to text. When selected, the Clear Hyperlinks icon () appears next to the cell, allowing you to clear only the hyperlink or the hyperlink and its formatting. The topic of hyperlinks will be covered in more detail in a later lesson.

Remove Hyperlinks – Remove both the hyperlink and hyperlink automatic formatting.

In contrast, using Delete, found on the Home tab in the Cells group, removes the selected cells (or the entire row or column) from the worksheet. The remaining worksheet cells then shift over to replace the deleted cells.

Hint: A quick way to remove the contents of a cell without removing formatting is to select the cell or cells you want to clear and then press DELETE on the keyboard.

Learn to use the clear command

In this exercise, you will use the clear command on cells containing various types of data and formatting.

1. Open the **Clear Formats** workbook located in the *StarterFiles* folder and save it as: **My Clear Formats** in the *MyProjects* folder.

Use each of the different Clear commands to see how it affects the data.

2. Select cells **B2** to **D2** and, on the Home tab, in the Editing group, click **Clear** and click **Clear All**.
3. Select cells **B3** to **D3** and, on the Home tab, in the Editing group, click **Clear** and click **Clear Formats**.
4. Select cells **B4** to **D4** and, on the Home tab, in the Editing group, click **Clear** and click **Clear Contents**.
5. Select cells **B5** to **D5** and press **DELETE**.

The Clear Contents command and the DELETE key accomplish the same result.

6. Select cells **B6** to **D6** and, on the Home tab, in the Editing group, click **Clear** and click **Clear Comments**.

	A	B	C	D
1		12,345.68	June 15, 2019	Sample text
2				
3		12345.6789	43631	Sample text
4				
5				
6		12,345.68	June 15, 2019	Sample text

By comparing row 1 to the other rows, you can see how the different clearing actions affected the cell contents.

Now re-enter different data into some of the cells.

7. Enter the following values (do not use the copy and paste functions):

Cell	Value
B2	9876.543
B4	9876.543
B5	9876.543
C2	Mar 1, 2019
C3	Mar 1, 2019
C4	Mar 1, 2019
C5	Mar 1, 2019
D2	label
D4	label
D5	label

Notice the following:

- In rows 2 and 3, the Clear command removes all cell formats to revert them to default.
- In cell C3, the date format temporarily reverts to a numeric format until replaced with a new date value, which is displayed in the default Excel date format instead of the date format that was cleared away.
- In row 2, Excel deletes all of the original data, including formatting and the cell comment, whereas in row 3, Excel retains all of the original data, even though the date value in cell C3 initially looked odd.
- In both rows 4 and 5, Excel deletes all of the original data except for the cell comments, but Excel retains the individual cell formats.
- In row 6, Excel deletes only the cell comment.

The completed worksheet should look like the following example:

	A	B	C	D
1		12,345.68	June 15, 2019	Sample text
2		9876.543	1-Mar-19	label
3		12345.6789	1-Mar-19	Sample text
4		9,876.54	March 1, 2019	label
5		9,876.54	March 1, 2019	label
6		12,345.68	June 15, 2019	Sample text

8. Save and close the workbook.

Using Cell Styles

Objective 2.2.7

You can use **cell styles** in Excel workbooks as a powerful formatting feature. As in Microsoft Word, a style in Excel is simply a grouping of specific format settings for a cell such as font, size, and color. Every time you apply this style to a cell, Excel formats the cell the same way. If the style is changed, Excel applies the changes to all cells with that style to maintain a consistent look throughout the worksheet with minimal effort.

Excel provides you with a set of prebuilt cell styles (also known as **Quick Styles**) that you can access from the Ribbon, on the Home tab in the Styles group under the Cell Styles command. After selecting the desired cells, click Cell Styles to display the gallery, shown in Figure 4-30.

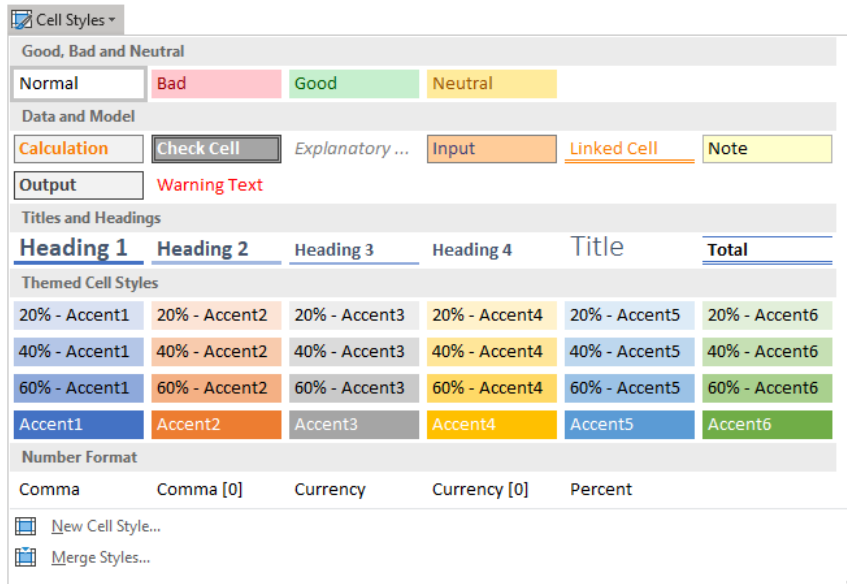


Figure 4-30: Cell Styles gallery

You can then choose which style you want to apply to the selected cells.

Another quick and easy way to apply cell styles to other cells is by using the Format Painter, located on the Home tab in the Clipboard group. Simply select a cell with the style you want, click the Format Painter, then click the cell or range of cells to which you want this cell style applied. If there are many non-adjacent cells to which you want to apply the cell style, double-click the Format Painter and it will stay on until it is disabled by clicking the Format Painter again.

Note the following restrictions:

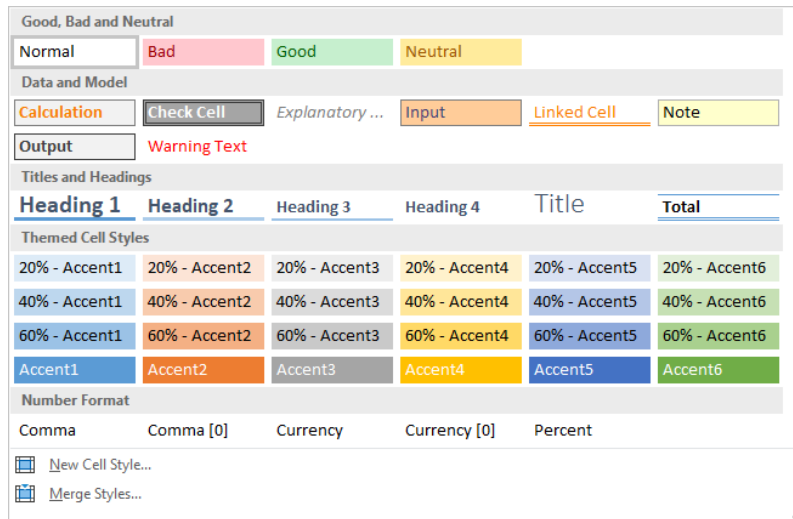
- Styles are defined individually for each workbook. You cannot store them in a template file. The only way to copy any custom user-defined styles from one workbook to another is to copy the original workbook, delete any data not needed, and re-enter the data.
- If you change a style, Excel applies the changes to all cells using that style in every worksheet in that workbook.
- To see the style currently applied to a cell, you must select it and then click Cell Styles in the Ribbon. The name of the applied style will be highlighted with a border. If the cell has no style applied, the Normal style will be highlighted. Each cell must be checked individually to view the cell style assigned to it.
- Styles are based on the currently selected theme. If you change the theme or the formatting of the theme, the style also changes.

Learn to apply cell styles

In this exercise, you will apply cell styles.

1. Open the **Balance Sheet** workbook located in the *StarterFiles* folder and save it as: **My Balance Sheet** in the *MyProjects* folder.
2. Select cell **B5**, then on the Home tab, in the Styles group, click **Cell Styles**.

Alternatively, the Cell Styles button may not appear in the Ribbon; instead, a small sample of different styles with a vertical scroll bar may be displayed in its place. If so, click the **More** button at the bottom of the scroll bar to see the full display of cell styles.



- Click **Heading 3** in the *Titles and Headings* section.

Apply this same style to another cell.

- Select cell **D5** and, on the Home tab, in the Styles group, click **Cell Styles** and click **Heading 3**.
- With cell D5 still selected, on the Home tab, in the Clipboard group, double-click the **Format Painter**.
- Click on each of the following cells to copy the formatting to them: **A6, A13** and **A18**.
- On the Home tab, in the Clipboard group, click the **Format Painter** to turn it off.

Set the first and last number in each cell range to the currency format with no decimal digits.

- Select cell **B7** and, on the Home tab, in the Styles group, click **Cell Styles**. Click **Currency [0]** in the *Number Format* section.
- Use the Format Painter to copy the style in cell **B7** to each of the following cells:
B11, B14, B16, B19, B21, B23
D7, D11, D14, D16, D19, D21, D23
- Turn off the Format Painter.

Set the remaining numbers in the worksheet to numeric format with commas and no decimal digits.

- Select cell **B8** and, on the Home tab, in the Styles group, click **Cell Styles**. Click **Comma [0]** in the *Number Format* section.
- Use the Format Painter to copy the style in cell **B8** to each of the following cells or cell ranges:
B9:B10, B15, B20
D8:D10, D15, D20
- Turn off the Format Painter.

Use the Total style for the totals in each major account group.

14. Select cell **B11** and, on the Home tab, in the Styles group, click **Cell Styles**. Click **Total** in the *Titles and Headings* section.
 15. Use the Format Painter to copy the style in cell **B11** to each of the following cells: **D11**, **B23** and **D23**.
 16. Turn off the Format Painter.
- Use the Heading 4 style for the row titles in each major account group.
17. Select cell **A11** and, on the Home tab, in the Styles group, click **Cell Styles**. Click **Heading 4** in the *Titles and Headings* section.
 18. Use the Format Painter to copy the style in cell **A11** to each of the following cells: **A16**, **A21** and **A23**.
 19. Turn off the Format Painter.

	A	B	C	D
1	Tolano Adventures			
2	Consolidated Balance Sheet			
3	As at June 30			
4				
5		Current Year		Previous Year
6	Assets			
7	Cash	\$ 45,430		\$ 44,536
8	Customer Deposits	85,930		75,930
9	Equipment, Net	234,824		235,924
10	Buildings, Net	1,927,245		1,927,350
11	Total Assets	\$ 2,293,429		\$ 2,283,740
12				
13	Liabilities			
14	Accounts Payable	\$ 42,569		\$ 36,096
15	Mortgage Payable	1,592,742		1,592,850
16	Total Liabilities	\$ 1,635,311		\$ 1,628,946
17				
18	Shareholders' Equity			
19	Share Capital	\$ 100,000		\$ 100,000
20	Retained Earnings	558,118		554,794
21	Total Shareholders' Equity	\$ 658,118		\$ 654,794
22				
23	Total Liabilities and Equity	\$ 2,293,429		\$ 2,283,740

20. Save and close the workbook.

Conditional Formatting

Objective 2.4.2

You use cell formatting to enhance the visual appeal of a worksheet. However, highlighting certain cells to differentiate them from the rest of the worksheet also draws attention to them or conveys the data they contain in a visual manner.

Conditional formatting is a powerful tool you can use to display the data in cells one way for some values, but another way for others, without the additional effort of manually changing the formatting each time you modify data or add new data to a worksheet.

The Ribbon offers several choices for setting up conditional formats.

Highlight Cell Rules – Use this option to highlight cell values based on their relation to specific values you enter. In this example, you specified that Excel should highlight cell values of greater than 12000 with a green background, while cells with less than 9000 would be highlighted with a pink background, and cells with in-between values would be in dark yellow text with a light yellow background.

	A	B
1	Sales By Customer, Year To Date	
2		
3	Air Wing Fuels Inc.	5,025.74
4	Awesome Bikes Ltd.	6,100.02
5	Boat Brokerage Sales Corp.	14,559.50
6	Consolidated Amalgamated Corp.	11,290.13
7	Global Swimsuits Unlimited	11,341.36
8	Ecological Bicycles Ltd.	6,346.47
9	Exotic Flowers Inc.	5,053.12
10	Farley's Farm Supplies Inc.	13,259.16
11	Flaming Hot Skis Ltd.	9,890.61
12	Fraser Glen College	10,296.38
13	Gas Tank Wholesalers Inc.	6,806.98
14	Hole In The Wall Computers Inc.	9,041.47
15	Humongous Holdings Ltd.	12,369.33
16	Les's Tailors Ltd	13,062.72
17	Megatron Entertainment Corp.	13,127.39
18	Millennium Holdings Ltd.	10,287.27
19	Office Supplies Unlimited	8,118.71
20	Paint The World Ltd.	8,628.84
21	Pullemout Dental Suppliers Inc.	10,020.39
22	Sweet Stuff Manufacturing Corp.	11,535.14
23	The Potato Chipper Ltd.	14,273.87

Top/Bottom Rules – Use this option to activate the conditional formatting on the top or bottom ranking cells in a range. In this example, the conditional formatting is set so that Excel highlights the top 10% of cells in red with a pink background, and the bottom 10% in dark green with a light green background. There are 21 cells selected in the range, so 10% is 2 cells each. If the range comprises 50 cells, the top and bottom 10% would be 5 cells each.

You can choose to highlight any percentage of cells for conditional formatting.

	A	B
1	Sales By Customer, Year To Date	
2		
3	Air Wing Fuels Inc.	5,025.74
4	Awesome Bikes Ltd.	6,100.02
5	Boat Brokerage Sales Corp.	14,559.50
6	Consolidated Amalgamated Corp.	11,290.13
7	Global Swimsuits Unlimited	11,341.36
8	Ecological Bicycles Ltd.	6,346.47
9	Exotic Flowers Inc.	5,053.12
10	Farley's Farm Supplies Inc.	13,259.16
11	Flaming Hot Skis Ltd.	9,890.61
12	Fraser Glen College	10,296.38
13	Gas Tank Wholesalers Inc.	6,806.98
14	Hole In The Wall Computers Inc.	9,041.47
15	Humongous Holdings Ltd.	12,369.33
16	Les's Tailors Ltd	13,062.72
17	Megatron Entertainment Corp.	13,127.39
18	Millennium Holdings Ltd.	10,287.27
19	Office Supplies Unlimited	8,118.71
20	Paint The World Ltd.	8,628.84
21	Pullemout Dental Suppliers Inc.	10,020.39
22	Sweet Stuff Manufacturing Corp.	11,535.14
23	The Potato Chipper Ltd.	14,273.87

Data Bars – You can use conditional formatting to embed a bar chart into a selected range of cells based on the value in each cell.

This type of formatting offers a quick visual representation of each cell value in relation to the others.

	A	B
1	Sales By Customer, Year To Date	
2		
3	Air Wing Fuels Inc.	5,025.74
4	Awesome Bikes Ltd.	6,100.02
5	Boat Brokerage Sales Corp.	14,559.50
6	Consolidated Amalgamated Corp.	11,290.13
7	Global Swimsuits Unlimited	11,341.36
8	Ecological Bicycles Ltd.	6,346.47
9	Exotic Flowers Inc.	5,053.12
10	Farley's Farm Supplies Inc.	13,259.16
11	Flaming Hot Skis Ltd.	9,890.61
12	Fraser Glen College	10,296.38
13	Gas Tank Wholesalers Inc.	6,806.98
14	Hole In The Wall Computers Inc.	9,041.47
15	Humongous Holdings Ltd.	12,369.33
16	Les's Tailors Ltd	13,062.72
17	Megatron Entertainment Corp.	13,127.39
18	Millennium Holdings Ltd.	10,287.27
19	Office Supplies Unlimited	8,118.71
20	Paint The World Ltd.	8,628.84
21	Pullemout Dental Suppliers Inc.	10,020.39
22	Sweet Stuff Manufacturing Corp.	11,535.14
23	The Potato Chipper Ltd.	14,273.87

Color Scales – Use this type of conditional formatting to show the relative value of each cell to each other cell using color gradients. This example shows the green-yellow-red option, with the lowest value highlighted with dark red, dark green for the highest value and yellow for the middle values. Different shades of these three colors highlight the values in between.

	A	B
1	Sales By Customer, Year To Date	
2		
3	Air Wing Fuels Inc.	5,025.74
4	Awesome Bikes Ltd.	6,100.02
5	Boat Brokerage Sales Corp.	14,559.50
6	Consolidated Amalgamated Corp.	11,290.13
7	Global Swimsuits Unlimited	11,341.36
8	Ecological Bicycles Ltd.	6,346.47
9	Exotic Flowers Inc.	5,053.12
10	Farley's Farm Supplies Inc.	13,259.16
11	Flaming Hot Skis Ltd.	9,890.61
12	Fraser Glen College	10,296.38
13	Gas Tank Wholesalers Inc.	6,806.98
14	Hole In The Wall Computers Inc.	9,041.47
15	Humongous Holdings Ltd.	12,369.33
16	Les's Tailors Ltd	13,062.72
17	Megatron Entertainment Corp.	13,127.39
18	Millennium Holdings Ltd.	10,287.27
19	Office Supplies Unlimited	8,118.71
20	Paint The World Ltd.	8,628.84
21	Pullemout Dental Suppliers Inc.	10,020.39
22	Sweet Stuff Manufacturing Corp.	11,535.14
23	The Potato Chipper Ltd.	14,273.87

Icon Sets – You can use this type of conditional formatting to highlight values using icons. In this example, a 5-bar strength meter (similar to the wireless network strength indicator on mobile computers and devices) indicates the relative value of each cell to all other cells in the range. The cells with the lowest values have no bars filled, while the highest values have all bars filled.

In all of these examples, you see the same conditional format applied to the entire cell range. If you change a value in any of these cells, the conditional format is automatically re-evaluated and the highlighting may change.

A cell may have both a manual format and a conditional format. If the cell contains a value that does not meet any of the specified conditions, the cell uses the manual format.

Formatting options include only the font styles (regular, bold, italics, or bold and italics), font colors, number formats, borders, and background fill colors and patterns. You may not choose different font names or font sizes in a conditional format.

	A	B
1	Sales By Customer, Year To Date	
2		
3	Air Wing Fuels Inc.	 5,025.74
4	Awesome Bikes Ltd.	 6,100.02
5	Boat Brokerage Sales Corp.	 14,559.50
6	Consolidated Amalgamated Corp.	 11,290.13
7	Global Swimsuits Unlimited	 11,341.36
8	Ecological Bicycles Ltd.	 6,346.47
9	Exotic Flowers Inc.	 5,053.12
10	Farley's Farm Supplies Inc.	 13,259.16
11	Flaming Hot Skis Ltd.	 9,890.61
12	Fraser Glen College	 10,296.38
13	Gas Tank Wholesalers Inc.	 6,806.98
14	Hole In The Wall Computers Inc.	 9,041.47
15	Humongous Holdings Ltd.	 12,369.33
16	Les's Tailors Ltd	 13,062.72
17	Megatron Entertainment Corp.	 13,127.39
18	Millennium Holdings Ltd.	 10,287.27
19	Office Supplies Unlimited	 8,118.71
20	Paint The World Ltd.	 8,628.84
21	Pullemout Dental Suppliers Inc.	 10,020.39
22	Sweet Stuff Manufacturing Corp.	 11,535.14
23	The Potato Chipper Ltd.	 14,273.87

Using the Rules Manager

When you use the Ribbon to set up conditional formatting in your worksheet, Excel creates the conditional formatting rules in the background.

You can use the Rules Manager (Figure 4-31) directly to create new rules that are more customized to your needs. The Rules Manager can also be used to modify existing rules or delete rules that are no longer needed. To access the Rules Manager, click the Conditional Formatting arrow, then click Manage Rules.

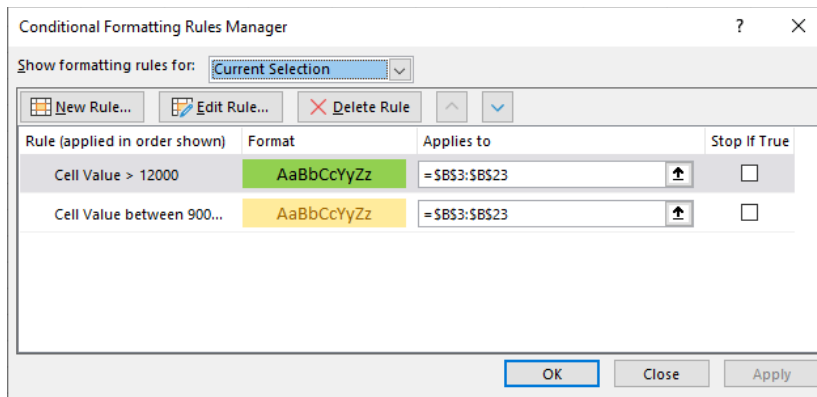


Figure 4-31: Rules Manager

The Rules Manager is covered in more depth in the Excel Expert course.

Learn to apply conditional formatting

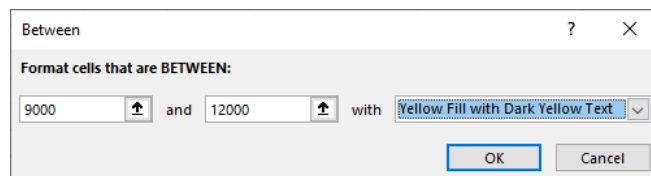
In this exercise, you will apply conditional formats.

1. Open the **Sales By Customer** workbook located in the *StarterFiles* folder and save it as: **My Sales By Customer** in the *MyProjects* folder.

You have been asked to prepare a report for your manager, identifying your best corporate customers based on the amount of sales this year. In addition, you need to identify mid-level corporate customers because the Marketing department may want to work closely with them during the latter half of the year.

You will identify the best customers as having generated more than \$12,000 of sales this year, and the mid-level customers as having generated more than \$9,000 but less than \$12,000.

2. Select cells **B3:B23**. On the Home tab, in the Styles group, click **Conditional Formatting**.
3. Click **Highlight Cells Rules** and then click **Between**.
4. In the Between dialog box, replace the value in the left-most text box with: **9000**.
5. Press **TAB** and replace the value in that text box with: **12000**.
6. Click the arrow for the right-most list box and click **Yellow Fill with Dark Yellow Text**.



7. Click **OK**.
8. With cells **B3:B23** still highlighted, on the Home tab, in the Styles group, click **Conditional Formatting**, click **Highlight Cell Rules** and click **Greater Than**.
9. In the Greater Than dialog box, replace the value on the left with: **12000**.
10. Click the arrow for the right-most list box and click **Custom Format**.

Excel displays the Format Cells dialog box to allow you to select from a wide variety of formatting options.

11. Click the **Fill** tab.
12. Click the **light green** color (fifth from the left, bottom row) in the *Background Color* section and click **OK**.
13. Click **OK** in the Greater Than dialog box.
14. Click in an empty cell outside of the cell range to view the data.

	A	B
1	Sales By Customer, Year To Date	
2		
3	Air Wing Fuels Inc.	5,025.74
4	Awesome Bikes Ltd.	6,100.02
5	Boat Brokerage Sales Corp.	14,559.50
6	Consolidated Amalgamated Corp.	11,290.13
7	Global Swimsuits Unlimited	11,341.36
8	Ecological Bicycles Ltd.	6,346.47
9	Exotic Flowers Inc.	5,053.12
10	Farley's Farm Supplies Inc.	13,259.16
11	Flaming Hot Skis Ltd.	9,890.61
12	Fraser Glen College	10,296.38
13	Gas Tank Wholesalers Inc.	6,806.98
14	Hole In The Wall Computers Inc.	9,041.47
15	Humongous Holdings Ltd.	12,369.33
16	Les's Tailors Ltd	13,062.72
17	Megatron Entertainment Corp.	13,127.39
18	Millennium Holdings Ltd.	10,287.27
19	Office Supplies Unlimited	8,118.71
20	Paint The World Ltd.	8,628.84
21	Pullemout Dental Suppliers Inc.	10,020.39
22	Sweet Stuff Manufacturing Corp.	11,535.14
23	The Potato Chipper Ltd.	14,273.87

Now observe what happens when you change data values. Assume that two of the cell values are incorrect.

15. Select cell **B3** and enter: **13000**.
16. Select cell **B10** and enter: **2000**.

Even though the formatting has not changed for any of these cells, the highlighting has changed based on the new cell values.

17. Save the workbook and keep it open for the next exercise.

Removing Conditional Formatting

Objective 2.4.3

To remove any conditional formatting, on the Home tab, in the Styles group, click the Conditional Formatting arrow, and select Clear Rules. You can then choose to clear the conditional formatting from the entire sheet or from only selected cells, as shown in Figure 4-32.

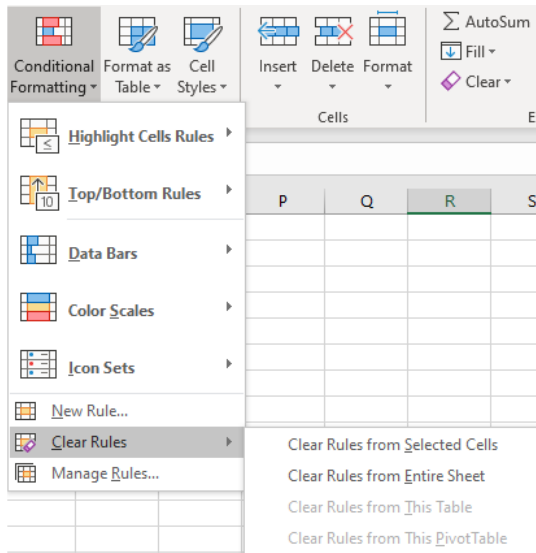


Figure 4-32: Clear Rules options

If selected cells are cleared and other cells in the original range are not, the conditional formatting will be applied to the remaining cells, ignoring those where the values have been cleared. For example, the Top 10% may be a different group of values. Clearing the entire sheet removes all conditional formatting from all cells on the worksheet instead of doing it range by range.

Learn to remove conditional formatting

In this exercise, you will remove conditional formats from cells.

1. With the **My Sales By Customer** open save it as: **My Sales By Customer (Clear)** in the *MyProjects* folder.
2. Select cells **B3:B23**, then on the Home tab, in the Styles group, click **Conditional Formatting**, and click **Manage Rules**.
3. In the Conditional Formatting Rules Manager dialog box, select the bottom rule (Cell Value between 9000 and 12000) and click **Delete Rule**.
4. Click **OK**.

The formatting rule is removed.

5. Select cells **B3:B23** if necessary.
6. On the Home tab, in the Styles group, click **Conditional Formatting**, click **Clear Rules**, and select **Clear Rules from Selected Cells**.

All conditional formatting is removed from cells B3:B23.

7. Save and close the workbook.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- ☒ Format numbers and decimal places.
- ☒ Change the alignment of cell contents.
- ☒ Merge cells and wrap text.
- ☒ Change fonts and font size.
- ☒ Apply borders around cells.
- ☒ Apply background colors and patterns to cells.
- ☒ Use the Format Painter.
- ☒ Clear cells and formatting.
- ☒ Use cell styles.
- ☒ Apply and remove conditional formatting.

Key Terms

Term	Definition
Alignment	The positioning or placement of content within a cell.
Cell style	A feature that enables you to apply many different formatting characteristics to one or more cells with a single command by choosing a style from a gallery. See also Quick Style.
Font	A specific typeface, such as Arial, or Times New Roman.
Format Painter	A tool you can use to copy formatting from a selected cell to other cells and cell ranges.
Live Preview	An Excel feature that temporarily changes the appearance of the selected cell(s) to show how they would appear with the format your mouse is currently pointing to on the Ribbon.
Quick Style	A combination of pre-built formatting options that can be applied to cells in the worksheet. Quick Styles are displayed in galleries. See also Cell style.

Quiz Questions

For each question, select the best answer.

- Which feature temporarily changes the appearance of selected cell(s) to the format that your mouse is currently pointing to on the Ribbon?
 - Live Preview
 - Gallery View
 - Format Manager
 - Format Painter
- Which number format does not allow you to control how negative numbers display?
 - Currency
 - Accounting
 - Fixed
 - Custom

3. In which of the following locations can you find commands for changing the orientation of text in a cell?
 - a. On the Page Layout tab, in the Page Setup group
 - b. On the Home tab, in the Alignment group
 - c. On the Margins tab of the Page Setup dialog box
 - d. On the Insert tab, in the Text group
4. Which tab of the Format Cells dialog box would you use to change the background color of a cell?
 - a. Fill
 - b. Number
 - c. Font
 - d. Indentation
5. What is the difference between clicking the Format Painter once and double-clicking it?
 - a. When you click it once, you can apply formatting attributes to only one other cell or cell range, whereas when you double-click it, you replace the contents of the target cell with the contents of the source cell.
 - b. When you click it once, you can apply formatting attributes to only one other cell or cell range, whereas when you double-click it, you clear all the formatting from the target cell or cell range.
 - c. When you click it once, you clear the formatting attributes of the cell, whereas when you double-click it, you restore the formatting attributes of the cell to their original state.
 - d. When you click it once, you can apply the formatting attributes to only one other cell or range, whereas when you double-click it, you can apply the formatting attributes to as many cells or cell ranges as you want until you turn it off.
6. Jim wants to delete not only data in a cell but also the formatting and comments. One way to do this is to:
 - a. click the backspace button.
 - b. click the delete button.
 - c. click Clear All on the ribbon.
 - d. click delete, delete comments, then manually reformat the cell.
7. A group of cell format settings (such as font, size and color) that can be applied to a cell is called a:
 - a. Cell group
 - b. Format group
 - c. Cell style
 - d. Format tab
8. Ed has created a worksheet of sales projections, and the numbers change daily. He would like all projected sales figures over 25,000 to display in purple. What is the easiest way to accomplish this?
 - a. Apply conditional formatting to the projected sales figures.
 - b. Sort the range of sales figures every day to see which are the highest, then apply formatting manually.
 - c. There is no easy way; Ed must look at each figure and manually apply formatting as appropriate.
 - d. Use the AutoFilter feature to only display sales over 25,000 and manually apply formatting to these rows.

9. Bill needs to print his worksheet for a meeting, but he doesn't have a color printer. He doesn't want the colored, conditional formatting to make his cells too dark when printing it, so decides he wants to turn off this feature on just the one sheet he is printing. How should he do this?
- Click the Undo button enough times to reverse all the effects of conditional formatting.
 - Copy the sheet and change the fill color to white.
 - Click the Conditional Formatting arrow, point to Clear Rules, then click Clear Rules from Entire Sheet.
 - Click Clear, Clear Formats.
10. Mary has extended text that she wants contained in one cell without making the column wider. What should she do?
- Avoid using the cells to the right of the cell so all the text will still appear.
 - Use the wrap text feature.
 - Use the smallest font possible.
 - Make the affected cell wider.
11. The feature that combines more than one cell into one larger cell is called:
- Merge cells
 - Wrap text
 - Cell style
 - Cell group
12. When using the Format Cells dialog box to add borders to a cell, you can specify which of the following?
- Color of the line
 - Style of the line
 - Diagonal lines
 - You can specify all of these items.
13. If you want to apply the Strikethrough effect to the text in a cell, you can use:
- the Strikethrough button in the Font group.
 - the Strikethrough style in the Styles group.
 - the Font dialog box.
 - You can use any of these methods to apply the Strikethrough effect to text in a cell.

Microsoft® Excel

Associate Certification Guide

Lesson 5: Viewing and Printing Workbooks

Lesson Objectives

In this lesson, you will change views, print and preview worksheets, and customize page setup. Upon completion of this lesson, you should be able to:

- ☐ Create worksheet windows.
- ☐ Arrange worksheet windows.
- ☐ Split panes.
- ☐ Freeze panes.
- ☐ Zoom in and out of worksheets.
- ☐ Print and preview worksheets.
- ☐ Use different workbook views.
- ☐ Add and preview page breaks.
- ☐ Change printing margins, orientation, paper size and scale.
- ☐ Print column and row titles or selected cell ranges.
- ☐ Add and modify headers and footers.
- ☐ Print selected worksheets.

Changing Worksheet Views

Worksheets can become very large and can expand to accommodate a tremendous amount of data. On the other hand, computer monitors and hand-held device screens are limited by their physical dimensions and resolution.

You encounter many situations when you need to work with worksheets that are much larger than your screen. To overcome this limitation, Excel provides you with the ability to change how the worksheet is displayed.

If you are doing some "What-if" evaluations, for example, you may want to see distant parts of a large worksheet on the screen at the same time. On the other hand, you may wish to have more than one workbook on the screen to cut and paste from one worksheet to another. Alternatively, you may have trouble working on your large worksheet because you cannot see the row and column headings when making entries. These scenarios can all be resolved by using the commands on the View tab of the Ribbon.

The View tab offers a variety of tools to facilitate different ways of viewing a worksheet, including (but not limited to) the commands in the Zoom and Window groups, shown in Figure 5-1.

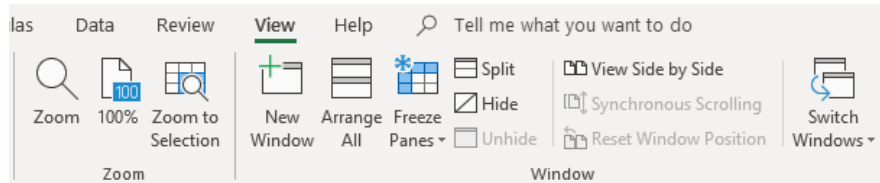


Figure 5-1: Options in the Zoom and Window groups on the View tab of the Ribbon

Zoom – Change the magnification percentage to zoom in and out (bigger and smaller text) on the worksheet.

100% – Force the zoom back to 100% immediately.

Zoom to Selection – Zoom in or out to display the entire group of selected cells on the worksheet (subject to the minimum (10%) and maximum (400%) zoom available in Excel).

New Window – Open a second view of the workbook. This is helpful when comparing different parts of a large worksheet or different worksheets.

Arrange All – Arrange all the Excel windows on the screen in one of several layouts: tiled, horizontal, vertical, or cascade.

Freeze Panes – Lock in place the rows above and the columns to the left of a selected cell while you scroll in the worksheet. Locking only the first row and first column is also an option. This option is useful to keep the headings on the screen when you are working in cells far from those headings.

Split – Split the worksheet into two or four panes based on the cell pointer position.

Hide – Hide the active window from the screen. This is useful when you are working with multiple windows and you want Excel to display only specific windows.

Unhide – Display a dialog box listing the windows you have hidden so that you can select individual windows and redisplay them.

View Side by Side – Place two open workbooks side by side in the Excel application window. You can place the two side by side in a vertical or horizontal position.

Synchronous Scrolling – Scroll through the worksheets in each pane simultaneously.

Reset Window Position – Reset the displayed worksheets to equal sizes.

Switch Windows – Present a list of the documents currently open in Excel. You can then bring a workbook to the front by clicking on it.

To increase the amount of display area available to view all your document windows, you can also collapse the Ribbon temporarily.

Creating and Arranging Worksheet Windows

Objective 1.4.4

You can use the New Window button on the View tab in the Window group to open another view of the **active workbook**.

Note: The active workbook is the workbook that contains the cell pointer. Even though you may have multiple workbooks open at the same time, only one workbook can be active at a time. If you need to update two of them at essentially the same time, you must switch back and forth between workbooks.

You can then arrange the workbook windows to view different parts of the workbook (either the same worksheet, or different worksheets of the same workbook) at the same time without having to scroll around the worksheet continuously to view cells that are far from each other.

For example, you may want to do some "What-if" evaluations on a workbook. These evaluations may require that you make changes at the top of your worksheet while you view the effects on the totals at the bottom of the worksheet. Using at least two windows on the same workbook facilitates this process.

Every open workbook will have its own window in the Excel application. If you use the New Window feature to create a second (or more) view of any of the workbooks, you will quickly run out of available space on the screen to display all these windows. However, you can arrange them in ways so that they are easily accessible.

On the View tab, in the Window group, clicking the Arrange All button opens the Arrange Windows dialog box, shown in Figure 5-2.

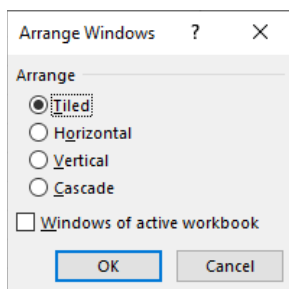


Figure 5-2: Arrange Windows dialog box

You use the Arrange Windows dialog box to quickly reposition all open workbook windows on the screen at the same time. When arranging the windows on the screen, you can choose from several options:

Tiled – Re-arrange worksheet windows on the screen so that all windows are as square as possible and positioned next to each other. Figure 5-3 shows an example of tiled worksheet windows.

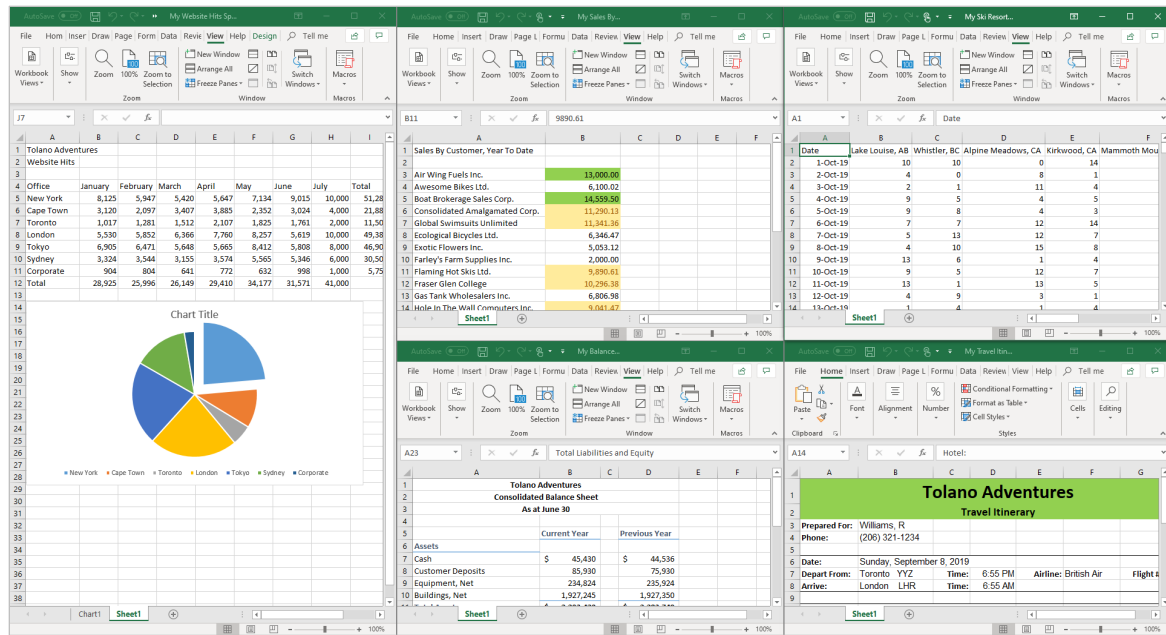


Figure 5-3: Tiled worksheet windows

Horizontal – Re-arrange worksheet windows on the screen so that each window stretches across the entire width of the Excel application window. Excel lines up the windows horizontally so that you can see as many columns as possible in each worksheet. Figure 5-4 shows an example of worksheet windows displayed in a horizontal arrangement.

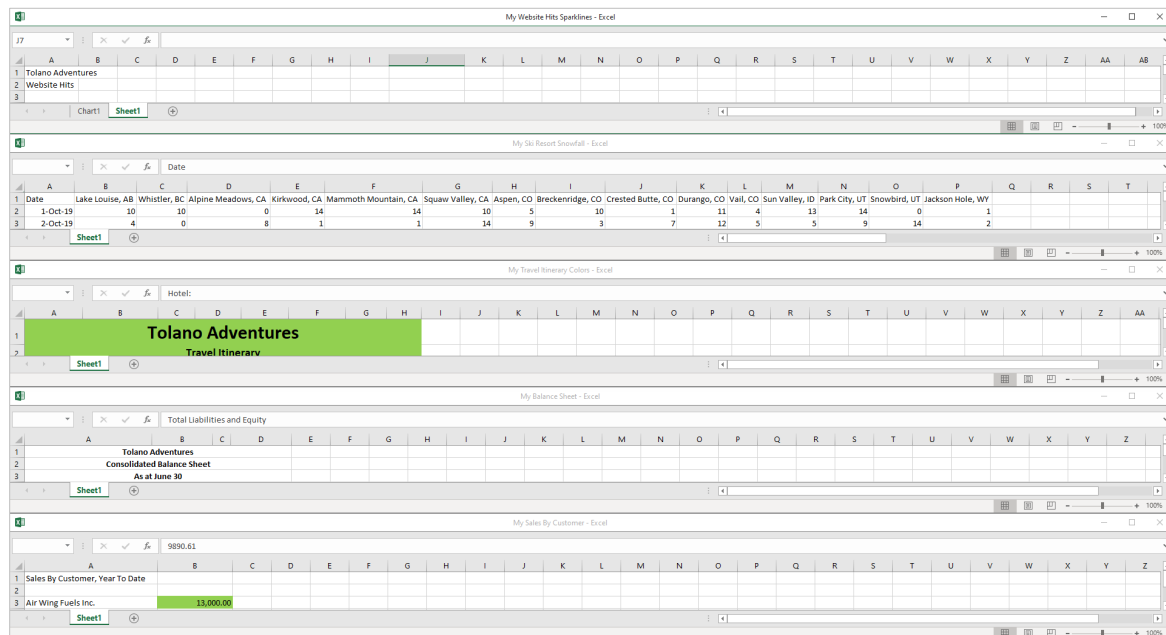


Figure 5-4: Horizontal worksheet windows

Vertical – Re-arrange worksheet windows on the screen so that each window stretches from the top to the bottom of the Excel screen. Excel lines up these windows vertically so that you can see as many rows as possible in each worksheet. Figure 5-5 shows an example of windows arranged vertically.

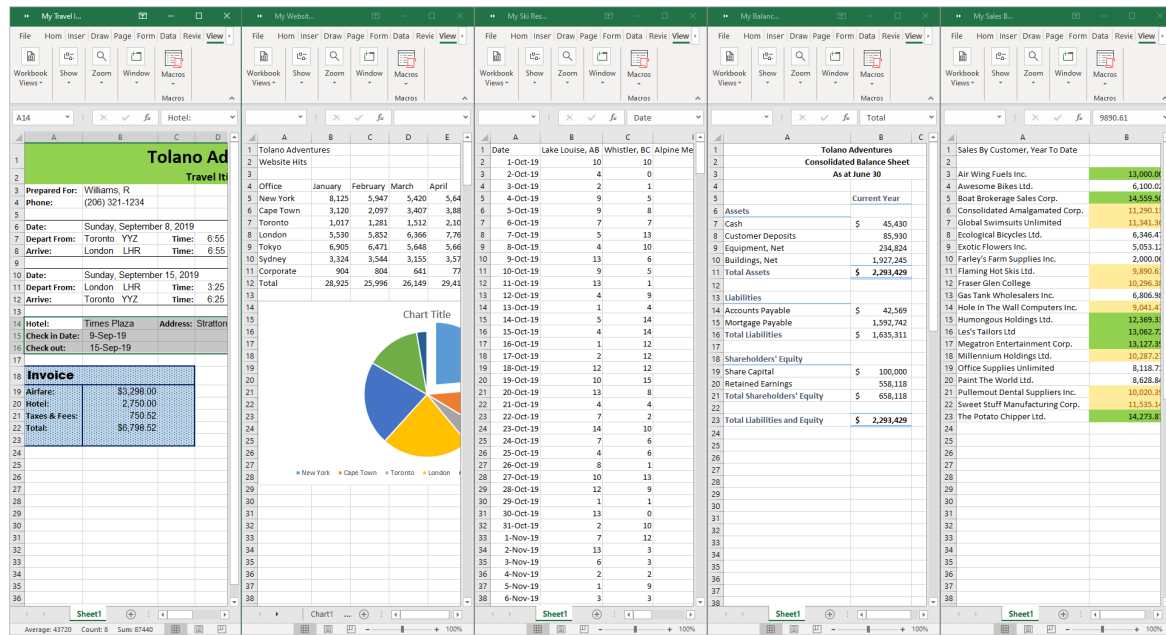


Figure 5-5: Vertical worksheet windows

Cascade – Re-arrange worksheets so that each one is on top of the next and slightly offset to give you a three-dimensional view of all open workbooks. This kind of arrangement is best when you do not want to reduce the size of each worksheet window, and you can flip between the open windows as needed. Figure 5-6 shows an example of cascaded windows.

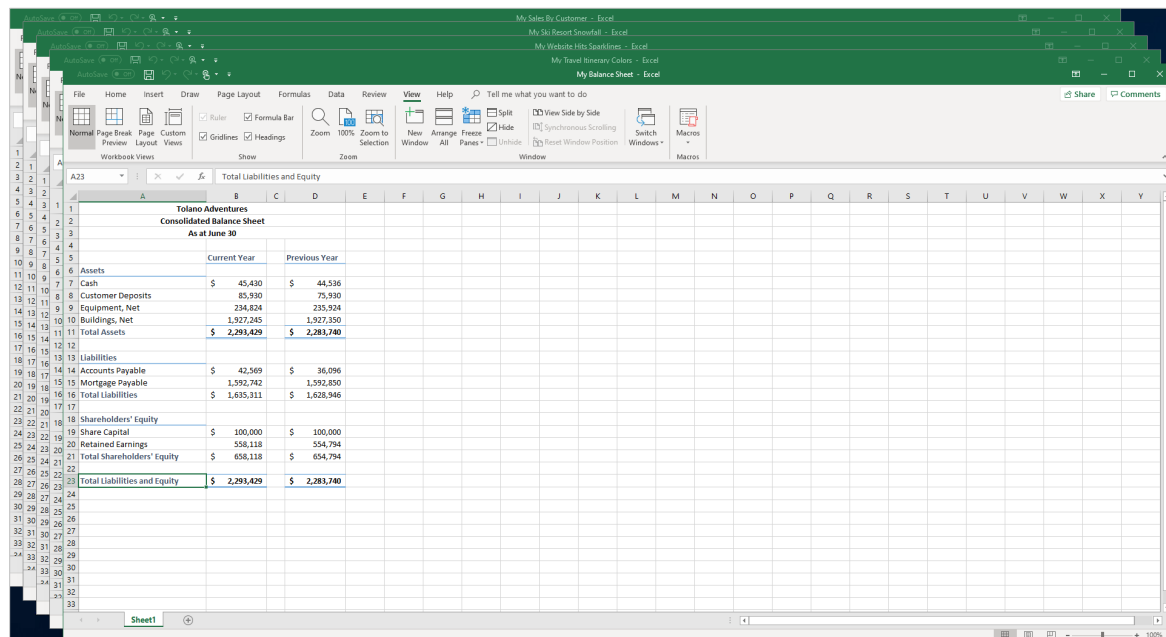


Figure 5-6: Cascaded worksheet windows

In all these view options, the active workbook is the one with the thin green border around the window edges and the workbook's filename displayed in bright white in the title bar. The other open workbooks have the workbook name displayed in a lighter shade of gray in the title bar, and the border around the window edges is light gray.

There is no limit to the number of Excel windows you can have open at the same time; however, the size of your computer monitor will limit how many – and how much of each – you can view at the same time. Another way to work around this problem is to connect a second (or more) monitor and extend your Windows display across to it.

Learn to use multiple workbook windows

In this exercise, you will open two windows on a single workbook, arrange the windows, and move between them.

1. Open the **Ski Resort Snowfall** workbook located in the *StarterFiles* folder.
2. On the View tab, in the Window group, click **New Window**.

Note that if the workbook is maximized to the full screen, nothing seems to happen when you select this option. But if you take a closer look at the title bar, the workbook is now identified as Ski Resort Snowfall - 2.

The original window is still open and identified as Ski Resort Snowfall - 1. If the original workbook is displayed as a restored window, then the second copy will appear as another workbook window in front of – and offset a little to the right and down from – the original one.

You can change the arrangement of these windows to view both at the same time.

3. On the View tab, in the Window group, click **Arrange All**.

The Arrange Windows dialog box appears.

4. With the **Tiled** option selected, click **OK**.

Excel arranges the two workbook windows on your screen side by side. If you had more than two windows or had other files open, Excel would tile them in several same-sized rectangles.

In this exercise, both workbooks appear identical on the screen, but only one of them is the active one. The active window is the one with the workbook name displayed in bright white in the title bar. The inactive window(s) display the workbook name in a light gray color.

Both windows are views of the same workbook. If you change a cell value in one window, the view in the other window is updated at the same time.

5. In the window on the left, select cell **B3** and enter: **5**.

The value in cell B5 is updated in both windows.

You can move around the worksheet in each of these windows independently of each other, allowing you to view different parts of the same worksheet (or even different worksheets) at the same time.

6. Drag the horizontal scroll bar of the active window (the one on the left) to move right in the worksheet.
7. Click anywhere in the other window to make it the active worksheet.
8. Drag the vertical scroll bar to move down in the worksheet.

This demonstrates that you can scroll through the two windows independently of each other, even though they are both showing the same worksheet.

9. Close all workbook windows and discard any changes made to the workbook.

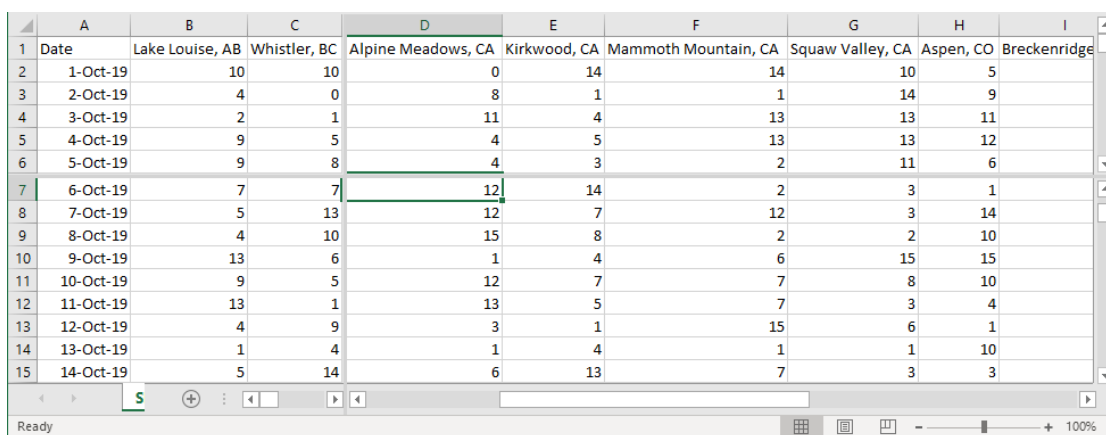
Splitting Panes

Objective 1.4.4

The split feature enables you to have just one instance of your workbook open but be able to view the current active worksheet using two or four window panes. In each of the split window views, you can move around to see different (or even the same) parts of the worksheet without having to continuously shift from one end of the worksheet to the other or move rows and columns around to see the related data closer together. The split operation is like using four different cameras simultaneously, with the ability to manipulate each one semi-independently of one another – you can point to any part of the worksheet regardless of whether those parts are close or far away from each other.

On the View tab, in the Window group, click Split to split the worksheet into one of the following views:

- Two horizontal panes; if the active cell is in column A, the split will be just above the row of the active cell.
- Two vertical panes; if the active cell is in row 1, the split will be to the immediate left of this column.
- Four panes; if the active cell is any other cell, the worksheet will split into four panes immediately above and to the left of this cell, as shown in Figure 5-7. If the active cell is A1, the worksheet will be split into four equal panes.



	A	B	C	D	E	F	G	H	I
1	Date	Lake Louise, AB	Whistler, BC	Alpine Meadows, CA	Kirkwood, CA	Mammoth Mountain, CA	Squaw Valley, CA	Aspen, CO	Breckenridge
2	1-Oct-19	10	10	0	14	14	10	5	
3	2-Oct-19	4	0	8	1	1	14	9	
4	3-Oct-19	2	1	11	4	13	13	11	
5	4-Oct-19	9	5	4	5	13	13	12	
6	5-Oct-19	9	8	4	3	2	11	6	
7	6-Oct-19	7	7	12	14	2	3	1	
8	7-Oct-19	5	13	12	7	12	3	14	
9	8-Oct-19	4	10	15	8	2	2	10	
10	9-Oct-19	13	6	1	4	6	15	15	
11	10-Oct-19	9	5	12	7	7	8	10	
12	11-Oct-19	13	1	13	5	7	3	4	
13	12-Oct-19	4	9	3	1	15	6	1	
14	13-Oct-19	1	4	1	4	1	1	10	
15	14-Oct-19	5	14	6	13	7	3	3	

Figure 5-7: Worksheet window split into four panes

After splitting the window, the split will stay at that location even as you move around the worksheet. The panes will scroll if you try to move to a cell outside of the current window.

You can alter the position of either the horizontal or vertical split bar by using the mouse. To move a split bar, position your mouse pointer over the bar. When the double-headed arrow appears, press and hold the mouse button and move the bar to the new location.

To remove the split, use one of the following methods:

- On the View tab, in the Window group, click the Split button again to remove both split bars.
- Drag the vertical split bar to the far left or far right of the worksheet.
- Drag the horizontal split bar to the top or bottom of the worksheet.
- Double-click on either of the split bars.

Freezing Panes

Objective 1.4.3

As your worksheet grows, it will become increasingly difficult to view all the data on the screen at the same time. More importantly, you will reach a point when you can no longer keep the row and column headings on the screen as you scroll down or across your large worksheet. It can become difficult to determine, for example, whether you are entering data in the February or March column, or in the Taxes or Travel row. To help you overcome this, Excel allows you to lock the titles on the screen while you scroll to a remote part of the worksheet.

Freezing panes refers to the feature that enables you to lock the top row(s) and/or left-most column(s). This feature provides you with three options from which to choose:

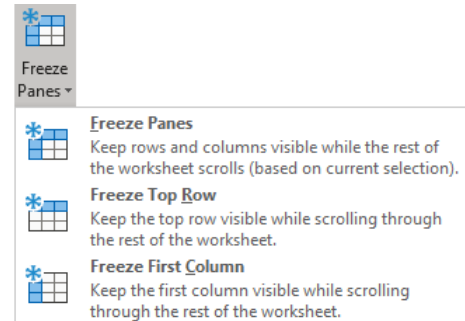
Note: Excel does not allow you to freeze and split panes at the same time.

Freeze Panes – In this option, the active cell serves as an anchor – when the feature is activated, all rows above and all columns to the left of the active cell remain in view until the feature is turned off. You may freeze more than one row or column in place. You can also freeze just the top row(s) or just the leftmost column(s).

Freeze Top Row – When you select this option, the selection of the active cell is not important. Excel will always freeze only the one row currently displayed at the top of the worksheet window. Note that if the top row currently displayed on the screen is not row 1 (for example, row 20), Excel will freeze that row, even though your column titles may be in row 1.

Freeze First Column – When you select this option, the selection of the active cell is not important. Excel will always freeze only the one column currently displayed at the far left of the worksheet window. Like the Freeze Top Row option, be sure to verify that the left column currently displayed is the correct one to freeze.

When freezing panes using the current cell, Excel locks *all* rows above and *all* columns to the left so that they will not move. Therefore, you should not freeze a block of rows and columns in the middle of the worksheet because you will not have much space to move the rest of your worksheet.



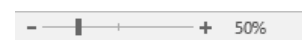
Changing the Zoom

Objective 1.4.2

The Zoom feature changes the display magnification of the worksheet on the screen. A higher magnification level is useful for looking at small objects close up or to highlight an area. A lower magnification level helps you to see the format and structure of the overall worksheet.

Several preset magnification levels are available using one of the following methods:

- on the View tab, in the Zoom group, click the appropriate zoom option, or
- on the Status bar, click Zoom Out or Zoom In, or drag the Zoom slider to the desired zoom percentage.



Alternatively, you can launch the Zoom dialog box (Figure 5-8), which enables you to select different magnification levels using one of the following methods:

- on the View tab, in the Zoom group, click Zoom, or

- on the Status bar, click Zoom Level.

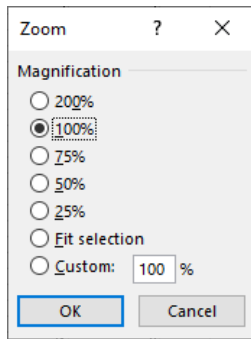


Figure 5-8: Zoom dialog box

To have Excel calculate the right zoom level, you can use the Fit selection option: select a range of cells and this option will magnify this group to fill the window. You can also select a range of cells and then, on the View tab, in the Zoom group, click Zoom to Selection.

You can also type a value in the Custom field if you want to use a different percentage than what is listed in the Zoom dialog box.

Learn to work with worksheet views

In this exercise, you will split panes, freeze panes, and work with the zoom settings.

1. Open the **Ski Resort Snowfall** workbook located in the *StarterFiles* folder and save it as: **My Ski Resort Snowfall** in the *MyProjects* folder.

Work with split panes.

2. Maximize the Excel application window if necessary, then select cell **D7**.
3. On the View tab, in the Window group, click **Split**.
4. Drag the horizontal split bar down so that it is in the middle of the screen.
5. Use the vertical scroll bar in the upper right pane to scroll down the worksheet.

Notice how the upper two panes in the window scroll down together.

6. Drag the horizontal scroll bar in the bottom left and bottom right panes to observe how the windows change.

Notice how the two panes in the window scroll left or right together.

7. Drag the scroll bars so that cell **H10** is visible in the middle of each of the four panes.
8. Select cell **H10** in any one of the panes.
9. Type: **9** to begin entering this value into cell H10.

The worksheet should appear as shown in the following example.

	G	H	I	F	G	H	I	J	K	L
4	13	11		13	13	11	13	8	5	1
5	13	12		13	13	12	13	13	10	11
6	11	6		2	11	6	3	13	2	8
7	3	1		2	3	1	4	9	7	5
8	3	14		12	3	14	10	9	8	15
9	2	10		2	2	10	6	2	2	1
10	15	9		6	15	9	0	11	8	9
11	8	10		7	8	10	6	8	7	13
12	3	4		7	3	4	7	14	8	12
13	6	1		15	6	1	12	14	6	12
14	1	10		1	1	10	2	13	12	6
5	13	12		13	13	12	13	13	10	11
6	11	6		2	11	6	3	13	2	8
7	3	1		2	3	1	4	9	7	5
8	3	14		12	3	14	10	9	8	15
9	2	10		2	2	10	6	2	2	1
10	15	9		6	15	9	0	11	8	9
11	8	10		7	8	10	6	8	7	13
12	3	4		7	3	4	7	14	8	12
13	6	1		15	6	1	12	14	6	12
14	1	10		1	1	10	2	13	12	6
15	3	3		7	3	3	8	4	9	12

10. Press **ENTER** to save the new value in cell H10.

11. On the View tab, in the Window group, click **Split** to remove the split bars.

Now try freezing panes.

12. Select cell **B2**.

13. On the View tab, in the Window group, click **Freeze Panes**, and then click **Freeze Panes**.

14. Scroll to the right in the worksheet so that columns **M** and **N** are displayed.

Note that the dates in column A remain in view.

15. Scroll down the worksheet.

Note that row 1 remains in place.

If you need to change the location of the titles, unfreeze the panes, relocate the cell marker and then freeze the panes again.

16. On the View tab, in the Window group, click **Freeze Panes** and then click **Unfreeze Panes**.

17. Select cell **D6**.

18. On the View tab, in the Window group, click **Freeze Panes** and then click **Freeze Panes**.

19. Scroll to the right in the worksheet so that columns **M** and **N** are displayed.

Notice that the top five rows and the three left-most columns remain locked while you scroll around the worksheet.

20. On the View tab, in the Window group, click **Freeze Panes** and then click **Unfreeze Panes**.

Now work with the zoom setting.

21. On the View tab, in the Zoom group, click **Zoom**.

22. In the Zoom dialog box, click **50%** and then click **OK**.

Reset the magnification level back to the default setting.

23. On the Status bar, click **Zoom level**, click **100%** and then click **OK**.

Hint: You can also quickly set the zoom to 100%. On the View tab, in the Zoom group, click 100%.

Choose a block of cells and zoom into that block.

24. Select cells **E17:G23**. On the View tab, in the Zoom group, click **Zoom to Selection**.

	E	F	G
17	3	3	7
18	3	3	5
19	1	13	7
20	6	13	11
21	14	13	1
22	4	13	5
23	12	2	1
24	13	2	1

25. On the View tab, in the Zoom group, click **100%**.

26. Save the workbook and keep it open for the next exercise.

Printing and Previewing the Workbook

To print your workbook, use one of the following methods:

- click File and then click Print, or
- press CTRL+P.

Excel will display the Print page in Backstage view (Figure 5-9).

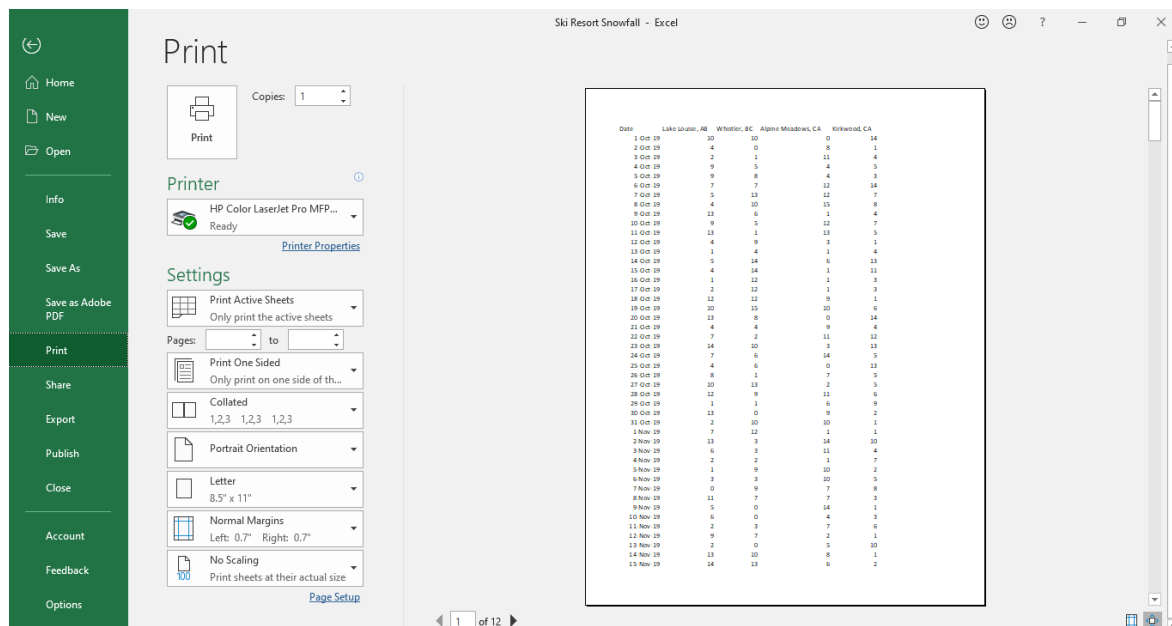


Figure 5-9: Print page in Backstage view

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

Excel takes advantage of a printer's ability to produce presentation quality work. Whether you are printing on an inkjet or laser printer, Excel uses the special fonts, borders and shading to their maximum potential. Excel takes the WYSIWYG (What You See Is What You Get) screen display and delivers it to the printer for a very professional presentation.

Note: You can customize the Quick Access Toolbar to display the Quick Print button. Clicking this button will print the worksheet immediately using the current page layout settings. You will learn about customizing the Quick Access Toolbar in a later lesson.

Prior to sending your worksheet to the printer, you should look at the preview area of the screen because the printer output will look almost exactly as it appears here. Previewing a worksheet before printing is cost-effective and environmentally sound because it can reduce the paper waste that often results from page layout mistakes.

Changing the Workbook Views

Objective 1.4.2

Excel allows you to select different ways of viewing your workbook on the screen. These options can be found on the View tab in the Workbook Views group. Coinciding buttons are also found on the status bar.

Normal – You will see this view by default. In this view (Figure 5-10), only the worksheet rows, columns, and headers appear. The page break lines only appear if you activate a print-related feature such as inserting page breaks or seeing a print preview of the workbook.

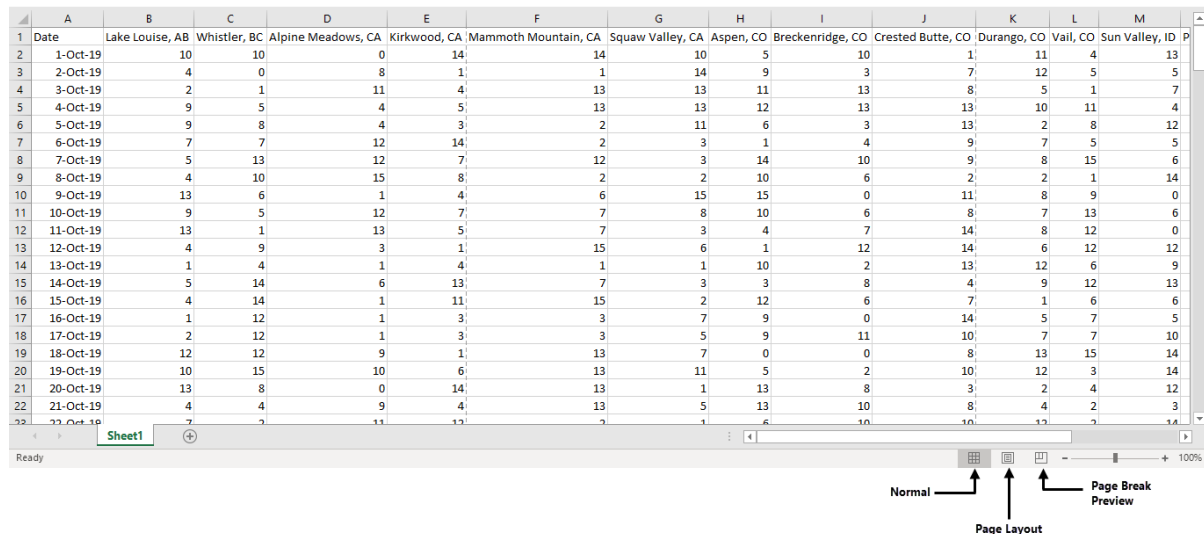


Figure 5-10: Normal view

Page Break Preview – Display watermarks on your worksheet to identify which rows and columns will appear on which pages, with the **page break** lines to mark the boundaries, as shown in Figure 5-11.

Figure 5-11: Page Break Preview view

Page Layout – Display the workbook as it will appear on the printer (Figure 5-12). For example, you can see which rows and columns will appear on which page, how wide the margins are, and the contents of the header and footer on each page. The vertical and horizontal rulers are also displayed to show the placement of all output on the page.

Note that this view is only a mockup without considering the capabilities of your printer. The print preview view (on the Print page in Backstage view) previews your worksheet on the screen more accurately because Excel can then identify what type of printer you are using.

Date	Lake Louise, AB	Whistler, BC	Alpine Meadows, CA	Kirkwood, CA
1-Oct-19	10	10	0	14
2-Oct-19	4	0	8	1
3-Oct-19	2	1	11	4
4-Oct-19	9	5	4	5
5-Oct-19	9	8	4	3
6-Oct-19	7	7	12	14
7-Oct-19	5	13	12	7
8-Oct-19	4	10	15	8
9-Oct-19	13	6	1	4
10-Oct-19	9	5	12	7
11-Oct-19	13	1	13	5
12-Oct-19	4	9	3	1
13-Oct-19	1	4	1	4
14-Oct-19	5	14	6	13
15-Oct-19	4	14	1	11

Figure 5-12: Page Layout view

Custom Views – This will allow you to save your current page layout settings with a name so that you can re-activate them later at any time.

Another window view option that does not appear in the Workbook Views group in the Ribbon is the full screen view. At the upper right of the Excel window, click the  (Ribbon Display Options) button, then click Auto-hide Ribbon to enable this view. This option maximizes the Excel window to the screen, and turns off the Ribbon, Quick Access Toolbar and Status Bar to give you more space to view the worksheet data.

To return to normal Ribbon view, click the Ribbon Display Options button, then click Show Tabs and Commands.

These different views are very useful to help you format your workbook prior to printing.

Learn to preview a workbook

In this exercise, you will preview a workbook prior to printing.

1. Ensure the My Ski Resort Snowfall workbook is open.
2. Click **File** and then click **Print**.
3. Click the **Zoom to Page** toggle switch at the bottom right corner of the print preview section to zoom in closer to the page.
4. Click the **Zoom to Page** toggle switch again to zoom back out to view the whole page again.
5. Click the **Next Page** and **Previous Page** buttons at the bottom of the print preview section to scroll through the different pages of the workbook.



6. Click the **Back** button, then on the View tab, in the Workbook Views group, click **Page Layout**.
7. Use the horizontal and vertical scroll bars to scroll up and down, and to the left and right, to view different parts of the worksheet.
8. On the View tab, in the Workbook Views group, click **Page Break Preview**.
9. On the View tab, in the Workbook Views group, click **Normal**.
10. Save the workbook and keep it open for the next exercise.

Customizing the Page Layout

Objective 1.5.3

By default, Excel creates every new workbook with the same print settings:

- The top and bottom margins are set to 0.75", and the left and right margins to 0.7".
- The orientation is portrait (vertical) rather than landscape (horizontal).
- The paper size is set to letter or A4, depending on the regional setting.
- The scaling is set to 100% (no zoom).
- There is no header or footer.
- There are no gridlines, or row and column headings.
- If the worksheet prints on more than one page, the page order sequence is set to top-down, and then left-to-right.

If you find the page order sequence confusing at first, visualize it as dividing the worksheet into vertical strips. Excel prints down each consecutive strip, starting from the left-most strip, and then starts at the top of the next strip, and the next, until the entire worksheet is printed. A nine-page worksheet, therefore, prints in the sequence indicated in Figure 5-13.



Figure 5-13: Excel page order sequence for printing a multiple-page worksheet

Before printing your worksheet, you will likely want to customize the page layout options to make it more presentable.

Setting Page Breaks

It is common to have worksheets that are too large to fit on a single sheet of paper. In those situations, Excel automatically inserts page breaks where one or more rows or columns do not fit within the printable area of the page. In many cases, these page breaks do not coincide with the natural grouping of the data. You can overcome this by manually inserting page breaks where you want them in the worksheet.

Note: You can also try other techniques to fit more data onto a single page, such as reducing the page margins or reducing the print scale.

To manually insert a page break, select the cell from which you want to start the next page, both across and down. On the Page Layout tab, in the Page Setup group, click the drop-down menu for Breaks and click Insert Page Break. The page break will appear in the top left corner of the active cell both vertically and horizontally. This is important to understand because the page break applies to both the current row and the current column. Not only does Excel force the current row to the next page, it also forces all data in the current column and to its right to the next strip of the printed pages. When you need to remove a manually inserted page break, you must do so in the cell into which you inserted it. Figure 5-14 shows a worksheet in which a manual page break has been inserted in cell D23.

	A	B	C	D	E
22	21-Oct-19	4	4	9	4
23	22-Oct-19	7	2	11	12
24	23-Oct-19	14	10	3	13
25	24-Oct-19	7	6	14	5

Figure 5-14: Worksheet with manual page break

In the Normal view, this manual page break is barely visible with the slightly thicker and darker gray lines marking it. Therefore, finding these cells to remove the manual page break will be somewhat difficult using the Normal view. However, the Page Break Preview view will clearly mark the location of all page breaks.

The positioning of page breaks is often a trial-and-error process. The Page Break Preview layout is an excellent tool that greatly simplifies this task. The default page breaks appear as dotted lines in the Page Break Preview view, whereas manually inserted page breaks appear as solid lines. In this mode, you can drag the page breaks to a new position. If necessary, Excel will automatically scale the print output to fit the information within the page breaks you have set.

Note: If you select the *Fit to* option, Excel ignores all manual page breaks when you print the worksheet.

Learn to adjust page breaks

In this exercise, you will insert and adjust page breaks.

1. Ensure the My Ski Resort Snowfall workbook is open.
2. Select cell **D23**.
3. On the Page Layout tab, in the Page Setup group, click **Breaks** and then click **Insert Page Break**.

Notice that the page break lines now appear in the worksheet to indicate where the page breaks are. However, in this view it is difficult to distinguish between a manual page break and an automatic one.

4. Click **File**, and then click **Print**.
5. Click **Next Page** and **Previous Page** to view the different pages of the worksheet.

Notice that the first page has only three short columns of data with a lot of empty space in the lower area of the page and to the right. This is the result of inserting a page break too high and too far to the left by selecting cell D23. It is in the wrong location, so remove this manual page break.

Date	Lake Louise, AB	Wheatley, BC
1 Oct 19	10	10
2 Oct 19	4	0
3 Oct 19	2	1
4 Oct 19	9	5
5 Oct 19	9	8
6 Oct 19	7	7
7 Oct 19	5	13
8 Oct 19	4	10
9 Oct 19	13	6
10 Oct 19	9	5
11 Oct 19	13	1
12 Oct 19	4	9
13 Oct 19	1	4
14 Oct 19	5	14
15 Oct 19	4	14
16 Oct 19	1	12
17 Oct 19	2	12
18 Oct 19	12	12
19 Oct 19	10	15
20 Oct 19	13	8
21 Oct 19	4	4

6. Click the **Back** button to return to the worksheet.
7. With cell **D23** selected, on the Page Layout tab, in the Page Setup group, click **Breaks** and then click **Remove Page Break**.
8. On the View tab, in the Workbook Views group, click **Page Break Preview**.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
16	15-Oct-19	4	14	1	11	15	2	12	6	7	1	6	6	1	4	1	
17	16-Oct-19	1	12	1	3	3	7	9	0	14	5	7	6	3	13	1	
18	17-Oct-19	2	12	1	3	3	5	9	11	10	7	7	10	3	2	12	
19	18-Oct-19	12	12	9	1	13	7	0	0	8	13	15	14	10	11	7	
20	19-Oct-19	10	15	10	6	13	11	5	2	10	12	3	14	14	9	10	
21	20-Oct-19	13	8	0	14	13	1	13	8	3	2	4	12	7	9	7	
22	21-Oct-19	4	4	9	4	13	5	13	10	8	4	2	3	10	4	14	
23	22-Oct-19	2	11	12	1	2	1	6	10	10	12	2	14	0	1	4	
24	23-Oct-19	10	3	13	2	10	2	2	10	10	14	13	9	3	10	7	
25	24-Oct-19	7	6	14	5	5	0	4	9	8	10	8	4	9	11	1	
26	25-Oct-19	4	6	0	13	1	14	4	12	10	12	1	14	0	5	12	
27	26-Oct-19	8	1	7	5	5	8	4	8	15	15	8	6	11	12	7	
28	27-Oct-19	10	13	2	5	7	1	9	2	13	10	2	1	5	1	6	
29	28-Oct-19	12	9	11	6	3	2	1	14	1	0	5	1	14	3	14	
30	29-Oct-19	1	1	6	9	9	2	9	7	10	13	7	7	3	14	11	
31	30-Oct-19	13	0	9	2	9	5	14	10	13	12	5	5	7	13	11	
32	31-Oct-19	2	10	10	1	11	1	0	8	10	13	4	11	14	14	11	
33	1-Nov-19	7	12	1	1	7	10	8	7	9	5	3	1	2	10	1	
34	2-Nov-19	13	3	14	10	6	0	1	11	11	2	7	9	6	2	13	
35	3-Nov-19	6	3	11	4	4	10	11	5	6	6	13	6	9	4	13	
36	4-Nov-19	2	2	1	7	4	7	10	12	11	3	5	6	11	13	5	
37	5-Nov-19	1	9	10	2	3	8	13	13	14	3	11	11	13	8	13	
38	6-Nov-19	3	3	10	5	13	2	6	4	4	1	8	9	1	13	9	
39	7-Nov-19	0	9	7	8	7	14	10	14	2	10	12	10	13	2	13	
40	8-Nov-19	11	7	7	3	8	10	12	1	10	12	11	5	1	2	11	
41	9-Nov-19	5	0	14	1	1	9	0	1	13	5	7	14	14	9	12	
42	10-Nov-19	6	0	4	3	3	9	8	4	3	11	8	13	8	2	5	
43	11-Nov-19	2	3	7	6	1	13	12	10	6	8	12	4	11	9	6	
44	12-Nov-19	9	7	2	1	11	9	8	12	1	9	1	11	15	5	9	
45	13-Nov-19	2	0	5	10	1	9	15	11	5	7	5	1	6	2	10	
46	14-Nov-19	13	10	8	1	5	3	2	1	10	15	5	9	5	9	15	
47	15-Nov-19	14	13	6	2	4	8	9	3	8	14	10	6	13	4	12	
48	16-Nov-19	9	10	4	3	7	13	5	13	2	8	13	13	7	1	6	
49	17-Nov-19	10	12	1	9	8	10	3	7	15	10	14	15	4	1	0	
50	18-Nov-19	3	8	8	13	6	9	4	13	13	14	4	2	12	8	10	
51	19-Nov-19	7	6	10	10	12	5	1	2	3	10	12	9	4	11	13	

In this view, Excel displays the page numbers as a watermark on each section of data to identify which rows and columns it will print on each page. All the page break lines are dotted, which indicates that none of them are set manually.

9. Position the mouse pointer over the page break line between pages 1 and 5 until a double-headed arrow ↔ appears.
10. Click the mouse button and drag the page break to the left by one column.

You have now set a manual page break to the left side of column E. Notice that the page break between pages 1 and 5 is now a solid line instead of a dotted line – this indicates that this is a manual page break.

Also notice that the automatic page break between pages 5 and 9 (and the pages below them) has moved from the left side of column K to the left side of column J because of your manual page break.

11. Drag the page break line at the left side of column J to the left by two columns.
12. Drag the horizontal page break line at the top of row 48 up to the top of row 33.
13. Select any cell on the right side of the page break on page 11 (any cell in the range H1:H32).
14. On the Page Layout tab, in the Page Setup group, click **Breaks** and then click **Remove Page Break**.
15. On the Page Layout tab, in the Page Setup group, click **Breaks** and then click **Reset All Page Breaks**.
16. Drag the vertical page break line at the left side of column F to the left side of column H.
17. Drag the vertical page break line at the left side of column P to the right by one column (the end of the data).
18. Drag the horizontal page break line (which likely falls somewhere between row 60 and row 65) from its current position to the top of row 63.

The worksheet should look similar to the following:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
22	21-Oct-19	4	4	9	4		13	5	13	10	8	4	2	3	10	4	14
23	22-Oct-19	7	2	11	12		2	1	6	10	10	12	2	14	0	1	4
24	23-Oct-19	14	10	3	13		2	14	2	10	10	14	13	15	3	10	7
25	24-Oct-19	7	6	14	5		5	0	4	9	8	10	8	4	9	11	1
26	25-Oct-19	4	6	0	13		1	14	4	12	10	12	1	14	0	5	12
27	26-Oct-19	8	1	7	5		5	8	4	8	15	15	8	6	11	12	7
28	27-Oct-19	10	13	2	5		7	9	5	13	10	2	1	5	1	6	6
29	28-Oct-19	12	9	11	6		3	2	1	14	1	0	5	1	14	3	14
30	29-Oct-19	1	6	9			9	2	9	7	10	13	7	7	3	14	11
31	30-Oct-19	13	0	9	2		9	5	14	10	13	12	9	5	7	13	11
32	31-Oct-19	2	16	8	1		11	1	0	8	10	13	12	11	14	14	11
33	1-Nov-19	7	12	1			7	10	8	7	9	3	1	2	10	1	1
34	2-Nov-19	13	3	14	10		6	0	1	11	11	2	7	9	6	2	13
35	3-Nov-19	6	3	11	4		4	10	11	5	6	6	13	6	8	4	13
36	4-Nov-19	2	2	1	7		4	7	10	12	11	3	5	6	11	13	5
37	5-Nov-19	1	9	10	2		3	8	13	13	14	3	11	11	13	8	13
38	6-Nov-19	3	3	10	5		13	2	6	4	4	1	8	9	1	13	9
39	7-Nov-19	0	9	7	8		7	14	10	14	2	10	12	10	13	2	13
40	8-Nov-19	11	7	7	3		8	10	12	1	10	12	11	5	1	2	11
41	9-Nov-19	5	0	14	1		1	9	0	1	13	5	7	14	14	9	12
42	10-Nov-19	6	0	4	3		3	9	8	4	9	11	8	13	8	2	5
43	11-Nov-19	2	3	7	6		1	13	12	10	6	8	12	4	11	9	6
44	12-Nov-19	9	7	2	1		11	9	3	12	10	1	11	15	5	9	9
45	13-Nov-19	2	0	5	10		12	5	16	11	5	7	5	1	6	2	10
46	14-Nov-19	13	10	8	1		5	3	2	1	10	15	5	9	5	9	15
47	15-Nov-19	14	13	6	2		4	8	9	3	8	14	10	6	13	4	12
48	16-Nov-19	9	10	4	3		7	13	5	13	2	8	13	13	7	1	5
49	17-Nov-19	10	12	1	9		8	10	3	7	15	10	14	15	4	1	10
50	18-Nov-19	3	8	8	13		6	9	4	13	13	14	4	2	12	8	10
51	19-Nov-19	7	6	10	10		12	5	1	2	3	10	12	9	4	11	13
52	20-Nov-19	6	7	12	14		1	4	9	10	3	6	2	9	2	14	11
53	21-Nov-19	3	4	13	7		3	13	5	9	4	5	10	9	3	12	12
54	22-Nov-19	12	15	3	3		14	10	1	13	7	8	2	10	4	6	5
55	23-Nov-19	14	10	14	9		2	2	5	12	9	9	10	10	4	3	14
56	24-Nov-19	1	2	9	13		5	1	0	15	14	9	2	14	0	9	12
57	25-Nov-19	6	0	1	1		6	0	14	5	1	9	3	7	10	10	4
58	26-Nov-19	3	5	12	13		6	6	4	12	11	1	3	2	2	4	2
59	27-Nov-19	14	12	5	10		13	7	10	2	5	15	14	11	9	9	6
60	28-Nov-19	1	6	6	14		1	6	5	7	0	5	3	10	9	10	12
61	29-Nov-19	8	12	7	6		9	7	13	10	10	12	9	6	15	9	6
62	30-Nov-19	13	14	11	4		5	3	13	8	12	6	13	15	6	6	10
63	1-Dec-19	0	1	6	9		4	11	4	2	11	5	6	5	4	2	2
64	2-Dec-19	0	7	3	9		5	3	9	10	2	4	10	0	9	0	7
65	3-Dec-19	6	4	15	7		6	5	4	6	6	12	9	11	7	9	13
66	4-Dec-19	0	10	4	10		14	12	2	2	9	7	15	4	15	5	12
67	5-Dec-19	10	1	3	3		4	7	8	6	6	0	6	3	8	0	13

19. On the **Page Layout** tab, look at the **Scale** setting in the **Scale to Fit** group.

Excel has automatically adjusted it down from 100% to about 75% to fit all the data on each page.

20. Click **File** and then click **Print**.

21. Click the **Next Page** and **Previous Page** buttons to view each of the pages.

22. Click the **Back** button, then on the **View** tab, in the **Workbook Views** group, click **Normal**.

23. Save the workbook and keep it open for the next exercise.

Adjusting Page Layout Options

Objective 1.3.1, 1.5.1, 1.5.3

Page layout settings affect the overall appearance of the printed page. These options include settings for margins, scaling, page size, orientation and so on. The page settings for printed worksheets can be accessed in the following locations:

- The **Page Layout** tab in the Ribbon
- The **Page Setup** dialog box
- The **Print** page in the **Backstage** view

The **Page Layout** tab includes several settings that you can modify, including (but not limited to) the commands in the **Page Setup**, **Scale to Fit**, and **Sheet Options** groups, shown in Figure 5-15.

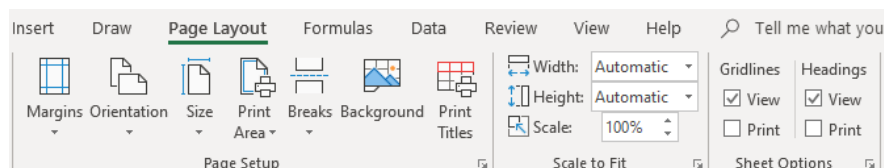


Figure 5-15: Page formatting commands on the **Page Layout** tab

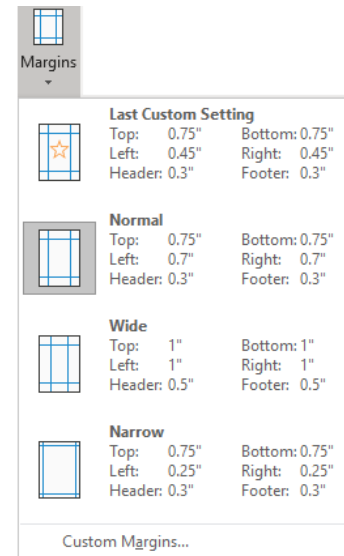
Adjusting the Page Setup

The Page Setup group includes the following options:

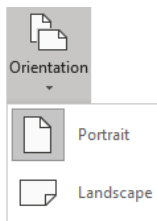
Margins – The Top, Bottom, Left, and Right settings are the amount of white space (measured in inches) from the edge of the page. Many printers require a minimum page **margin** because they are not able to print to the edges of the paper. Additionally, reports are not visually appealing when data appears up to the edges of the paper. You also need to allow space on the left or right margin if you are going to insert the pages into a notebook or ring binder. A wider margin is needed where the paper is held in place by the binding mechanism.

The Header margin sets the distance between the Header and the top edge of the page, and the Footer margin between the Footer and the bottom edge of the page to allow space for the page header and footer to appear.

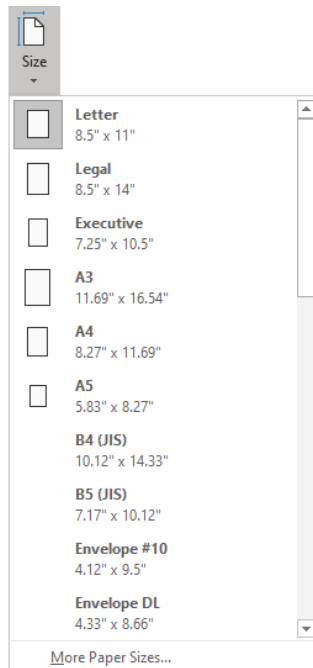
If you select Custom Margins, the Page Setup dialog box is displayed to show all Margin options available.



Orientation – The page orientation options are Portrait (vertical) or Landscape (horizontal).



Size – This option lets you specify what size of paper to use for printing. You must choose options that are within the print capabilities of your printer, and you must remember to load the appropriate paper or select the correct tray from which to print.



If you select More Paper Sizes, the Page Setup dialog box is displayed showing the various page options.

Print Area – After selecting a group of cells, click Print Area, then click Set Print Area to specify to print only the range defined as the print area. To clear the print area, click Print Area, then click Clear Print Area.

Breaks – Excel automatically inserts page breaks. To manually insert page breaks instead, click the Breaks button.

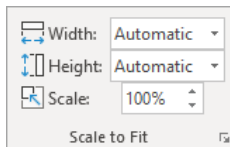
Background – Click this button to insert a picture as a background for the worksheet. Set a background picture with caution – you do not want to obscure the content of the cells.

Print Titles – Print titles are rows and/or columns that appear at the top/left of every page of printed output. Click this button to open the Page Setup dialog box with the Sheet tab displayed.

Understanding the Scale to Fit and Sheet Options

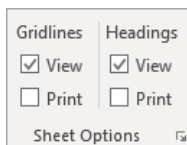
The Scale to Fit group includes the following options:

Width, Height, Scale – You can use the Width and Height options to calculate the correct scale value to fit the worksheet into the specified number of pages vertically and horizontally. For example, you can scale down a worksheet that requires nine pages to fit into a width of two pages and a height of three pages so that it will print on six pages. The Scale option enables you to magnify or shrink the size of the worksheet proportionally on the page. The Zoom feature only affects the display of the workbook on the screen. Scale is the equivalent for printing.



The Sheet Options group includes these options:

Gridlines, Headings – The Gridlines option causes lines to display around each cell. By default, they are turned on for the screen (View) and turned off for printing.



Similarly, the Headings option is turned on by default on the screen and turned off for printing. This option identifies columns to be labeled as A, B, C, and so on, and rows to be labeled as 1, 2, 3, and so on.

Using the Page Setup Dialog Box

The Page Setup dialog box has been the traditional way of formatting worksheet pages since the very first version of Excel. Therefore, long-time Excel users are accustomed to using this method to format their worksheets before printing them.

On the other hand, the Page Layout tab described above is a relatively new feature that allows you to access most of the formatting features from the Ribbon. If you need a page formatting option that is not available in the Ribbon, you will need to access it in the Page Setup dialog box.

The dialog box launchers in the Page Setup, Scale to Fit, and Sheet Options groups on the Page Layout tab all open the Page Setup dialog box. In the first two instances, the dialog box opens with the Page tab selected; in the third instance, the dialog box opens with the Sheet tab selected.

The Page tab of the Page Setup dialog box is shown in Figure 5-16.

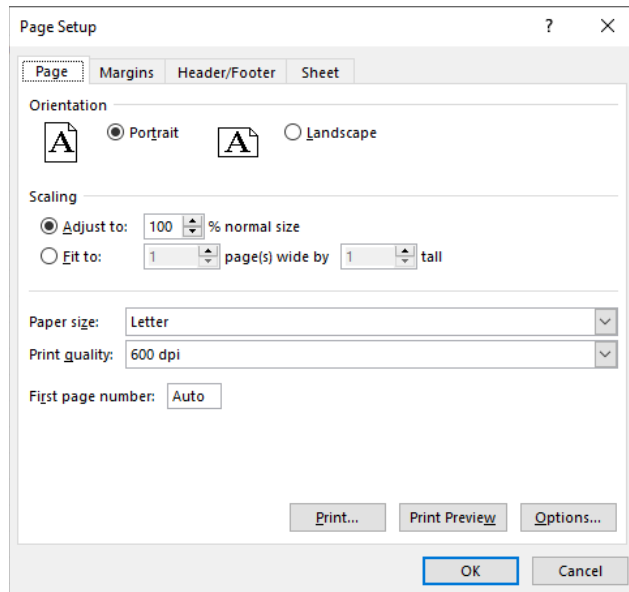


Figure 5-16: Page Setup dialog box – Page tab

Many items on the Page tab of the Page Setup dialog box are also represented on the Ribbon; however, some are accessible only through the dialog box.

Scaling – The *Adjust to* option in the dialog box is labeled as *Scale* on the Ribbon. You can specify a percentage to magnify or shrink the size of the worksheet proportionally. The *Fit to* option in the dialog box is labeled as *Width and Height* on the Ribbon. These settings force the automatic scaling feature to “fit” the worksheet into the specified number of pages.

Print quality – This option determines the density of the print characters.

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.

The Margins tab in the Page Setup dialog box is shown in Figure 5-17.

The Margins tab can be used to specify the following options or print parameters:

- The amount of white space (measured in inches or centimeters, depending on your region) to leave on each side of the page
- The distance between the Header and the top edge of the page, and between the Footer and the bottom edge of the page, if they are present
- Whether to center the worksheet on the page horizontally or vertically, or both

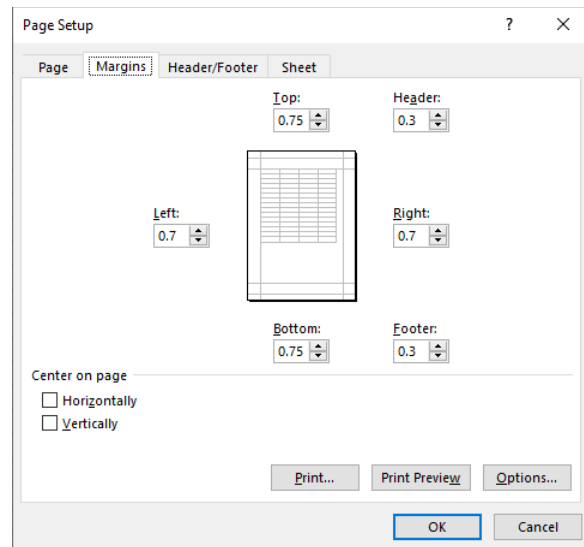


Figure 5-17: Page Setup dialog box – Margins tab

Note: The Header/Footer tab of the Page Setup dialog box will be discussed later in this lesson.

The Sheet tab of the Page Setup dialog box is shown in Figure 5-18.

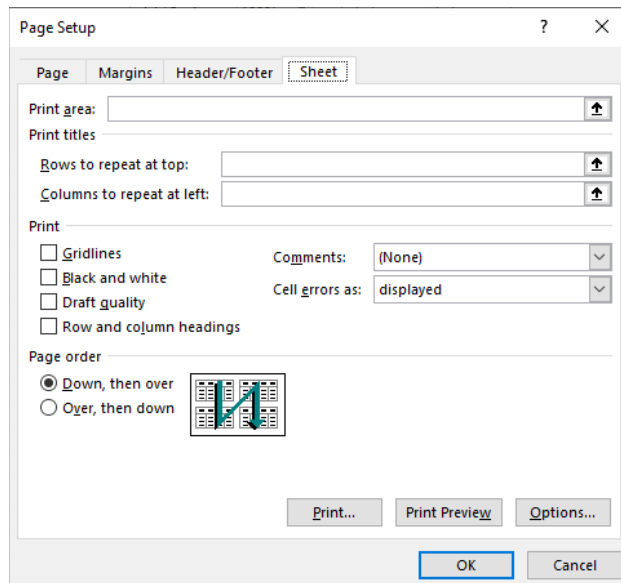


Figure 5-18: Page Setup dialog box – Sheet tab

This tab includes the following features.

Print area – Use this field to specify a range of cells as the print area.

Print titles – Use these fields to specify rows or columns (or both) to print on every page of the printed output. Typically, these rows and columns contain the text labels that identify the purpose of the data in those rows or columns.

Print – Select options in this section if you want them to appear on the printed pages.

Page order – By default, Excel prints down the rows, and then across the columns (Down, then over). However, you can specify to print across the columns and then down the rows (Over, then down).

Formatting Using Backstage

The Print page in Backstage (Figure 5-19) also contains options for the most commonly used settings. These options include Print Area, Orientation, Page Size, Margins, and Scaling. The Print Area drop-down menu includes Print Active Sheets, Print Entire Workbook, Print Selection, and Ignore (previously set) Print Area.

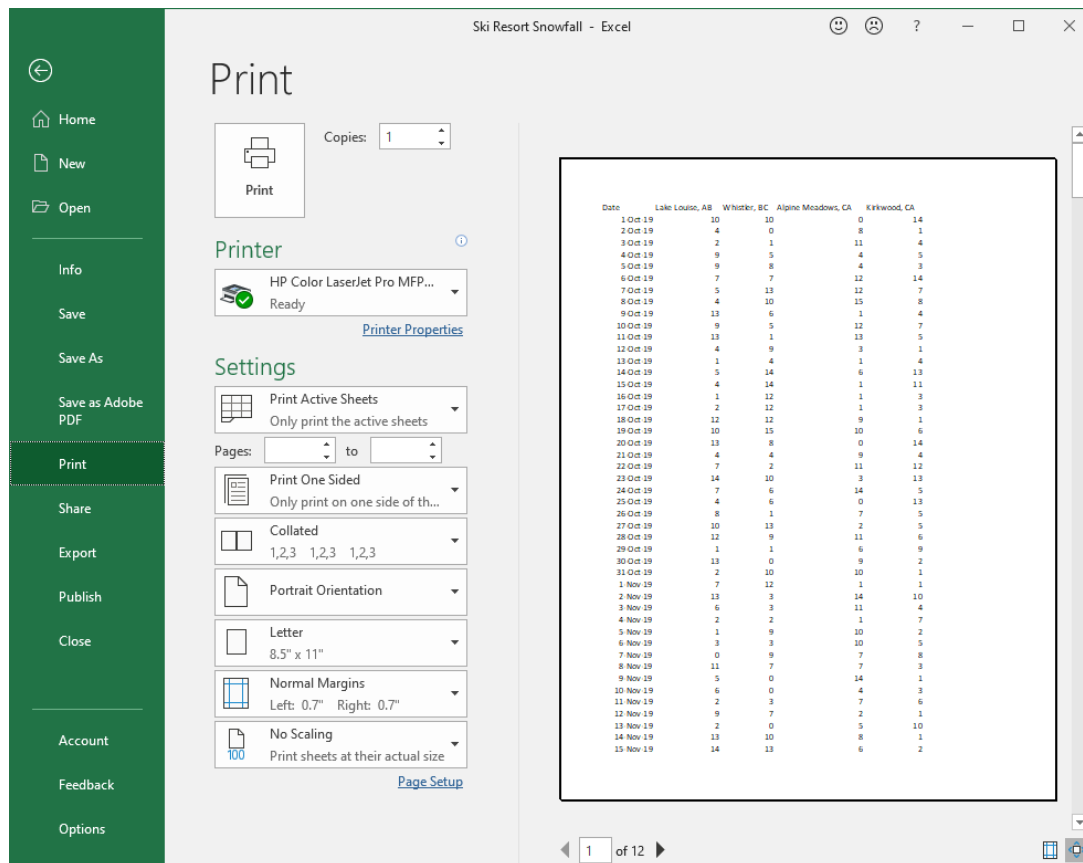


Figure 5-19: Print Page in Backstage

The Print page displays a page of your worksheet in Print Preview mode. As you change your page formatting settings, the print preview adjusts to show those changes immediately.

You can also open the Page Setup dialog box directly from this page. Click the Page Setup hyperlink to access any page formatting setting that is not available in this page.

Learn to modify the page layout

In this exercise, you will change page setup settings and observe the effect.

1. Ensure the My Ski Resort Snowfall workbook is open.
2. On the Page Layout tab, in the Page Setup group, click **Orientation** and click **Landscape**.
3. On the Page Layout tab, in the Page Setup group, click **Size** and click **Legal** (or A4 Long or A4 Plus, if this is the page size for your region).

Note: For some types of printers, Excel may display only paper sizes 8.5" x 11" (21.5 cm x 28 cm) or the paper size name, Letter or Legal.

4. Click **File** and click **Print**.

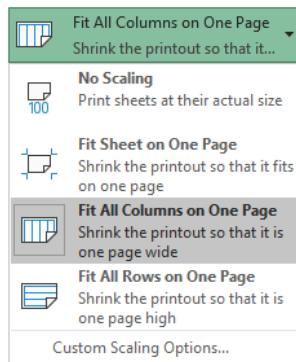
- Click the **Next Page** and **Previous Page** buttons to view each of the pages.

Note that the worksheet now appears sideways and the page is wider at 14 inches (35.5cm), legal size paper. More columns now fit onto each page, but some columns still need to overflow to additional pages. Make note of the total number of pages.

- Click the **Back** button, then on the Page Layout tab, in the Scale to Fit group, click the **Width** arrow and click **1 page**.
- Click **File** and click **Print**.
- Click the **Next Page** and **Previous Page** buttons to view each of the pages.

Excel has automatically scaled the data down to fit all columns onto one page. Again, make note of the number of pages and compare against the number of pages before scaling.

- In the Settings section, click **Fit All Columns on One Page** to open the drop-down list and view the options.



- Click in a blank area of the Excel window to close the list.
- Click **Landscape Orientation** and then click **Portrait Orientation**.

The entire worksheet now fits onto two pages but the size of the text is very small. You can enter your own scale value to find a better compromise.

- Click **Fit All Columns on One Page** and then click **Custom Scaling Options**.

The Page Setup dialog box appears with the Page tab selected.

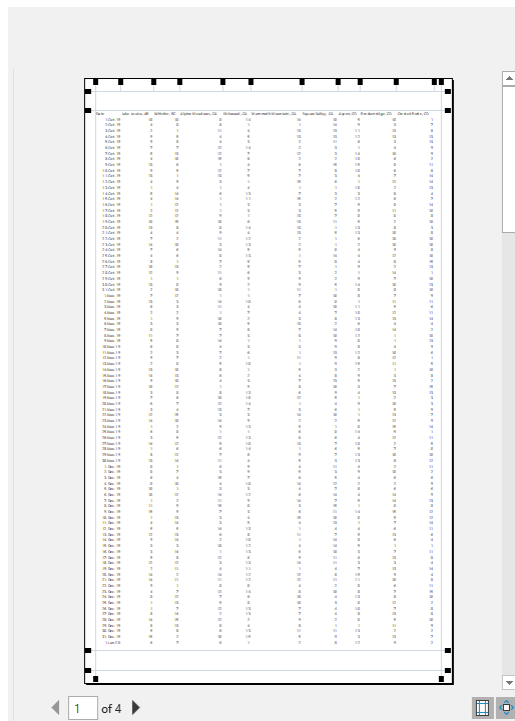
- On the Page tab, click **Adjust to** and replace the number in the field with: **65**. Click **OK**.

Hint: You can also set the *Adjust to* value by entering it into the Scale field, on the Page Layout tab, in the Scale to Fit group.

- Click the **Zoom to Page** button in the lower right corner of the window to zoom in closer.
- Click **Zoom to Page** to zoom out again.
- Click the **Show Margins** button in the lower right corner of the window to display the margin markers in the preview.

The margin markers are useful to show the amount of white space reserved as the page margins. Excel has three predefined margins and the ability to specify your own custom margins.

- Click **Normal Margins** and then click **Narrow**.



Now revert to the default page settings – scale at 100%, letter page size, and normal margins.

18. Click **Show Margins** again to remove the margin markers in the preview.
 19. Click **Custom Scaling** and then click **No Scaling**.
 20. Click **Legal** then click **Letter** (or A4 if that is your standard paper size).
 21. Click **Narrow Margins** then click **Normal**.
 22. Click the **Back** button, then on the Page Layout tab, in the Sheet Options group, click the **Print** check box under *Headings* to turn it on.
 23. Click **File** and click **Print**.
- The column and row headings display in the Print Preview area.
24. Click the **Back** button, then on the Page Layout tab, in the Sheet Options group, click deselect the **Print** check box under *Headings* to turn it off.
 25. Save the workbook and keep it open for the next exercise.

Adding a Header or Footer

Objective 1.3.3

A **header** is the text you want to appear at the top of every printed page. A **footer** is the text you want to appear at the bottom of every printed page of a worksheet. If you do not insert text into the header and footer, they remain blank.

Every printed worksheet should have a header and footer to help readers identify the data presented on the pages. As a minimum, you should add a header and footer to your worksheet displaying the current page number, print date and workbook name, whether the worksheet requires one or more pages to print. Whenever possible, you should enter a descriptive heading label instead of using the workbook name. Workbook names sometimes do not describe the data contents. To illustrate this point, ask yourself if you have created workbooks named as data.xlsx or Book1.xlsx. By entering a heading label such as Daily Snowfall Readings, your printed pages will be more meaningful and appear more professional.

Any header or footer that you set up will apply only to the active worksheet. Therefore, if two or more worksheets in a workbook have data that you need to print, you must set up the header and footer for each of the worksheets even if they all contain the same information.

You can create or modify a worksheet header or footer using either the Page Setup dialog box or the Ribbon. To use the Page Setup dialog box, click the dialog box launcher in the Page Setup group on the Page Layout tab, then click the Header/Footer tab (Figure 5-20).

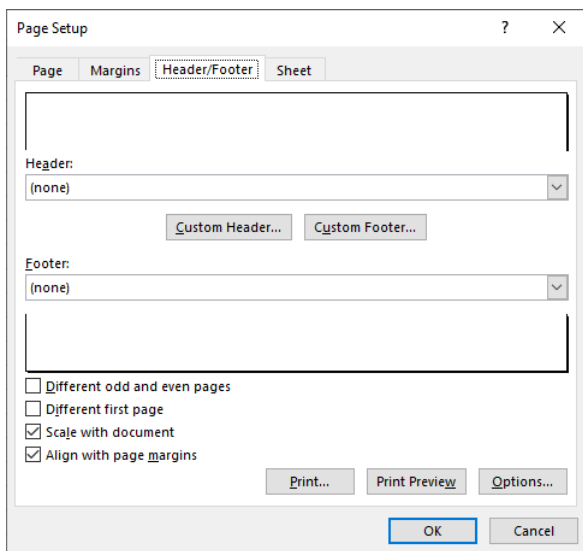


Figure 5-20: Page Setup dialog box – Header/Footer tab

The Header and Footer drop-down menus within the dialog box display presets for headers and footers and include items such as the page number, sheet name, workbook name, and so on. When you select one of these options, it appears in the appropriate section of the dialog box. Use the check boxes in the dialog box to apply additional options:

Different odd and even pages – If headers/footers should be different on odd pages versus even pages, select this option.

Different first page – To leave the header/footer off the first page, select this option.

Scale with document – By default, this box is selected and formats headers and footers with the same font size and scaling as the rest of the worksheet. If different font size and scaling is desired for headers and footers, this should be deselected.

Align with page margins – To align the headers and footers with the left and right page margins, select this option.

For more options, in the Page Setup dialog box, click Custom Header to open the Header dialog box, shown in Figure 5-21; or click Custom Footer to open the Footer dialog box. Use these dialog boxes to create your own header or footer for the worksheet. The header or footer consists of three sections: left, center, and right. By default, the text in the left section is left justified, the center section is centered, and the right section is right justified.

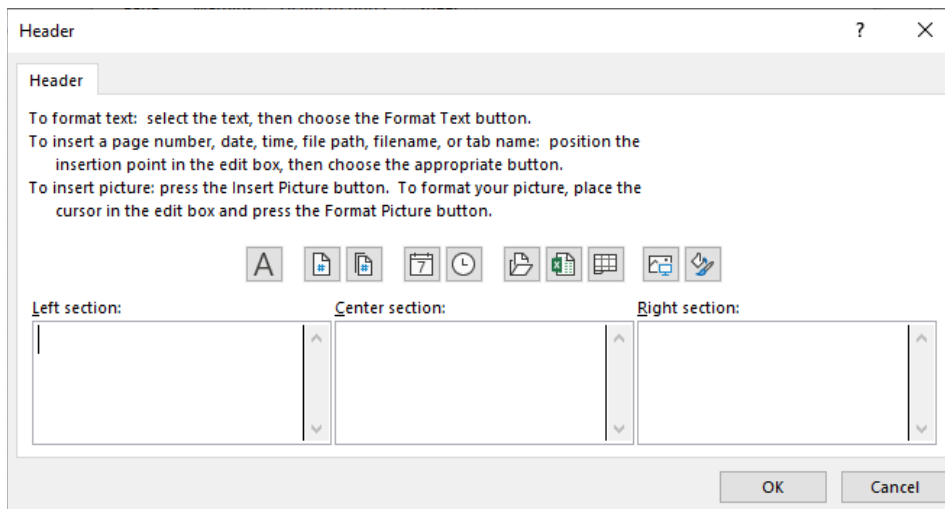


Figure 5-21: Header dialog box

The middle section contains command buttons that can be used to format or insert commonly used variables into the header or footer:

Format Text – Provides tools for formatting header or footer text.

Page Number – Click this button to display the code `&[Page]` in the selected section of the header or footer. The page number will start at 1 by default. You can change this in the Page Setup dialog box as described previously.

Number of Pages – Click this button to display the code `&[Pages]`. This calculates the total number of pages in the selected worksheet(s) to be printed. This is often used with the Page number code to show each page number as one among the total of all the pages (for example, Page 1 of 4).

Current Date – Insert the current date (from the computer) into the report, displayed as the code `&[Date]`.

Current Time – Insert the current time (from the computer) into the report, displayed as the code `&[Time]`.

File Path – Insert the current path (drive and folder location) and file name into the header or footer, displayed as the code `&[Path]&[File]`.

File Name – Insert the name of the file into the header or footer, displayed as the code `&[File]`.

Sheet Name – Insert the name of the tab for the current worksheet, displayed as the code `&[Tab]`.

Picture – Insert a picture into the header or footer, displayed as the code `&[Picture]`.

Format Picture – Provides options to change the properties for the picture.

You can also add or modify a worksheet header or footer using the Ribbon by switching to Page Layout view. To access Page Layout view, use one of the following methods:

- on the Insert tab, in the Text group, click Header & Footer, or
- on the View tab, in the Workbook Views group, click Page Layout.

When you are in Page Layout view, you can then click in the header or footer section of the worksheet and enter your changes directly.

Figure 5-22 shows the Header section in Page Layout view. Figure 5-23 shows the Footer section.

Date	Lake Louise, AB	Whistler, BC	Alpine Meadows, CA	Kirkwood, CA
1-Oct-19	10	10	0	14
2-Oct-19	4	0	8	1
3-Oct-19	2	1	11	4

Figure 5-22: Header section in Page Layout view

12-Nov-19	9	7	2	1
13-Nov-19	2	0	5	10
14-Nov-19	13	10	8	1

Figure 5-23: Footer section in Page Layout view

When you click in any of the header or footer sections (left, center, or right) while in the Page Layout view, the Ribbon displays the Header & Footer Tools Design tab, shown in Figure 5-24.

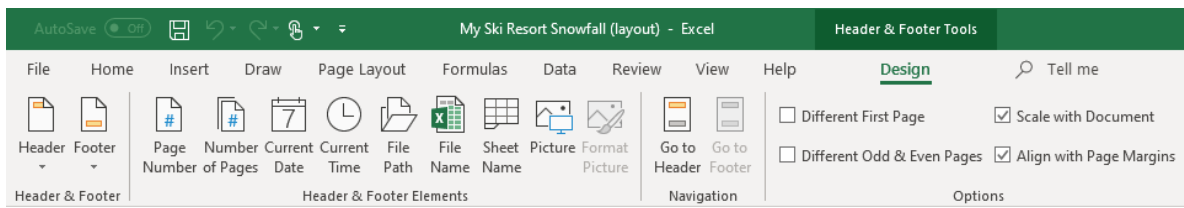
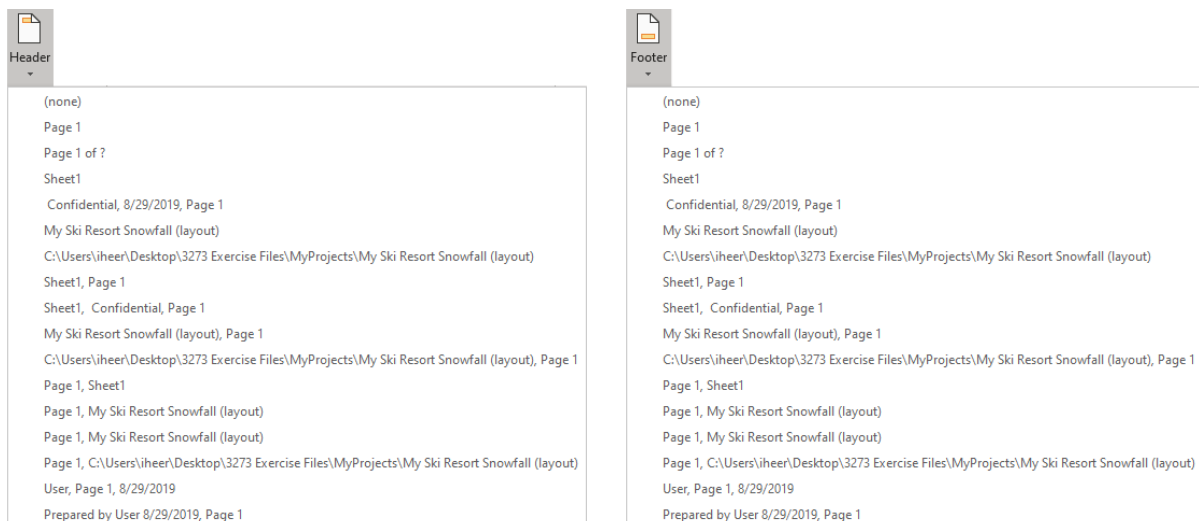


Figure 5-24: Header & Footer Tools Design tab

The Header & Footer group on this contextual tab has several predefined standard header or footer options to choose from:



Learn to add headers and footers

In this exercise, you will create headers and footers.

1. Ensure the My Ski Resort Snowfall workbook is open and save it as: **My Ski Resort Snowfall (header)** in the *MyProjects* folder.
2. Click **File** and click **Print**.
3. Click the **Next Page** and **Previous Page** buttons to view each of the pages.

Each of the pages has a lot of data on it but there are no page numbers to indicate in what sequence they are printed.

If you inadvertently mix up your pages (such as accidentally dropping your report on the floor), you will have a hard time reassembling them in the correct sequence. You can insert a header or footer containing the page number to prevent this from happening.

4. Click the **Back** button, then on the Insert tab, in the Text group, click **Header & Footer**.

Excel automatically displays the Page Layout view with the cell pointer in the middle section of the header.

5. On the Header & Footer Tools Design tab, in the Header & Footer group, click **Header** and then click the preformatted header that appears as My Ski Resort Snowfall (header).

By selecting this predefined header, the header is now closed and the cell pointer is back in the active cell of the worksheet.

It may take up to a minute before the text "My Ski Resort Snowfall (header)" appears in the header.

6. Move the cursor over the middle section of the header and then click in the middle section of the header again.

The header shows a code: `&[File]` instead of the file name. When you print the workbook, the code is automatically translated to show the workbook file name. By using a code instead of the text label ("My Ski Resort Snowfall (header)" in this case), the header will always show the correct file name even if you save the workbook with a different name.

Header					
		&[File]			
Date	Lake Louise, AB	Whistler, BC	Alpine Meadows, CA	Kirkwood, CA	
1-Oct-19	10	10	0	14	
2-Oct-19	4	0	8	1	

7. On the Header & Footer Tools Design tab, in the Navigation group, click **Go to Footer**.

The cell pointer is now in the Center section of the footer.

8. On the Header & Footer Tools Design tab, in the Header & Footer group, click **Footer** and then click the preformatted footer second from the top of the list (Page 1).

Again, it may take up to a minute before the footer is updated to display the selected footer text.

9. Scroll up the worksheet and click in the left section of the page header.

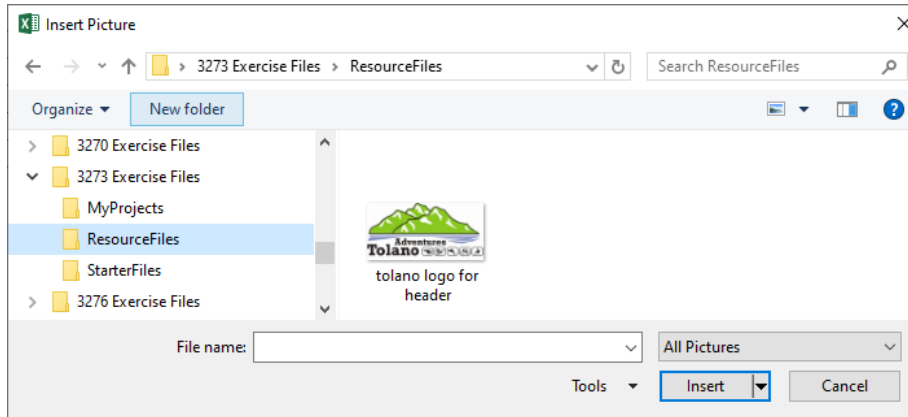
Now add the company logo to the header.

10. Click the **Header & Footer Tools Design** tab if necessary.
11. On the Header & Footer Tools Design tab, in the Header & Footer Elements group, click **Picture**.

The Insert Pictures dialog box appears. This dialog box allows you to select a source from which to obtain the picture from your local computer or from the Internet.

12. In the Insert Pictures dialog box, in the *From a file* option, click **Browse**.

A second Insert Picture dialog box is displayed to find the picture file from your local computer.



13. Navigate to the *ResourceFiles* folder, then select the **tolano logo for header** file and click **Insert**.
14. Click on any cell in the worksheet area.
15. Save the workbook and keep it open for the next exercise.

Setting Print Titles and Print Areas

Objective 1.5.1

With large worksheets, you can freeze row and column titles so that you can always relate any cell to their descriptions. However, the Freeze Panes feature applies only to the screen. The equivalent feature when printing is to set **Print Titles**. By setting print titles, you designate specific data rows or data columns or both to print on every page of the printed output. Typically, these rows and columns contain the text labels that identify the purpose of the data in those rows or columns.

You set print titles using the options in the Print titles section in the Sheet tab of the Page Setup dialog box (Figure 5-25).

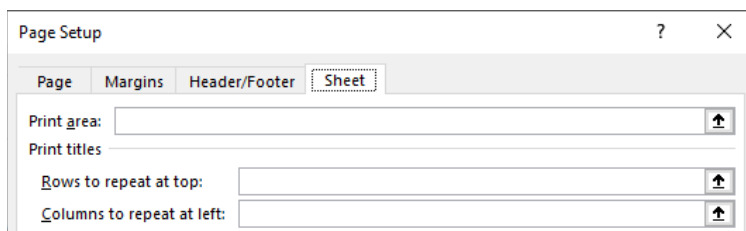


Figure 5-25: Page Setup dialog box – Print titles settings

Click the collapse button (the upward arrow at the right end of the field) for the *Rows to repeat at top* field to shrink the dialog box, and then in the worksheet, click the row header(s) for the row(s) you want to use as titles and press ENTER. The address for the selected row(s) will then display in the *Rows to repeat at top* field in the dialog box. Repeat this process for columns to repeat at the left.

Note: You can select any number of rows to display at the top or columns to display at the left provided they are contiguous (all rows or columns are together).

Excel also provides an option to specify a range of cells as the **Print Area**, which will ensure that only this section of the worksheet is selected for printing by default. This feature is very useful when you consistently want to print only a range of cells instead of the entire worksheet.

To specify a range of cells as a print area, select the cell range in the worksheet, then on the Page Layout tab, in the Page Setup group, click Print Area, then click Set Print Area.

Note: If you have specified rows and columns as Print Titles, do not include these rows and columns in the print area range.

Specifying a Range of Cells to Print

Alternatively, you can select just a range of cells to print as a one-time event. To do so, select the range of cells on the worksheet, then change the print settings from Print Active Sheets to Print Selection.

Before deciding to set only a range of cells for printing, you should take a second look at your data. In most cases, you should expect to print the entire contents of a worksheet. If you are setting the print area because you have more than one group of data, you should consider separating the different groups into different worksheets. The real problem is that these different groups of data just happen to be on the same worksheet. Once separated, you can then print the entire worksheet without being confused by the print range setting.

Learn to print titles and ranges of cells

In this exercise, you will specify to print titles on every page and you will select a range of cells for printing.

1. Ensure the **My Ski Resort Snowfall (header)** workbook is open.
2. Click **File** and click **Print**.
3. Click the **Next Page** and **Previous Page** buttons to view each of the pages.

As you look at each of the pages, you will notice that some pages are just rows and columns of numbers. As a result, you are unable to relate these numbers to dates and locations.

You can resolve this by specifying print titles.

4. Click the **Back** button, then on the Page Layout tab, in the Page Setup group, click **Print Titles**.

Excel displays the Sheet tab in the Page Setup dialog box.

You can now select column or row headers or the range of cells you want to print by selecting these cells directly from the worksheet. If you have a small screen, you can shrink the Page Setup dialog box temporarily so that you can access a greater area of the worksheet.

5. Click the **Collapse** button for the *Rows to repeat at top* field.
6. Click the row **1** header on the worksheet behind the Page Setup - Rows to repeat at top dialog box.

Note: You must access the Page Setup dialog box from the Ribbon to be able to make these changes. If you had clicked Page Setup in the Print screen, the *Print area* and *Print titles* selection boxes will be grayed out and you can't change them.

Excel enables you to select any number of rows to display at the top of every page provided they are contiguous (all rows are together).

7. Click the **Expand** button in the Page Setup - Rows to repeat at top window.

Hint: You can also press ENTER to expand this dialog box.

Instead of shrinking the Page Setup dialog box, you can simply move it aside before selecting the rows or columns.

8. In the Page Setup dialog box, click in the **Columns to repeat at left** field.
9. If necessary, move the Page Setup dialog box so that it is not blocking your view of column A in the worksheet.
10. Click the column **A** header in the worksheet, then press **ENTER** to close the Page Setup dialog box.
11. Scroll down and across the worksheet in Page Layout mode to view each of the pages.

The worksheet now has row 1 and column A repeated on every page. With this change, it is much easier to relate every cell value to the date and ski resort.

Suppose you are consistently asked for data only for ski resorts located in Colorado. You can specify the Colorado data as a print range and that data will automatically be selected as the data to print each time you open the workbook.

12. Select the cell range **H2:L184**.
13. In the Page Layout tab, in the Page Setup group, click **Print Area**, then click **Set Print Area**.
14. Click **File** and then click **Print**.
15. Click the **Next Page** and **Previous Page** buttons to view each of the pages.

Now only the information for Colorado will be included in the printed output.

16. Save the workbook.

Suppose you get a special request for the data for Squaw Valley, CA for October 24 through November 9. You can select this range and specify to print only the selected range.

17. Click the **Back** button and select the cell range **G25:G41**.
18. Click **File** and click **Print**.
19. In the *Settings* section, click **Print Active Sheets**, then click **Print Selection**.

There will only be one page to print in this case, and only this cell range will be printed. This feature is much easier to use than hiding all other rows and columns to exclude the rest of the worksheet from the page.

Suppose you want to switch back to printing the Colorado data specified as the print area.

20. In the *Settings* section, click **Print Selection**, then click **Print Active Sheets**.

The print preview now shows the Colorado pages of data specified as the print area.

The print area setting can be removed easily if it is no longer needed.

21. Click **Back** and on the Page Layout tab, in the Page Setup group, click **Print Area** and click **Clear Print Area**.

22. Click **File** and click **Print**.

The preview now shows all data in the worksheet will be printed.

23. Close the workbook without saving the changes.

Printing Selected Worksheets

Objective 1.5.3

The Office Backstage Print Settings allow you to select one of four options for printing:

- Print the current active worksheet(s).
- Print all worksheets in the entire workbook.
- Print the currently selected range of cells in the current active worksheet.
- Ignore previously set print areas.

You will usually have only one worksheet as your active worksheet. When you print the active sheet, Excel will print the contents of that worksheet only.

If you want to print more than one worksheet (but not the entire workbook) at the same time, then you must select all these worksheets as a group first, and then print them. Use the CTRL key to add the worksheets to the group of active worksheets. You can also use the SHIFT key to select a contiguous group of worksheets as the active group.

Learn to print selected worksheets

In this exercise, you will print a selected group of worksheets in a workbook.

1. Open the **Quarterly Income Statement Printing** workbook located in the *StarterFiles* folder.
2. Click the **Quarter 1** worksheet tab.
3. Press and hold **CTRL** and click the **Quarter 3** and **Quarter 4** worksheet tabs to select them as part of the group.

17	Advertising	250	250	250	750			
18	Utilities	325	325	325	975			
19	Total:	6245	6245	6245	18735			
20								
21								

<	>	Company	Quarter 1	Quarter 2	Quarter 3	Quarter 4	+
---	---	---------	-----------	-----------	-----------	-----------	---

Notice the label [Group] appearing in the title bar of the workbook.

4. Click **File** and click **Print**.
5. Verify that **Print Active Sheets** is currently selected.
6. Click the **Next Page** and **Previous Page** buttons to view each of the worksheets you have selected for printing. Three pages are currently selected.

You can also print all the worksheets in this workbook.

7. In the Settings section, click **Print Active Sheets**, then click **Print Entire Workbook**.
8. Click the **Next Page** and **Previous Page** buttons to view each of the worksheets that have been selected for printing. Five pages are now selected.
9. Click **Back**, then close the workbook and discard any changes.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- ☒ Create worksheet windows.
- ☒ Arrange worksheet windows.
- ☒ Split panes.
- ☒ Freeze panes.
- ☒ Zoom in and out of worksheets.
- ☒ Print and preview worksheets.
- ☒ Use different workbook views.
- ☒ Add and preview page breaks.
- ☒ Change printing margins, orientation, paper size and scale.
- ☒ Print column and row titles or selected cell ranges.
- ☒ Add and modify headers and footers.
- ☒ Print selected worksheets.

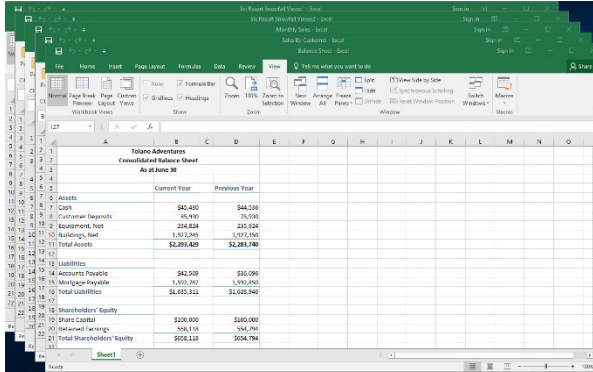
Key Terms

Term	Definition
Active workbook	The workbook that contains the cell pointer.
Footer	Text that appears at the bottom of every page of printed output and may include automatic page numbering.
Header	Text that appears at the top of every page of printed output and may include automatic page numbering.
Margin	The white space or area from the edge of the paper to the printed text.
Page Break	The division between two pages.
Print Area	A range specified as the default selection for printing.
Print Titles	Rows and/or columns set to repeat at the top/left of each page of printed output.

Quiz Questions

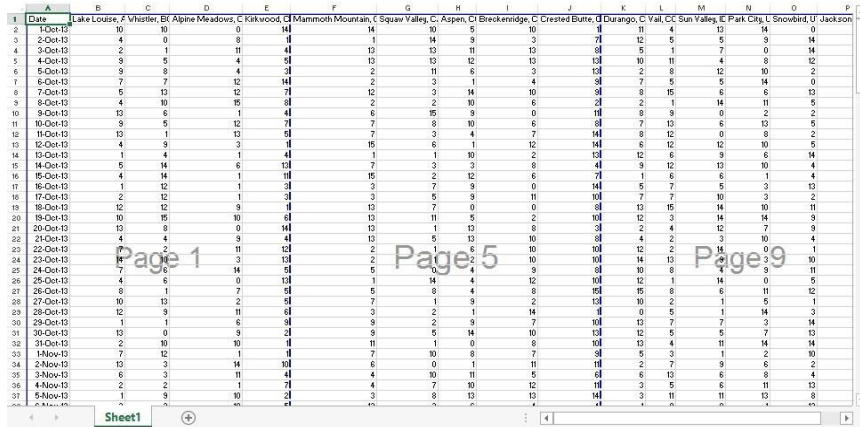
For each question, select the best answer.

1. The open windows in the following figure are arranged in which configuration?



- Horizontal
 - Tiled
 - Cascade
 - Vertical
2. How do you open another view of the active workbook?
- Press CTRL+N.
 - Press CTRL+V.
 - Click the View Side by Side button.
 - Click the New Window button.
3. Sarah is entering weekly sales data for week 37 of the current year; however, when she moves down to the cells where she needs to enter the data, the column headings scroll out of view and sometimes she loses track of which column she is working in. What can Sarah do to keep the column headings visible even while she is working in a distant portion of the worksheet?
- Freeze the panes.
 - Reset the window position.
 - Cascade the window.
 - Adjust the zoom so that she can see the entire worksheet on screen.
4. Which of the following are benefits of previewing a worksheet prior to printing?
- You can easily see formulas that contain circular references.
 - You can see how many pages your printed output will require.
 - You can avoid wasting paper due to page layout settings.
 - You can easily correct grammar errors because grammar check is part of the print preview process.

5. Which view is shown in the following figure?



- Normal
 - Watermark
 - Page Break Preview
 - Page Layout
6. Denise needs to print a report that will be inserted into a larger report, and therefore needs the page numbering to begin at 312. In which tab of the Page Setup dialog box can she specify this beginning page number?
- Margins
 - Header/Footer
 - Sheet
 - Page
7. Which code inserts the name of the tab for the current worksheet into an Excel footer?
- &[Tab]
 - &[Page]
 - &[File]
 - &[Path]&[File]
8. Andrea needs to print a 7-page report of inventory figures. The column headings print only on the first page of the report. What should she do to ensure the column headings print on every page?
- Add the column headings into the report header.
 - There is no way to ensure that column headings print on every page of a report.
 - Set the row with the column headings as a print title.
 - Repeat the column headings at the page break locations throughout the report.
9. How do you remove the split bars and return to one pane only?
- Press CTRL+C.
 - Press F4.
 - Set the Excel Options to show a single pane only.
 - On the View tab, in the Window group, click the Split button again.

10. Which of the following actions can you perform to open the Zoom dialog box?
- a. On the Status bar, click Zoom Level.
 - b. Drag the zoom slider all the way to the left.
 - c. On the View tab, in the Zoom group, click the dialog box launcher.
 - d. Any of these actions will open the Zoom dialog box.
11. Which statement about manually inserted page breaks is true?
- a. The page break applies only to the current row.
 - b. When you remove a manually inserted page break, you must do so in the cell into which you inserted it.
 - c. Manually inserted page breaks appear as dotted lines in the Page Break Preview view.
 - d. All of these statements about manually inserted page breaks are true.
12. Dan needs to print Sheet1, Sheet6, and Sheet9 of a large workbook. What is the most efficient way to accomplish his task?
- a. Print each worksheet separately using the Print Active Sheets option.
 - b. Select the desired worksheets and group them, then print using the Print Active Sheets option.
 - c. Select ranges on each of the worksheets, then print using the Print Selection option.
 - d. Print the entire workbook and discard the pages that are not needed.
13. Where can you access settings for the margins, orientation, and page size?
- a. The Page Layout tab in the Ribbon
 - b. The Page Setup dialog box
 - c. The Print page in the Backstage view
 - d. You can access the settings for margins, orientation and page size in any of these locations.

Microsoft® Excel

Associate Certification Guide

Lesson 6: Working with Charts

Lesson Objectives

In this lesson, you will work with charts. Upon completion of this lesson, you should be able to:

- ☐ Create charts.
- ☐ Move a chart to a new location or to its own chart sheet.
- ☐ Resize a chart to a different size or shape.
- ☐ Change the chart type.
- ☐ Work with pie charts.
- ☐ Change the chart design.
- ☐ Add new data to a chart.
- ☐ Create, customize, and remove sparkline charts.
- ☐ Preview charts for printing.
- ☐ Use the Quick Analysis Tool.

Creating a Basic Chart

Objective 5.1.1, 5.3.3

A **chart** is a pictorial representation of the data you enter in a worksheet. Often, a chart can be a more descriptive way of representing your data. As a result, those viewing the information provided by your spreadsheets may find it easier to examine and understand a chart rather than many rows and columns of numbers. A pictorial representation of the data will often help identify trends or patterns in the data.

Figure 6-1 shows a sample chart and a few commonly-included chart elements.

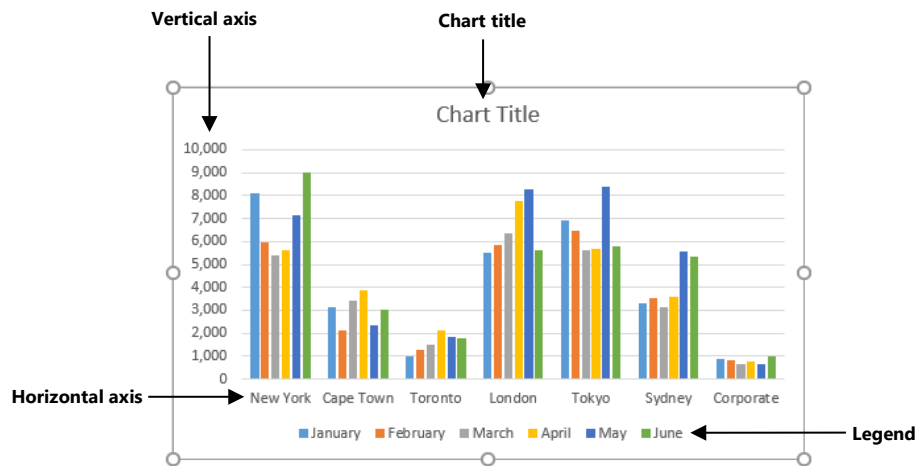


Figure 6-1: Chart elements

The chart's horizontal axis (also known as the **X axis**) is located at the bottom of the chart and the vertical axis (also known as the **Y axis**) is located at the left or right side of the chart. Labels can be applied to either or both axes. Excel will automatically include a **legend** with the chart to explain the meaning of each line in a line chart or column in a column chart. Although you can remove the legend, it may be helpful to others to retain it if your chart has more than one data series. A data **series** is a row or column of numbers that are plotted in a chart. In Figure 6-1, the vertical axis shows the number, the horizontal axis shows the city, and the legend shows which color represents which month.

Excel can display worksheet information in a variety of ways. Incorporating fonts, patterns, symbols, graphics and 3-D (three-dimensional) effects, Excel's charting feature is an extremely professional presentation tool.

To insert a chart, select the data to be charted and then, in the Charts group on the Insert tab, click the Recommended Charts button and the Insert Chart dialog box (Figure 6-2) will appear with a set of charts that are commonly used for the data you have selected.

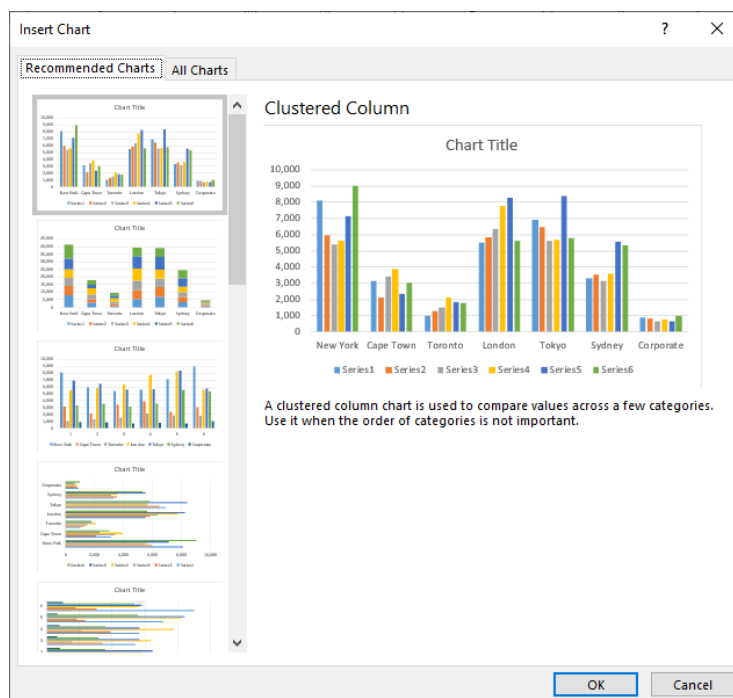


Figure 6-2: Insert Chart dialog box – Recommended Charts tab

If this set of charts does not meet your needs, the full set of chart types and layouts are available in the All Charts tab, shown in Figure 6-3.

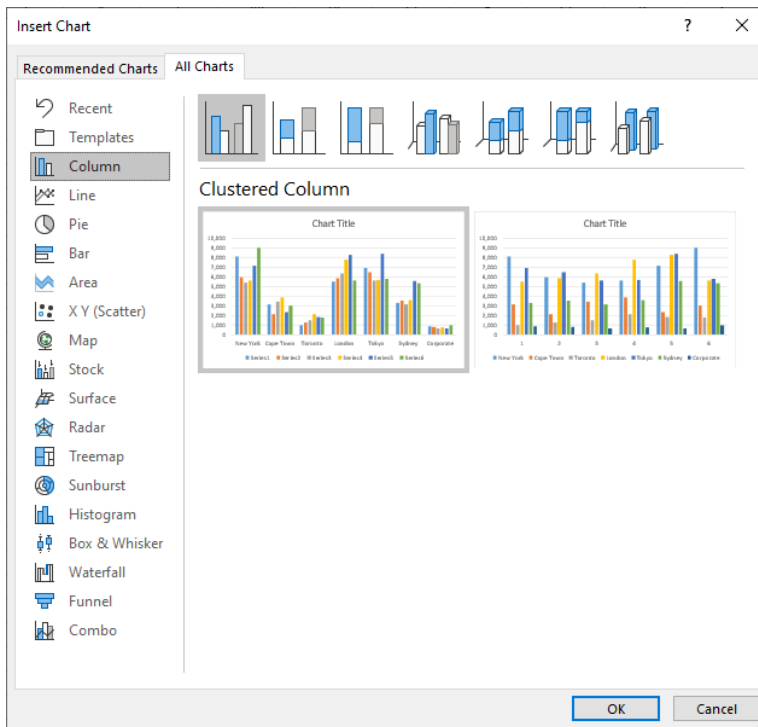
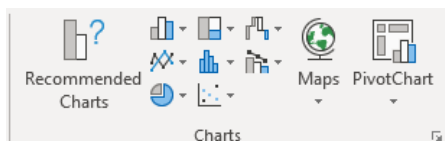


Figure 6-3: Insert Chart dialog box – All Charts tab

You can select the type of chart you want on the left side of the dialog box and select from among different forms of the chart across the top of the dialog box. Available variations of the currently selected form appear in the preview area.

Alternatively, chart types can be selected directly from the Charts group on the Insert tab of the Ribbon.



Once the chart appears in the worksheet, you will also see two different tabs for the Chart Tools contextual ribbon that you can use to create or modify chart elements. You will learn about many of these tools as you progress through this lesson.

Adding Alternative Text (Alt Text) to a Chart

Objective 5.3.3

Alternative text (alt text) is descriptive text added to graphic objects (such as images, charts, shapes, and so on), which can be read by screen readers or other text-to-speech tools to help those who are visually impaired to understand the purpose or meaning of the object.

By providing alt text for the graphic objects in your workbooks, you help ensure your workbooks are globally accessible.

To add alt text to a chart, right-click the chart, then click Edit Alt Text in the shortcut menu to open the Alt Text task pane (Figure 6-4).

Enter a brief description of the chart (or its purpose in the document) in the text box. The alt text that you enter here can be read by screen readers.

You can also select the *Mark as decorative* check box to specify that the object is purely decorative in nature.

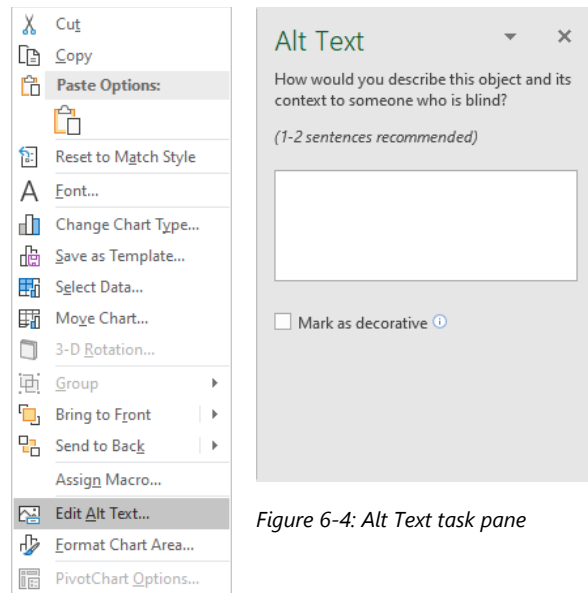


Figure 6-4: Alt Text task pane

Learn to create a chart

In this exercise, you will create a chart.

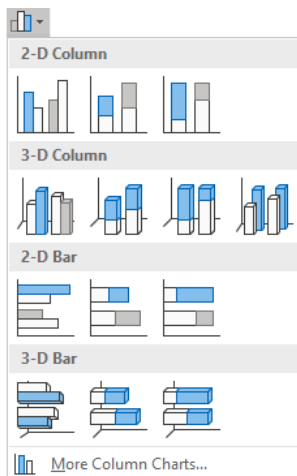
1. Open the **Website Hits** workbook located in the *StarterFiles* folder and save it as: **My Website Hits** in the *MyProjects* folder.

This worksheet shows the number of times that potential customers of Tolano Adventures are accessing their website.

2. Select the range of cells from **A4** to **G11**.

Note that the row and column titles were included in this range, but the total values were not. If you wish, you can include the totals in the chart. In many cases, however, the purpose of creating a chart is to show any patterns in the data. Including the totals would actually reduce the visibility of the pattern because their presence causes the rest of the data to shrink in size.

3. On the Insert tab, in the Charts group, click **Insert Column or Bar Chart**.



4. Point to each of the icons in the drop-down menu.

A live preview of the selected chart is displayed. If none of them meets your requirement, you can click on a different chart type from the Ribbon.

- Click the **Clustered Column** option (left-most item in the 2-D Column set).

The column chart now displays. Note that whenever you select the chart, the cells containing the source data are marked and two new tabs display on the Chart Tools contextual ribbon tab.

Providing alt text for your charts helps ensure your workbooks are globally accessible.

- Right-click an empty area in the chart, then click **Edit Alt Text** to open the Alt Text task pane.
- Click in the text box in the task pane, then type: **Column chart of website hits for January through June.**
- Close the task pane.
- Save the workbook and keep it open for the next exercise.

Moving and Resizing Charts

You can move charts to any location on a worksheet. Typically, you place a chart next to its source data so that users can see both at the same time. To move a chart around on a worksheet, simply use the mouse to drag it to its new location. While moving a chart, take care when placing the mouse pointer to ensure that you are not moving a single component within the chart by mistake. To move an entire chart, you must click on a blank area of the chart where no chart components are located.

You can also make charts larger or smaller or change their shape. To resize a chart, click and drag any of the resizing handles (Figure 6-5) located around the border of the chart. Every chart has eight of these handles: four in the corners and four at mid-points between the corners. The mid-point handles are used to change either the width or the height of the chart. The corner handles can be used to make the chart larger or smaller in two directions at the same time by changing the width and height at the same time. Whenever you change the size or shape of a chart, the internal components will generally resize proportionately.

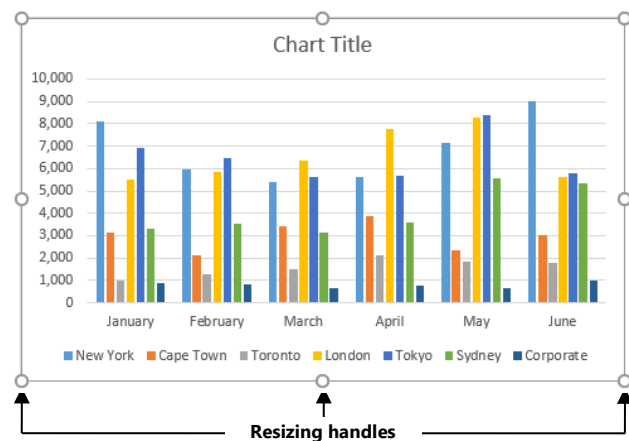


Figure 6-5: Chart with resizing handles

Creating Chart Sheets

Objective 5.1.2

By default, Excel places a chart in the same worksheet where the source data is located. You can move this chart to its own chart sheet, back to its original worksheet, or to a different worksheet.

When you move a chart to its own chart sheet, the chart will automatically resize itself to fill the entire sheet.

To move a chart to its own sheet:

- Right click on a blank area inside the chart, select Move Chart to display the Move Chart dialog box (Figure 6-6), click the New sheet radio button, name the chart as you would any new sheet (or leave the default name if desired), and click OK.
- On the Chart Tools Design tab, in the Location group, click Move Chart. In the dialog box, click the New sheet radio button, name the chart as you would any new sheet (or leave the default name if desired), and click OK.

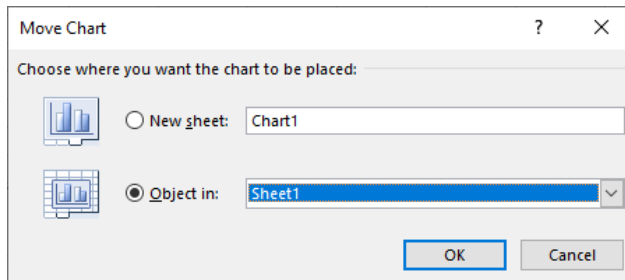


Figure 6-6: Move Chart dialog box

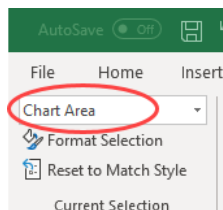
Learn to move and resize a chart

In this exercise, you will move and resize a chart.

1. With the My Website Hits workbook open, click in any blank area of the worksheet to take the chart out of editing mode.

To move a chart right after creating it, you may have to click outside of the chart before you are permitted to move it.

2. Click in any blank area of the column chart to put it into editing mode.
3. Click the **Chart Tools Format** tab.
4. Look in the **Chart Elements** box in the Current Selection group in the Ribbon, which displays the name of the chart component that you selected.



5. If the Chart Elements box displays a name other than *Chart Area*, click another blank area of the chart until it does. Generally, any of the four corners of the chart are the best choices.

Hint: You can also select Chart Area from the list box in the Current Selection group.

6. Click the same blank area on the chart again and drag the chart so that it is directly below the data.

Make the chart bigger.

7. Point to each of the four corners of the chart to view how the mouse pointer changes.
8. Click and drag the bottom right corner down and outwards to make the chart bigger.

9. Point to each of the resizing handles to view how the mouse pointer changes.
10. Click the middle handle at the bottom of the chart and drag it down to make the chart taller.

You can also resize and move the components inside the chart. Imagine a square box around each of these components of the chart. To move the component, you click inside the box and move it to a new location.

11. Click in a blank area inside the legend, then drag the legend to another location in the chart such as in the middle of the column bars.
12. Click **Undo** in the Quick Access Toolbar.

Now move the chart to its own sheet.

13. On the Chart Tools Design tab, in the Location group, click **Move Chart**.
14. In the Move Chart dialog box, click **New sheet** and click **OK**.

The chart now displays in its own chart sheet. Notice the Chart1 worksheet tab.

15. Click the **Sheet1** worksheet tab.

The chart is no longer in this worksheet.

16. Save the workbook and keep it open for the next exercise.

Changing Chart Types

You can easily change the type of chart you have selected if the chart does not display the worksheet information in the way you would like.

The type of chart to use will depend on what you are trying to show. Line charts are better for showing trends, column charts are better for showing volume, and pie charts are better for showing portions of a total.

Excel provides a variety of chart types and several subtypes within each major type. This section discusses the most commonly-used chart types.

Column – Use to compare values over time or across categories. This is a vertical presentation of a bar chart, as shown in Figure 6-7.

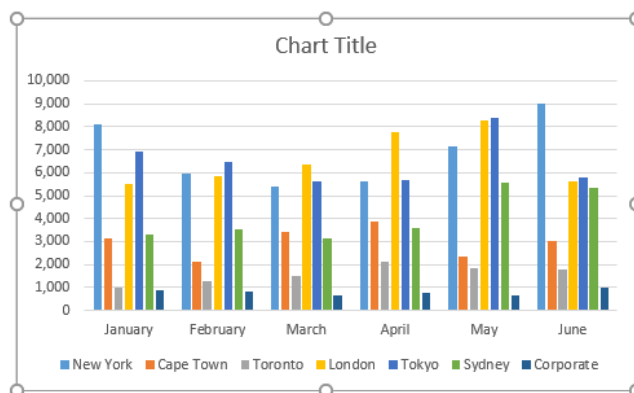


Figure 6-7: Column chart

Line – Use to compare continuous trends for series of data, as shown in Figure 6-8.

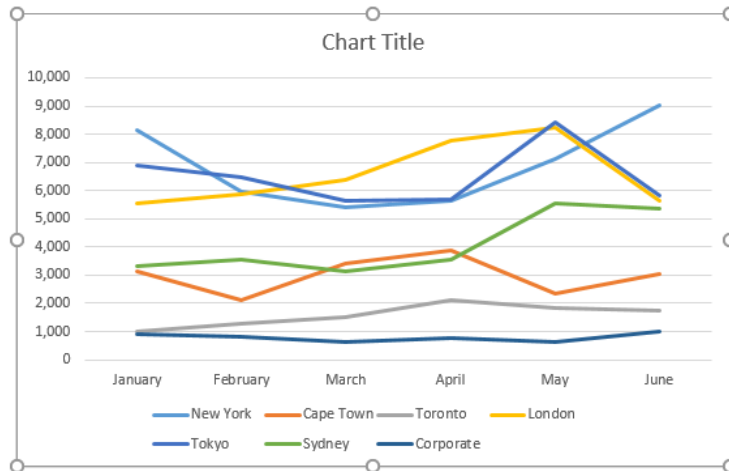


Figure 6-8: Line chart

Pie – Use to compare the relative size of each portion that together make up the combined total, as shown in Figure 6-9.

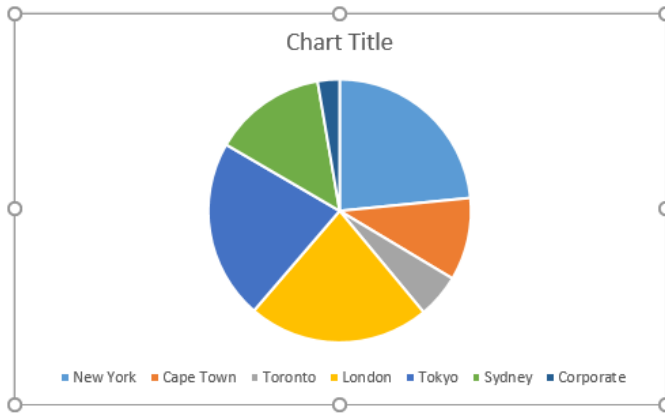


Figure 6-9: Pie chart

Bar – Use to compare values over time or categories. This is a horizontal presentation of a column chart, as shown in Figure 6-10.

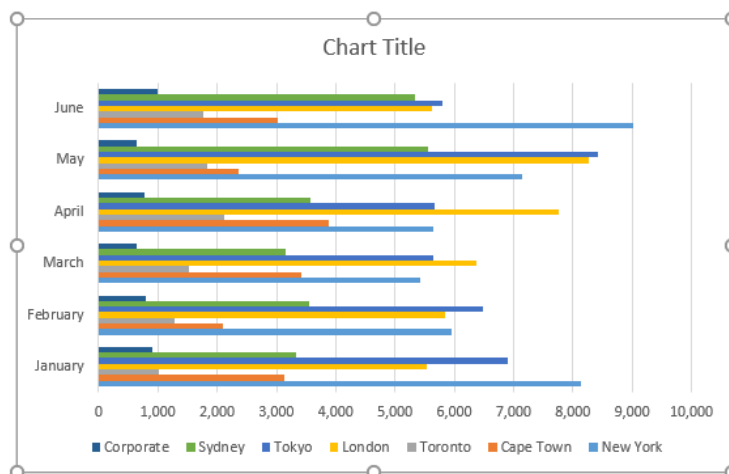


Figure 6-10: Bar chart

Note: Advanced chart types, including Area, XY, Map, Stock, Surface, Radar, Treemap, Sunburst, Histogram, Box & Whisker, Waterfall, Funnel, and Combo are discussed in the Excel Expert course.

Most of these chart types have both two-dimensional and three-dimensional choices. Three-dimensional charts can be more interesting to look at but may be more difficult to read because they tend to look crowded.

To change the chart type, click on the chart to go into chart mode and then use one of the following methods to open the Change Chart Type dialog box, shown in Figure 6-11:

- on the Chart Tools Design tab, in the Type group, click Change Chart Type, or
- right-click in any blank area of the chart and then click Change Chart Type.

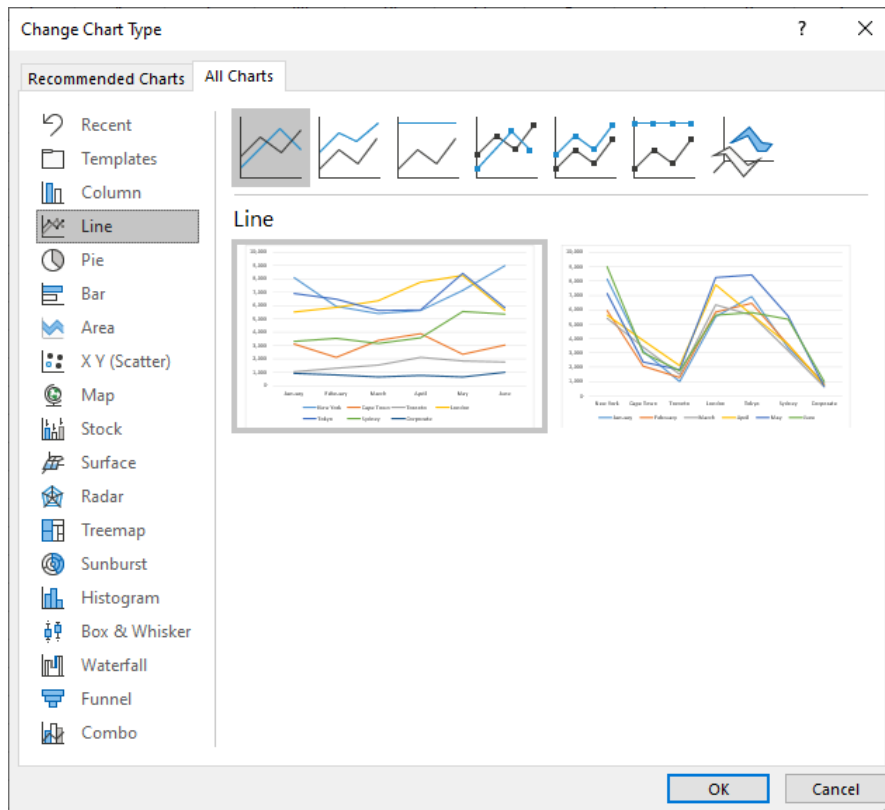


Figure 6-11: Change Chart Type dialog box

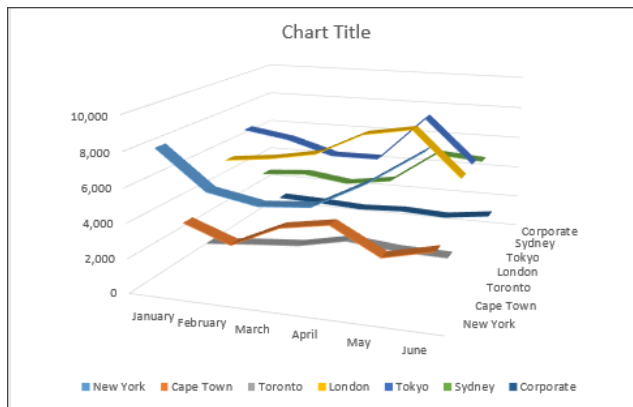
Learn to change the chart type

In this exercise, you will change the chart type.

1. With the My Website Hits workbook open, click the **Chart1** worksheet tab and then click in any blank area of the chart.
2. On the Chart Tools Design tab, in the Type group, click **Change Chart Type**.

The Change Chart Type dialog box appears showing the different chart types from which to choose.

3. In the *All Charts* tab, click the **Line** option on the left side of the dialog box, then click the **3-D Line** option (the right-most one) at the top of the dialog box to display previews of the 3-D line charts.
4. In the preview area, click the right-most 3-D line chart.



5. Click **OK**.

Choose another chart type.

6. On the Chart Tools Design tab, in the Type group, click **Change Chart Type**.

7. In the *All Charts* tab, click the **Pie** option on the left side of the dialog box, then click the **Pie** option above the preview area if necessary and click **OK**.

Change the chart type back to a column chart.

8. On the Chart Tools Design tab, in the Type group, click **Change Chart Type**.

9. In the *All Charts* tab, click the **Column** option on the left side of the dialog box, click the **Clustered Column** option above the preview area, click the preview with the calendar months on the horizontal axis (the one on the left), and click **OK**.

10. Save the workbook and keep it open for the next exercise.

Working with Pie Charts

A pie chart is one of the chart type options that Excel provides. It is commonly used in business applications because it is particularly useful for displaying relative sizes (or percentages) of each piece of the total. For example, if you are writing a report about the importance of segments of your business, you may want to use the pie chart to show the various business segments.

Pie charts are not like the other chart types. For example, column and line charts are excellent choices for visually showing more than one data series – a table with multiple rows and columns of data. Pie charts only allow you to choose one data series, usually the totals for a table, or one row or column of that table.

You may wish to enhance your display further by exploding or moving out a portion of the pie. This draws the viewer's attention to that piece of the pie. You can explode pie slices only by using the mouse; you cannot use the keyboard to do this. You can explode more than one piece of the pie. However, exploding too many pieces may be distracting to the audience.

Learn to explode a pie chart

In this exercise, you will create and explode a pie chart.

1. Ensure the My Website Hits workbook is open.

First, create a new pie chart using only the total values for each office. The pie chart must include the category (X) titles as well as the total data in the chart, so you must highlight two rows that are not next to each other.

2. Click the **Sheet1** tab, then select cells **A5** to **A11**.

Note: For this pie chart, the data series selected will be the total number of website hits for each office.

3. Press and hold **CTRL** and select cells **H5** to **H11**. Release **CTRL**.
4. On the Insert tab, in the Charts group, click **Insert Pie or Doughnut Chart** to display the various pie chart types.
5. Click the **Pie** option in the *2-D Pie* section to create the pie chart.

Now explode a piece of the pie.

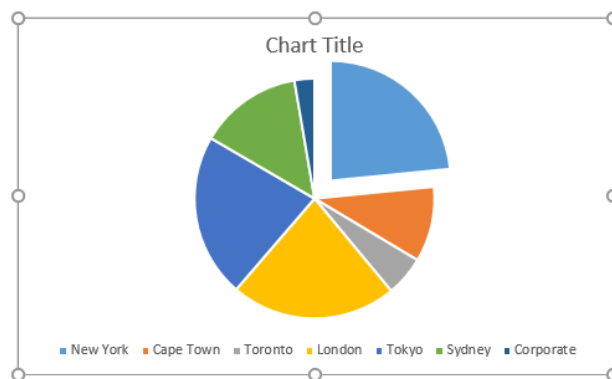
6. Click any pie slice in the chart.

The selection blocks should appear on every pie slice.

7. Click again on the **New York** pie slice (the one in the upper right).

The selection blocks should now appear only around this piece.

8. Click and drag the **New York** pie slice away from the rest of the pie. When you have the pie slice in the desired position, release the mouse button.



9. Drag the chart so that it is directly below the data.
10. Save the workbook and keep it open for the next exercise.

Modifying the Chart Design and Location

Objective 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2

You can easily modify and refine your chart using the tools on the Design tab of the Chart Tools ribbon.

These tools include:

Add Chart Element – Used to add, modify, or format chart components such as the chart title, data labels, legend, and horizontal or vertical axis. Although the Ribbon option is labeled as Add Chart Element, it can also be used to remove the element from the chart. The chart elements include:

- **Axes** – Choose to have one of the axes as the primary one with a label while leaving the label off the other axis.
- **Axis Titles** – Label what the group on an axis represents. For example, numbers may appear on the Y axis, but to make it clearer, you could label what those numbers represent, such as US dollars or population.
- **Chart Title** – A chart title is useful to know what the chart represents.
- **Data Labels** – Data labels give more details to the chart by providing the exact data. For example, if a bar on a column chart stops somewhere between 60 and 70, a data label can tell you that the number for this bar is exactly 64. This can provide much more detailed information on the chart, but caution is needed to avoid overwhelming the chart with so many details that it is hard to read.
- **Data Table** – Similar to data labels, data tables provide more detailed information. If this detail is needed in the chart, but data labels are difficult to read, data tables are a good option to clearly show the details of the data in a table under the chart portion of the chart.
- **Error Bars** – Used only in area, bar, column, line, and X Y charts, error bars show potential errors or an amount of uncertainty in statistical or scientific data.
- **Gridlines** – Choose among different types of gridlines behind the chart. This can make it easier to approximate exactly where the information lines up with the axes.
- **Legend** – Often there are more than just two categories of data. Two categories can be displayed on the axes while a third category can be represented with different colors. A legend can clarify what the colors represent.
- **Lines** – Used in a line chart, a line starts at the highest point of the line on the chart and goes down lining up with each point along the horizontal axis.
- **Trendline** – Trendlines can overlay a chart showing a trend to help predict future data.
- **Up/Down Bars** – Used on a line chart, bars appear at each point along the horizontal axis between the two lines. For example, if the lines represent projected sales versus actual sales, this is helpful to emphasize where the lines may be far apart versus close together. One option can show a difference in the bars when one line falls below the other versus above it.

Quick Layout – Used to select from one of several predefined chart layouts for the current chart type.

Change Colors – Used to select from one of several predefined color sets for the data points, lines, or bars.

Chart Styles – Used to select from one of several predefined chart visual styles.

Switch Row/Column – Used to exchange the data rows and columns as the data series for the chart. This is useful for providing a different focus for the data, such as grouping the data by month of sales versus location of sales. It emphasizes one aspect of the data over another.

Select Data – Used to select a different cell range for the chart. This is useful when you are adding data. For example, if your chart shows sales per month, and you finish a new month, you can add this data without deleting and creating a new chart. Just add the sales for the most recent month to the existing chart.

Change Chart Type – Used to change the chart to a different chart type.

Move Chart – Used to move the chart between a worksheet and a dedicated chart sheet.

You have seen that you can create a chart on a selected set of data with just a few clicks of the mouse. However, the chart will use a standard set of default settings. You will typically want to modify the chart design to create exactly the look you want. The Chart Tools Design tab (Figure 6-12) contains commands to help you get the design you want.

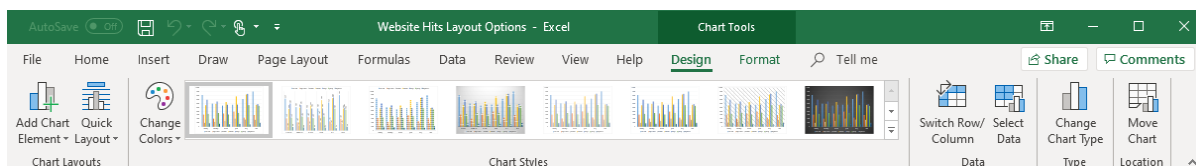


Figure 6-12: Chart Tools Design tab

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.

Learn to change chart layout options

In this exercise, you will apply different layout options for a chart.

1. With the My Website Hits workbook open, click the **Chart1** tab.
2. Click in a blank area of the clustered column chart to put it into editing mode.
3. On the Chart Tools Design tab, in the Chart Layouts group, click **Quick Layout**.
4. Point to some of the layouts in the drop-down menu and observe the change in the chart.
5. Click **Layout 1**.

Preview different chart styles to see how the chart is affected.

6. On the Chart Tools Design tab, in the Chart Styles group, point to some of the chart styles and observe the change in the chart.
7. Click a style of your choice to apply it to the chart.
8. In the Quick Access toolbar, click **Undo** to undo the application of the chart style.

In this chart, each month is a category (appearing in the X-axis), and each location is a series (as shown in the legend). Assume that you want to exchange their positions so that each location is a category. You can do this very easily.

9. On the Chart Tools Design tab, in the Data group, click **Switch Row/Column**.

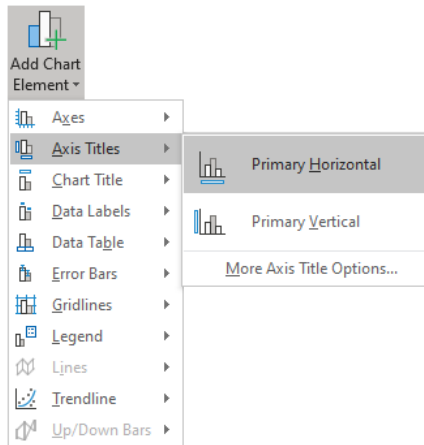
You decide the chart is better with the months as categories. Switch between rows and columns in the data source once more.

10. On the Chart Tools Design tab, in the Data group, click **Switch Row/Column**.
11. Click twice in the **Chart Title** box in the chart, highlight the default text *Chart Title* and type: **Monthly Website Hits** as the new title.

Excel replaces the default text with your new title.

Now add titles to each of the two chart axes.

12. On the Chart Tools Design tab, in the Chart Layouts group, click **Add Chart Element**, then click **Axis Titles** and **Primary Horizontal**.



13. Click in the horizontal **Axis Title** box in the chart and replace the default title with: **Month** as the new axis title. Click outside the horizontal Axis Title box.
14. On the Chart Tools Design tab, in the Chart Layouts group, click **Add Chart Element**, then click **Axis Titles** and **Primary Vertical**.
15. Click in the vertical **Axis Title** box in the chart and replace the default title with: **# of Hits** as the new axis title, then click outside the vertical Axis Title box.

Remove the legend.

16. On the Chart Tools Design tab, in the Chart Layouts group, click **Add Chart Element**, then click **Legend** and click **None**.

Now add the legend back to the chart and place it at the bottom. You can choose from five standard locations to place the legend in the chart. You can also manually move it to any location in the chart or turn it off.

17. On the Chart Tools Design tab, in the Chart Layouts group, click **Add Chart Element**, then click **Legend** and click **Bottom**.

Now adjust the gridlines in the clustered column chart.

By default, your chart is created with the major horizontal gridlines. These lines help readers view the top of the bars to the Y-axis markers, especially the bars farthest away from the axis. You can also activate or remove other gridline options.

18. On the Chart Tools Design tab, in the Chart Layouts group, click **Add Chart Element**, then click **Gridlines** and click **Primary Major Vertical**.

The addition of vertical lines between the categories now helps the readers see each group of data series. You can also add additional sets of horizontal and vertical gridlines.

19. On the Chart Tools Design tab, in the Chart Layouts group, click **Add Chart Element**, click **Gridlines**, then position (but do not click) the mouse pointer over each of the options in the menu.

The Live Preview of the selected option is displayed in the chart. Each of the options acts as a toggle switch – for example, by pointing at the Primary Major Horizontal option, these gridlines turn off.

20. In the Gridline menu, click **Primary Major Vertical** to turn the vertical gridlines off.

21. Save the workbook and keep it open for the next exercise.

Adding New Data Series

Objective 5.2.1

New data series or categories can be added to a worksheet at any time but the chart may not be automatically updated. You can add this new data to the chart to keep it current using any of the following methods:

- With the chart selected, on the Chart Tools Design tab, in the Data group, click Select Data to display the Select Data Source dialog box (Figure 6-13). Change the cell references in *Chart data range* and click OK. Alternatively, simply reselect all the cells (including the new data) that are to be included in the chart, then click OK.

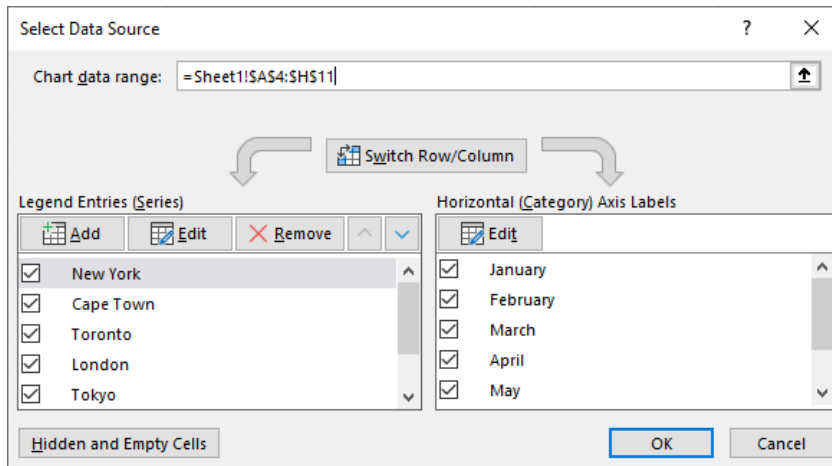


Figure 6-13: Select Data Source dialog box

- Copy the new data into the Clipboard, select the chart, then click Paste Special. Use the dialog box (Figure 6-14) to specify how you want the new data to be added and click OK to paste the data into the chart.

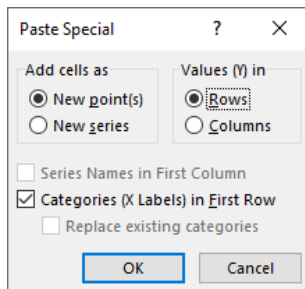


Figure 6-14: Paste Special dialog box

- When the chart is selected, the data that coincides with the chart is also selected. When you point the mouse over a corner of these selected cells, a diagonal arrow appears. Then you can drag the boundary of the data range selection box on the worksheet to include the new data. The added data then appears in the chart. This is normally the quickest method but can be used only when the chart and the data are on the same worksheet.

Learn to add data to a chart

In this exercise, you will add new data to a chart.

1. With the My Website Hits workbook open, click the **Sheet1** worksheet tab if necessary.
2. Scroll up and click the column **H** header to select the entire column.
3. On the Home tab, in the Cells group, click **Insert** to add a new column.
4. Enter the following new data into the worksheet:

Cell	Value
H4	July
H5	10,000
H6	4,000
H7	2,000
H8	10,000
H9	8,000
H10	6,000
H11	1,000

Notice that the SUM formulas in column I were automatically changed to include this new column. However, the SUM formula in cell H12 has to be copied from the cell next to it.

5. Copy the formula in cell **G12** to **H12**.

	A	B	C	D	E	F	G	H	I
1	Tolano Adventures								
2	Website Hits								
3									
4	Office	January	February	March	April	May	June	July	Total
5	New York	8,125	5,947	5,420	5,647	7,134	9,015	10,000	51,288
6	Cape Town	3,120	2,097	3,407	3,885	2,352	3,024	4,000	21,885
7	Toronto	1,017	1,281	1,512	2,107	1,825	1,761	2,000	11,503
8	London	5,530	5,852	6,366	7,760	8,257	5,619	10,000	49,384
9	Tokyo	6,905	6,471	5,648	5,665	8,412	5,808	8,000	46,909
10	Sydney	3,324	3,544	3,155	3,574	5,565	5,346	6,000	30,508
11	Corporate	904	804	641	772	632	998	1,000	5,751
12	Total	28,925	25,996	26,149	29,410	34,177	31,571	41,000	

6. Click the **Chart1** worksheet tab and click in a blank area of the chart.
7. On the Chart Tools Design tab, in the Data group, click **Select Data** to open the Select Data Source dialog box.

A marquee boundary line appears around the cell range A4 to G11 in Sheet1, which is the data currently displayed in the chart. You can change it by simply selecting the entire cell range – including the new column of data – to be used for the chart.

8. Select the cell range **A4:H11** in Sheet1.

Note: You could also have changed the cell reference directly by typing in the new cell range into the *Chart data range* text box.

9. Click **OK**.

The chart is now updated with this new data.

10. Save the workbook and keep it open for the next exercise.

Using Sparklines

Objective 2.4.1

The Sparklines feature, located on the Insert tab of the Ribbon, allows you to create a miniature chart inside a worksheet cell. This feature allows you to improve the visibility and readability of your worksheet without having to create one or more full-size charts, which may take a lot of space. Like a regular chart, the sparkline displays a visual representation of each value in a horizontal or vertical range of cells. Because Excel displays the entire chart in a single worksheet cell, only the data points are shown without any additional components such as a legend, titles, or axis.

To insert a sparkline, on the Insert tab, in the Sparklines group, click the type of sparkline you want to insert. The Create Sparklines dialog box (Figure 6-15) appears.

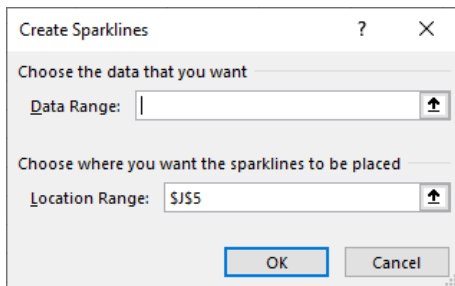
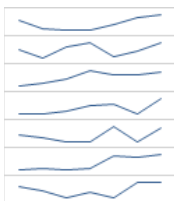


Figure 6-15: Create Sparklines dialog box

If necessary, delete any cell references that appear in the Data Range text box, then select the data for which you want to create the sparklines. The selected data range appears in the Data Range text box. Then in the Location Range text box, delete any existing cell references and either type or select the range where you want the sparklines to display. Click OK to insert the sparklines.

There are three types of sparklines:

Line – Use this chart type to represent the values. The relative height of each point indicates the size of each value.



Column – Use this chart type also to represent the values. The relative height of each column indicates the size of each value.



Win/Loss – Use this chart type to indicate whether each value is positive (greater than zero) or negative (less than zero). In this chart, every bar is the same shape and size. However, positive values appear as higher bars and negative values appear as lower bars. Note that this example highlights negative values further by showing them in red.

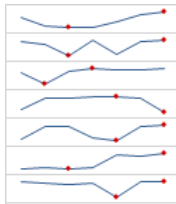


Sparkline charts have additional capabilities that you will not find in regular charts. The following are two examples of these capabilities:

- You can display data in the regular way with a sparkline chart at the same time in the same cells.



- You can activate markers in a sparkline chart such as high, low, first, last, and negative points. Without gridlines and axis markers, these markers help identify important points on the chart.



The Sparkline Tools Design tab (Figure 6-16) offers a range of different settings and options to modify and customize sparkline charts.

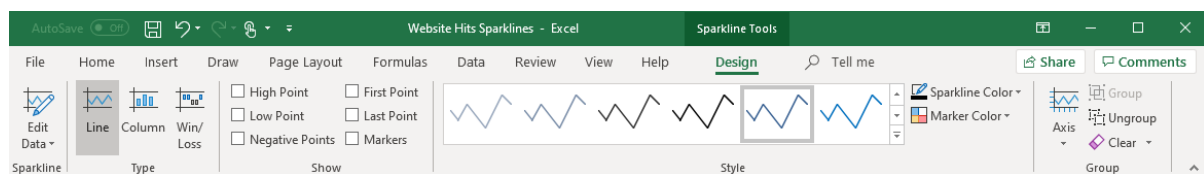


Figure 6-16: Sparkline Tools Design tab

To remove the sparkline chart(s) from your worksheet, use the Clear button. To remove the sparkline from just one cell, use Clear Selected Sparklines. To remove the entire sparkline group, use Clear Selected Sparkline Groups.

Learn to insert sparklines

In this exercise, you will insert sparkline charts.

- With the My Website Hits workbook open, click the **Sheet1** tab, if necessary, then select cell **J5**.
- On the Insert tab, in the Sparklines group, click **Line**.

The Create Sparklines dialog box appears.

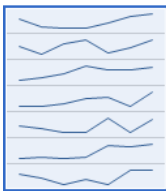
3. Delete any cell references that may be in the Data Range text box, then select the cell range **B5 to H5**. You may have to move the Create Sparklines dialog box aside to select this cell range.
4. Ensure that **\$J\$5** displays in the Location Range text box. If it does not, delete any cell references that may be in the Location Range text box, then select cell **J5** from the worksheet and click **OK**.

A sparkline chart now appears in cell J5. You can copy this to the other cells in column J.

Hint: to create a sparkline group at one time using the Create Sparklines dialog box, in step 4, you would select the entire cell range of B5:H11 as the Data Range and cells J5:J11 as the Location Range.

5. With cell **J5** selected, click and drag the AutoFill handle in the lower right corner of cell **J5** down to cell **J11**.

After pasting the sparkline chart to the other cells, Excel automatically designates the entire range of cells as a sparkline group. Therefore, a format change to one of those cells automatically applies to the other cells in the group. Whenever you select one or more cells in a sparkline group, a boundary line appears around the group to indicate that those cells belong together.

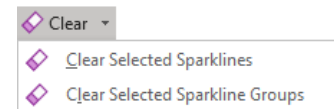


You can also use the copy and paste method to copy the sparkline chart from one cell to the other cells. When you use this technique, however, Excel does not treat the originating cell as a member of the sparkline group. Because of this, you should always use the AutoFill technique to create a sparkline group in adjacent cells. Otherwise, you will have to manually add the originating cell to the sparkline group.

6. Click in cell **J5**, then, if necessary, click the **Sparkline Tools Design** tab.
7. On the Sparkline Tools Design tab, in the Show group, click the **High Point** and **Low Point** check boxes to turn them on.
8. With cell **J5** selected, on the Sparkline Tools Design tab, in the Type group, click **Win/Loss** to convert the line sparkline to a group of columns (a win/loss sparkline).
9. On the Sparkline Tools Design tab, in the Type group, click **Column** to change the line sparkline to a group of columns of varying heights (a column sparkline).

Now clear the sparkline group.

10. On the Sparkline Tools Design tab, in the Group group, click the **Clear** arrow and click **Clear Selected Sparkline Groups**.



11. In the Quick Access Toolbar, click **Undo**.

The column sparkline group is restored.

	A	B	C	D	E	F	G	H	I	J
1	Tolano Adventures									
2	Website Hits									
3										
4	Office	January	February	March	April	May	June	July	Total	
5	New York	8,125	5,947	5,420	5,647	7,134	9,015	10,000	51,288	
6	Cape Town	3,120	2,097	3,407	3,885	2,352	3,024	4,000	21,885	
7	Toronto	1,017	1,281	1,512	2,107	1,825	1,761	2,000	11,503	
8	London	5,530	5,852	6,366	7,760	8,257	5,619	10,000	49,384	
9	Tokyo	6,905	6,471	5,648	5,665	8,412	5,808	8,000	46,909	
10	Sydney	3,324	3,544	3,155	3,574	5,565	5,346	6,000	30,508	
11	Corporate	904	804	641	772	632	998	1,000	5,751	
12	Total	28,925	25,996	26,149	29,410	34,177	31,571	41,000		

12. Save the workbook and keep it open for the next exercise.

Printing Charts

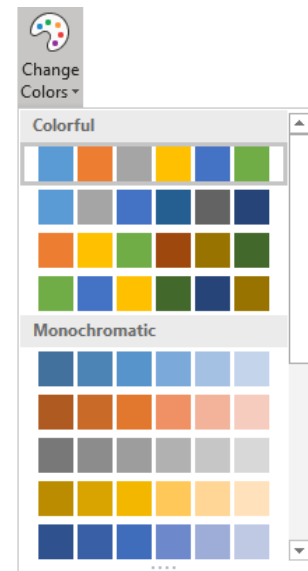
You can print charts as part of a worksheet or on their own as individual chart sheet(s). Depending on the circumstances, each method has its own set of advantages.

When you print a chart as part of a worksheet, you are printing a worksheet. In other words, any data or other charts that are on the worksheet will also be printed at the same time. Therefore, you can change the appearance of the printout by rearranging the worksheet: the chart can be moved around with the data above, below, or next to it. You can also change the size of the chart and the formatting of the data.

If you select only the chart for printing, whether it is on a worksheet or in its own chart sheet, only that chart will be printed. Any data or other charts that may be on the same worksheet will not be included in the printout. The chart will automatically resize itself to the size of the page.

The color charts that Excel creates are interesting to look at on the screen but you may get very different results if you are printing using a black and white printer. The many different chart colors will then convert to various shades of gray which are difficult to distinguish from each other. To ensure that you get the best results, on the Chart Tools Design tab, in the Chart Styles group, click Change Colors, then click one of the Monochromatic (that is, single-color) options to select a color palette that is more favorable to black and white printers.

As an alternative to selecting a monochromatic color palette, you can manually select a different fill pattern of your choosing for each series. These fill patterns allow readers to quickly identify the series (city, in the example shown in Figure 6-17) within each group. To do this, double-click the column or bar you would like to fill, and the Format Data Series task pane will appear. Select the Fill & Line tab, expand the Fill group, click Pattern fill, and then select a pattern. This option works with other chart features such as pie slices and areas.



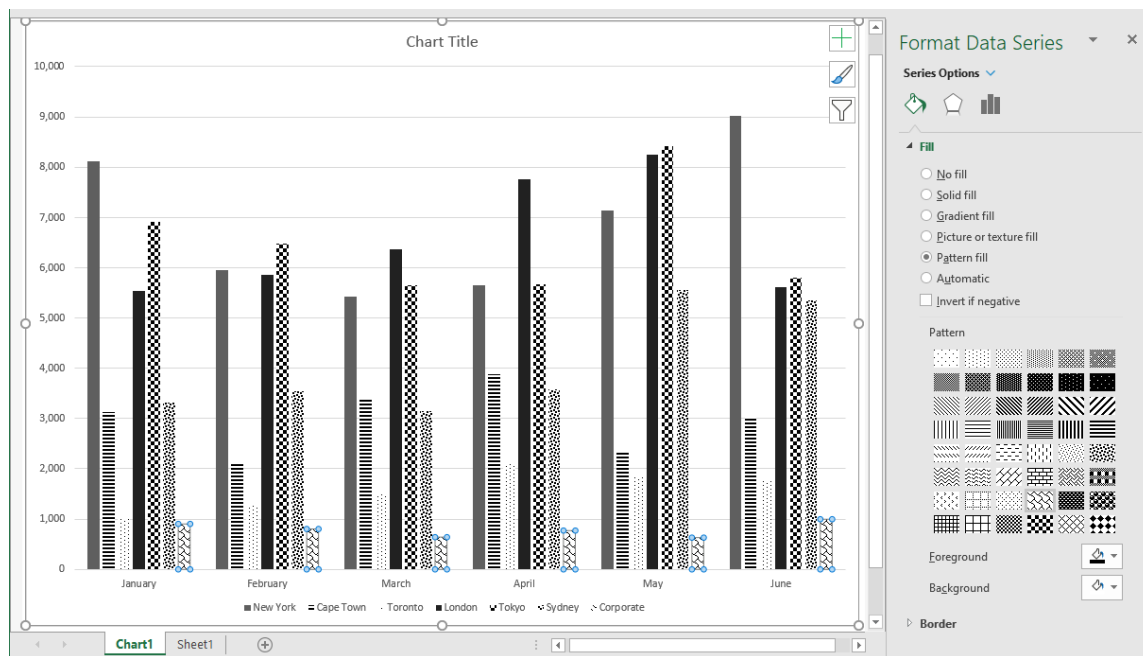
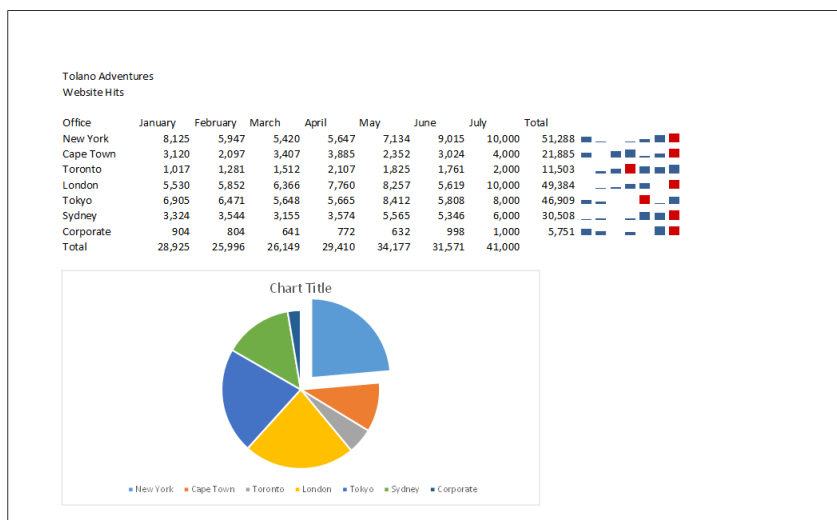


Figure 6-17: Chart with pattern fills for data series

Learn to preview charts for printing

In this exercise, you will preview charts for printing.

1. Ensure the My Website Hits workbook is open and that the **Sheet1** worksheet is selected.
2. Click any cell outside of the pie chart so that the chart is not selected.
3. Click **File** and then click **Print**.
4. Click **Portrait Orientation** and then click **Landscape Orientation** to change the orientation.



As long as the chart is not in edit mode, Excel prints the worksheet with all of the contents including any chart(s).

Now preview only the pie chart on its own for printing.

5. Click the **Back** button, then click in a blank area inside the pie chart to select it and put it into edit mode.
6. Click **File** and then click **Print**.
7. If necessary, click **Portrait Orientation** and then click **Landscape Orientation** to change the orientation.
8. Click the **Back** button, then click in a blank cell outside of the pie chart.
9. Click the **Chart1** worksheet tab.
10. Click **File** and then click **Print**.

Because this is a chart sheet, only the chart will print, even though it is not in edit mode.

11. Click the **Back** button.
12. Save and close the workbook.

Using the Quick Analysis Tool

Objective 2.4.2

As described earlier in this lesson, the first step when creating a chart is to select the range of cells. This same action is used for several different tasks including adding conditional formatting. Whenever a range of cells is selected, a Quick Analysis icon is displayed next to the bottom right corner cell, as shown in Figure 6-18.

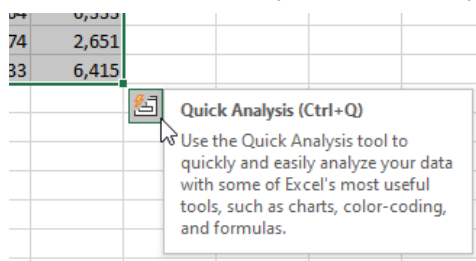
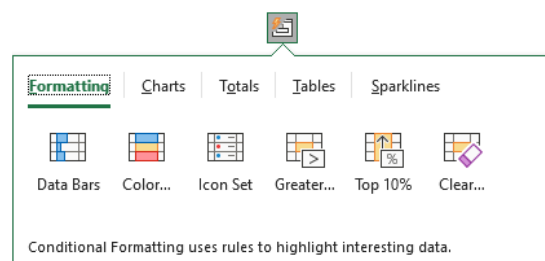


Figure 6-18: Quick Analysis icon

When you click on the icon, a pop-up menu displays with multiple options that are often selected for a cell range. These are arranged into the following groups:

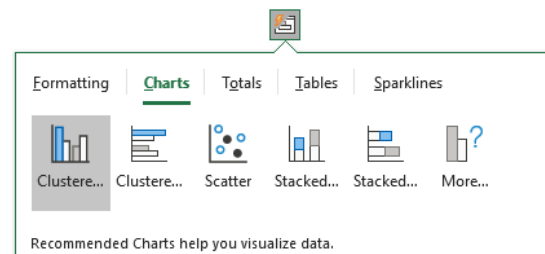
Formatting

Used to add conditional formatting to the selected range of cells.



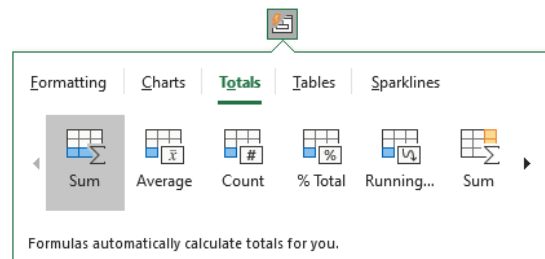
Charts

Used to add a chart for the selected range of cells.



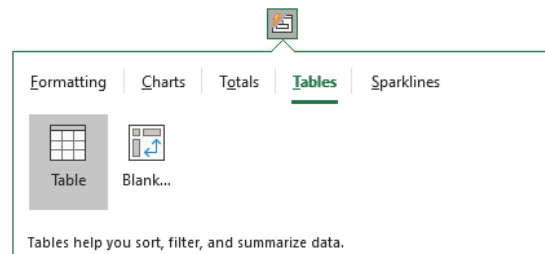
Totals

Used to add summary totals below or to the right of the selected range of cells.



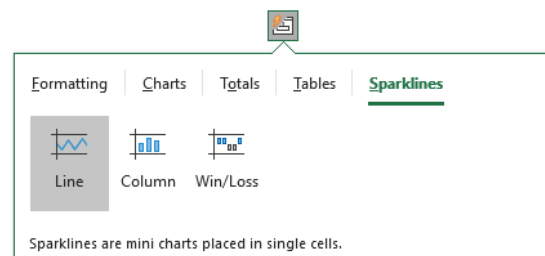
Tables

Used to convert the range of cells to a table or to create a PivotTable. (PivotTables are discussed in detail in the Excel Expert courseware.)



Sparklines

Used to add sparklines to the right of the selected range of cells.



Learn to use the Quick Analysis Tool

In this exercise, you will use the Quick Analysis Tool to create conditional formatting, charts, totals, and sparklines.

1. Open the **Caribbean Vacation Bookings** workbook located in the *StarterFiles* folder and save it as: **My Caribbean Vacation Bookings** in the *MyProjects* folder.
2. Select the cell range **B5 to G12**.
3. Click the **Quick Analysis** icon below the bottom right corner of the selected range.

When selected, the Quick Analysis menu displays the conditional formatting options by default.

4. With the **Formatting** category selected, point to the **Data Bars** conditional format.

		2013	2014	2015	2016	2017	2018
5	Antigua	1,912	1,668	1,730	1,870	2,229	1,453
6	Bahamas	1,529	1,157	2,710	4,001	2,146	2,999
7	Barbados	1,287	1,771	1,300	2,129	1,753	3,289
8	Bermuda	3,467	3,167	4,247	2,801	5,243	4,301
9	Cancun, Mexico	7,185	7,774	15,586	10,540	14,863	12,795
10	Costa Rica	2,129	3,983	8,614	7,164	4,264	6,333
11	Dominican Republic	2,564	3,172	5,064	2,565	4,074	2,651
12	Jamaica	1,788	3,158	3,741	4,315	5,533	6,415

- Move the mouse pointer to point to each of the other conditional formatting options.
- Click the **Greater Than** conditional format.
The cells in the range containing the largest values are highlighted.
- In the Greater Than dialog box, change the value to **5000** and click **OK**.

Greater Than ? X

Format cells that are GREATER THAN:

5000 with Light Red Fill with Dark Red Text

OK Cancel

All values greater than 5,000 are highlighted in the range.

5	Antigua	1,912	1,668	1,730	1,870	2,229	1,453
6	Bahamas	1,529	1,157	2,710	4,001	2,146	2,999
7	Barbados	1,287	1,771	1,300	2,129	1,753	3,289
8	Bermuda	3,467	3,167	4,247	2,801	5,243	4,301
9	Cancun, Mexico	7,185	7,774	15,586	10,540	14,863	12,795
10	Costa Rica	2,129	3,983	8,614	7,164	4,264	6,333
11	Dominican Republic	2,564	3,172	5,064	2,565	4,074	2,651
12	Jamaica	1,788	3,158	3,741	4,315	5,533	6,415

Conditional formatting can be easily removed using the Clear option.

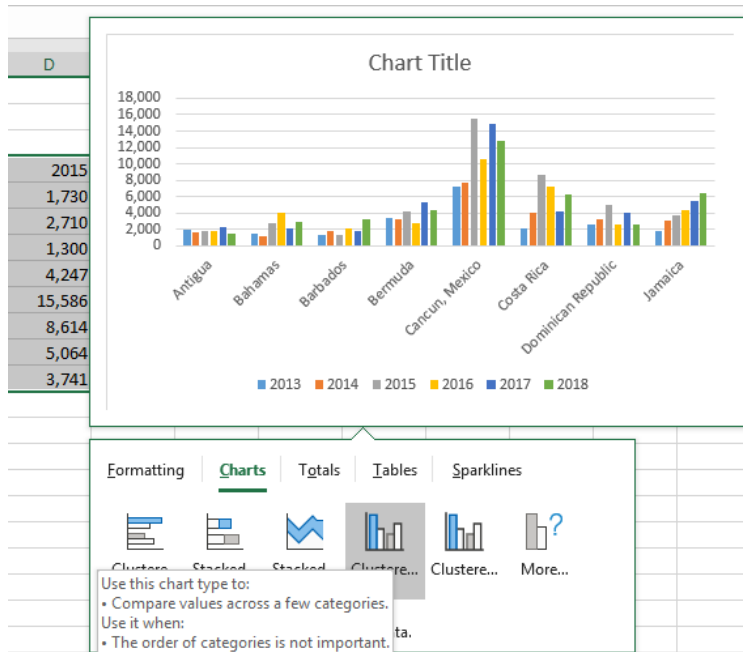
- Click the **Quick Analysis** icon again and click **Clear Format** in the Formatting category.

The conditional formatting is removed.

Charts can be easily created with the Quick Analysis Tool. However, you should include the row and column containing the headers.

- Select the cell range **A4 to G12**, then click the **Quick Analysis** icon and click the **Charts** category.
- Hover over the first Clustered Column on the left, then over the second one, and compare the differences between the two.

The two charts give you the option of where to show the rows as X-axis categories and the columns as data series or switched the other way.

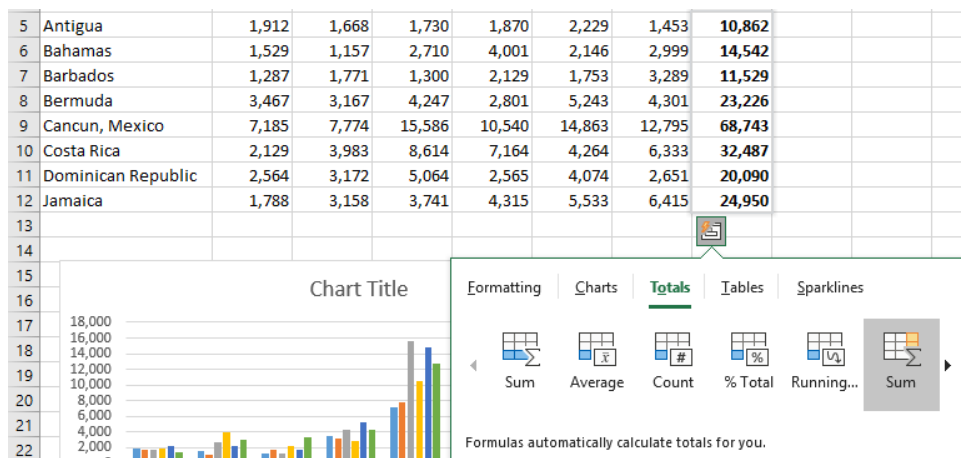


11. Click the **Clustered Column** option on the left, then drag the chart to a new position below the worksheet data. Be sure there is at least one blank row between the data and the chart.

Now use the Quick Analysis Tool to create summary calculations for you.

12. Select the cell range **A5 to G12** again and click the **Quick Analysis** icon.
13. Click the **Totals** category, then point to the **Sum** option on the left, and then point to the **Sum** option on the right.

Notice that the icon indicates where the summary total calculations are placed in the worksheet.



14. Click the **More** button (right-facing arrow) to scroll the Quick Analysis menu to the right to see more options, then point to each of the options.
15. Click in a blank area of the worksheet to close the Quick Analysis menu.

Now insert sparklines. Be sure to select only the cells containing actual data that do not include the headings.

16. Select the cell range **B5:G12**.

17. Click the **Quick Analysis** icon.
18. Click the **Sparklines** category and point to each of the sparklines options.
19. Click **Column** to enable these sparklines in column **H**.

1,870	2,229	1,453	
4,001	2,146	2,999	
2,129	1,753	3,289	
2,801	5,243	4,301	
10,540	14,863	12,795	
7,164	4,264	6,333	
2,565	4,074	2,651	
4,315	5,533	6,415	

20. Save and close the workbook.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- ☒ Create charts.
- ☒ Move a chart to a new location or to its own chart sheet.
- ☒ Resize a chart to a different size or shape.
- ☒ Change the chart type.
- ☒ Work with pie charts.
- ☒ Change the chart design.
- ☒ Add new data to a chart.
- ☒ Create, customize, and remove sparkline charts.
- ☒ Preview charts for printing.
- ☒ Use the Quick Analysis Tool.

Key Terms

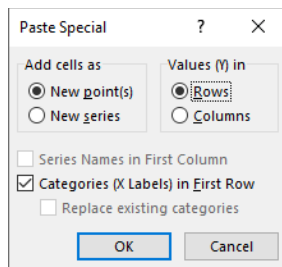
Term	Definition
Chart	A pictorial representation of the data you enter in a worksheet.
Legend	A box on a chart that explains the meaning of each line in a line chart, or bar in a bar chart.
Series	Each set of data used in a chart.
X axis	The horizontal edge of a chart, marking the scale used there.
Y axis	The vertical edge of a chart, marking the scale used there.

Quiz Questions

For each question, select the best answer.

1. You can create a chart by:
 - a. clicking Insert Column or Bar Chart, and then typing data into the chart datasheet.
 - b. selecting data in a worksheet, and then clicking Insert Column or Bar Chart.
 - c. clicking the Chart function in the function library.
 - d. You can use any of these methods to create a chart.
2. Which of the following are chart types supported in Excel?
 - a. Area, block, combo
 - b. Block, column, bar
 - c. Column, line, bar
 - d. Stock, surface, sonar
3. Which of the following types of chart is suited for displaying relative sizes (or percentages) of each piece of a total?
 - a. Column
 - b. Line
 - c. Bar
 - d. Pie
4. How many series of data can be shown on a pie chart?
 - a. One
 - b. Two
 - c. Three
 - d. Any number
5. Which of the following are changes you can make to a chart design?
 - a. Fill or outline color, reflection, change the chart type.
 - b. Add a chart title or legend, select a different chart layout, exchange the data rows and columns, and change the chart type.
 - c. Shadow effects, height and width, fill or outline color.
6. Which of the following are types of sparkline charts?
 - a. Star, Column and Bar
 - b. Column, Star and Win/Loss
 - c. Line, Bar and Column
 - d. Line, Column and Win/Loss
7. Which of the following is the Quick Analysis Tool used for?
 - a. Insert a trend line to a chart.
 - b. Perform what-if analysis.
 - c. Insert charts, sparklines, pivot tables, and conditional formatting.
 - d. Inspect a chart for errors.

8. If a chart is in a worksheet with other data, how can you print only the chart?
- On the Print tab in Backstage view, in the Settings area, click the Print Chart Only button.
 - Drag the chart to an empty area of the worksheet and then print – the second page of printed output will contain the chart.
 - Be sure to click inside the chart to select it and put it into edit mode before accessing the Print tab in Backstage view.
 - You must move a chart to its own chart sheet if you want to print only the chart.
9. Jamie is presented with the Paste Special dialog box shown below. What is Jamie doing?



- Switching chart columns and rows
 - Adding a data series to a chart
 - Adding a legend to a chart
 - Pasting a chart into its own chart sheet
10. Where do you specify alternative text for a chart?
- In the workbook document properties
 - In the chart legend
 - In the Alt Text task pane
 - In the Select Data Source dialog box
11. A chart will automatically resize itself to fill the entire sheet when:
- you move it to its own chart sheet.
 - you select one of the AutoFit Quick Layouts.
 - you move the chart to cell A1.
 - you add an empty range as the final data series.
12. You can use the Add Chart Element command on the ribbon to:
- Move the chart to its own chart sheet.
 - Change the colors in the chart.
 - Change the layout of the chart.
 - Add data labels to a chart.
13. Where can you find the command that will allow you to apply different layouts to a chart?
- On the Chart Tools Design tab
 - On the Chart Tools Format tab
 - In the Styles group on the Home tab
 - You can apply a layout only when you are creating a chart.

14. Matt added a new chart to his worksheet. It shows the correct data, but the data series and categories do not provide the correct focus for the data. What can he do?
- Rearrange the data in his worksheet so that the chart shows the data the way he wants.
 - Apply a different chart layout to the chart.
 - Click the Switch Row/Column button.
 - Try using a different chart type.
15. Which of the following methods can you use to "explode" a piece of a pie chart?
- Select the piece and press CTRL+E.
 - Click and drag the desired piece away from the rest of the pie.
 - Select the piece, then apply the Exploded Series Point style.
 - You can use any of these methods to explode a piece of a pie chart.
16. Where can you find predefined styles to apply to a chart?
- On the Chart Tools Design tab
 - On the Chart Tools Format tab
 - In the Add Chart Element drop-down list
 - In the Change Chart Type drop-down list

Microsoft® Excel

Associate Certification Guide

Lesson 7: Organizing Data

Lesson Objectives

In this lesson, you will explore methods for organizing data. Upon completion of this lesson, you should be able to:

- ☐ Create, modify, and delete range names.
- ☐ Use the Go To feature to jump to a cell or named range.
- ☐ Convert a range of cells into a table.
- ☐ Modify a table by adding and deleting rows and columns of data.
- ☐ Apply and remove formatting on a table.
- ☐ Convert a table to a range of cells.
- ☐ Sort data.
- ☐ Filter data.

Working with Named Ranges

Creating Named Ranges

Objective 2.3.1, 4.1.2

When developing worksheets, you will find that they quickly become very large and it becomes difficult to keep track of all the cells. One useful feature to help you cope with the vast amount of data is the ability to create a meaningful name for a cell or **range of cells**. For example, it is much easier to understand the formula `=Total_Revenues–Total_Expenses` than a cryptic formula such as `=C7–C18`. With meaningful names, it becomes easier for users to understand the purpose of these cells. **Named ranges** are labeled in the Name Box to the left of the formula bar. The name is displayed only when all the cells in the range are selected.

To define a range with a name, select the range and then use one of the following methods:

- On the Formulas tab, in the Defined Names group, click Define Name. The New Name dialog box appears, as shown in Figure 7-1.

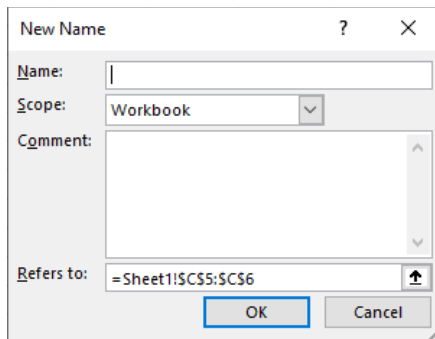


Figure 7-1: New Name dialog box

Type the name in the Name field and click OK.

- On the Formulas tab, in the Defined Names group, click Name Manager. The Name Manager dialog box appears, as shown in Figure 7-2.

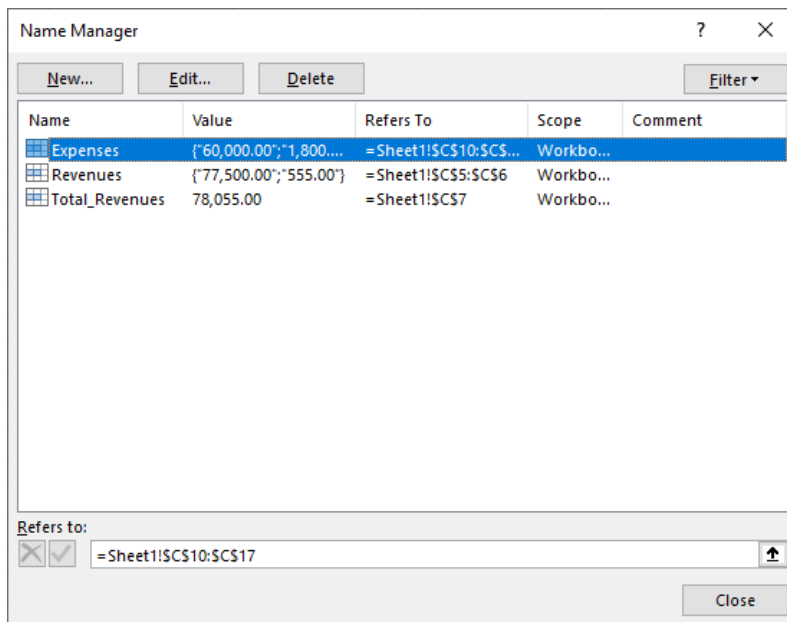


Figure 7-2: Name Manager dialog box

Click the New button in the Name Manager dialog box to open the New Name dialog box, type the name in the Name field and click OK.

- Right-click the selected range and then click Define Name to open the New Name dialog box. Type the name in the Name field and click OK.
- Click in the Name Box to the left of the Formula Bar, type the name and press ENTER.

You can also quickly create multiple named ranges by using the row and/or column headings already in place. Select the range of cells including the headings you want to use as cell range names, then on the Formulas tab, in the Defined Names group, click Create from Selection. The Create Names from Selection dialog box appears, as shown in Figure 7-3.

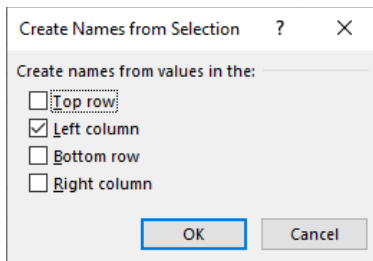


Figure 7-3: Create Names from Selection dialog box

Use the check boxes in the dialog box to specify the cells that contain the text to be used as the range names. Click OK to define the named ranges in the worksheet. If there are spaces in the headings, the spaces will be replaced with underscore (_) characters.

Range names can be from 1 to 255 characters in length. They may contain alphabetic or numeric characters (alphanumeric), underscores (_), backslashes (\), periods (.) and question marks (?). You cannot use spaces in range names. The first character must be alphanumeric, an underscore, or a backslash. Range names are not case sensitive (for example, Sales=SALES=sales).

Using Named Ranges

Objective 4.1.2

Once you define a name for a cell or a range of cells, you can use that name when creating formulas. Excel also provides tools to convert formulas by replacing the cell references with their new range names.

The named ranges can also be accessed using the Name Box, located to the left of the formula bar. Type the named range desired in the Name Box or click the arrow for the drop-down menu and choose from the list of defined named ranges on the worksheet. You can also quickly jump to a named range by using the Go To feature.

In addition to making spreadsheets easier to read, range names can reduce the number of errors made. For example, the formula `=C7-C18` can easily be entered incorrectly. However, if you incorrectly enter a range name in a formula, Excel will not be able to match the incorrectly entered range name to any cell and will display an error message.

Range names also reduce errors if you change the cells included in the range. For example, suppose you change the cell range for the range name *Expenses* from C10:C18 to C10:C19. Because you used a range name, you can change the cell range once, and every formula in the workbook that uses the *Expenses* range name will be automatically updated. If you did not use a range name, then you would need to manually ensure that the cell range C10:C18 is changed to C10:C19 everywhere it is used in the workbook. You would likely miss one or more instances.

Learn to create range names

In this exercise, you will create range names and create formulas that use range names.

1. Open the **Income Statement** workbook located in the *StarterFiles* folder and save it as: **My Income Statement** in the *MyProjects* folder.
2. Select cells **C5:C6**.
3. On the Formulas tab, in the Defined Names group, click **Define Name**.

The New Name dialog box appears with the cell range entered.

4. In the Name field, type: **Revenues** and click **OK**.

From now on, whenever you select these two cells, the range name *Revenues* displays in the Name Box, which appears to the left of the formula bar.

Revenues		
X ✓ f_x 77500		
A	B	C
1	Tolano Adventures	
2	Income Statement	
3		
4	Revenues:	
5	Sales	77,500.00
6	Other Revenues	555.00
7	Total Revenues	
8		

5. Select cell **C5**, then select cell **C6** and observe what displays in the Name Box in each instance.
6. Select the cell range **C5:C6** and observe what displays in the Name Box.

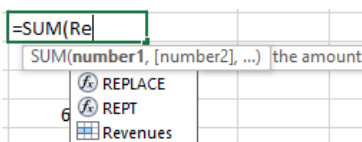
The range name appears only when the entire range is selected.

7. Select cells **C10:C17**. On the Formulas tab, in the Defined Names group, click **Define Name**.
8. In the Name field, type: **Expenses** and click **OK**.

Create a formula that uses a named range.

9. Select cell **C7**.
10. Type: **=SUM(Revenues)** and press **ENTER**.

Notice that as you type the first one or two characters of the range name, a quick tip box appears, showing you this name and other functions with similar names.



You can use the mouse to double-click the range name in the quick tip box to select it and continue with entering the rest of the formula.

11. Select cell **C18**, type: **=SUM(ex** to enter the first part of the formula.
12. Double-click the **Expenses** name in the quick tip box to select it, type: **)** and press **ENTER**.

Create a named range from selected cells.

13. Select cells **B7:C7**.
14. On the Formulas tab, in the Defined Names group, click **Create from Selection**.

The Create Names from Selection dialog box appears.

15. Verify that the **Left column** check box is the only one selected and click **OK**.
16. Select cell **C7**.

Note that the range name in the Name Box is **Total_Revenues**.

Hint: Excel does not permit blank spaces in range names. You can use the underscore character as one alternative between the words in a multi-word range name.

Now use the Name Manager.

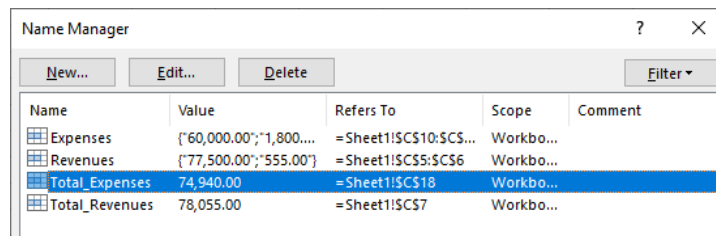
17. Select cell **C18**.
18. On the Formulas tab, in the Defined Names group, click **Name Manager**.

The Name Manager dialog box appears.

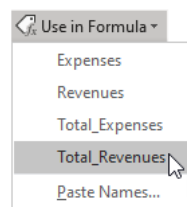
19. In the Name Manager dialog box, click **New** to open the New Name dialog box.
20. Verify that the Name is **Total_Expenses** and that the *Refers to* field contains the formula **=Sheet1!\$C\$18**, then click **OK**.

If the Name Manager dialog box is blocking access to the worksheet behind it, you can minimize it temporarily by clicking the **Collapse** button to the right of the *Refers to* field. You can then select a range of cells from the worksheet.

The new range name now appears in the Name Manager dialog box.



21. Click **Close** to close the Name Manager dialog box.
22. Select cell **C20**, and type: **=**.
23. On the Formulas tab, in the Defined Names group, click **Use in Formula**.



24. Click **Total_Revenues**, then press – (minus) to indicate that you are going to perform a subtraction operation.
25. On the Formulas tab, in the Defined Names group, click **Use in Formula**. Click **Total_Expenses** and press **ENTER**.
26. Save the workbook and keep it open for the next exercise.

Modifying and Deleting Named Ranges

Objective 2.3.1

You can use the Name Manager to modify and delete range names or change the cell range references.

In some cases, Excel will automatically adjust the named range, and in others, you must adjust the named range manually. For example, you may find that you need to add rows to a named range. If you add the rows inside the range, Excel automatically includes the new data as part of the named range. If you add the new data outside of the range, you will need to expand the named range to include the new row(s).

Be cautious when deleting named ranges. When you delete a named range, any formula that refers to this name no longer displays the correct value. Deleting a range name may also cause a domino effect with other formulas that indirectly refer to this formula.

Learn to modify named ranges

In this exercise, you will use the Name Manager to update and delete range names.

1. Ensure the My Income Statement workbook is open.
2. Click the gray header for row **18** to select the entire row. Right-click in the selected row and click **Insert** in the shortcut menu.
3. Select cell **B18**, type: **Travel** and press **TAB**.
4. In cell **C18** type: **1400** and press **ENTER**.

Note that none of the figures in the report changed because the new entry sits outside of the named range *Expenses*.

Now expand the named range to include the new entry.

5. On the Formulas tab, in the Defined Names group, click **Name Manager**.
6. In the Name Manager dialog box, click the **Expenses** row to select it.
7. In the *Refers to* text field, change the range to **=Sheet1!\$C\$10:\$C\$18** as the range.
8. Click **Update** (the checkmark) to the left of the field to update the reference in the Name Manager dialog box, and then click **Close**.

The worksheet should now show the correct calculations for each of the functions.

	A	B	C
1		Tolano Adventures	
2		Income Statement	
3			
4		Revenues:	
5		Sales	77,500.00
6		Other Revenues	555.00
7		Total Revenues	78,055.00
8			
9		Expenses:	
10		Rent	60,000.00
11		Telephone	1,800.00
12		Internet	1,500.00
13		Photocopier	960.00
14		Supplies	3,000.00
15		Courier	780.00
16		Advertising	3,000.00
17		Utilities	3,900.00
18		Travel	1,400.00
19		Total Expenses	76,340.00
20			
21		Net Income	1,715.00

Try deleting a range name and see how it affects the worksheet.

9. On the Formulas tab, in the Defined Names group, click **Name Manager**.

10. Click the **Revenues** row and then click **Delete**.

Excel displays a message box asking you to confirm the deletion of this range name.

11. Click **OK** in the message box and then click **Close** to close the Name Manager dialog box.

Excel displays an error indicator in cell C7, which contains a formula that references the deleted range name. Note also that the change has affected the formula in cell C21, even though it does not reference the range name *Revenues* directly.

12. In the Quick Access Toolbar, click **Undo**.

13. Save the workbook and keep it open for the next exercise.

Go To a Cell or Named Range

Objective 1.2.2

Moving from cell to cell in a worksheet is very simple because the process is the same as with other Windows programs. You can select a cell that appears on the screen simply by clicking on it. If you need to scroll to sections of the worksheet that are currently off the screen, you can use the scroll buttons.

In Excel, you can use a quicker method of jumping to a specific cell (if you know exactly what the cell address is) by using the Go To feature.

With very large worksheets, the Go To feature helps you to navigate more easily. To display the Go To dialog box (Figure 7-4), use one of the following methods:

- Press F5.
- Press CTRL+G.

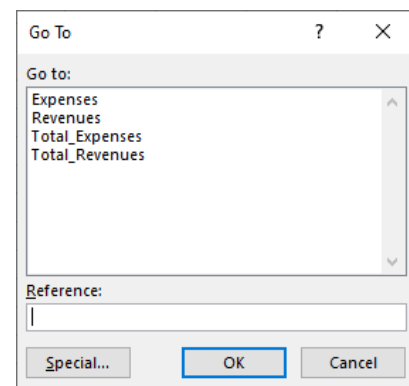


Figure 7-4: Go To dialog box

Alternatively, you can use the Name Box (Figure 7-5) located to the left of the formula bar to select a named range of cells or to jump to a specific worksheet cell.

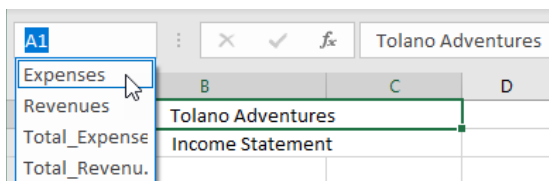


Figure 7-5: Named ranges in the Name Box drop-down list

Learn to use the Go To feature

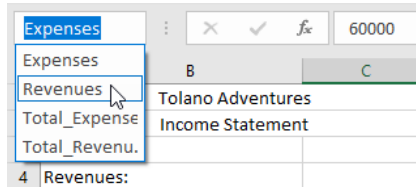
In this exercise, you will use the Go To dialog box and the Name Box to jump to specific cells.

1. Ensure the My Income Statement workbook is open.
2. Click on cell **A3** to jump to that cell using the mouse.

3. Press **F5** to open the Go To dialog box.
4. In the Go To dialog box, click **Expenses** and click **OK**.

Use the Name Box to jump to another named range.

5. Click the drop-down arrow in the **Name Box** and click **Revenues**.



6. Press **CTRL+G**, type: **H14** in the Reference text box (be sure that H14 is the only address in that text box) and click **OK**.
7. Click in the **Name Box**, type: **F3** and press **ENTER**.
8. Save and close the workbook.

Using Tables

Creating a Table

Objective 3.1.1

Many worksheets consist of a rectangular block of data in which the rows and columns of data have a common structure and format. Excel offers you the ability to define this block as a **table**. When you define a block of data as a table, you can use a variety of table tools for selecting summary formulas, formatting, sorting, and filtering. These same features are available even without using tables but you must manually select the range of cells before using the features (with summary formulas and sorting, Excel will guess which cells you want but you still have to verify the range is correct). However, by defining a range of cells as a table, you indicate to Excel that this group belongs together as a single unit. These same tools are then easier to apply because Excel now knows which cells to include.

A table is not the same as a named range of data but you can define a range name for a table if you wish.

To create a table, the data must be contiguous. That is, there must not be any blank rows or columns in the range of cells. Also, the data must be arranged in row order, with an optional header at the top of each column and the data listed below.

To convert a selected range of cells containing data to a table, use one of the following methods:

- Click the Quick Analysis tool, click the Tables category, then click Table.
- On the Home tab, in the Styles group, click Format as Table, then click a table style.
- On the Insert tab, in the Tables group, click Table.
- On the Home tab, in the Styles group, click Format as Table, then click a table style.
- Press CTRL+T.

With the last two methods, the Create Table dialog box (Figure 7-6) appears. If the cells containing headers are included in the selection, be sure to select the *My table has headers* check box. (Often, this check box is selected automatically.) Otherwise, default headers will be inserted at the top of the data.

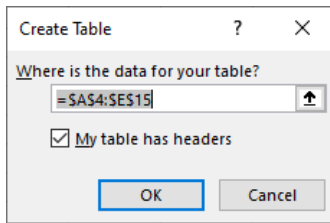


Figure 7-6: Create Table dialog box

Configuring Table Style Options

Objective 3.1.2, 3.2.2, 3.2.3

Once you create the table, Excel activates an AutoFilter icon next to each column title and applies the current active theme. The Table Tools Design contextual ribbon tab (Figure 7-7) is also added to the Ribbon.

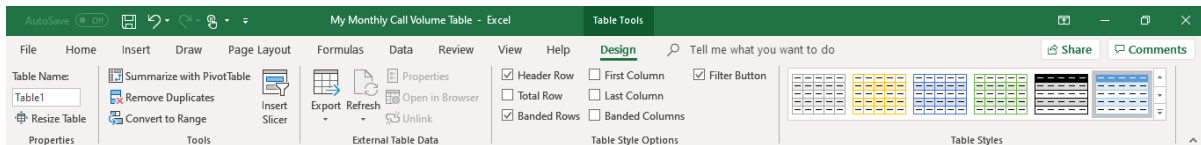


Figure 7-7: Table Tools Design tab

The Table Styles group includes pre-defined table styles that you can apply to the table.

The Table Style Options group includes options you can use to:

- Show the header row (by default, the header is shown).
- Add a Total Row at the bottom of the table. When you activate the Total Row, Excel automatically moves any data below the table down by one row.
- Highlight the first or last column – or both – with the bold attribute. By default, both options are turned off.
- Apply “banding” to rows by using two different color shades for alternating rows. This feature often improves the readability of tables that are very wide because data in the same row have the same color. Similarly, Banded Columns alternate two different color shades for columns. By default, the Banded Rows option is turned on, but Banded Columns is turned off.
- Turn the AutoFilter icon off.

Naming and Using Tables in Formulas

Objective 2.3.2, 4.1.2

Whenever a table is created, Excel assigns to the data range the default name *Table1* (or the next available incremental number if tables were previously created in the workbook).

You can rename the table to something more meaningful by clicking on the table and then clicking the Table Tools Design tab. In the Properties group, click in the Table Name text box and replace the default name with your desired table name.

You can use a table name in a formula, just as you can use a named cell range. For example, the formula `=SUM(CallVolume)` will calculate the sum total for all numeric values in the table named *CallVolume*.

Because tables can contain a lot of data, you also have the ability to reference individual columns within the table by adding the column title within square brackets, for example, =SUM(CallVolume[Sales Inquiries]). This type of cell reference is known as a **structured reference**. Figure 7-8 shows an example of a formula that uses a structured reference.

Tolano Adventures						
Monthly Call Volume						
Month	Sales Inquiries	Service Inquiries	General Inquiries	Complaints	Total	
Jan-19	8,947	4,799	68	26	13,840	
Feb-19	3,643	5,658	36	14	9,351	
Mar-19	5,861	9,739	0	7	15,607	
Apr-19	3,741	4,429	18	25	8,213	
May-19	4,537	5,420	59	19	10,035	
Jun-19	3,146	1,417	77	12	4,652	
Jul-19	2,533	7,811	19	6	10,369	
Aug-19	7,209	2,188	71	15	9,483	
Sep-19	1,082	8,718	56	24	9,880	
Oct-19	2,748	8,002	72	14	10,836	
Nov-19	5,617	5,000	14	7	10,638	
Total	49,064	63,181	490	169	112,904	
Grand Total	112904					
Sales Inq	49064					
Service Inq	63181					

Figure 7-8: Formula with a structured reference

It is highly recommended that your formulas reference individual columns in tables to avoid unintended results, especially if the tables contain columns with date, time, or text data. If a formula references the entire table, the date and time data will be treated as numeric data and will be included in the formula calculations.

Learn to create tables

In this exercise, you will create and rename a table, configure table style options, and enter formulas to perform calculations on a table.

1. Open the **Monthly Call Volume Table** workbook located in the *StarterFiles* folder and save it as: **My Monthly Call Volume Table** in the *MyProjects* folder.

Convert data to a table.

Hint: When creating a table, leave at least one empty row and column on all sides of the table to separate it from any other data on the worksheet.

2. Click on any cell in the range **A4:E15**.
3. On the Insert tab, in the Tables group, click **Table**.
4. Confirm that the **My table has headers** check box is selected in the Create Table dialog box, and then click **OK**.

The data is now converted into a table.

Rename the table.

5. On the Table Tools Design tab, in the Properties group, click in the **Table Name** field and replace the default name with: **CallVolume** (with no spaces between the words).

Add a Total row and enter some formulas.

6. On the Table Tools Design tab, in the Table Style Options group, select the **Total Row** check box.

A total row is added to the table.

Note: When you activate the Total row, Excel automatically moves any data below the table down by one row.

7. Select cell **B16**, click the drop-down arrow that appears next to it, and click **Average**.

A formula is added to cell B16 that calculates the average for the Sales Inquiries column in the table.

8. Select cell **B16** again, click the drop-down arrow, and then click **Count** to change the formula.
9. Select cell **B16** again, click the drop-down arrow, and then click **Sum** to change the formula once more.
10. Select each of the cells **C16:D16** and select the **Sum** calculation.

Note: You cannot copy the contents of a column total to other cells in a table.

If you also want to display row totals (in a new column to the right of the table), you will have to insert them manually. Tables do not have the ability to create row totals automatically. Row totals show the sum total (or other statistical summary calculations of your choosing) for each row of data.

11. Click cell **F4** and enter: **Total**.

12. With cell F5 as the active cell, on the Home tab, in the Editing group, click **AutoSum** and press **ENTER**.

Even though you only entered the row total for the first row, Excel automatically inserts them for the rest of the rows, except the Total row. This demonstrates one of the advantages of identifying this range of cells as a table.

13. Click cell **F5**.

You can see that the formula used for this sum total is specifically used for tables.

14. Select cell **F16**, click its drop-down arrow, and select **Sum**.

	A	B	C	D	E	F
1	Tolano Adventures					
2	Monthly Call Volume					
3						
4	Month	Sales Inquiries	Service Inquiries	General Inquiries	Complaints	Total
5	Jan-19	8,947	4,799	68	26	13,840
6	Feb-19	3,643	5,658	36	14	9,351
7	Mar-19	5,861	9,739	0	7	15,607
8	Apr-19	3,741	4,429	18	25	8,213
9	May-19	4,537	5,420	59	19	10,035
10	Jun-19	3,146	1,417	77	12	4,652
11	Jul-19	2,533	7,811	19	6	10,369
12	Aug-19	7,209	2,188	71	15	9,483
13	Sep-19	1,082	8,718	56	24	9,880
14	Oct-19	2,748	8,002	72	14	10,836
15	Nov-19	5,617	5,000	14	7	10,638
16	Total	49,064	63,181	490	169	112,904

15. Save the workbook and keep it open for the next exercise.

Modifying Table Data

Objective 3.2.1

After a table is created, you can add or delete rows and columns of data.

To add a new column of data at the far right of a table, simply enter data into the first blank column. Excel will automatically extend the table to include this new column. Similarly, Excel will extend the table to include a new row of data that you enter directly below a table, as long as the Total Row feature is not activated. If the Total Row is activated, you must use one of the following methods:

- Manually insert a new blank data row by clicking on the bottom right cell containing data (immediately above the Total Row), and then clicking the TAB key.
- Manually insert a new blank data row by clicking any cell in the bottom data row, then on the Home tab, in the Cells group, click the Insert arrow, and click Insert Table Row Below.
- Add the new row of data below the Total Row, and then manually extend the table to include the new row.

After adding new data to a table, it is wise to ensure the formula references include the new row or column in the total formulas. You can do this by clicking the cell in which the total is located and checking the formula bar. To create the total formula for the new data, click the drop-down menu in the total cell to create the appropriate formula.

The Insert button in the Home tab can also be used to insert a new row or column anywhere in the table, not just as the last row of data. Be aware that the Insert drop-down menu may show different Insert Table options, including various combinations of Insert Table Rows Above, Rows Below, Columns to the Left and Columns to the Right, depending on which cell in the table is currently selected as the active cell.

Similarly, on the Home tab, in the Cells group, you can use the Delete button to delete rows or columns of data from the table.

Learn to modify table data

In this exercise, you will insert rows and columns into different parts of a table.

1. Ensure the My Monthly Call Volume Table workbook is open.
2. Select cell **F15** and press **TAB**.

Notice that Excel automatically shifts the Total row down by one row and that the formula in cell F15 is copied down to this new row.

3. In cell **A16**, type: **12/1** as the new value and press **TAB**.
4. Enter the following values into the remaining cells of the row:

B16	8969
C16	7375
D16	7
E16	1

Notice also that the statistical formulas in row 17 automatically updated even though the new data were added at the bottom of the list.

5. Select cell **F8**, then on the Home tab, in the Cells group, click the **Insert** arrow, and click **Insert Table Columns to the Left**.
6. Click cell **F4** and enter: **Other**.
7. Enter the following values into the remaining cells of the column:

F5	500	F11	200
F6	300	F12	480
F7	250	F13	100
F8	450	F14	200
F9	400	F15	150
F10	220	F16	300

8. Select cell **F17**, click the drop-down arrow that appears next to it, and click **Sum**.

Because you added a column to the table, you must ensure that the Total column at the far right includes this new column.

9. Click cell **G5** and note the formula in the formula bar.
10. Press **F2**, delete the table cell reference [**Complaints**], replace it with: [**Other**], and press **ENTER**.

A column (or row) can also be easily removed from a table.

11. Click any cell in the range **D4** to **D17**, then on the Home tab, in the Cells group, click the **Delete** arrow, and click **Delete Table Columns**.

The General Inquiries column is deleted.

Add another row of data to the table using a different method.

12. Enter the following values:

A18	January <next year>
B18	7000
C18	4000
D18	20
E18	200

13. Ensure that cell F17 is **not** the active cell, then position the mouse pointer at the bottom right corner of cell **F17** so that the pointer changes to a double-headed arrow .
14. Click and drag the resize handle down to row **18**.

Hint: If the Total Row had not been activated for this table, the new row would have been automatically added to the table.

Because you added the new data below the Total Row, Excel did not know if you intended to keep that data separate from the table. Therefore, you had to manually expand the table to include the January row.

Now delete the newly added row.

15. Select cell **B17**, then on the Home tab, in the Cells group, click the **Delete** arrow, and click **Delete Table Rows**.
16. Save the workbook and keep it open for the next exercise.

Formatting Table Data

Objective 3.1.2, 3.2.2

By default, the theme selected for the workbook is applied to all tables in that workbook. You can override the theme for specific tables by selecting a different table style from the Table Styles gallery (Figure 7-9) on the Table Tools Design tab, in the Table Styles group.

The table style colors option can be removed by choosing the option at the top left of the gallery (None). Colors can be re-applied later if needed again.

The Table Tools Design tab also allows you to activate or de-activate other table formatting options including:

- Highlighting the first or last column – or both – with the bold font option. By default, both options are turned off.
- “Banding” rows by using different color shades for alternating rows. This feature often improves the readability of tables that are very wide because data in the same row have the same color. By default, the Banded Rows option is turned on, but Banded Columns is turned off.
- Turning the AutoFilter icon off.

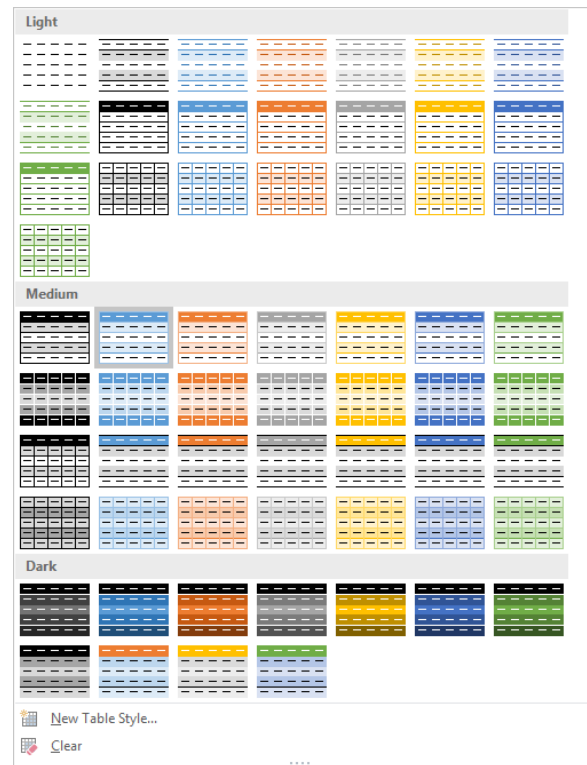


Figure 7-9: Table Styles gallery

Learn to format table data

In this exercise, you will format a table.

1. Ensure the My Monthly Call Volume Table workbook is open.
2. Click any cell in the table.
3. On the Table Tools Design tab, in the Table Style Options group, select the **First Column** and **Last Column** check boxes to turn these features on.
4. On the Table Tools Design tab, in the Table Style Options group, select the **Banded Columns** check box to turn that feature on.

Every second column in the table is now white while the others are shaded. This will become more obvious when you turn row banding off.

5. On the Table Tools Design tab, in the Table Style Options group, deselect the **Banded Rows** check box to turn that feature off.
6. On the Table Tools Design tab, in the Table Styles group, click the **More** button to display all the table styles.

7. Point the mouse pointer at different table styles and observe the live preview effect on the table.

You can also force all table coloring to be turned off, regardless of your banding options.

8. With the Table Styles gallery still displayed, click **Clear**.

Notice that the bolding in the first and last columns, and the Total row in the table are also removed, even though the check boxes in the Table Style Options group are still activated.

In Excel, clearing the table style is the same as selecting the None style.

9. On the Table Tools Design tab, in the Table Styles group, click the **More** button, click the **Green, Table Style Medium 21** option (Medium section, third row, far right).
10. If necessary, select the **First Column** and **Last Column** check boxes to turn these features on.
11. If necessary, select the **Banded Rows** check box to turn this feature on and deselect the **Banded Columns** check box to turn this feature off.

	A	B	C	D	E	F
1	Tolano Adventures					
2	Monthly Call Volume					
3						
4	Month	Sales Inquiries	Service Inquiries	Complaints	Other	Total
5	Jan-19	8,947	4,799	26	500	14,272
6	Feb-19	3,643	5,658	14	300	9,615
7	Mar-19	5,861	9,739	7	250	15,857
8	Apr-19	3,741	4,429	25	450	8,645
9	May-19	4,537	5,420	19	400	10,376
10	Jun-19	3,146	1,417	12	220	4,795
11	Jul-19	2,533	7,811	6	200	10,550
12	Aug-19	7,209	2,188	15	480	9,892
13	Sep-19	1,082	8,718	24	100	9,924
14	Oct-19	2,748	8,002	14	200	10,964
15	Nov-19	5,617	5,000	7	150	10,774
16	Dec-19	8,969	7,375	1	300	16,645
17	Total	58,033	70,556	170	3,550	132,309

12. On the Table Tools Design tab, in the Table Style Options group, deselect the **Filter Button** check box to turn this feature off.
13. Click any of the Header Row cells (A4 to F4) to try to access the AutoFilter icon.
14. On the Table Tools Design tab, in the Table Styles group, select the **Filter Button** check box to turn this feature back on again.
15. Save the workbook and keep it open for the next exercise.

Converting a Table to a Cell Range

Objective 3.1.3

If you no longer wish to keep the data in a table format, you can convert it back to a regular set of rows and columns of data without the table definition. On the Table Tools Design tab, in the Tools group, click Convert to Range to convert the data from a table back to a cell range.

Excel will display the message box shown in Figure 7-10 prompting you to confirm that you want to convert the table back to a normal range.

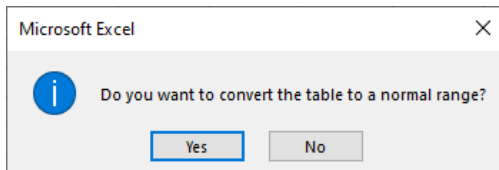


Figure 7-10: Confirm table conversion

The worksheet will not appear any different, except that the Table Tools Design tab no longer appears, and the column titles no longer display the AutoFilter icons.

Learn to convert a table to a range

In this exercise, you will convert a table back to a range.

1. Ensure the My Monthly Call Volume Table workbook is open.
2. Ensure that the active cell is anywhere within the table, then on the Table Tools Design tab, in the Tools group, click **Convert to Range**.
3. In the message box, click **Yes**.

The worksheet does not appear any different, except that the Table Tools Design tab no longer appears and the column titles no longer display the AutoFilter icons.

4. Click the drop-down button on the right side of the Name Box to display the list of any range names in the worksheet.

The list is empty. This indicates that the Convert to Range tool simply converts the data to a set of rows and columns with data. If you want to create range names, you must add them manually.

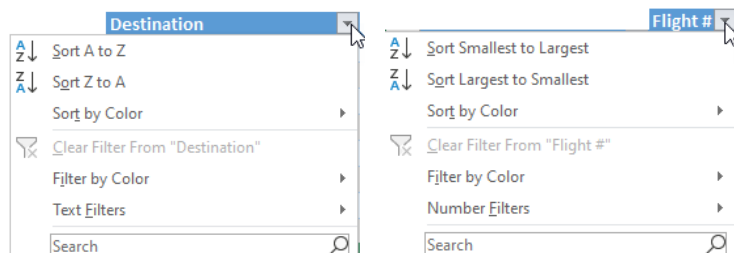
5. Save and close the workbook.

Sorting Data

Worksheets with a large amount of data are often difficult to understand. Excel provides a sorting tool that enables you to change the sequence of the data based on the values in selected columns. After sorting, the data becomes more readable. You can **sort** and re-sort the data as many times as required, using different columns each time. You can sort the data by columns or rows, but the most common method is sorting by columns (with column headers and the data extending downwards).

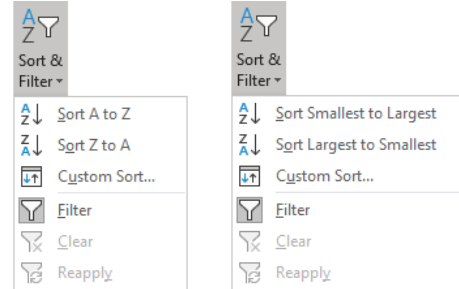
Sorting by Single-Level Data

If your data is organized into a table, you can use the sort options built into the AutoFilter button that appears at the top of each column. However, this menu is limited to sorting by one column.

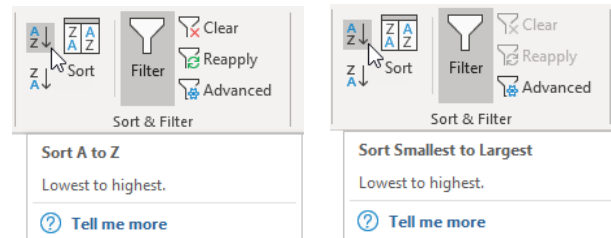


Regardless of whether your data is in a table, the Ribbon has two ready-to-use buttons to enable sorting:

- on the Home tab, in the Editing group, click Sort & Filter and then click Sort A to Z to sort in ascending sequence or Sort Z to A to sort in descending sequence, or



- on the Data tab, in the Sort & Filter group, click Sort A to Z or Sort Z to A.



Depending on what type of data you are sorting, the Ribbon menu will display a different command description. If the data is text, the Ribbon menu will display Sort A to Z and Sort Z to A. If the data contains numbers, the Ribbon menu will display Sort Smallest to Largest and Sort Largest to Smallest. If the data contains date values, the Ribbon menu will display Sort Oldest to Newest and Sort Newest to Oldest.

Sorting by Multi-Level Data

Objective 3.3.2

In many cases, you will need to sort by more than one column to handle situations with multiple rows with the same value. For example, you may have a customer list with several people having the same last name. In this situation, you will want to sort the list using two columns – one containing the customer's last name and the other containing the first name.

To sort by more than one column, you need to specify settings in the Sort dialog box, as shown in Figure 7-11. This figure shows a range of data sorted using three different columns as sort keys. The primary sort key is airline name in ascending order, as indicated by the green marker: A at the top, down to Z at the bottom. The destination name is the secondary sort key, as designated by the first *Then by* selection: for rows with the same airline. These rows are sorted by destination name as indicated by the red box. The third level sort key in this example is the departure time: for rows where the same airline is flying to the same destination on the same day. These rows are sorted by the departure time from earliest to latest as designated in the second *Then by* selection. This group is identified by the blue box.

	A	B	C	D
	Airline	Flight #	Destination	Departure Time
1	Aer Lingus	104	Dublin (DUB)	5:45 PM
2	Aer Lingus	108	Dublin (DUB)	9:50 PM
3	Aer Lingus	110	Shannon (SNN)	6:30 PM
4	Aeroflot	316	Moscow (SVO)	7:00 PM
5	AeroMexico	5610	Albany, NY (ALB)	7:00 PM
6	AeroMexico	5904	Barcelona (BCN)	5:35 PM
7	AeroMexico	5762	Buffalo, NY (BUF)	9:00 PM
8	AeroMexico	5783	Burlington, VT (BTV)	9:00 PM
9	AeroMexico	400	Mexico City (MEX)	9:00 AM
10	AeroMexico	527	Mexico City (MEX)	9:05 AM
11	AeroMexico	400	Mexico City (MEX)	5:50 PM
12	AeroMexico	5388	Norfolk, VA (ORF)	7:30 PM
13	AeroMexico	5776	Philadelphia, PA (PHL)	7:30 PM
14	AeroMexico	5760	Richmond, VA (RIC)	6:35 PM
15	AeroMexico	5722	Rochester, NY (ROC)	8:30 PM
16	AeroMexico	5878	Rome (FCO)	5:30 PM
17	AeroMexico	9411	Rome (FCO)	9:45 PM
18	AeroMexico	5251	Syracuse, NY (SYR)	8:30 PM
19	AeroMexico	5797	Toronto (YYZ)	8:00 PM
20	AeroMexico	5725	Washington, DC (DCA)	8:30 PM
21	Air Berlin	7451	Dusseldorf (DUS)	5:45 PM
22	Air China	982	Beijing (PEK)	4:50 PM
23	Air China	8778	Los Angeles, CA (LAX)	6:00 PM

Sort dialog box settings:

- Sort by: Airline
- Sort On: Cell Values
- Order: A to Z
- Then by: Destination
- Sort On: Cell Values
- Order: A to Z
- Then by: Departure Time
- Sort On: Cell Values
- Order: Smallest to Largest
- My data has headers: ☒

Figure 7-11: Sorting by multi-level data

The settings in the Sort dialog box determine how the data is to be sorted:

Add Level, Delete Level, Copy Level – These buttons allow you to add, delete or copy columns (or rows) in this dialog box to be used as sort keys. Note that the topmost sort key is the highest (primary) sorting level, followed by the remaining levels in descending order.

Move up/Move down – These buttons allow you to change the selected sort level higher or lower in the sorting sequence.

Options – This button displays a dialog box that allows you to sort top to bottom or left to right and choose whether to treat the data as case-sensitive. If you turn the case-sensitive option on, then upper case letters are treated as different characters than lower case characters. For example, the letter “A” is not the same as the letter “a”.

My data has headers – This option tells Excel to treat the first row (or column) of cells as labels or titles for the data below (or to the right). Use this option to prevent sorting the header data together with the other data – they will remain in their place as headers. If the range of cells being sorted does not contain column or row headers, then turn off this setting.

Column/Row – This identifies the column or row to be used for sorting. The sequence of these columns or rows specifies the sorting level. By default, the data is sorted by column with the headers in the top row.

Sort On – The sort options include *Cell Values* (cell data), *Cell Color*, *Font Color*, or *Conditional Formatting Icon*. These options identify what to use in the cells for sorting. In most cases you will want to sort using the cell values, which is the default.

Order – This option indicates whether to sort the data in ascending (*A to Z*, *Smallest to Largest*, *Oldest to Newest*) or descending (*Z to A*, *Largest to Smallest*, *Newest to Oldest*) order.

Sort by – This is the primary sort key: the first column or row Excel will use to sort the data.

Then by – These are optional columns or rows for sorting if multiple rows have the same primary sort key. You can select up to 64 columns or rows as sort levels.

Note: You can sort data in any range of cells even if they are not constructed as a table. The sort commands are available on the Home tab in the Editing group using the Sort & Filter button, and on the Data tab in the Sort & Filter group using the Sort button.

Learn to sort data

In this exercise, you will sort data using a single column and using multiple columns.

1. Open the **Flights Sort** workbook located in the *StarterFiles* folder and save it as: **My Flights Sort** in the *MyProjects* folder.

Sort using a single column.

2. Click the AutoFilter icon for **Airline**, then click **Sort A to Z**.

The data in the table is sorted by airline name. You can also change the sort sequence to something different, such as by what time each flight leaves.

3. Click the AutoFilter icon for **Departure Time**, then click **Sort Smallest to Largest**.

You can see that all the rows have been completely re-sorted using only the Departure Time column. In other words, both of these steps used single-level sorting.

The data in the table also shows that most airlines (such as Delta Air Lines) fly to multiple destinations from this airport on the same day. You can sort the data using two different columns at the same time.

Sort using two columns.

4. Ensure that the active cell is anywhere inside the table, then on the Home tab, in the Editing group, click **Sort & Filter** and then click **Custom Sort**.

The Sort dialog box appears.

Hint: You can also open the Sort dialog box from the Data tab.

5. In the Sort dialog box, click the arrow next to the **Sort by** field and click **Airline**.

The Airline column is now the primary sort key.

Use the Destination column as the secondary sort key, in descending sequence.

6. Click **Add Level** to add another sort key.
7. Click the arrow for **Then by** and then click **Destination**.
8. Click the arrow for **Order**, click **Z to A**, then click **OK**.

	A	B	C	D
1	Airline	Flight #	Destination	Departure Time
2	Aer Lingus	110	Shannon (SNN)	6:30 PM
3	Aer Lingus	104	Dublin (DUB)	5:45 PM
4	Aer Lingus	108	Dublin (DUB)	9:50 PM
5	Aeroflot	316	Moscow (SVO)	7:00 PM
6	AeroMexico	5725	Washington, DC (DCA)	8:30 PM
7	AeroMexico	5797	Toronto (YYZ)	8:00 PM
8	AeroMexico	5251	Syracuse, NY (SYR)	8:30 PM
9	AeroMexico	5878	Rome (FCO)	5:30 PM
10	AeroMexico	9411	Rome (FCO)	9:45 PM
11	AeroMexico	5722	Rochester, NY (ROC)	8:30 PM
12	AeroMexico	5760	Richmond, VA (RIC)	6:35 PM
13	AeroMexico	5776	Philadelphia, PA (PHL)	7:30 PM
14	AeroMexico	5388	Norfolk, VA (ORF)	7:30 PM
15	AeroMexico	405	Mexico City (MEX)	9:00 AM
16	AeroMexico	5279	Mexico City (MEX)	9:05 AM
17	AeroMexico	403	Mexico City (MEX)	5:50 PM

Notice the direction of the arrows in the AutoFilter icons for the Airline and Destination columns.

Note: Once sorted, the data cannot be put back into its original sequence except by using the Undo button. But if you saved and closed the workbook in the interim, the Undo option will no longer be available to restore the data back to the original sequence.

9. Click the AutoFilter icon for **Departure Time**, then click **Sort Smallest to Largest**.
10. Save and close the workbook.

Filtering Information

Objective 3.3.1

Worksheets are often used to store large amounts of data. Finding information in large worksheets is often difficult because of the sheer volume. Sorting the rows is one way of making it easier to find information. However, you still have to look through many of the rows in the worksheet to find what you are looking for. Another way to locate information quickly is to use a filter to hide the rows you are not interested in viewing. Filtering does not change the content of your worksheet or the sequence of the rows (the way sorting does), only what you see of your worksheet.

The quickest and easiest way to **filter** data in Excel is to use the AutoFilter icons on the right side of each of the column titles. If the data is formatted as a table, the AutoFilter icons will be activated by default. If the data is not formatted as a table, you can activate them for any range of data.

In its simplest form, the AutoFilter finds and displays the rows where the value in the selected column meets the criteria that you specify. All other rows are hidden from view until you change the filter criteria or you turn the AutoFilter off.

	A	B	C	D
1	Airline	Flight #	Destination	Departure Time
406	Lufthansa	8626	Pittsburgh, PA (PIT)	2:55 PM
423	Lufthansa	8550	Fort Lauderdale, FL (FLL)	3:13 PM
434	Lufthansa	8574	San Juan (SJU)	3:29 PM
511	Lufthansa	401	Frankfurt (FRA)	4:00 PM
546	Lufthansa	8632	Buffalo, NY (BUF)	4:20 PM
564	Lufthansa	8620	Raleigh-Durham, NC (RDU)	4:39 PM
640	Lufthansa	8638	Syracuse, NY (SYR)	5:10 PM
671	Lufthansa	411	Munich (MUC)	5:30 PM
736	Lufthansa	8552	Fort Lauderdale, FL (FLL)	6:05 PM
741	Lufthansa	8654	Rochester, NY (ROC)	6:11 PM
801	Lufthansa	8634	Buffalo, NY (BUF)	6:35 PM
886	Lufthansa	8556	Tampa, FL (TPA)	7:20 PM
965	Lufthansa	8568	Austin, TX (AUS)	8:10 PM
1036	Lufthansa	8564	New Orleans, LA (MSY)	9:29 PM
1043	Lufthansa	405	Frankfurt (FRA)	9:40 PM
1063	Lufthansa	8624	Raleigh-Durham, NC (RDU)	9:50 PM
1095	Lufthansa	8640	Syracuse, NY (SYR)	10:40 PM
1097	Lufthansa	8656	Rochester, NY (ROC)	10:45 PM
1103	Lufthansa	8636	Buffalo, NY (BUF)	10:50 PM
1116	Lufthansa	8578	San Juan (SJU)	11:55 PM

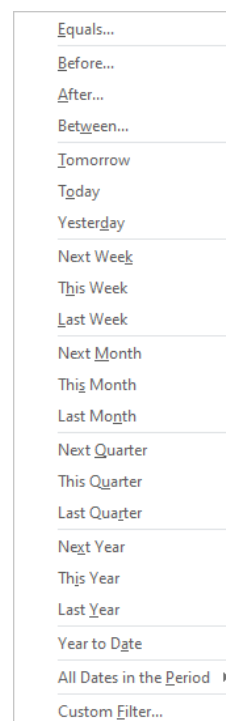
In addition, Excel provides powerful selection criteria that are specific to columns containing text, numbers or dates, such as the following:

Numbers – Evaluate numeric data in the selected column using any of the following:

- A comparison operator such as equals, greater than, or less than.
- The top 10 values. Despite the name displayed in the menu, the filter criteria can also be configured differently to select the top or bottom-most rows. You can also select any number of rows, not just 10. And finally, you can select the number of rows or percentage of rows. For example, 10% of 20 rows will result in only two rows being displayed.
- All rows above or below the average of all values in the column.
- A custom filter that allows you to select more complex criteria.

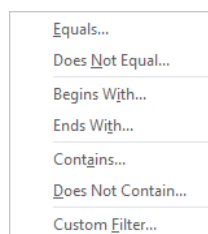
Equals...
 Does Not Equal...
 Greater Than...
 Greater Than Or Equal To...
 Less Than...
 Less Than Or Equal To...
 Between...
 Top 10...
 Above Average
 Below Average
 Custom Filter...

Dates – Evaluate date-type data using a wide variety of criteria that are specific for dates, as shown in the filter menu list:



Text – Evaluate text data in the selected column using any of the following:

- A comparison operator such as equals, greater than, or less than.
- Begins or ends with a snippet of text.
- Contains or does not contain a snippet of text.
- A custom filter that allows you to select more complex criteria.



The filter menus for each of the data types that you see listed above are only the most commonly used ones. If you select any of the comparison operators displayed in these filter menus, you will launch the Custom AutoFilter dialog box (Figure 7-12), which allows you to specify exactly how you want to filter the data.

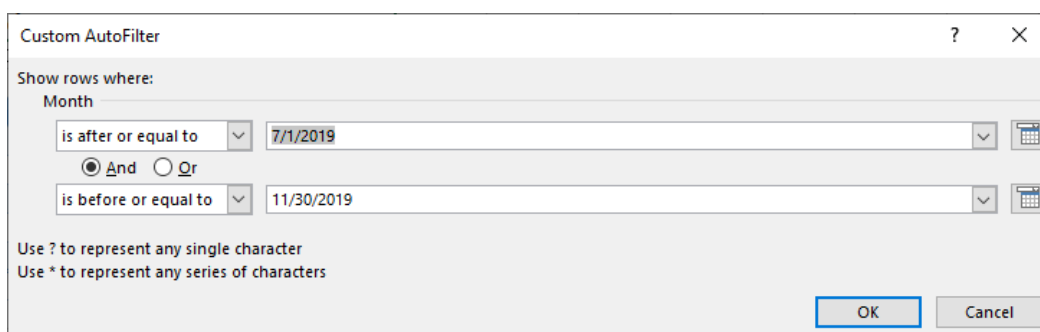


Figure 7-12: Custom AutoFilter dialog box

The Custom AutoFilter dialog box allows you to select additional comparison operators, such as “does not equal” for date data, and “greater than” for text data, and so on.

Furthermore, the AutoFilter feature in Excel has the flexibility to help you build more complex queries that you can use to narrow the results and hide rows that you do not want to see. For example, you can select criteria that examine two or more columns. You can then specify that these filtering criteria on multiple columns work together (using an “and” relationship) or as alternatives (an “or” relationship). In a table, the AutoFilter icon displays an indicator that a filter has been enabled for that column.

When multiple filter criteria have been applied to a table, the AutoFilter icons will display an indicator in each column for which a filter has been applied, as shown in Figure 7-13.

	A	B	C	D	E	F
1	Tolano Adventures					
2	Monthly Call Volume					
3						
4	Month	Sales Inquiries	Service Inquiries	Complaints	Other	Total
11	Jul-19	2,533	7,811	6	200	10,550
14	Oct-19	2,748	8,002	14	200	10,964

Figure 7-13: Table filtered on multiple criteria

Note: These more advanced filtering topics are covered in depth in the Expert level courseware.

The following exercise demonstrates how to filter data in an Excel table. However, you can activate the AutoFilter feature and use its filtering capability in any range of cells even if they are not constructed as a table. To activate AutoFilter for a range of cells, on the Home tab, in the Editing group, click Sort & Filter and click the Filter button; or on the Data tab, in the Sort & Filter group, click the Filter button.

Learn to filter information

In this exercise, you will filter data in a table.

1. Open the **Monthly Call Volume Filter** workbook located in the *StarterFiles* folder and save it as **My Monthly Call Volume Filter** in the *MyProjects* folder.
2. Click the AutoFilter icon for the **Month** header to activate the AutoFilter.
3. Click the + for 2019 to open that tree and see all data rows in the table for this year value.

The AutoFilter menu displays a list of every unique value in this column. You set the filter by selecting the check box for the value(s) you want and deselecting the check box for the value(s) you do not want.

4. Scroll up and click the **(Select All)** check box to deselect it, then select the **March** and **June** check boxes. Click **OK**.

The table now shows only the rows for March and June. Excel hides the rows that do not meet the criteria and displays only records that have a matching value in the filtered field. Excel also changes the AutoFilter icon to indicate that it is using a field to limit the records displayed.

	A	B	C	D	E	F
4	Month	Sales Inquiries	Service Inquiries	Complaints	Other	Total
7	Mar-19	5,861	9,739	7	250	15,857
10	Jun-19	3,146	1,417	12	220	4,795
18	Total	9,007	11,156	19	470	20,652

The conditions you select are called filter criteria. Up to this point in the exercise, you used the most common condition – filtering based on whether the value is **equal** to the criteria or not. You can also set up other types of criteria, such as greater than or less than.

Now set up a more complex filter criteria called "Between", which is a combination of greater than or equal to, and less than or equal to.

5. Click the AutoFilter icon for the **Month** header again.
6. Point to **Date Filters** then click **Between** in the menu to open the Custom AutoFilter dialog box.

7. Enter **July 1, 2019** in the first blank entry field.
8. Enter **November 30, 2019** in the second blank entry field.
9. Click **OK** to apply the filter.

Depending on whether the data contains text, date, or numeric values, you will have access to different types of filtering criteria. Some filtering criteria apply to all data types, such as "equal" and "does not equal". Other criteria apply only to specific data types, such as "begins with" which can be used only on text data and "top 10" which can be used only on numeric data.

Now, specify multiple filtering criteria.

10. Click the AutoFilter icon for the **Other** header.
11. Deselect the **(Select All)** check box, then select the **200** check box and click **OK**.

The table now shows only two rows – those that fall within the specified dates and show the value 200 in the Other column.

Turn off the AutoFilter for the Other column.

12. Click the AutoFilter icon for the **Other** header, then click **Clear Filter From "Other"**.

The table reverts to displaying all of the months from July to November, which indicates that you had two filters working together at the same time.

Now turn off the AutoFilter for the Month column as well.

13. Click the AutoFilter icon for the **Month** header, then click **Clear Filter From "Month"**.

The full table is displayed again.

14. Save and close the workbook.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- | | |
|---|---|
| ☒ Create, modify, and delete range names. | ☒ Apply and remove formatting on a table. |
| ☒ Use the Go To feature to jump to a cell or named range. | ☒ Convert a table to a range of cells. |
| ☒ Convert a range of cells into a table. | ☒ Sort data. |
| ☒ Modify a table by adding and deleting rows and columns of data. | ☒ Filter data. |

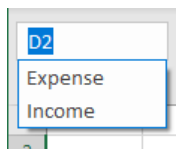
Key Terms

Term	Definition
Filter	The process of temporarily hiding data rows that do not meet the filter criteria.
Named range	A range of cells that has been assigned a name.
Range of cells	A contiguous block of cells with one or more rows and one or more columns of cells.
Sort	The process of changing the sequence of data rows based on the values in selected columns.
Structured reference	A special syntax for referencing a specific column within an Excel table. The structured reference uses a combination of the table name and the column name.
Table	A group of cells that Excel treats as a single entity.

Quiz Questions

For each question, select the best answer.

1. What does the following figure indicate?



- There are two named ranges in the worksheet.
 - There are two worksheets in the workbook.
 - There are two functions available to paste into the current worksheet cell.
 - There are two data series in the chart in the current worksheet.
2. A range name cannot contain a(n):
- backslash
 - underscore
 - blank space
 - A range name cannot contain any of the options listed here.
3. Which dialog box can be used to add, modify or delete named ranges in a worksheet?
- Range Manager dialog box
 - Sheet Setup dialog box
 - Name Manager dialog box
 - Titles dialog box
4. To go to a named cell, range, or workbook element:
- press F5 to use the Go To dialog box.
 - press CTRL+G to use the Go To dialog box.
 - click on the name box to the left of the formula bar.
 - Any of the above.

5. To create a table, which of the following conditions must be met?
- All data must be of the same type, such as text, numbers, or dates but not a mixture.
 - The data can be arranged in row or column order.
 - The data in the range of cells must be contiguous and be arranged in row (not column) order.
 - Any range names must be removed first before creating the table.
6. Banding a table means to:
- Apply different color shades to alternating rows or columns of a table.
 - Apply a "band-aid" fix to the table data.
 - Discard the contents of a table.
 - Group several tables together so that their data is combined.
7. To sort data by multiple columns, you should use:
- the Sort dialog box.
 - the sort options built into the AutoFilter button that appears at the top of each column.
 - the Sort & Filter button on the Home tab in the Editing group.
 - the Sort A to Z button on the Data tab in the Sort & Filter group.

8. What can you tell by looking at the following table?

Quarter 1	Quarter 2	Quarter 3
74	95	100
98	95	100

- The table is sorted on multiple levels.
 - The table has been converted to a cell range.
 - The table is filtered by values in two of the columns.
 - The table does not display AutoFilter buttons.
9. You can easily add new data rows to a table by just entering the data right under the table, and Excel will automatically add it to the table as long as:
- the rows are banded.
 - the Total Row is not activated.
 - the Filter Button appears.
 - the Header Rows are visible.
10. To rename a table, find the table, then rename it using the Table Name box found in the:
- View tab in the Windows group.
 - Page Layout tab in the Page Setup group.
 - Table Tools Design tab in the Properties group.
 - Home tab in the Editing group.
11. If you want to use a table name in a formula:
- you can simply type or insert the table name into the formula.
 - you must copy the table name from the Name Manager dialog box and then paste it into the formula.
 - you must use the Insert Table Name function in your formula.
 - Table names cannot be used in formulas.

12. If you no longer wish to keep the data in a table, you can:
- delete the table and reenter the data.
 - click Undo to the point before you created the table.
 - convert it back to a regular set of rows and columns of data without a table definition.
 - click Delete a Table.
13. Karen does not like the colors Excel applied when she created a table in her workbook. How should she remove the colors?
- She should select the table and then use the Clear All command in the Editing group on the Home tab.
 - She should use the Remove Colors option in the Tools group on the Table Tools Design tab.
 - She should clear all the check boxes in the Table Style Options group on the Table Tools Design tab.
 - She should apply the option on the top left of the Table Styles gallery.
14. Which of the following methods can you use to add a total row to a table?
- Use the Insert Total command button.
 - Select the Total Row check box in the Table Style Options group.
 - Apply a table style that includes a total row.
 - You can use any of these methods to add a total row to a table.

Microsoft® Excel

Associate Certification Guide

Lesson 8: Using Data Tools

Lesson Objectives

In this lesson, you will use a variety of data tools to help you search for data, use hyperlinks, import and export data, and ensure workbooks are accessible. Upon completion of this lesson, you should be able to:

- | | |
|---|---|
| ☐ Customize the Quick Access toolbar. | ☐ Import and export data. |
| ☐ Find data in the worksheet. | ☐ Change workbook document properties. |
| ☐ Replace data in the worksheet. | ☐ Use the Document Inspector tool. |
| ☐ Create, modify, and delete hyperlinks. | ☐ Use the Accessibility Checker tool. |

Customizing Excel

Customizing the Quick Access Toolbar

Objective 1.4.1

The Quick Access Toolbar (QAT) is located at the left of the title bar above the Ribbon and by default, contains the AutoSave indicator and the Save, Undo, and Redo command buttons, as shown in Figure 8-1.

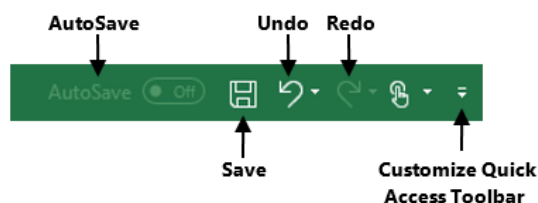


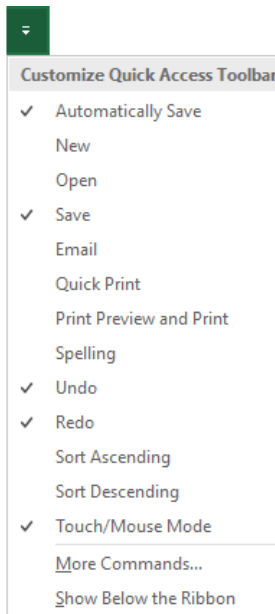
Figure 8-1: Quick Access Toolbar default configuration

You will recall that the Ribbon includes multiple tabs on which the many Excel commands and features are organized into logical groups. Typically, you move from one tab to another to access the different Excel commands you need while using and updating your worksheet. However, the QAT does not have any tabs, giving you very fast access to all the buttons in it. It is also easy to access in its location above the Ribbon.

If you use certain Excel commands and features very frequently, you can make them more accessible by adding them to the QAT, saving you the effort of having to switch to a different tab to find it in the Ribbon. The combination of being in a convenient location and the ease of customization makes the QAT an ideal location to place your most frequently used commands

To customize the QAT, use one of the following methods:

- click Customize Quick Access Toolbar and click a command from the displayed list or click More Commands to open the Excel Options dialog box, or



- click File, click Options to open the Excel Options dialog box, and then click the Quick Access Toolbar tab to access the options shown in Figure 8-2, or

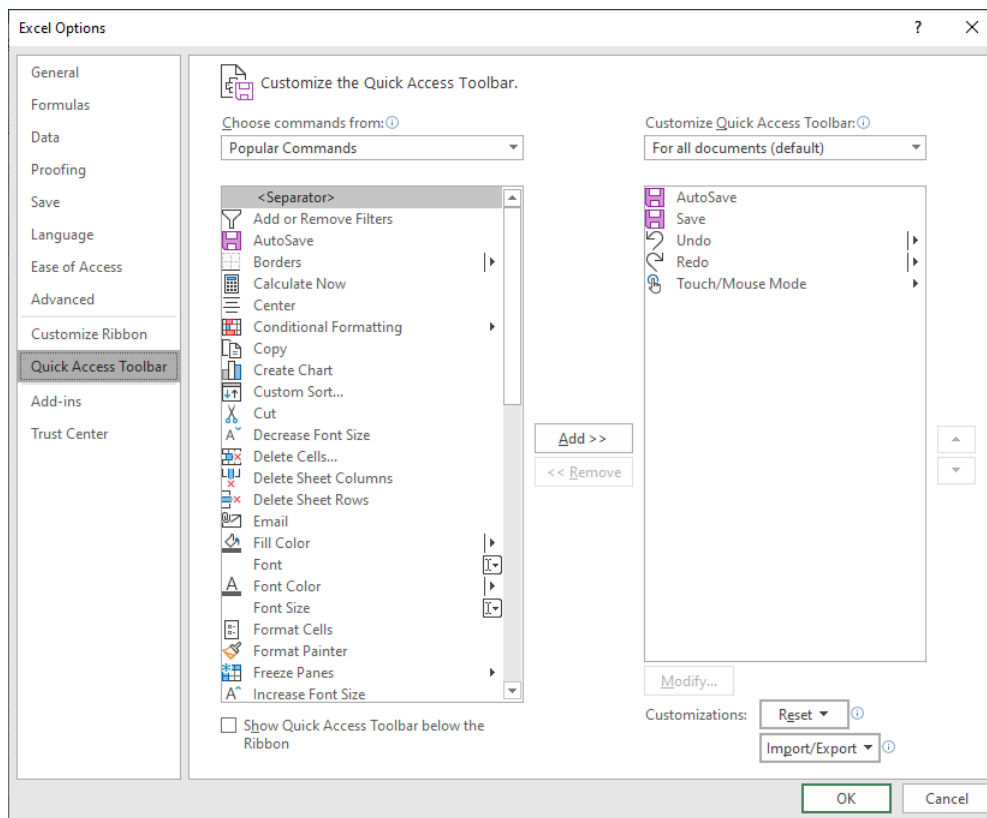


Figure 8-2: Excel Options dialog box – Quick Access Toolbar tab

- right-click anywhere on the Ribbon to access the shortcut menu shown in Figure 8-3, then click Customize Quick Access Toolbar to open the Quick Access Toolbar tab of the Excel Options dialog box.

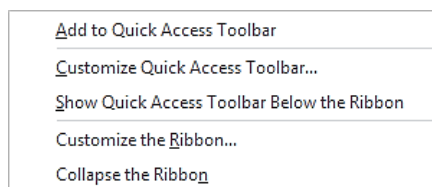


Figure 8-3: Customize shortcut menu

You can even add commands and features to the QAT that are not currently accessible from the Ribbon. If the feature is accessible in the Customize Quick Access Toolbar tab of the Excel Options dialog box, you can add it to the QAT.

You can also move the Quick Access Toolbar to a different position directly below the Ribbon using one of the following methods:

- click Customize Quick Access Toolbar and then click Show Below the Ribbon, or
- right-click the Ribbon and then click Show Quick Access Toolbar Below the Ribbon.

Learn to customize the Quick Access toolbar

In this exercise, you will customize the Quick Access toolbar by adding and removing command buttons.

1. Create a new blank workbook.
2. Click **Customize Quick Access Toolbar** at the far right of the Quick Access Toolbar.

3. Click **Quick Print** in the menu.
4. Click **Customize Quick Access Toolbar** then click **Print Preview and Print**.

The Quick Access Toolbar now includes the *Quick Print* and *Print Preview and Print* buttons.

Remove these two command buttons using different methods for each.

5. Click the **Customize Quick Access Toolbar** then click **Quick Print**.

The Quick Print button is removed.

6. Click **File**, click **Options**, and then click the **Quick Access Toolbar** tab.
7. In the list displayed on the right in the Excel Options dialog box, click **Print Preview and Print**, click **Remove**, and then click **OK**.
8. Close the workbook and discard any changes.

Finding and Replacing Data

Finding Data

Objective 1.2.1

You can search a worksheet for every occurrence of a value (text label or number), function name, or cell reference by using the Find feature. By default, the Find tool will search for the value in the *Find what* text box in every cell in the current worksheet. The search value can be as long or short as you need. Any cell that contains this value – even if it is only part of a longer value – will be selected.

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

- on the Home tab, in the Editing group, click Find & Select and then click Find, or
- press CTRL+F.

You will have to click the Options button in the Find and Replace dialog box to display all the options shown in Figure 8-4.

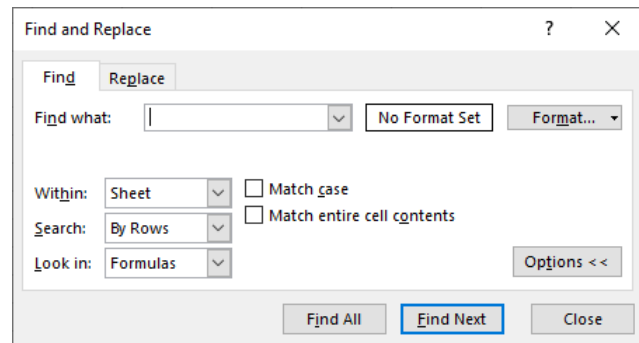


Figure 8-4: Find and Replace dialog box – Find tab

Find what – The value for which to search.

Within – Search only within the current worksheet or the entire workbook.

Search – Indicate which direction to search:

- By Rows: Search from left to right across each row in the worksheet/workbook starting from the top row.
- By Columns: Search down each column starting from the left-most column.

Look in – Specify whether to look only at the value (the result of a function rather than the formula or function text), the underlying formula, or any comment in each cell. The Formulas option is generally more flexible even if the cell contains just a value.

Match case – Specify whether to match the upper and lower case of alphabetic characters in the cell.

Match entire cell contents – Specify whether the cell must contain only the *Find what* value, or the cell may contain other text characters as well. This setting only applies when you are searching for text data.

Replacing Data

You can also replace the search item with a new value, on an individual basis by using Replace, or for all cells at one time that contain the search item by using Replace All. The Replace function simplifies and speeds up the task of replacing one word or value with another. This automated process virtually eliminates any typing errors you would make if you had to do it manually.

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

- on the Home tab, in the Editing group, click Find & Select, and click Replace, or
- press CTRL+H, or
- if the Find dialog box is already open, click the Replace tab.

The Replace tab of the Find and Replace dialog box is shown in Figure 8-5.

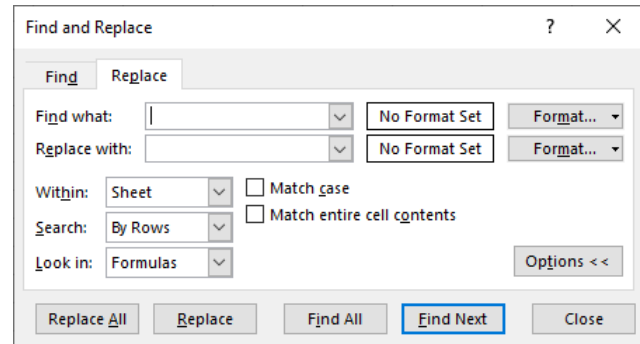


Figure 8-5: Find and Replace dialog box – Replace tab

You may want to use Replace to control and verify that each replacement should be made. An alternative is to use the Find tab before using the replace function to search through the worksheet and verify that your search value and options have been set correctly. Once you are certain that your search value and options are correct, you can proceed with using Replace All. If you replace a cell value by mistake, you can use the Undo command.

Learn to find and replace data

In this exercise, you will find and replace data.

1. Open the **World Capitals** workbook located in the *StarterFiles* folder.

First, try looking for a word.

2. On the Home tab, in the Editing group, click **Find & Select** and then click **Find**.
3. In the *Find what* text box, type: **united** and click **Find Next**.
4. Click **Find Next** several more times and observe which cells are selected.

Now try different find options.

5. In the Find and Replace dialog box, click **Options**, if necessary, to display all find options.
6. Click the **Match case** check box to select it and then click **Find Next**.

A message box displays with the message “We couldn’t find what you were looking for.” Even though Excel did not have any difficulty earlier looking for the word *united*, none of the cells contains the word united in all lower-case characters.

7. Click **OK** to close the message box.
8. Click in the **Find what** text box and change the value to search for to: **United** (be sure to use upper-case for the first letter).
9. Click **Find Next** several times.

10. In the *Find what* text box, delete **United** and replace it with **spain**.
11. Deselect the **Match case** check box, and then click **Find Next** several times.
12. Select the **Match entire cell contents** check box and then click **Find Next** several times.

Now only one row is found with the word *Spain* as the full name.

13. Deselect the **Match entire cell contents** check box.

Now use the replace feature.

14. In the *Find what* text box, type: **x** and click **Find Next** several times to find all words containing the letter **x**.
15. Click the **Replace** tab.
16. In the *Replace with* text box, type: **zh** and click **Find Next**.

Excel locates the first word with an **x** in it.

17. Click **Replace**.

Instead of using Replace, you could click Replace All to replace all occurrences in the worksheet at one time.

18. Click **Replace All** to replace every remaining instance of the letter **x**.

Excel has completed replacing all specific text occurrences when a message box appears with "All done. We made 3 replacements."

19. Click **OK** to close the message box.
20. Click **Close**.
21. Close the workbook without saving any changes.

Using Hyperlinks

A **hyperlink** is a clickable element in an electronic document that you can use to jump to or open another document. Hyperlinks were introduced with the Internet to allow users to navigate from one web page to another whether the next web page was in the same website or another.

By clicking a hyperlink, you can access the referenced document. Each hyperlink contains a code called a Uniform Resource Locator (URL), which is the unique address for a document or page at a particular location on the Internet or an intranet.

Over time, hyperlinks have evolved to link to any type of document in any location, not just on the Internet. A hyperlink in an Excel workbook can be used to:

- launch web pages from the Internet or the internal organizational intranet, or
- open a workbook or document located on a computer (including your own) within your home or corporate network, or an online storage service such as OneDrive, SharePoint, or Dropbox, or
- jump to another cell or named range in the same workbook, or
- create a new workbook, or
- launch the default email program (for example, Outlook), and create an email with a specific set of recipients and, optionally, a subject line.

Inserting Hyperlinks

Objective 1.2.3

To insert a hyperlink, use one of the following methods to access the Insert Hyperlink dialog box, as shown in Figure 8-6:

- on the Insert tab, in the Links group, click the Link button, or
- right-click on a cell and click Link, or
- press CTRL+K.

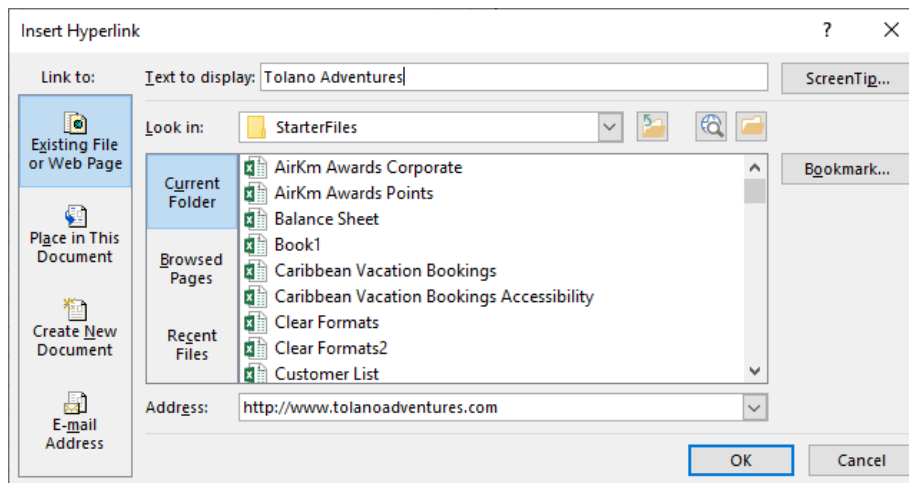


Figure 8-6: Insert Hyperlink dialog box

The Insert Hyperlink dialog box allows you to insert one of four types of hyperlinks:

Existing File or Web Page – Used to link to workbooks, files or documents stored on a local or networked hard drive, or websites on the intranet or the Internet.

Place in This Document – Used to link to a cell or named range of cells in the current workbook either in the current worksheet or another worksheet.

Create New Document – Used to create a new workbook using the name that you specify in the *Name of new document* text box and located in the folder specified under *Full path*.

E-mail Address – Used to launch the email program (for example, Outlook) installed on the local computer and create a new email message using the email address and subject line specified in this dialog box.

A mailto URL is a special type of URL used by email systems.

Excel also provides a way to quickly access recently used items:

Current Folder – Look for other files in the folder currently in use.

Browsed Pages – Quickly link to recently browsed pages. Before creating a hyperlink, it is likely you would have recently looked at a website. Instead of having to copy and paste the website information, possibly missing part of it, the information is already easily accessed under this option in the Insert Hyperlink dialog box.

Recent Files – Similarly, files needed for a hyperlink would have likely been recently viewed. Quickly and easily find these files here.

Modifying and Deleting Hyperlinks

Objective 1.2.3

Hyperlink addresses are unique, specific "directions" to a document regardless of where it is stored. If you move or rename the referenced document, you must change the hyperlink.

You may also want to change the text displayed in the worksheet for the hyperlink or add a custom ScreenTip.

To modify a hyperlink in the worksheet, use one of the following methods:

- right-click the hyperlink and then click Edit Hyperlink, or
- move the cell pointer to the cell containing the link and then, on the Insert tab, in the Links group, click Link to display the Edit Hyperlink dialog box. Make the necessary changes and close the dialog box.

Note: When you use the arrow keys on the keyboard to move the cell pointer from a nearby cell into a cell containing a hyperlink, the link is not activated. You can also press and hold CTRL while clicking the cell containing the hyperlink; or click and hold the left mouse button on the cell for a few seconds until the mouse pointer changes from a hand to a white cross, then release the mouse button and press F2 to go into edit mode.

When you no longer need the hyperlink, you can remove the reference. The text displayed for the hyperlink remains in the cell.

To delete a hyperlink in the worksheet, use one of the following methods:

- right-click the link and then click Remove Hyperlink, or
- move the cell pointer to the cell containing the link and then, on the Insert tab, in the Links group, click Link to display the Edit Hyperlink dialog box. Click Remove Link.

Learn to insert hyperlinks

In this exercise, you will create, modify, test, and delete hyperlinks.

1. Open the **Financial Statement Links** workbook located in the *StarterFiles* folder and save it as: **My Financial Statement Links** in the *MyProjects* folder.

Insert a hyperlink to a website.

2. Select cell **B3**.
3. On the Insert tab, in the Links group, click **Link**.
4. Click in the **Address** field and type: **www.tolanoadventures.com**.
5. Click in the **Text to display** field and change the contents to: **Tolano Adventures**.
6. Click **OK**.

Insert hyperlinks to other workbooks.

7. Select cell **B5**.
8. On the Insert tab, in the Links group, click **Link**.
9. Display the *Look in* list, navigate to the *ResourceFiles* folder, and select the **Income Statement Create Range** workbook.

10. Click in the **Text to display** field and change the contents to: **Income Statement**, then click **OK**.
11. Right-click cell **B7**, then click **Link**.
12. Navigate to the *ResourceFiles* folder, select the **Balance Sheet** workbook, and click **OK**.

Test a hyperlink.

13. Position the mouse pointer over the hyperlink in cell **B5**. The pointer changes to a white pointing hand.
Notice that a ScreenTip will appear with the URL for the Income Statement Create Range.xlsx workbook.
14. Click the **Income Statement** hyperlink.

The Income Statement Create Range workbook opens on top of the My Financial Statement Links workbook.

15. Close the Income Statement Create Range workbook.

The color of the hyperlink changes to indicate that it has been used.

Modify a hyperlink.

16. Right-click the **Income Statement** hyperlink in cell B5 and then click **Edit Hyperlink**.
17. In the Edit Hyperlink dialog box, select the **Quarterly Income Statement Company** workbook in the *ResourceFiles* folder.
18. Click **OK** to save the updated hyperlink.

You can change the hyperlink text directly on the worksheet without having to launch the Edit Hyperlink dialog box.

19. Click cell **A7** and then press the **RIGHT ARROW** key to make cell B7 the active cell without activating the hyperlink.

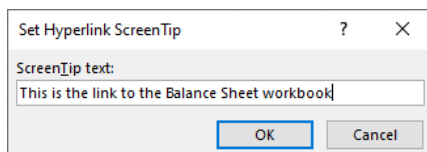
Hint: You can select any nearby cell and then use the keys on the keyboard to select the cell.

20. Press the **F2** key to switch to edit mode, change the link text to **Balance Sheet workbook** and press **ENTER**.

	A	B
1	Tolano Adventures	
2		
3	Website:	Tolano Adventures
4		
5	Income Statement:	Income Statement
6		
7	Balance Sheet:	Balance Sheet workbook

Now create a custom ScreenTip for one of the hyperlinks.

21. Right-click the **Balance Sheet** hyperlink in cell B7 and then click **Edit Hyperlink**.
22. In the Edit Hyperlink dialog box, click **ScreenTip** to open the Set Hyperlink ScreenTip dialog box.
23. Click in the **ScreenTip text** field and type: **This is the link to the Balance Sheet workbook**



24. Click **OK**.
25. In the Edit Hyperlink dialog box, click **OK**.
26. Position the mouse pointer over the hyperlink in cell **B7** to view the ScreenTip.
Test the changed Balance Sheet workbook hyperlink.
27. Click the hyperlink in cell **B7**.
28. Close the Balance Sheet workbook.
Delete a hyperlink.
29. Right-click the hyperlink in cell **B7** and click **Remove Hyperlink**.
The hyperlink in cell B7 changes to plain text.
30. Save and close the workbook.

Importing and Exporting Data

Importing Data from External Text Files

Objective 1.1.1

Most businesses use various specialized computer applications for their operations. Typically, these systems reside on servers, other PCs within the same corporate network, or with remote servers (such as cloud providers). The challenge has always been to move data from one application to another without having to manually re-enter the data. Almost all these applications can **export** data into files, and the text data file format is the most commonly used.

Excel uses the Office Open XML format to store its own workbook data. However, many other applications do not currently support this format. Fortunately, Excel has built-in capabilities for importing and exporting data easily.

In Excel, the commands in the Get & Transform group comprise a powerful set of tools that make it possible to connect to data from various sources, "clean up" or transform the data into the form you need and **import** it into Excel.

On the Data tab, there are six icons in the Get & Transform Data group (Figure 8-7) used for importing external data.

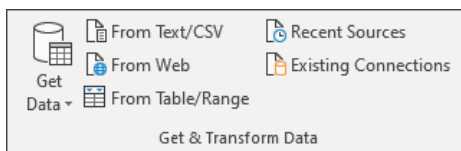
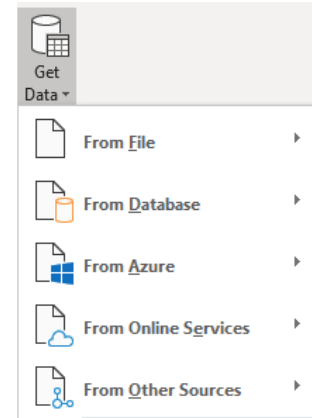


Figure 8-7: Get & Transform Data group on the Data tab

- **Get Data** – Displays a drop-down menu of options you can select to import data:
 - **From File** – Imports data from a selected Workbook, Text/CSV, XML, or JSON file. You can also navigate to a folder or SharePoint location to specify the file you want to import.
 - **From Database** – Imports data from a selected database file. You can select from among SQL Server, Microsoft Access, Analysis Services, SQL Server Analysis Services, Oracle, IBM DB2, MySQL, PostgreSQL, Sybase, Teradata, and SAP HANA database types.
 - **From Azure** – Imports data from a file stored in Microsoft Azure. Azure is a cloud-computing service created by Microsoft in which developers can build, test, install, and manage applications and services through Microsoft data centers. You can select files from SQL Database, SQL Data Warehouse, HDInsight, Blob Storage, Table Storage, and Data Lake Store services.
 - **From Online Services** – Imports data from files stored in various online services such as SharePoint, Microsoft Exchange, Dynamics 365, Facebook, Salesforce Objects, and Salesforce Reports.
 - **From Other Sources** – Imports data from files that come from various sources, some of which you can access directly using the options in the Get & Transform Data group. You can select data from sources such as a Table/Range, the Web, Microsoft Query, SharePoint List, OData Feed, Hadoop File, Active Directory, Microsoft Exchange, ODBC, OLEDB, and Blank Query.
- **From Text/CSV** – Imports data from a file containing numeric and alphabetic data in text format, in which the values are separated from each other by a tab, space, comma, or some other character.
- **From Web** – Imports data that is displayed in specific locations of a Web page.
- **From Table/Range** – Imports data from a selected Excel table or named range.
- **Recent Sources** – Imports data from a recently-opened source file.
- **Existing Connections** – Imports data using an existing data connection that was previously created for this workbook, this computer, or your network.



When you click the From Text/CSV option to import data from an external text file, the Import Data dialog box (Figure 8-8) will display from which you select the name of the text or comma-separated value file whose contents you want to import.

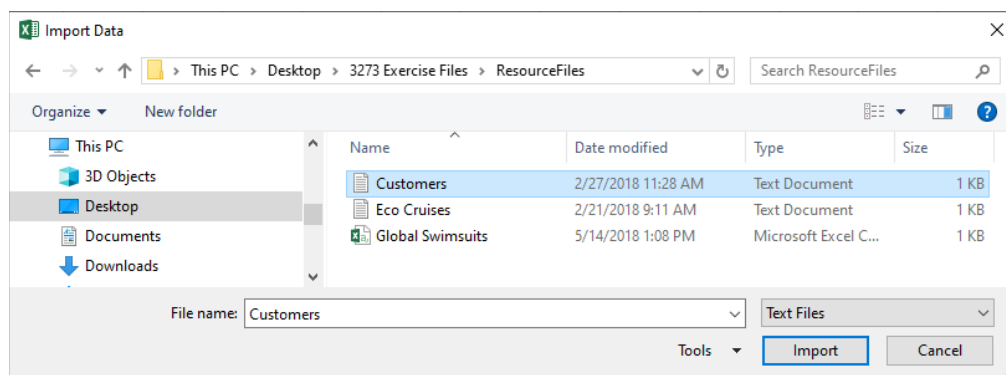


Figure 8-8: Import Data dialog box

Select the file you want and click Import. The contents of the file will display in a preview window (Figure 8-9) showing the overall structure of the data.

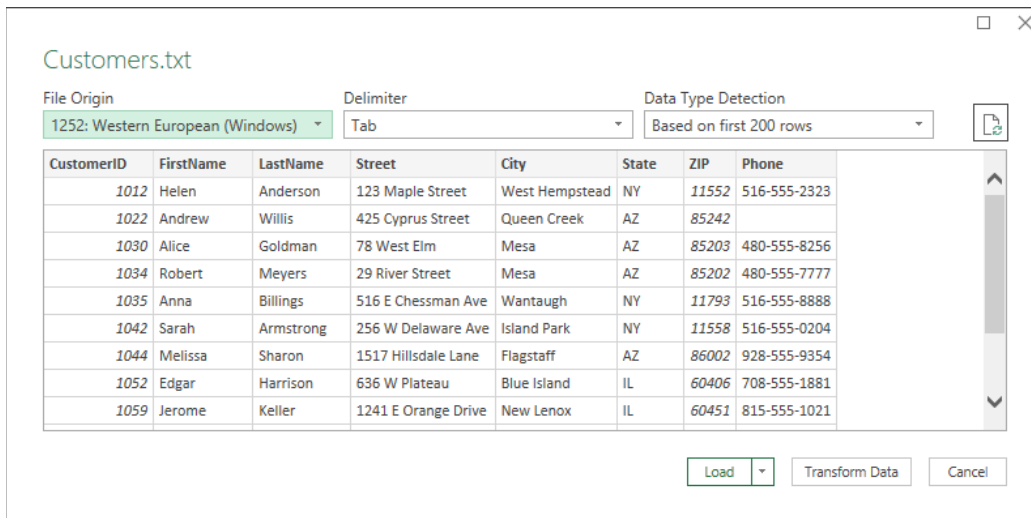


Figure 8-9: Preview window of data to be imported

Table 8-1 describes the options in the preview window.

Table 8-1: Preview window options

Field	Description
File Origin	Select an option to specify the character set used to create the data in the text file. In most cases, you can accept the default setting.
Delimiter	Select an option to specify the character used to separate each field of text in the text file. Excel attempts to detect each instance of the delimiter in the text file to determine the value that should appear in each column in the worksheet. Any printable character can be used as a delimiter. You can select from among the Colon, Comma, Equals sign, Semicolon, Space, Tab, Custom, and Fixed Width delimiters. Select Custom if you need to specify a delimiter that is not part of the default list, such as the quote or double-quote character. Select Fixed Width if the values are vertically aligned in columns (possibly with no gaps between the columns), and blank spaces are used where necessary to align the data.
Data Type Detection	Select an option to specify the number of rows in the text file that Excel uses to interpret the type of data contained in the text file.
 (Preview)	Click this button to preview the imported data based on options you select in the File Origin, Delimiter, and Data Type Detection drop-down lists. You should always preview the data to ensure it will display correctly in Excel.
Load	Click this button to load the imported data. You can click the arrow on the right side of the Load button and click the Load To command to specify how to view the imported data in your workbook, such as whether you want to place the data in the existing worksheet or in a new worksheet, and which worksheet cell to use as the starting point for the imported data. Clicking the Load command in the drop-down menu is the same as clicking the Load button, which will import the data as a table into a new worksheet starting in cell A1.

Transform Data (Edit)

Click this button to display the Query Editor, in which you can determine how the data will appear in the worksheet. For example, you can transpose the columns and rows, filter the data, sort the data, and so on. Depending on your version of Excel, this button may appear as "Edit".

When you have successfully imported the data, the Queries & Connections task pane opens. Within this task pane you can see how many rows of data were imported, as shown in Figure 8-10.

The screenshot shows an Excel worksheet with data imported from a text file. The data is organized into columns: CustomerID, FirstName, LastName, Street, City, State, ZIP, and Phone. The Queries & Connections task pane on the right shows a query named 'Customers' with 13 rows loaded.

CustomerID	FirstName	LastName	Street	City	State	ZIP	Phone
1012	Helen	Anderson	123 Maple Street	West Hempstead	NY	11552	516-555-2323
1022	Andrew	Willis	425 Cyprus Street	Queen Creek	AZ	85242	
1030	Alice	Goldman	78 West Elm	Mesa	AZ	85203	480-555-8256
1034	Robert	Meyers	29 River Street	Mesa	AZ	85202	480-555-7777
1035	Anna	Billings	516 E Chessman Ave	Wantagh	NY	11793	516-555-8888
1042	Sarah	Armstrong	256 W Delaware Ave	Island Park	NY	11558	516-555-0204
1044	Melissa	Sharon	1517 Hillside Lane	Flagstaff	AZ	86002	928-555-9354
1052	Edgar	Harrison	636 W Plateau	Blue Island	IL	60406	708-555-1881
1059	Jerome	Keller	1241 E Orange Drive	New Lenox	IL	60451	815-555-1021
1066	Rose	Callahan	2363 Window Drive	Trona	CA	93562	760-555-1221
1071	Ken	Dedarian	9234 E El Dorado	Olympia	WA	98501	360-555-4853
1074	Kim	Park	123 E 33rd Street	Lincoln	NE	68501	402-555-0720
1079	Terry	Lawrence	89 Boulder Drive	Oxford	AL	36203	256-555-0219

Figure 8-10: Imported data

Learn to import text

In this exercise, you will import a text file into a worksheet.

1. Create a new blank workbook and save it as **My Eco Cruises** in the *MyProjects* folder.
2. On the Data tab, in the Get & Transform Data group, click **From Text/CSV**.

The Import Data dialog box appears.

3. Navigate to the *ResourceFiles* folder, select the **Eco Cruises** text document file and click **Import**.

A preview window appears showing how the imported data will display in an Excel worksheet.

The screenshot shows the 'Eco Cruises.txt' preview window. It displays the file origin, delimiter (Tab), and data type detection (Based on first 200 rows). The data is previewed in a table with 7 columns and 8 rows.

Column1	Column2	Column3	Column4	Column5	Column6	Column7
Ship	June 1	June 8	June 15	June 22	June 29	July 6
Ocean Princess	104	56	164	164	50	58
Ocean Sun Ray	10	152	57	89	177	85
Ocean Jewel	129	73	161	184	190	93
Ocean Virgin	135	30	36	168	103	129
Ocean Dancer	75	143	96	144	169	81
Ocean Radiance	150	18	106	111	158	70

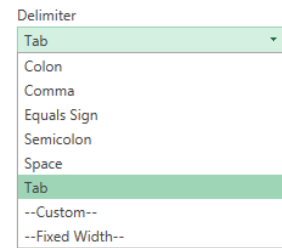
Notice that Tab appears in the Delimiter field. Based on the data in the text file, Excel determined that the TAB character was used to separate (or delimit) the values in each field and placed each delimited value in a separate column.

Specify the delimiter character.

- Click the **Delimiter** drop-down arrow to display the list of delimiters.

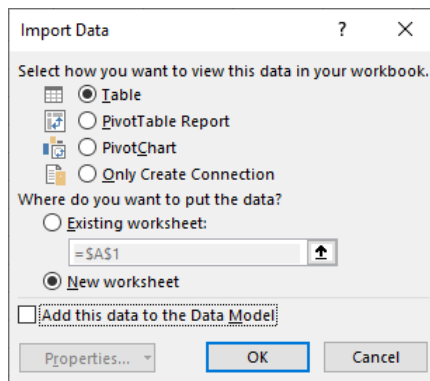
If you select a different delimiter, Excel will attempt to detect each instance of the delimiter in the text file and place each value separated by the delimiter in its own column in the worksheet.

- In the *Delimiter* drop-down list, click **Comma**. The preview window displays how the imported data will appear in the Excel workbook.
- Display the *Delimiter* drop-down list, and then click **Space**. The preview window displays how the imported data will appear in the Excel workbook.
- Change the delimiter back to **Tab**.



Load the imported text.

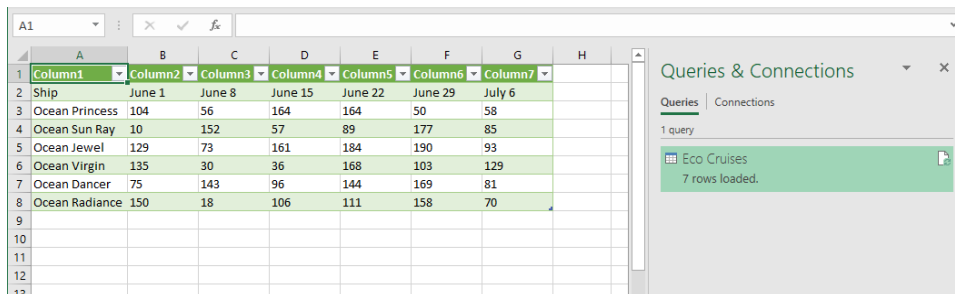
- Click the arrow on the **Load** button, then click **Load To**. The Import Data dialog box associated with the Load To Command appears.



Notice that the default selections specify to import the data in a table format and load the data into a new worksheet starting at cell A1.

- Ensure that **Table** is selected, select **Existing worksheet**, and then click **OK**.

Excel loads the imported data into the current worksheet as a table starting in cell A1 and opens the Queries & Connections task pane.



You can edit and format the table as desired.

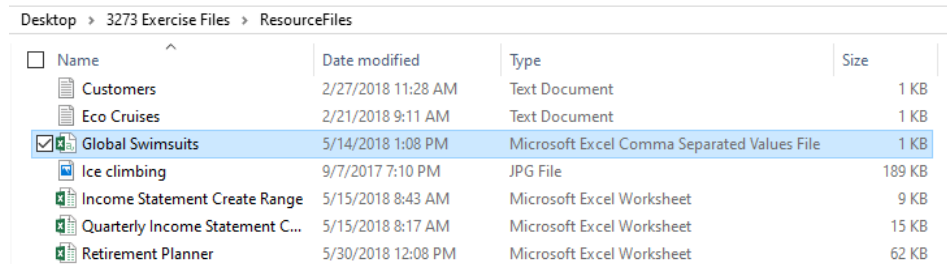
- Save and close the workbook.

Importing Data from External CSV Files

Objective 1.1.2

A CSV (**Comma Separated Values**) file contains data in text form, just like a text file with the filename extension of .TXT. But because CSV files must follow a set of rules in how the data is laid out inside the file, Excel is able to open CSV files directly. It almost treats CSV files like Excel workbooks.

Figure 8-11 shows how Windows displays this type of file in File Explorer.

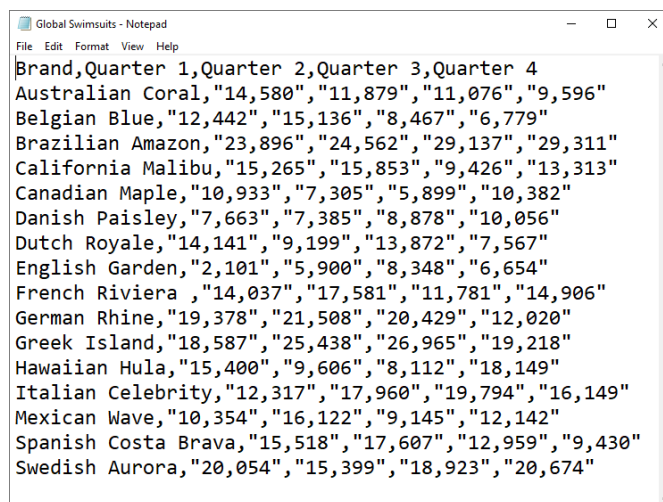


Name	Date modified	Type	Size
Customers	2/27/2018 11:28 AM	Text Document	1 KB
Eco Cruises	2/21/2018 9:11 AM	Text Document	1 KB
Global Swimsuits	5/14/2018 1:08 PM	Microsoft Excel Comma Separated Values File	1 KB
Ice climbing	9/7/2017 7:10 PM	JPG File	189 KB
Income Statement Create Range	5/15/2018 8:43 AM	Microsoft Excel Worksheet	9 KB
Quarterly Income Statement C...	5/15/2018 8:17 AM	Microsoft Excel Worksheet	15 KB
Retirement Planner	5/30/2018 12:08 PM	Microsoft Excel Worksheet	62 KB

Figure 8-11: A CSV file in File Explorer

Notice that the icon to the left of the Global Swimsuits file name is similar to the icons of Excel workbooks, but it is not the same. Also, the file type is Microsoft Excel Comma Separated Values File.

If you open this file using Notepad, you will see the contents appear as shown in Figure 8-12.



Brand	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Australian Coral	"14,580"	"11,879"	"11,076"	"9,596"
Belgian Blue	"12,442"	"15,136"	"8,467"	"6,779"
Brazilian Amazon	"23,896"	"24,562"	"29,137"	"29,311"
California Malibu	"15,265"	"15,853"	"9,426"	"13,313"
Canadian Maple	"10,933"	"7,305"	"5,899"	"10,382"
Danish Paisley	"7,663"	"7,385"	"8,878"	"10,056"
Dutch Royale	"14,141"	"9,199"	"13,872"	"7,567"
English Garden	"2,101"	"5,900"	"8,348"	"6,654"
French Riviera	"14,037"	"17,581"	"11,781"	"14,906"
German Rhine	"19,378"	"21,508"	"20,429"	"12,020"
Greek Island	"18,587"	"25,438"	"26,965"	"19,218"
Hawaiian Hula	"15,400"	"9,606"	"8,112"	"18,149"
Italian Celebrity	"12,317"	"17,960"	"19,794"	"16,149"
Mexican Wave	"10,354"	"16,122"	"9,145"	"12,142"
Spanish Costa Brava	"15,518"	"17,607"	"12,959"	"9,430"
Swedish Aurora	"20,054"	"15,399"	"18,923"	"20,674"

Figure 8-12: A CSV file opened in Notepad

A CSV file is simply a text file with commas used as a delimiter to separate the values between columns. The numbers have commas inside, so the double-quote character (") is used as the text qualifier around each number.

When you open a CSV file in Excel, Excel displays the values in columnar format using the comma delimiter to determine which values appear in which columns. Excel also displays a notification (Figure 8-13) below the Ribbon indicating that Excel features might be lost if you save the workbook in the CSV file format instead of saving it as an Excel workbook.

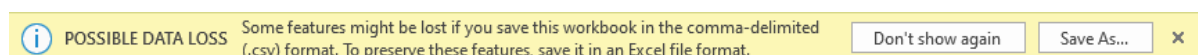


Figure 8-13: Notification upon opening a CSV file as a workbook

Learn to open non-native files in Excel

In this exercise, you will open a comma-delimited text file as a workbook.

1. In an empty Excel application window, click **File**, click **Open**, then click **Browse** to display the Open dialog box.
2. Navigate to the *ResourceFiles* folder.
3. In the Open dialog box, click the arrow to the right of **All Excel Files** and click **Text Files** in the drop-down list.
4. Right-click the file **Global Swimsuits.csv**, click **Open with**, then click **Notepad**.

Notice that this CSV file contains text data (including numbers) with commas used as a delimiter to separate the values between columns.

5. Close the Notepad window and discard any changes that may have been made to the file.
6. In the Open dialog box in Excel, double-click **Global Swimsuits.csv** to open the file.

Excel displays a notification that some features could be lost if you save the file in its original format.

7. Click the close (x) button in the notification bar to close it.

Modify the worksheet and save the data as an Excel workbook.

8. Increase the width of column **A** to display the full text in every row.
9. Click **File**, click **Save As**, click **This PC**, then navigate to the *MyProjects* folder.
10. Change the file name to: **My Global Swimsuits**.
11. Click the **Save as type** arrow and then click **Excel Workbook**.
12. Click **Save**.

The CSV file is now saved as an Excel workbook.

13. Close the workbook.

Exporting Excel Data as CSV

Objective 1.5.2

Excel provides an easy-to-use method of exporting data to other file formats, including the CSV format. In the Save As page in Backstage view, or in the Save As dialog box, the *Save as type* drop-down list includes an extensive list of different formats for saving the worksheet data, as shown in Figure 8-14.

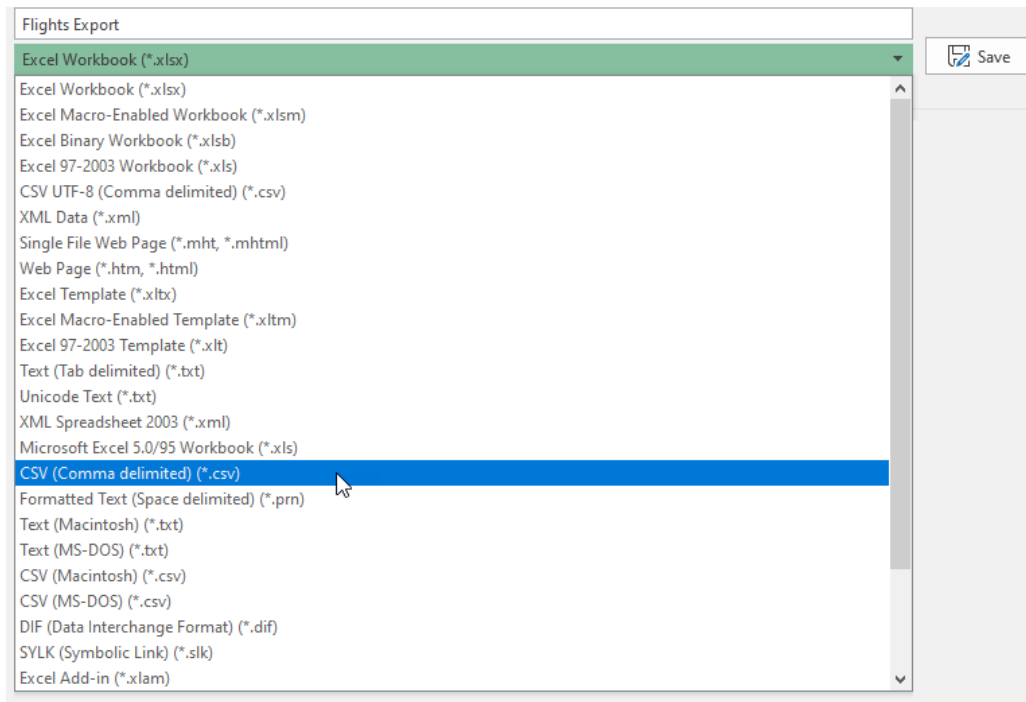


Figure 8-14: Save as type drop-down list in Backstage view

Note that CSV files contain only text data. This means that when saving a workbook in the CSV format, Excel will discard anything that is not pure data. For instance, the result of a formula shown in the cell would be exported, but not the formula itself. Also, charts and other graphics would be deleted. Therefore, your CSV workbook should not use Excel features such as formulas, cell formatting, charts, and multiple worksheets.

If you try to save a workbook that uses these features as a CSV file, Excel will display a notification below the Ribbon to remind you that some features may be lost.

Learn to export data from Excel

In this exercise, you will export worksheet data to a CSV file.

1. Open the **Flights Export** workbook located in the *StarterFiles* folder.

Export the worksheet data.

2. Click **File**, click **Save As**, then click **Browse** to open the Save As dialog box.
3. In the Save As dialog box, navigate to the *MyProjects* folder and change the file name to **My Flights Export**.
4. Click the **Save as type** arrow, select **CSV (Comma delimited)**, then click **Save**.

A notification appears below the Ribbon to inform you of possible data loss.

5. Close the open file.

Now examine the exported file.

6. Open the **My Flights Export** CSV file from the *MyProjects* folder.

Notice that all the cell formatting that was in the original workbook has been removed, and only the text data remains.

7. Close the open file.

Accessing Workbook Properties

Objective 1.4.5

All files contain **metadata**; that is, information about the file as an entity such as the date and time it was created and last modified, who created it, and the size of the file. Excel workbooks contain additional metadata such as your company name, the name of your computer, the number of times the workbook was modified, and so on.

This metadata – also known as **document properties** – is useful for sorting, organizing, and finding workbooks, especially when you have many of them to look through.

All files have different types of document properties:

- **Standard properties** – These are properties that are created by all Microsoft Office applications such as Excel and Word. These include author name, document title, and subject.
- **Automatically updated properties** – These properties are the statistical information about the file, including the size, and dates when the file was created or modified. Users are not permitted to change these properties.
- **Custom properties** – Excel allows users to create any number of customized properties of their own or select from 27 pre-defined custom properties.

File Explorer displays file-related metadata in the Details tab of the Properties dialog box, as shown in Figure 8-15.

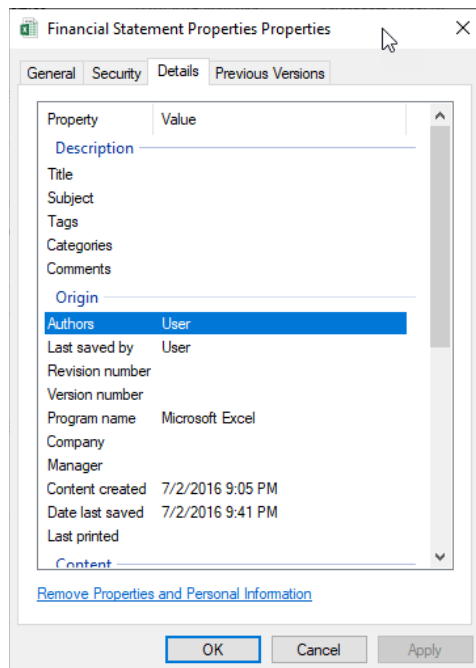


Figure 8-15: File Explorer Properties dialog box – Details tab

From within Excel, you can access this same metadata, plus additional metadata that are specific to the Microsoft Office suite. Many of the basic properties are included on the Info page in the Backstage view. More of this metadata can be displayed and set in the Properties dialog box, which you can access by clicking Properties, and then Advanced Properties, as shown in Figure 8-16.

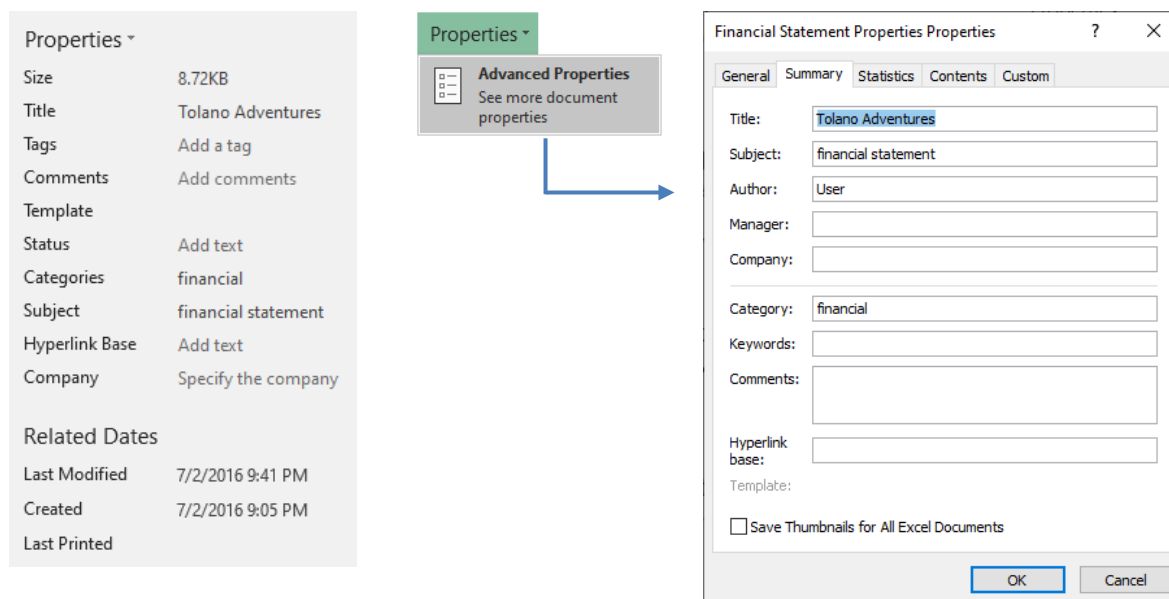


Figure 8-16: Examining document properties in Excel

Learn to edit workbook properties

In this exercise, you will view and modify Excel workbook metadata.

1. In File Explorer, navigate to the *StarterFiles* folder.
2. Right-click the **Financial Statement Properties** file and click **Properties** to open the Properties dialog box.
3. Click the **Details** tab, then scroll down the window to view its contents.
Notice that you can click the *Remove Properties and Personal Information* link at the bottom of the window.
4. Click **Cancel** to close the Properties window.
5. In Excel, open the **Financial Statement Properties** workbook located in the *StarterFiles* folder and save it as: **My Financial Statement Properties** in the *MyProjects* folder.
6. Click **File**, and on the Info page in Backstage view, click **Properties**, and then click **Advanced Properties** to open the Properties dialog box.
7. In the Summary tab, enter the following:
 Title: **Tolano Adventures**
 Subject: **financial statement**
 Author: **<your name>**
 Category: **financial**
 Keywords: **links, website, income statement, balance sheet**
8. Click each of the tabs to view their contents.
9. Click **OK** to close the dialog box.

Notice that some of the property values that you entered in the dialog box now appear in the Properties section of the Info page. They will also appear externally in File Explorer.

10. Save the workbook.

11. In File Explorer, navigate to the *MyProjects* folder, then right-click the **My Financial Statement Properties** file, and click **Properties**.
12. Click the **Details** tab, then view its contents.

Notice that this window now displays the new property values you entered in the Excel workbook.

13. Click **Cancel** to close the Properties window and close File Explorer.

Using the Document Inspector

Objective 1.5.4

Although metadata is useful to the person who created the workbook, this collection may not be appropriate if shared with other users. For example, the Labor Relations department in a company may send a workbook containing personnel information to a union representative. That file may contain some metadata that may seem innocuous, such as the person who created it. However, the union may use that information to strengthen their position during upcoming negotiations.

The **Document Inspector** is designed to look for certain types of data stored in workbooks and report them to you. Some of these items include:

- Comments, revision marks, document versions, or annotations containing names of people who have made changes or made notations in the workbook.
- Workbook metadata that may include information about the originator.
- Information in any headers or footers, including watermarks.
- Hidden data rows, columns, and worksheets.
- Custom XML data that is not visible in the document.

The document inspection report is often useful to help users find hidden or private information in the workbook that they intend to share or publish for other people to use. By knowing that these types of data exist in a workbook, you can decide on whether it is appropriate to leave this data in or remove it.

Begin by saving the workbook to protect any data the Document Inspector may remove.

To inspect a workbook, click File, and on the Info page, click Check for Issues, then click Inspect Document. Excel will prompt you to save the file first. Click Yes to save the file before proceeding or click No to skip directly to the inspection process. The Document Inspector dialog box presents a check list of items for which it can check, as shown in Figure 8-17.

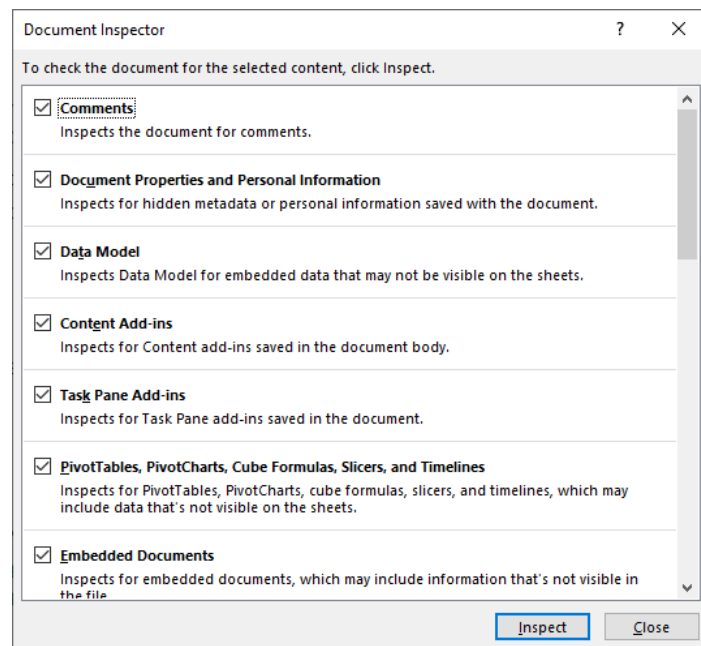


Figure 8-17: Document Inspector list of items to check

Select the items you want to include and click **Inspect**. The results of the inspection will then appear, as shown in Figure 8-18.

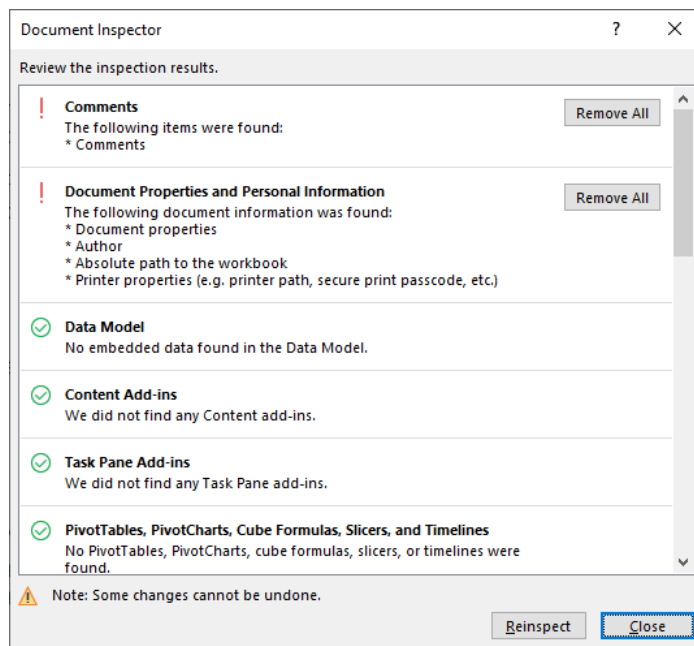


Figure 8-18: Document Inspector results window

Review the results of the inspection. Click the **Remove All** button for the types of content you want Excel to remove from your workbook. (Alternatively, you can just close the dialog box.) You may then click **Reinspect** to check the workbook again or click **Close** to exit the Document Inspector dialog box.

Learn to use the Document Inspector

In this exercise, you will use the Document Inspector to check a document for metadata you might not want to share with others.

1. With the **My Financial Statement Properties** workbook open save it as: **My Financial Statement Inspect** in the *MyProjects* folder.
2. Click **File**, and on the Info page, click **Check for Issues**, then click **Inspect Document**.

The Document Inspector window shows the items in your workbook that will be inspected. You can then choose which items to keep or remove.

3. Leave all default options unchanged and click **Inspect**.

The items that the Document Inspector identified and which you may choose not to share if you intend to distribute this document to others are displayed. The Document Inspector provides the option to remove the items automatically, so that you do not have to remove them manually.

4. Scroll down the Document Inspector window to look for all sections that show the exclamation mark icon that need your attention.
5. Scroll back up to the top of the Document Inspector window and click **Remove All** in the *Document Properties and Personal Information* section.

The *Document Properties and Personal Information* section now shows a check mark to show that the issues have been resolved. You can do a re-inspection to check again.

6. Click **Reinspect** and then click **Inspect**.
7. Scroll down the Document Inspector window to look for any sections that show the exclamation mark icon. None should be showing.
8. Close the Document Inspector dialog box.
9. Click **Properties**, then click **Advanced Properties**.
10. In the Properties dialog box, click the **Summary** tab if necessary.

Notice that the *Author, Title, Subject, Keywords, Category, and Status* fields are now blank.

11. Click **OK** to close the Properties dialog box.
12. Save and close the workbook.

Using the Accessibility Checker Tool

Objective 1.5.4

Computers have opened many new opportunities for persons with disabilities to enable them to become more self-sufficient and enhance their career opportunities. Windows and the Microsoft Office suite are designed with several features to assist persons overcome their physical limitations. However, workbooks should avoid certain attributes that can make it more difficult for users with disabilities.

By following these guidelines, your workbook can be used by more users of all abilities:

- Use descriptive text for charts, images and other graphic objects. The text-to-speech tool in the computer can then read these descriptions for persons with sight disabilities. The descriptions are entered into workbooks using the Alt Text option.
- Worksheet tab names should clearly describe the purpose of their respective worksheets. For example, rename a worksheet to “Addresses” instead of using the default name of Sheet1.
- Use descriptive headings for data rows and columns.
- Use range names wherever possible to allow users to move quickly between significant parts of the worksheet.
- Create dense spreadsheets by minimizing the use of empty cells. Avoid using empty rows and columns wherever possible.
- Hyperlinks should display as descriptive text instead of the default URL. For example, “company intranet” instead of “https://corp.intnet.com”.
- Use text fonts that are plain. A sans-serif font such as Arial, Calibri, or Verdana is recommended. Sans-serif fonts are more block-like and lack the little extensions on the end of the strokes.
- Use a high contrast color difference between the foreground and background.

To analyze a workbook to improve its use by persons with disabilities, you can use the Excel **Accessibility Checker** tool. To run this tool, go to the Backstage view, and click the Info category if necessary. Then on the Info page, click Check for Issues, then click Check Accessibility.

The Accessibility Checker task pane (Figure 8-19) will display the inspection results and suggest improvements that can be made.

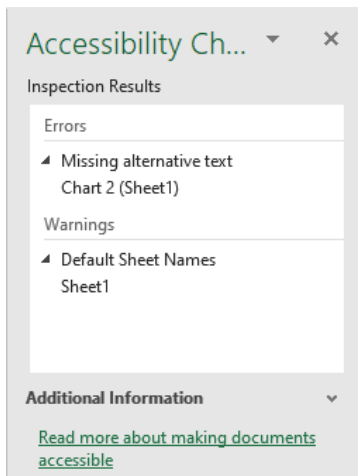


Figure 8-19: Accessibility Checker task pane – Inspection Results

Selecting an error item in the Accessibility Checker pane selects the item in the worksheet and displays additional information in the lower part of the task pane about how to remedy the issue. The quickest way to correct an error is to click the drop-down arrow to the right of the item in the task pane and click one of the Recommended Actions, as shown in Figure 8-20.

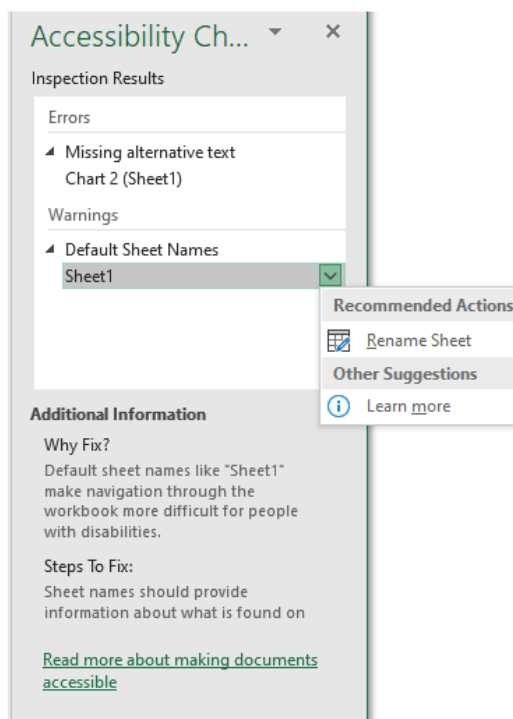


Figure 8-20: Accessibility Checker task pane – Recommended Actions

This will activate options (such as opening a task pane or selecting a worksheet tab name) you need to use to correct the error. Repeat the process for each item in the Inspection Results. You can also close the Accessibility Checker task pane and correct the issues independently.

Learn to check for accessibility issues

In this exercise, you will check a workbook for its compliance with accessibility guidelines and make corrections where necessary.

1. Open the **Caribbean Vacation Bookings Accessibility** workbook located in the *StarterFiles* folder and save it as: **My Caribbean Vacation Bookings Accessibility** in the *MyProjects* folder.
2. Click **File** in the Ribbon.
3. On the Info page in Backstage view, click **Check for Issues**, then click **Check Accessibility**.

The Accessibility Checker pane lists an error and a warning, each of which should be corrected.

Correct the warning about the default sheet name from the Accessibility Checker pane.

4. In the Accessibility Checker pane, in the *Warnings* section, click the **Sheet1** drop-down arrow, then select **Rename Sheet**.
5. Type: **Bookings**, and press **ENTER**.
6. Close the Accessibility Checker task pane.

Correct the error by adding alternative text to the chart.

7. Click the chart in the worksheet. The Name Box shows the object name is Chart 2.
8. Right-click the chart, then click **Edit Alt Text**.

The Alt Text task pane is displayed.

9. In the task pane, click in the text box and type: **Bookings column chart**.
10. Close the Alt Text task pane.

Re-run the accessibility checker.

11. Click **File**, click **Check for Issues**, then click **Check Accessibility**.

No accessibility issues are found. People with disabilities should not have difficulty reading the workbook.

12. Close the Accessibility Checker task pane.
13. Save and close the workbook.

Lesson Summary

Now that you have completed this lesson, you should be able to:

- | | |
|--|--|
| ☒ Customize the Quick Access toolbar. | ☒ Import and export data. |
| ☒ Find data in the worksheet. | ☒ Change workbook document properties. |
| ☒ Replace data in the worksheet. | ☒ Use the Document Inspector tool. |
| ☒ Create, modify, and delete hyperlinks. | ☒ Use the Accessibility Checker tool. |

Key Terms

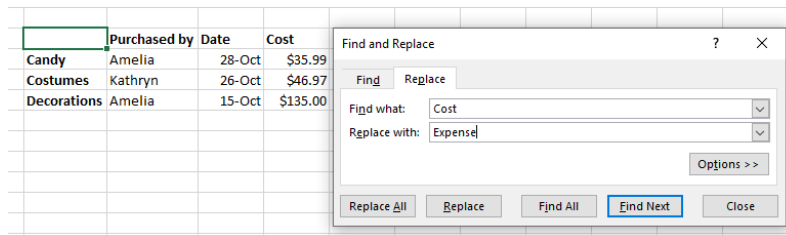
Term	Definition
Accessibility Checker	An Excel feature that inspects a workbook for data and objects that may pose challenges to users with disabilities.
Comma Separated Values (CSV) file	Also known as Comma Delimited text files. A file that contains data in text form, wherein each cell value is separated by a comma. That is, a comma is used as a delimiter to separate the values between columns.
Document Inspector	A tool to assist in removing any personal or hidden information you do not want others to see when they open the file.
Document properties	A collection of data that provides information about a file. Properties may include items such as keywords, author name, file creation date, and so on.
Export	To convert a file (or its data) into a format other than the one it is currently in.
Hyperlink	A link to another location or file.
Import	To bring information stored in a file saved in a different format into the software application in which you are currently working.
Metadata	A collection of data that describes and provides information about other data.

Quiz Questions

For each question, select the best answer.

- Which commands can you add to the Quick Access toolbar?
 - Any Excel command that is available in the Customize Quick Access toolbar tab of the Excel Options dialog box
 - Only the commands that are visible on the current tab of the Ribbon
 - Only the commands that are accessible on one of the default Ribbon tabs
 - Only the commands available in the Customize Quick Access toolbar drop-down list
- Which of the following methods can you use to customize the Quick Access toolbar?
 - Open the Excel Options dialog box and access the Quick Access toolbar tab.
 - Click the Customize Quick Access toolbar button.
 - Right-click the Ribbon, then click Customize Quick Access toolbar.
 - You can use any of these methods to customize the Quick Access toolbar.
- Which option setting in the Find and Replace dialog box will specify that you want to search an entire workbook for every occurrence of a value (text label or number), function name, or cell reference?
 - Within
 - Look in
 - Search
 - Match entire cell contents

4. Lydia created a worksheet and wants to change the column title Cost to Expense. Examine the following figure, then select the statement(s) that is/are true.



- Lydia can use either the Replace or Replace All commands, because in either case, only one replacement will be made.
 - Lydia should use the Replace All command because it would be more efficient.
 - Lydia should use the Replace command to ensure Excel does not make undesired replacements.
 - Lydia should click the Options button so that she can specify how many replacements she wants Excel to make.
5. A hyperlink in a workbook can be used to:
- Open a different workbook that is stored on your computer.
 - Run the Formula Annotator add-in.
 - Open the Watch window.
 - Edit a macro.
6. Where will you find the options you need to import data from a text file into Excel?
- The Data tab
 - The Formulas tab
 - The Developer tab
 - The Insert tab
7. Which of the following is not permitted as a delimiter character?
- Double-quote (")
 - Comma (,)
 - Equals sign (=)
 - All of the listed characters are permitted to be used as delimiters.
8. Where will you find the options you need to export Excel data to a Comma Separated Values (CSV) file?
- The Export & Transform group on the Data tab
 - The Export Forms group on the Developer tab
 - The Save As dialog box
 - The File Export group on the Formulas tab
9. Where can you view the properties of a workbook?
- On the Review tab in the Notes group
 - On the View tab in the Window group
 - In the Excel Options dialog box
 - On the Info tab in Backstage view

10. The Document Inspector will not identify which of the following for corrective action?
- a. Hidden rows, columns, or worksheets
 - b. Custom XML data, even any that is hidden
 - c. Misspelled names of people
 - d. The name of the person who created the workbook
11. The Accessibility Checker Tool will not identify which of the following for corrective action?
- a. Worksheets that still have their default names instead of customized ones
 - b. Worksheet cells that do not have volume controls to assist people who are hearing impaired
 - c. Graphic objects that do not have a description
 - d. Charts that do not have a description
12. Which command should you use to open a CSV file in Excel?
- a. Convert, CSV
 - b. Import, CSV
 - c. Insert, CSV
 - d. File, Open

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Excel

Associate Certification Guide

Appendices

Appendix A

Courseware Mapping

Appendix B

Glossary of Terms

Appendix C

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Appendix A: Courseware Mapping

Skills Required for the Microsoft® Office Specialist Excel Exam MO-200:

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Objective Domain		Lesson
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Objective Domain		Lesson
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Appendix B: Glossary of Terms

Absolute cell address – A cell address that remains fixed (the column and row coordinates do not change) regardless of where the address may be copied and pasted in a workbook.

Accessibility Checker – An Excel feature that inspects a workbook for data and objects that may pose challenges to users with disabilities.

Active cell – The currently selected cell.

Active workbook – The workbook that contains the cell pointer.

Alignment – The positioning or placement of content within a cell.

AutoFill – A method of copying data and formulas or creating data series by dragging the lower right corner of a cell or range.

AutoFit – A feature that will automatically adjust the width of a column or the height of a row so that the cells are just wide or high enough to display the values in all the cells of that column or row.

AutoSum – A tool that will quickly insert a SUM function into the current cell and determine the appropriate cell range to be used.

Backstage – A view that allows you to manage the workbook, including printing, opening and saving in different formats, and changing the metadata.

Built-in functions – Pre-programmed formulas used to perform specific calculations. You can either type these functions in or use the Insert Function wizard to assist.

Cell range – A rectangular block of cells. You refer to a cell range by listing the addresses of two cells at opposite corners of the range, separated by a colon (:).

Cell reference – The column and row coordinates which comprise a cell address. For example, the cell reference A1 indicates a cell at the intersection of column A and row 1.

Cell style – A feature that enables you to apply many different formatting characteristics to one or more cells with a single command by choosing a style from a gallery. See also Quick Style.

Chart – A pictorial representation of the data you enter in a worksheet.

Clipboard – A location used to temporarily store data that is cut or copied from an application.

Comma Separated Values (CSV) file – Also known as Comma Delimited text files. A file that contains data in text form, wherein each cell value is separated by a comma. That is, a comma is used as a delimiter to separate the values between columns.

Contextual tab – A ribbon tab that appears only when applicable.

Copy – An editing function used to duplicate the content in selected cells.

Cut – The editing process of transferring the contents of selected cells to the Clipboard so that you can move them from one location and place them into another.

Delete – An editing function that enables you to remove text from a worksheet, including entire columns or rows.

Document Inspector – A tool to assist in removing any personal or hidden information you do not want others to see when they open the file.

Document properties – A collection of data that provides information about a file. Properties may include items such as keywords, author name, file creation date, and so on.

Export – To convert a file (or its data) into a format other than the one it is currently in.

Filter – The process of temporarily hiding data rows that do not meet the filter criteria.

Flash Fill – A feature that will extract, combine, and/or re-sequence cell contents from one or more cells to create new values.

Font – A specific typeface, such as Arial, or Times New Roman.

Footer – Text that appears at the bottom of every page of printed output and may include automatic page numbering.

Format Painter – A tool you can use to copy formatting from a selected cell to other cells and cell ranges.

Formula – A calculation involving any combination of values, cell references, and/or built-in functions. A formula begins with an equals sign.

Formula bar – A field on the screen that displays the contents in the active cell. It can also be used to make entries into the worksheet.

Function – A feature designed by Microsoft that enables you to quickly perform a calculation or formula using a specialized function.

Header – Text that appears at the top of every page of printed output and may include automatic page numbering.

Hyperlink – A link to another location or file.

Import – To bring information stored in a file saved in a different format into the software application in which you are currently working.

Insert – An editing function that enables you to add text between other text, including entire columns or rows.

Insert Function – The feature Excel provides to help you select the desired function to perform calculations.

Legend – A box on a chart that explains the meaning of each line in a line chart, or bar in a bar chart.

Live Preview – An Excel feature that temporarily changes the appearance of the selected cell(s) to show how they would appear with the format your mouse is currently pointing to on the Ribbon.

Margin – The white space or area from the edge of the paper to the printed text.

Marquee – A rectangle outlined with a moving, dotted line that appears around a cell range that has been cut or copied and can be pasted into a new location.

Metadata – A collection of data that describes and provides information about other data.

Mixed cell reference – A cell address where either the column or row reference is absolute, and the other reference is relative.

Named range – A range of cells that has been assigned a name.

Page Break – The division between two pages.

Paste – The editing function of placing cut or copied data into a new location.

Print Area – A range specified as the default selection for printing.

Print Titles – Rows and/or columns set to repeat at the top/left of each page of printed output.

Quick Access Toolbar – A toolbar that appears in the upper left part of the Excel window that contains buttons for frequently used commands. It is customizable to give you access to commands that you use frequently.

Quick Style – A combination of pre-built formatting options that can be applied to cells in the worksheet. Quick Styles are displayed in galleries. See also Cell style.

Range of cells – A contiguous block of cells with one or more rows and one or more columns of cells.

Relative cell address – A cell address that adjusts positionally when copied to other cells in a worksheet.

Ribbon – The collection of commands grouped under different tabs across the top of the Excel screen. Each tab is aimed at a type of activity, such as controlling the page layout or inserting items into a worksheet.

Series – Each set of data used in a chart.

Smart tag – An indicator that recognizes specific data and offers action options based on the type of data that is recognized.

Sort – The process of changing the sequence of data rows based on the values in selected columns.

Structured reference – A special syntax for referencing a specific column within an Excel table. The structured reference uses a combination of the table name and the column name.

Table – A group of cells that Excel treats as a single entity.

Template – A pre-designed workbook that may already contain data, formulas, and other objects, thereby saving you time and effort in entering these items.

Text functions – Functions that are used for handling and manipulating text strings. Examples include CONCAT, LEFT, LEN, LOWER, MID, PROPER, RIGHT, TEXTJOIN, TRIM, and UPPER.

Undo – A feature that enables you to reverse the last command that was executed. You can undo up to a maximum of the 100 most recently used commands.

X axis – The horizontal edge of a chart, marking the scale used there.

Y axis – The vertical edge of a chart, marking the scale used there.

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