

K2's EXCEL TIPS, TRICKS, AND TECHNIQUES FOR ACCOUNTANTS

CONTINUING PROFESSIONAL EDUCATION SERIES



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Introduction

Three Rules of this Seminar

1. **There Are No Dumb Questions.** Please ask questions if you need further explanation. We welcome your questions and will do our best to provide accurate and meaningful answers.
2. **Obtain the Information for Which You Came.** If you have a specific interest in a topic, please let us know. If your topic is not part of the course materials, we will do our best to accommodate your request. Your instructor is anxious to meet your needs.
3. **Share and Share-Alike.** Your instructor is here to share relevant information about the course. We hope that you will be willing to do the same. If you have helpful tips or experiences, please share them with the other participants and us.

Course Development

The shareholders, associates, and staff of K2 Enterprises and K2E Canada Inc. developed this course and the related course materials. We aim to deliver high-quality educational practices that help you use and understand the tools and concepts discussed in this session more effectively.

We designed our course presentation style for busy professionals. Through numerous short case studies and feature reviews, we deliver concise, easy-to-understand, easy-to-absorb information.

To maximize your time and the value of attending this course, we have carefully filtered out trivial and obscure features. Our goal is not to cover every keystroke and menu option, but to provide a fast-paced course that focuses on state-of-the-art information technology and how it can benefit you and your staff.

About K2 Enterprises

For over three decades, our team members have delivered more than 45,000 technology-focused seminars, webinars, and conferences worldwide. To stay on top of technology, our team members read numerous technology trade magazines, attend conferences, and speak with technology companies each year to stay current with the latest information for our courses. Also, we experience everything we teach and recommend to our audiences. Because our shareholders and associates are based in different states and provinces, using technology efficiently and appropriately is essential to our business's success and survival.

Our Mission Statement

K2 aims to develop and deliver the highest-quality technology seminars and conferences for business professionals. We work cooperatively with professional organizations such as state CPA societies, associations of Chartered Professional Accountants, and technology vendors. We make every effort to maintain high integrity, family values, and friendship among all involved.

Our Instructional Team

For a complete listing of instructors and bios, please visit:

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- K2's Advanced Excel
- K2's Business Intelligence, Featuring Microsoft's Power BI Tools
- K2's Case Studies In Fraud And Technology Controls
- K2's Excel Best Practices
- K2's Excel Essentials For Staff Accountants
- K2's Excel PivotTables For Accountants
- K2's Excel Tips, Tricks, And Techniques For Accountants
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- K2's Excel Charting And Visualizations
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- K2's Mastering Advanced Excel Functions
- K2's Microsoft Teams
- K2's Securing Your Data: Practical Tools For Protecting Information
- K2's Technology Update
- K2's Top PDF Features You Should Know

Besides the seminars listed above, K2 also produces numerous one and two-day technology conferences annually. You can find a complete listing of our course offerings, including dates, locations, and course descriptions, on our website at:

K2 Enterprises

[Technology Conference - K2 Enterprises](#)



K2E Canada Inc.

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On-Site Training

Working cooperatively with state CPA organizations and associations of Chartered Professional Accountants, we are pleased to offer all our seminars and conference sessions as on-site training opportunities. On-site training provides companies of all sizes with numerous advantages, including the following.

- **Customization.** K2 can customize the content of all on-site training events to meet your organization's specific needs. For example, we can combine selected parts of existing courses into a focused learning experience to meet your team's needs. Likewise, we can develop custom content from the ground up and deliver it to your team members, ensuring we meet your training objectives.
- **Cost savings.** For organizations of all sizes, on-site training can provide significant cost savings compared to public training venues. In addition to potentially reduced registration fees, these cost savings materialize in the form of reduced travel costs and reducing the amount of time team members spend away from the office.
- **Convenience.** Because you select your on-site training event's date, time, and location, on-site training is more convenient for you and your team than traditional training options. Many organizations schedule on-site training with staff meetings, retreats, and customer/client events to leverage the value of all participants' time.

Customization, cost savings, and convenience are the three C's of "training to go." For more information on how you and your organization can experience these benefits or schedule an on-site training event, please visit:

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Web-Based Training

K2 offers web-based CPE and CPD to accounting and business professionals throughout the United States and Canada. K2's award-winning instructors deliver two-, four-, and eight-hour webinars on numerous technology-focused topics.

Additionally, K2 provides on-demand training. On-demand courses offer you the advantage of receiving top-quality training at a time and location that fits your busy schedule. You can start a class today and complete it in the future. For more information, please visit:

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K2 Internet Sites

K2 maintains multiple websites containing information and links relevant to CPAs and other business professionals as a service to the profession. Further, the content of these sites can enrich your experience during and after our seminars. In addition, our pages contain links to some of the top accounting and content management software solutions and even to a few sites that are just fun places to visit. If you have any comments or questions regarding our web pages, please email webmaster@k2e.com.

K2 has two primary websites. You can view information regarding CPE and CPD opportunities, access a library of technology tips and articles, and link to K2-related websites.

www.k2e.com



www.k2e.ca



www.cpafirmtech.com

CPA Firm Technology contains technology-related information explicitly targeted at public accounting firms. We include product reviews, hardware and operating system discussions, affinity programs for CPA firms, and Cloud computing resources.



www.accountingsoftwareworld.com

Accounting Software World provides information related to accounting and financial management solutions. Here, you can find software and service reviews, product comparisons, white papers, and other material of interest to those seeking information about accounting software and service solutions.



www.totallypaperless.com

For information about document management and paperless processes, please visit **Totally Paperless**. In addition, you will find reviews on hardware and software used by all types of businesses in document imaging and management processes.



Productivity Tips and Tricks

Chapter

1

Excel has become the tool of choice for accountants and business professionals. Many have been using Excel for years, but most are self-taught and depend on others in their offices for tried and true solutions to common problems. This course will heighten users' awareness of commonly-used, powerful Excel features while revealing advanced capabilities seldom used by most practitioners. This course's information, guidance, recommendations, and real-world examples will improve your spreadsheet skills and productivity.

Learning Objectives

Upon completing this chapter, you should be able to:

- Utilize features such as freeze panes and split windows to optimize the working environment in Excel;
- Identify and select cells with specific characteristics;
- Implement alternate means for adding data to a worksheet, including Paste Special, date and time stamps, Custom Fill Lists, AutoCorrect, and Fill Cells with a Series;
- Enter and copy formulas more efficiently, open workbooks with ease, group data for presentation purposes; and
- Access resources available in addition to Excel's Help system for solving issues in Excel.

We begin the course with various tips and tricks to improve results while reducing the effort and time expended. Of note, virtually all these tips will reduce the time required to prepare financial statements and related documents while increasing the accuracy of these documents.

Freeze Panes and Split Windows

If you work with spreadsheets that contain long, multi-row lists or wide multicolumn reports – such as multi-period financial statements – you commonly face the problem of column headings or account numbers scrolling off the screen as they move around a worksheet. The simple solution is to freeze or split the panes for display. When panes are frozen, specific rows and columns remain visible while you scroll through a worksheet. Position the cursor in the worksheet and select **Freeze Panes** from the Ribbon's **View** tab to freeze panes, as shown in **Figure 1**. The rows that are frozen are above the active cell. The columns that are frozen are to the left of the

active cell. Excel darkens grid lines when panes are frozen. Select **Unfreeze Panes** from the **Freeze Panes** list of options to unfreeze the worksheet's panes.

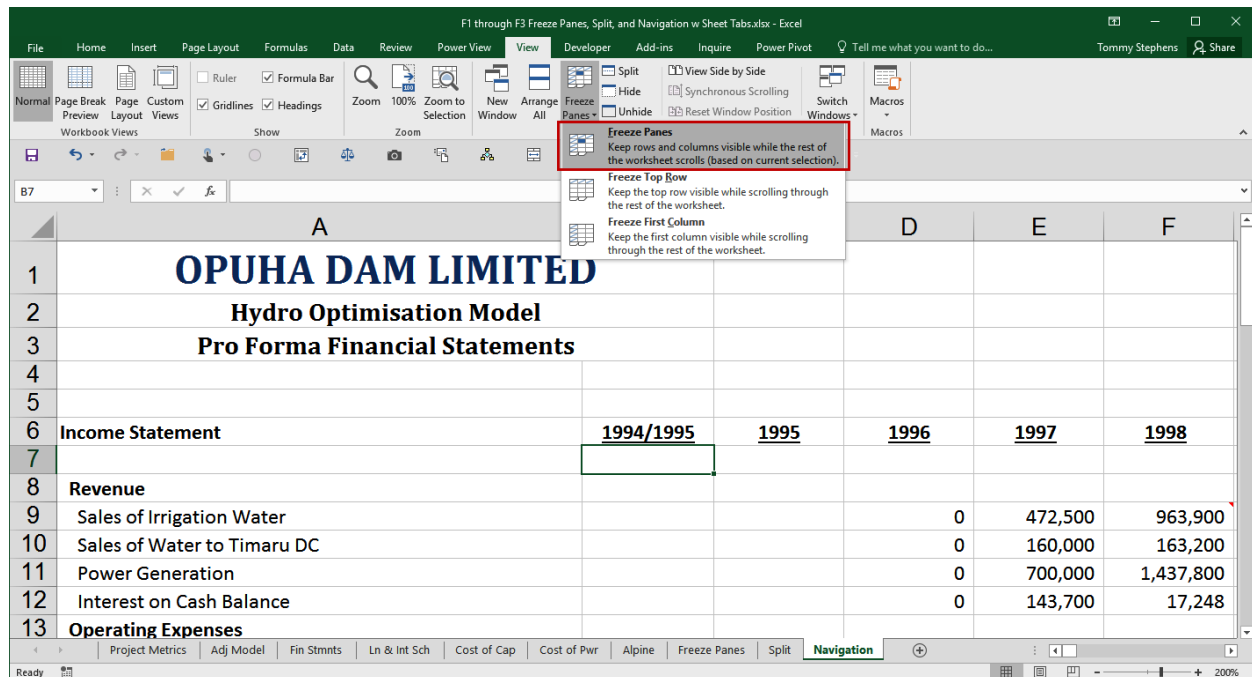


Figure 1 - Freezing Panes to Maintain Display of Headings

Split panes divide the Excel grid into separate worksheet areas, each of which you can scroll in any direction independently of the other panes. This behavior helps you work in large spreadsheets while building formulas between different worksheet areas or watching calculation results as assumptions are changed. In Excel 2013 and newer, select the cell where the split-screen should appear and click **Split** from the Ribbon's **View** tab. **Figure 2** illustrates this technique. To change the split bar's location, move the cursor over a split until it changes to a double-pointed arrow. Then, left-click on the split and move it to the desired location. To remove a split, double-click any part of the split bar.

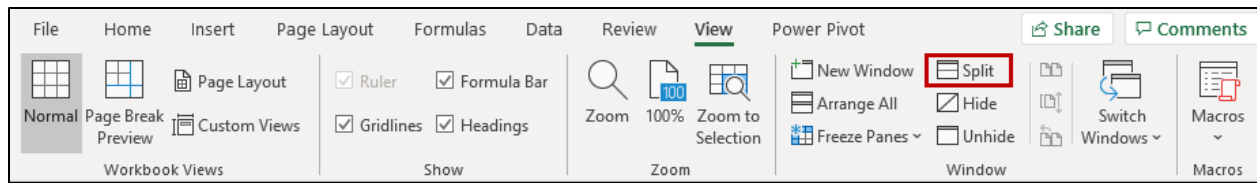


Figure 2 - Splitting Panes to Create Separate Worksheet Areas

Navigating Sheet Tabs

Navigating between worksheets is often half the battle in workbooks with many worksheets. To move through a workbook more efficiently, right-click the worksheet scroll buttons, select the worksheet of interest, and select **OK**, as shown in **Figure 3**.

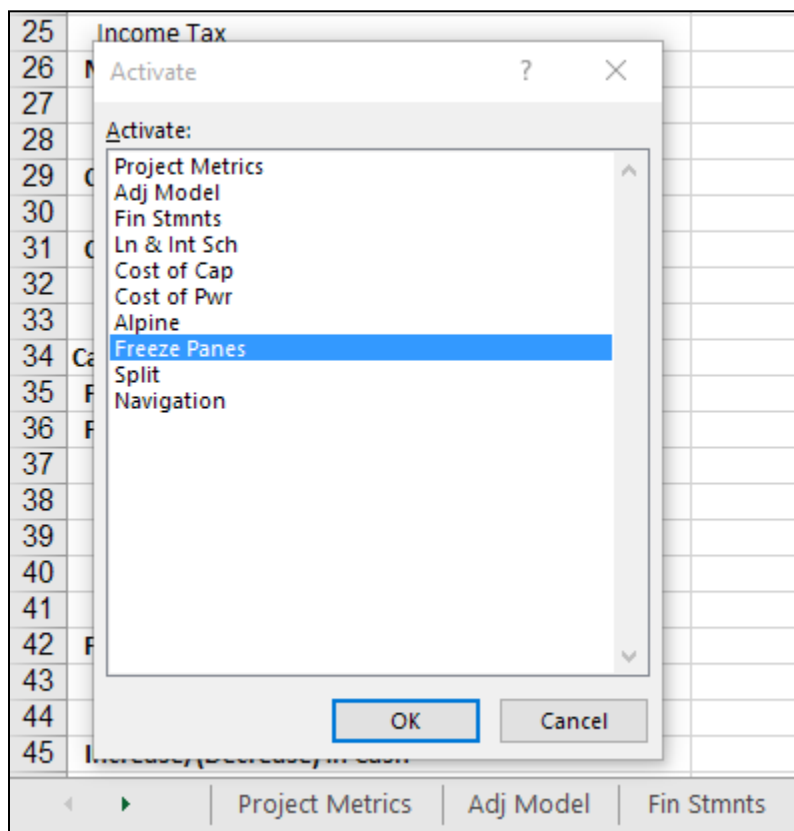


Figure 3 - Right-clicking on the Scroll Buttons for a List of Worksheets

Navigation with Hyperlinks

Hyperlinks assist with navigating within and between workbooks and other documents or Web pages. They also link to external data sources. The links can be to any file type or Web page. Clicking a link opens the related document in the registered application for that file type. For

example, this functionality helps link financial statements to detailed schedules in Excel. You can also use hyperlinks to connect to external documents, such as PDFs or accounting databases.

To create a hyperlink, position the cursor in the cell to contain the link. Then, click **Hyperlink** or use the keyboard shortcut **Ctrl + K** to open the Insert Hyperlink dialog box on the Ribbon's Insert tab. Next, select the type of link to create from the **Link To** column on the left. Next, type the link or navigate to the file or Web address to complete the required information. Links can open a Microsoft Office document to a specified page, sheet, or defined name. Optional information includes the **Text to display** and **ScreenTip**, as shown in **Figure 4**.

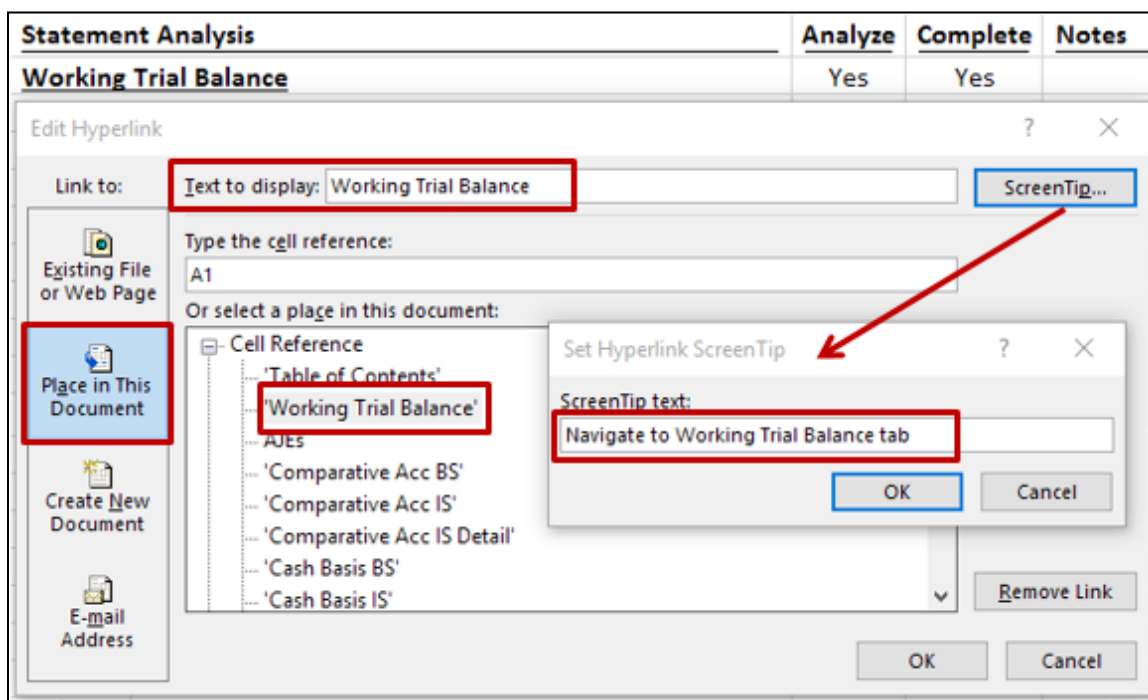


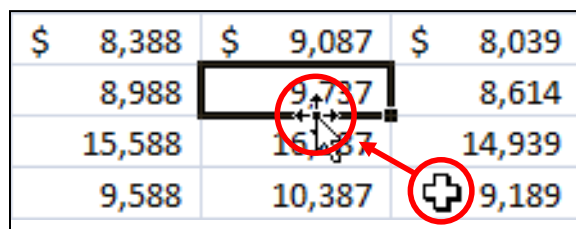
Figure 4 - Creating a Hyperlink to a Location in the Same Workbook

Control Hyper-scroll When Selecting Ranges

Everyone who uses Excel has experienced hyper-scroll – when, during a mouse operation such as highlighting or dragging, the cursor seems to speed up and highlight an entire row or column. Unknown to most, you can control scroll speed by carefully bumping your cursor against the worksheet window's edges. The edges act just as an accelerator pedal does in an automobile. Barely touching the edge causes Excel to scroll slowly. The scroll speed accelerates as you move the mouse cursor past the edge. In the latest version, Excel seems to pause ever so slightly, regardless of scroll speed, when it reaches the end of a row or column of data, allowing you to stop the scroll operation. Be aware of this behavior to lessen your frustration and improve your productivity.

Although highlighting with a mouse is suitable for small ranges of cells, using the mouse to highlight large ranges is time-consuming and problematic. There are several alternative methods for highlighting large ranges.

1. Hold down the **SHIFT** key and use the navigation keys (UP, DOWN, LEFT, RIGHT arrows, PAGE UP, PAGE DOWN, etc.) to highlight the desired range without using your mouse. Alternatively, you can simultaneously hold down the **CTRL** and **SHIFT** keys and use the navigation keys to select all the cells in a contiguous range.
2. Position the cursor in one corner of the desired range. Next, scroll through the worksheet using the scroll bars to the opposite end of the range. Then **SHIFT + Click** on the cell representing the range's opposite corner.
3. To quickly move to the edge of any range of contiguous data, position the cursor in the column or row of interest and then double-click on the cell edge that represents the direction in which the cursor is to move. For example, double-clicking on the bottom edge will move the cursor to the bottom of the column. However, if there is a break in the data, the movement will stop at the break. Press the **SHIFT** key while double-clicking an edge to highlight the data in the column or row. Note that when positioning the mouse pointer over a cell edge, the pointer changes from the Swiss cross to a compass rose, as shown in **Figure 5**.



\$ 8,388	\$ 9,087	\$ 8,039
8,988	9,737	8,614
15,588	16,437	14,939
9,588	10,387	9,189

Figure 5 - Mouse Pointer Changing to a Compass Rose When Properly Positioned

Select Cells with Special Characteristics

Excel offers built-in functionality to select cells with particular characteristics. These characteristics include cells containing constants or formulas, blank spaces, or visible ones. To choose all cells containing formulas, click **Find & Select** on the Ribbon's **Home** tab. Then click **Formulas**, as shown in **Figure 6**. This procedure may help you review a workbook received from a client or staff member. Finally, consider applying a **Style** to the selected cells so they will be easily visible during the review process.

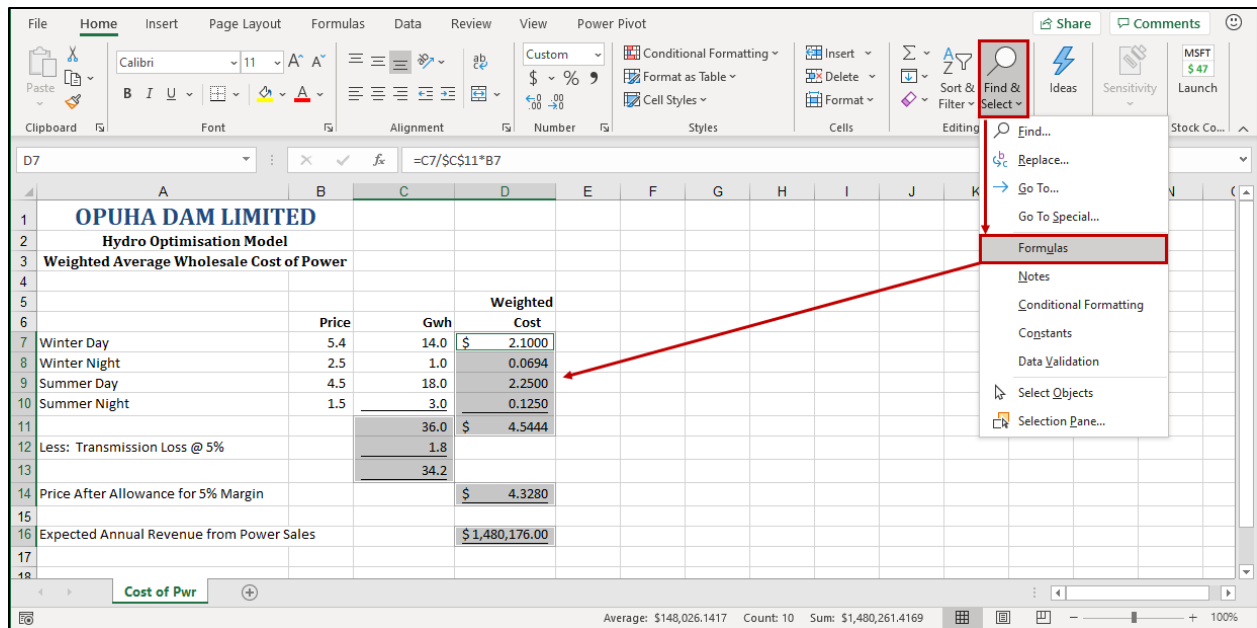


Figure 6 - Selecting All Cells That Contain Formulas

Selecting cells with more specialized characteristics involves using the **Go To Special** dialog box, also available from the **Find & Select** command. For example, as shown in **Figure 7**, you can use Go To Special to select only those containing Comments.

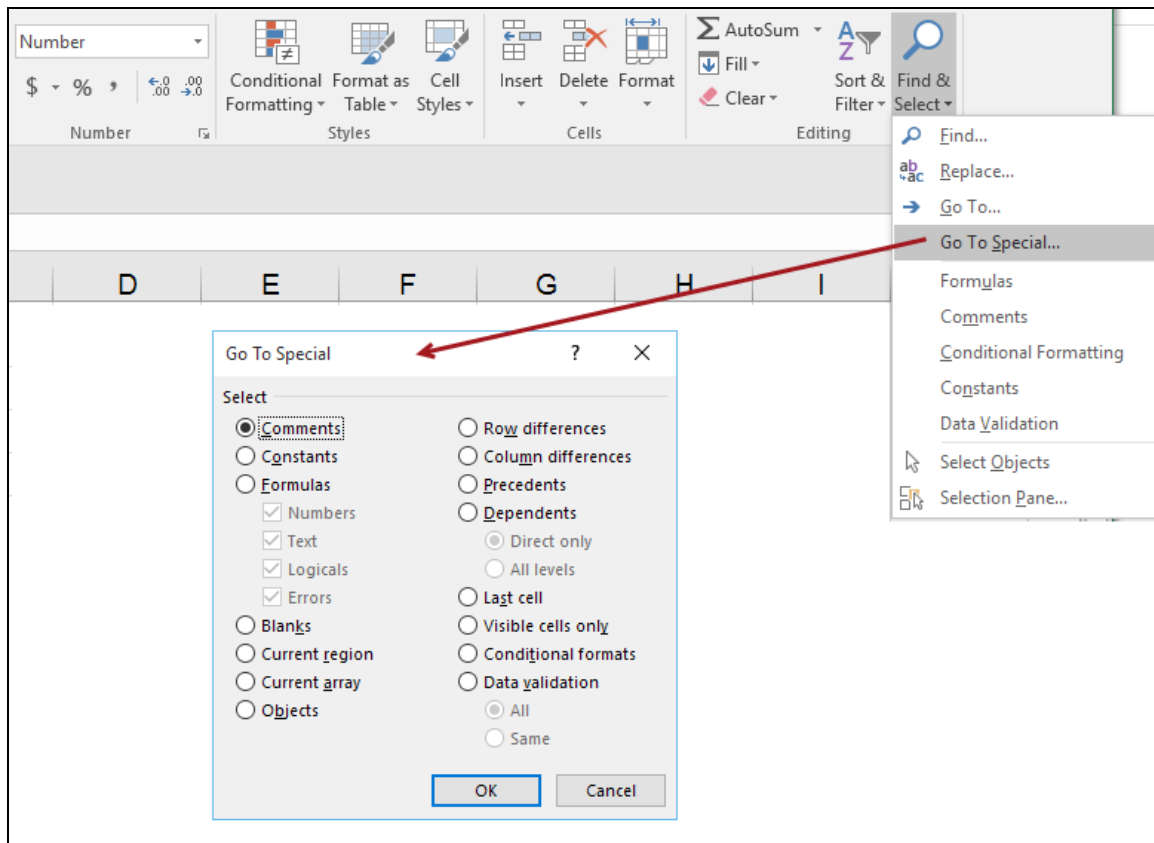


Figure 7 - Using Go To Special to Select Only Cells with Conditional Formats

View All Formulas

The last tip allows you to *identify* all the cells in a worksheet that contain formulas or other unique characteristics, but this tip *displays* all the formulas. Once Excel displays the formulas, you can examine the worksheet for inconsistencies and errors or print the worksheet for documentation purposes. For example, selecting **Show Formulas** from the **Formulas** tab of the Ribbon will cause Excel to display all formulas. Alternatively, you can use the keyboard shortcut of pressing **CTRL + `** (the grave symbol) to achieve the same result, as shown in **Figure 8**.

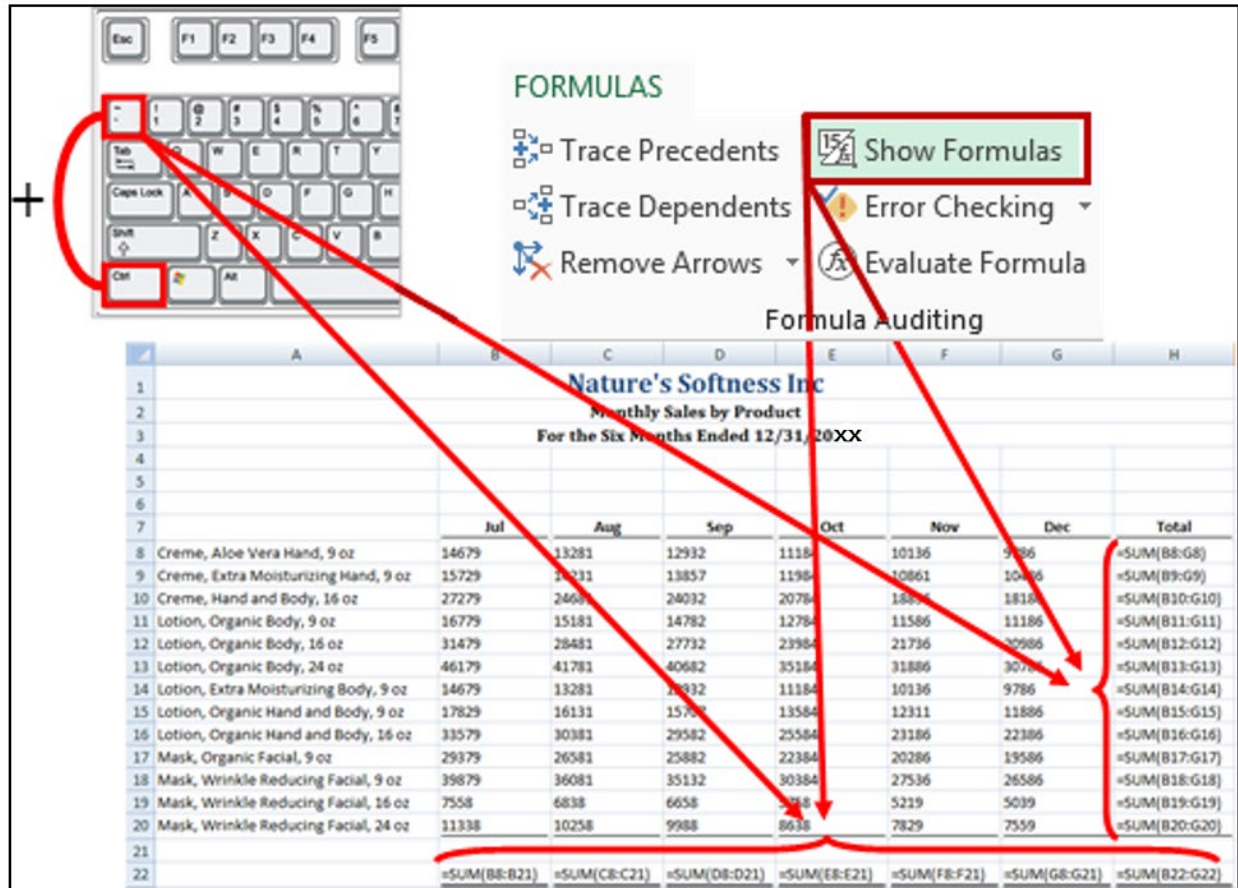


Figure 8 - Displaying All Formulas in a Worksheet

Add Date or Time Stamps

You can quickly add a date or timestamp to any worksheet using keyboard shortcuts, as shown in Figure 9.

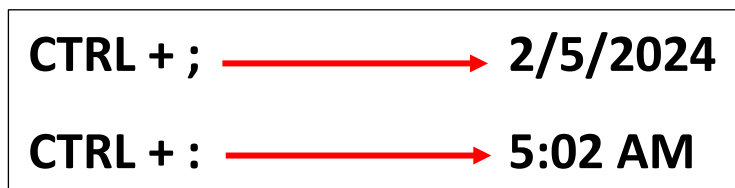


Figure 9 - Add Date and Time Stamps Using Keyboard Shortcuts

Note that date and time stamps added using these techniques are “hard-coded” into the worksheet and do not update with the computer’s system clock. For a dynamic datestamp, enter **=TODAY()** in a cell; for a dynamic timestamp, use **=NOW()** and change the format so that the cell only displays the time and excludes the date.

Using the Office Clipboard

The Office Clipboard accumulates up to twenty-four items cut or copied from other Microsoft Office documents, such as Excel workbooks, Word documents, PowerPoint slideshows, or Outlook messages. Further, the Office Clipboard makes each copied item available for pasting into other Office applications. The accumulated items remain on the Office Clipboard until all Office programs are closed or until you delete the items from the Clipboard task pane. To display the **Office Clipboard** pane, click the dialog launcher in the **Clipboard** group of the Ribbon's **Home** tab, as shown in **Figure 10**.

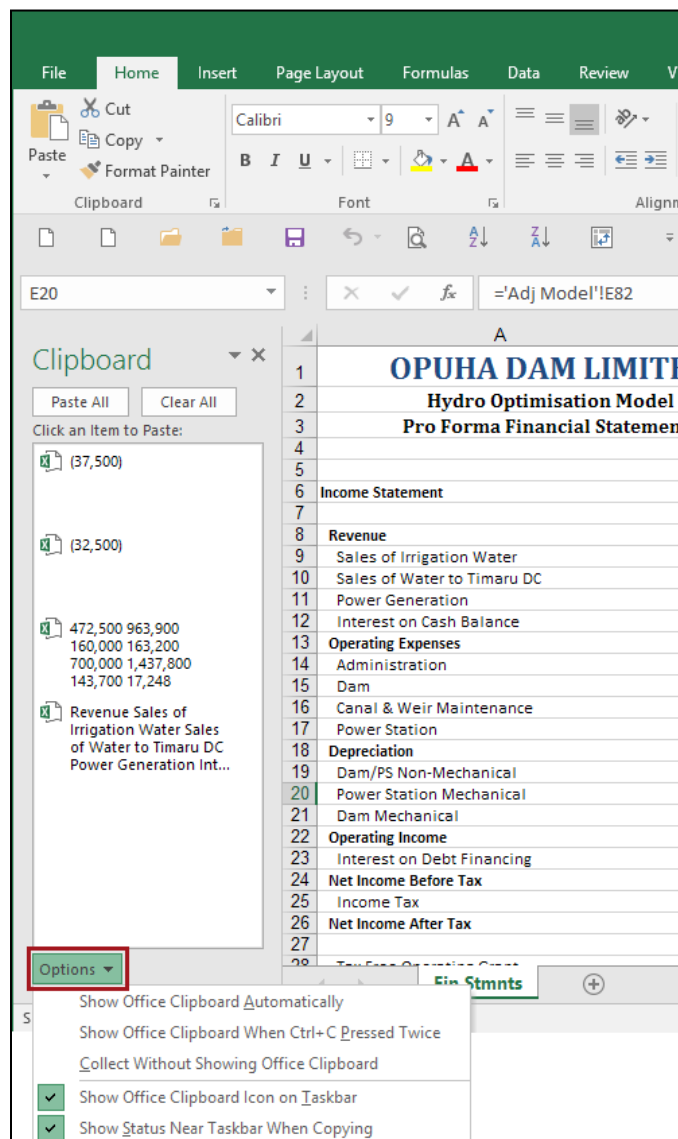


Figure 10 - Using the Office Clipboard to Accumulate and Paste Items

The Office Clipboard holds up to 24 items, with the most recently copied items at the top. Upon adding a 25th item to the list, the oldest item disappears.

Paste Special Power

Convert Formulas to Values

You can use the **Paste Special** command to alter the default rules of the pasting process. For example, by default, formats paste with data, formulas paste as formulas, and the paste process does not affect destination column widths. Our first example of this powerful command is to use **Paste Values** to convert formulas into their values. This functionality is beneficial for turning the results of intermediary calculations or audit samples selected with Excel functions into static values. For example, **Figure 11** shows a random sample of check numbers chosen using the **RANDBETWEEN** function. To make these values static, copy the formulas to the clipboard and select **Paste, Paste Values** from the Ribbon's **Home** tab to complete the process.

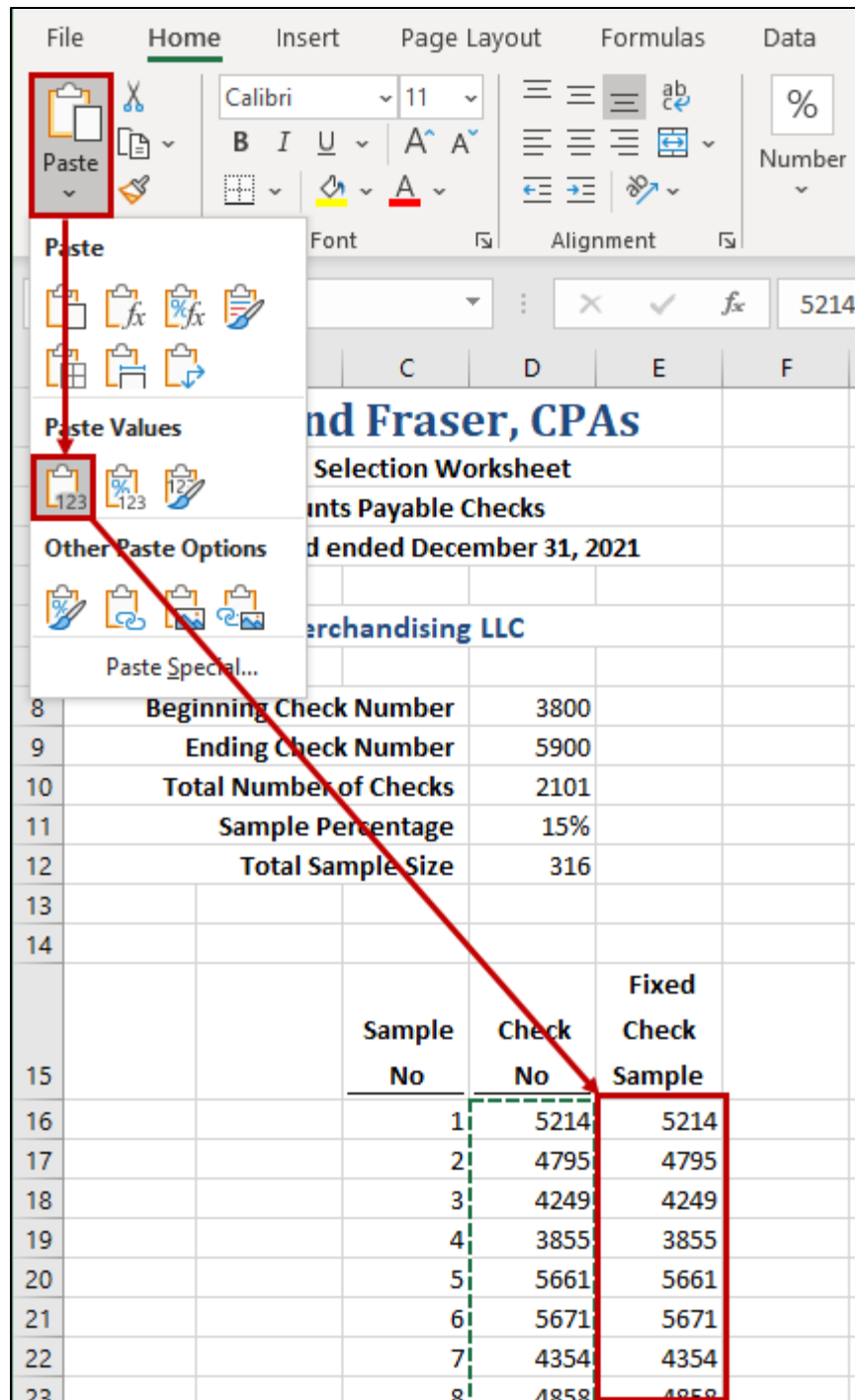


Figure 11 - Using Paste Values to Turn Formulas into Values

Convert Negative Numbers

Accountants often export data from a general ledger for reporting and analysis. Sometimes, applications export data such as sales revenue or cash payments as negative numbers. For example, check amounts are negative in the QuickBooks Missing Check report. To convert these

amounts to positive numbers for analysis and reporting, use the **Paste Special** command to multiply them by minus one (-1). There is no need to use the commonly employed convoluted process of building formulas, copying them, pasting their values, and deleting the original data column.

To convert negative numbers to positive values using **Paste Special**, perform the following steps.

1. Enter minus one (-1) into a blank cell of the worksheet.
2. With the cursor still in the cell where you entered minus one (-1), copy its contents to the clipboard by pressing **CTRL + C**.
3. Now, highlight the cells containing the negative numbers to convert and, from the **Home** tab of the Ribbon, click **Paste, Paste Special**.
4. In the **Operation** section of the **Paste Special** dialog box, select **Multiply** and click **OK**, as shown in **Figure 12**.

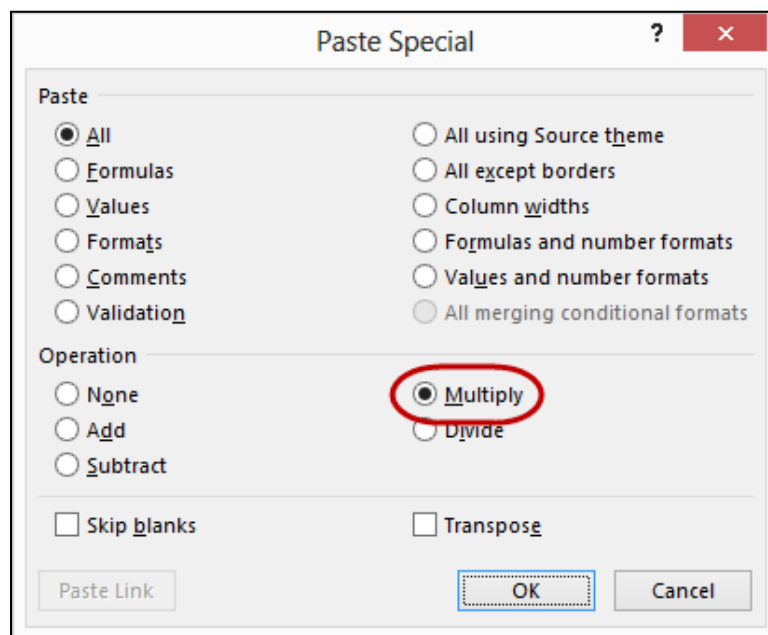


Figure 12 - Using Paste Special to Alter the Default Paste Rules

5. Delete the cell's contents that contain minus one (-1) to complete the process.

Other types of special pastes are available from the **Paste Special** dialog box. For example, you can paste column widths, formats, or comments from that dialog box. You can perform other operations, too, such as pasting column widths and formatting.

Implement a Percentage Increase

This example is like the previous one in that we will perform a mathematical operation as part of the paste process. In this case, the management team of GTM Manufacturing is having a budget status and review meeting. During the meeting, the Director of Marketing suggested that the budget estimate for souvenirs is too low. He points out that the company introduced three new products and increased advertising and promotional expenditures. Under these circumstances, he expects souvenir sales to increase by about 35% across all geographic regions. To re-estimate total sales quickly, use the **Paste Special** technique to multiply the sales of souvenirs by one plus the expected percentage increase in sales (135%), as shown in **Figure 13**.

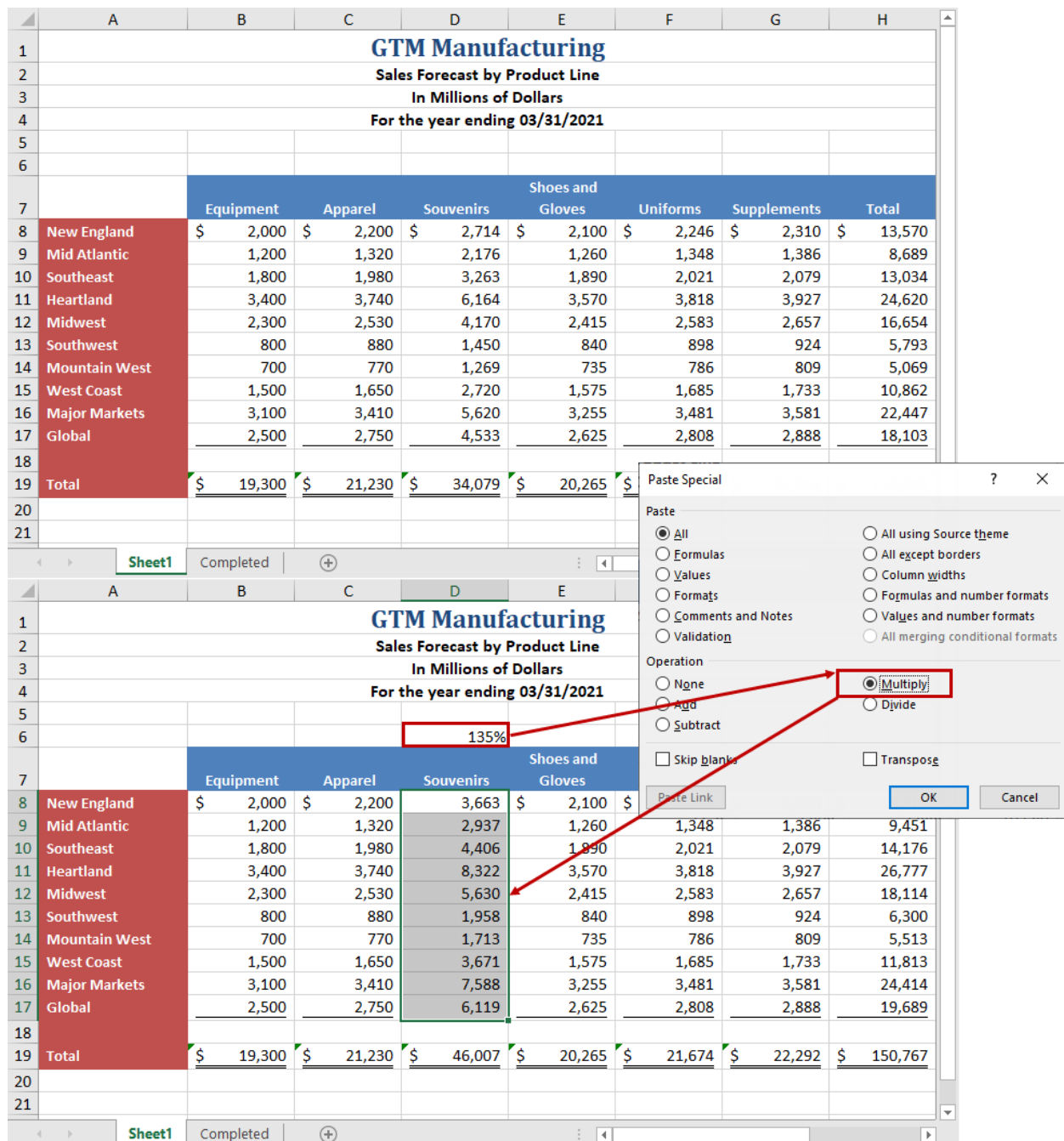


Figure 13 - Using Paste Special to Increment a Sales Forecast

Fill Cells with a Series

Using the **Fill Handle**, you can quickly fill a range of cells with values, labels, or dates. The Fill Handle is the small black square in the lower right corner of the cursor, as shown in **Figure 14**.

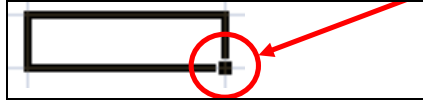


Figure 14 - The Fill Handle

Select the cell that contains the first value, label, or date. Then click and drag the fill handle down or across the adjacent cells to fill with the list. Next, click the context-sensitive **Auto Fill Options** button and select the options desired, as shown in **Figure 15**. Note that the **Auto Fill Options** change depending on the data type. For example, when filling date-oriented data, the options include *Fill Days*, *Fill Weekdays*, *Fill Months*, and *Fill Years*.

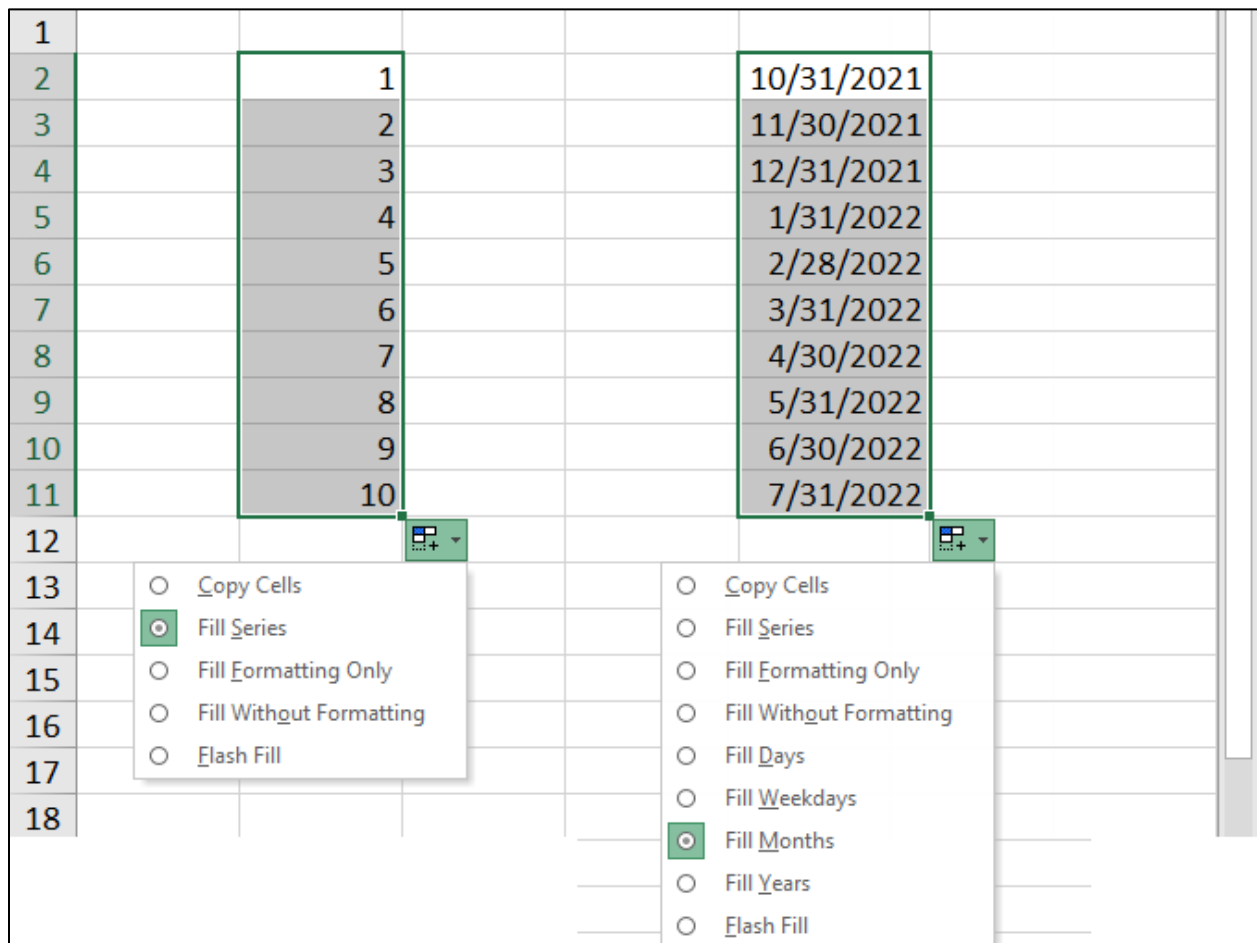


Figure 15 - Using the Fill Handle and Auto Fill Options to Fill Cells

The **CTRL** key alters how cells fill when using the Fill Handle. It serves as a toggle switch for turning auto-incrementing on or off. If you are auto-incrementing the cells, pressing the **CTRL** key changes the operation so the cells copy. On the other hand, if you are copying the cells, pressing the **CTRL** key will cause the cells to be auto-incremented. The following table summarizes the operation of the **CTRL** key with the Fill Handle.

Fill Handle Only	CTRL + Fill Handle
Cells copy.	Cells increment.
Cells increment.	Cells copy.

Custom Fill Lists

Just as you can use the Fill Handle to enter a series of values, labels, and dates, you can also fill cells with a **Custom List**. For example, if you repeatedly enter department names – *Sales, Marketing, Production, Shipping and Receiving, Accounting, Human Resources*, etc. – in worksheets, you can create a **Custom List** to automate the task. You can create Custom Lists by clicking the Ribbon's **File** tab, followed by **Options, Advanced**, and **Edit Custom Lists**, to open the dialog box shown in **Figure 16**.

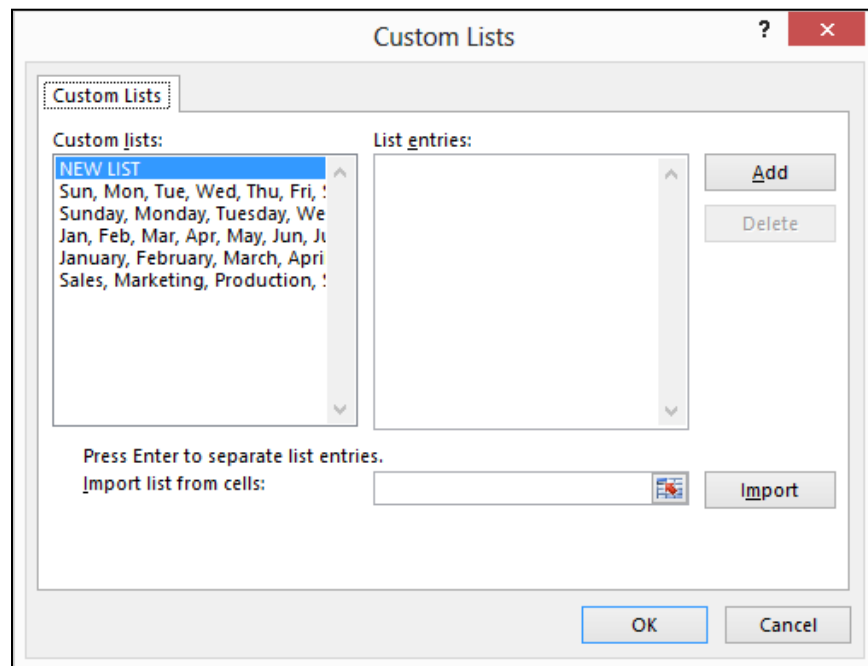


Figure 16 - Custom List Dialog Box

There are several ways of creating a Custom List. Perhaps the easiest way is to use an existing row or column of labels. First, highlight the row or column that contains the labels that will make up the Custom List. Next, click **Import** in the **Custom Lists** dialog box and click **OK** to complete the process, as shown in **Figure 17**.

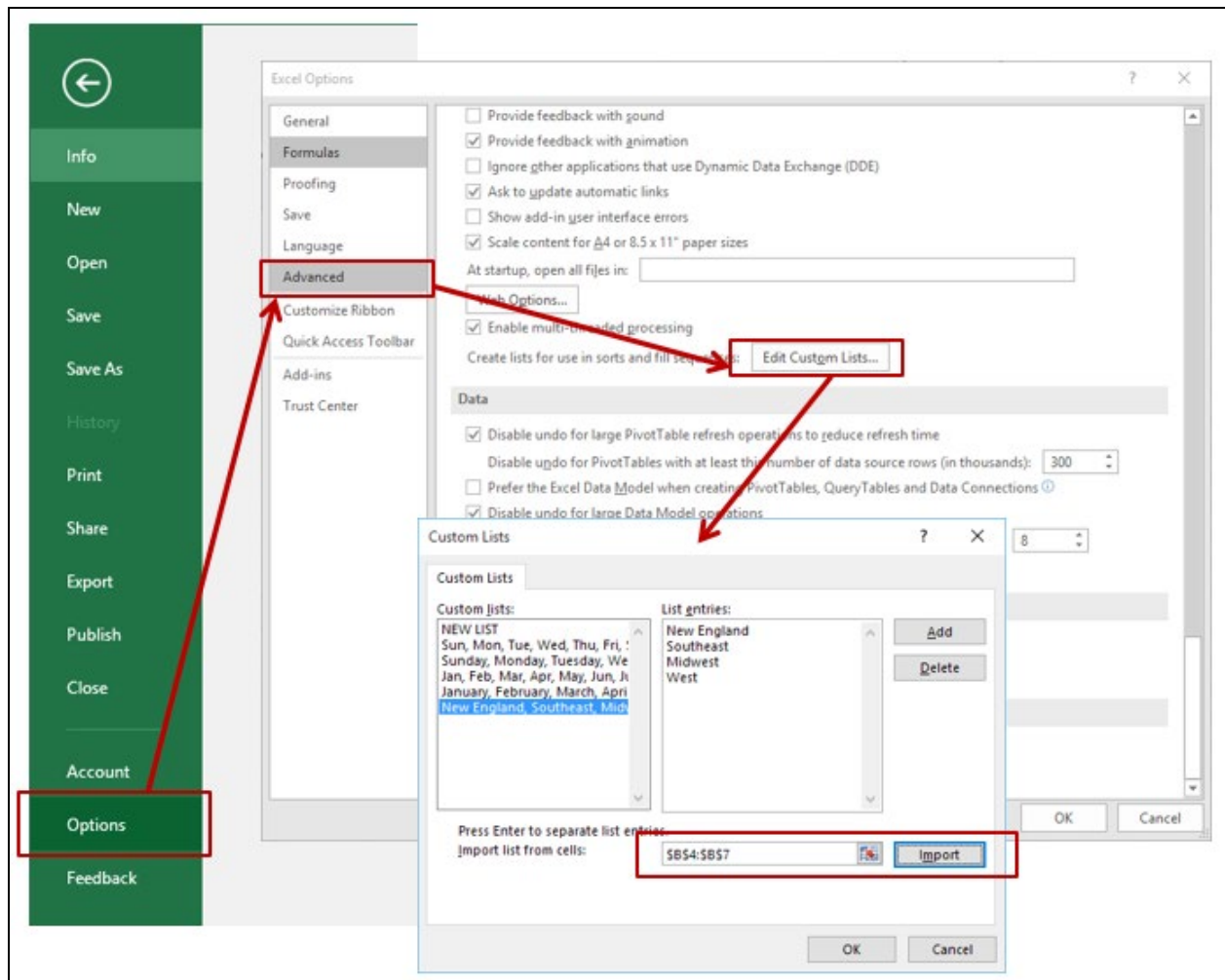


Figure 17 - Creating a Custom List for Use with the Fill Handle

To fill a range of cells with items from a Custom List, enter one of the labels in the Custom List into a cell. Then, drag the **Fill Handle** up, down, or across adjacent cells, and Excel will fill in the remaining items from the list.

Enter and Copy Formulas Easily

Formulas and formatting are key worksheet components. Likewise, entering and copying formulas are also common but critical processes. You can use the Fill Handle to copy formulas down and across quickly and easily, as shown in **Figure 18**.

Note that the selection in the context-sensitive **Auto Fill Options** drop-down menu is **Fill Without Formatting**. That characteristic allows the formula to copy without copying the dollar signs (\$) in the format.

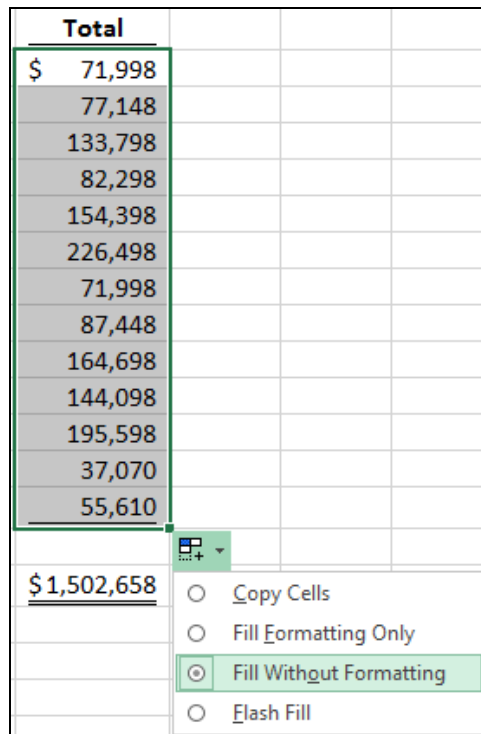


Figure 18 - Using the Fill Handle to Copy Formulas

When building formulas, accounting professionals sometimes must create the same formula in multiple non-contiguous cells. The most common solution is creating a formula in a single cell and copying and pasting it numerous times. Alternatively, you can copy a formula across a range of cells and delete it from the cells where it is not required. A better solution is to enter a formula in multiple cells using a single simultaneous process. First, use **CTRL + Click** to highlight all the cells you plan to enter a formula into. Then, enter the formula utilizing any conventional method with cell references based on the last cell selected to receive the formula. Then, rather than pressing **Enter** when the formula is complete, press **CTRL + Enter** to enter the formula in all the selected cells, as shown in **Figure 19**.

Aug	Six Months to Date	Mar	Apr	May	Jun	Jul	Aug	Six Months to Date	Aug	Six Months to Date
\$ 275.0		\$ 250.0	\$ 287.5	\$ 330.0	\$ 380.0	\$ 1,247.5	\$ 275.0		\$ 275.0	\$ 2,770.0
137.5		125.0	132.5	140.0	147.5	545.0	137.5		137.5	1,227.5
137.5		125.0	155.0	190.0	232.5	702.5	137.5		137.5	1,542.5
27.5		25.0	32.5	40.0	47.5	145.0	27.5		27.5	317.5
\$ 110.0		\$ 100.0	\$ 122.5	\$ 150.0	\$ 185.0	\$ 557.5	\$ 110.0	=SUM(B17:G17)	\$ 110.0	\$ 1,225.0

Figure 19 - Entering a Formula in Multiple Cells Simultaneously

The **AutoSum** button resides on the Ribbon's **Home** and **Formulas** tabs. Although the name implies otherwise, the icon provides access to more than just the SUM function. The AutoSum button reveals a drop-down menu, providing access to *many* functions, as shown in **Figure 20**.

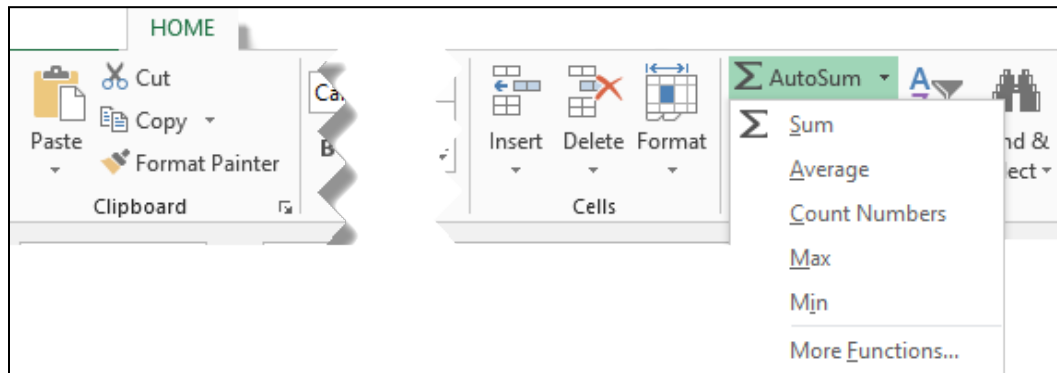


Figure 20 - AutoSum Providing Access to All Functions

The AutoSum button can insert formulas that foot and cross-foot financial data automatically. Just highlight the data, extending the highlighted range to the right to include blank rows and columns where the formulas should appear, as shown in **Figure 21**. Then, click the **AutoSum** button and select a function; Excel inserts formulas for the selected rows and columns with a single command, thereby footing and cross-footing the table simultaneously. Alternatively, if you plan to use the SUM function, rather than clicking the AutoSum button and selecting Sum, you may enter the keyboard shortcut **ALT + =**, and Excel will enter the Sum functions.

Jul	Aug	Sep	Oct	Nov	Dec	Total		
\$ 14,679	\$ 13,281	\$ 12,932	\$ 11,184	\$ 10,136	\$ 9,786			
15,729	14,231	13,857	11,984	10,861	10,486			
27,279	24,681	24,032	20,784	18,836	18,186			
16,779	15,181	14,782	12,784	11,586	11,186		Dec	Total
31,479	28,481	27,732	23,984	21,736	20,986		\$ 9,786	\$ 71,998
46,179	41,781	40,682	35,184	31,886	30,786		10,486	77,148
14,679	13,281	12,932	11,184	10,136	9,786		18,186	133,798
17,829	16,131	15,707	13,584	12,311	11,886		11,186	82,298
33,579	30,381	29,582	25,584	23,186	22,386		20,986	154,398
29,379	26,581	25,882	22,384	20,286	19,586		30,786	226,498
39,879	36,081	35,132	30,384	27,536	26,586		9,786	71,998
7,558	6,838	6,658	5,758	5,219	5,039		11,886	87,448
11,338	10,258	9,988	8,638	7,829	7,559		22,386	164,698
							19,586	144,098
		39,879	36,081	35,132	30,384	27,536	26,586	195,598
		7,558	6,838	6,658	5,758	5,219	5,039	37,070
		11,338	10,258	9,988	8,638	7,829	7,559	55,610
		306,365	277,187	269,898	233,420	211,544	204,244	1,502,658

Figure 21 - Footing and Cross-footing with AutoSum

Simple incidental calculations, such as sums, averages, or counts, can be made from financial data in a worksheet without building formulas. First, select the cells of interest. Then, look at the **Status Bar** near the worksheet's bottom, as **Figure 22** illustrates. By default, Excel displays the selected cells' Average, Count, and Sum. Other functions (**Minimum**, **Maximum**, and **Numerical Count**, for example) and functionality (the state of **Caps Lock**, **Num Lock**, and **Overtyping Mode**) are available by right-clicking the Status Bar and selecting from the customizing menu.

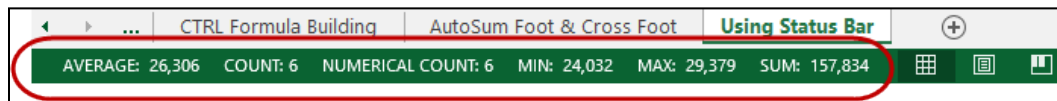


Figure 22 - Getting Simple Ad Hoc Calculations Directly from the Status Bar

Use AutoCorrect

AutoCorrect is a powerful, little-utilized tool that is frustrating for some. The frustration arises when you enter text in cells, and the text entered is the object of a default AutoCorrect entry. For example, the AutoCorrect feature replaces the text "\$123(c)(3)" with "\$123©(3)" in default, as shown in **Figure 23**.

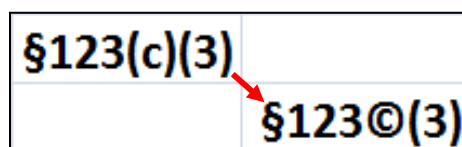


Figure 23 - Default AutoCorrect Entry Causing Frustration

The source of the frustration is a default AutoCorrect entry that turns this sequence of characters – open parenthesis, the letter "C," and closed parenthesis (**C**) – into the copyright symbol, ©, as shown in **Figure 24**.

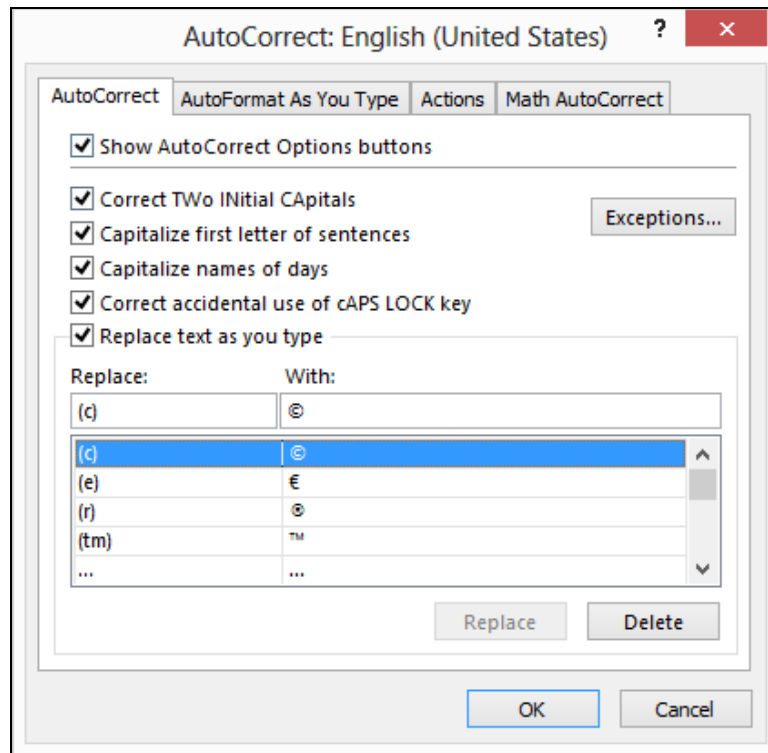


Figure 24 - Default AutoCorrect Entries

To correct this at the time of data entry, click the **Undo** button or press **CTRL + Z** immediately after replacing the characters with the copyright symbol. Then, complete the entry and press **Enter**.

Change the default **AutoCorrect** entry for the copyright symbol to correct this issue permanently. You can change AutoCorrect options by clicking the **File** tab of the Ribbon, **Options**, and **Proofing** in the **Excel Options** dialog box. Then, click the **AutoCorrect Options** button in the pane on the right to open the **AutoCorrect** dialog box. As shown in Figure 24, click on the offending entry for the copyright symbol and modify the text in the **Replace** box to read "(cp)." Click **Add**. Then, highlight the original default entry for the copyright symbol and click **Delete**. Complete the process by clicking **OK** twice. Now, when "(c)" is typed into a cell, Excel will no longer replace the characters with the copyright symbol, but you can still enter the copyright symbol by typing in "(cp)."

AutoCorrect's functionality allows you to create shorthand entries. In addition, you can add often-used text and phrases and corrections for commonly misspelled words to your **AutoCorrect** entries. For example, suppose you routinely type "tset" for "test" or want a shorthand entry for a client with a lengthy name, such as Opihi River Development Corporation. In either of these cases, **AutoCorrect** can provide the needed functionality.



A quick way to correct common misspellings recognized by Excel's Spell Check tool is to click the **AutoCorrect** button instead of the **Change** button in the Spelling dialog box.

File Opening Tricks

Many accounting professionals work with sets of workbooks, all of which need to be open simultaneously to complete specific tasks correctly. If the workbooks reside in the same folder, you can open all of them with a single operation to save time. In the **Open** dialog box, use **CTRL + Click** or **CTRL + Shift** to select multiple files before pressing the **Open** button, as shown in **Figure 25**.

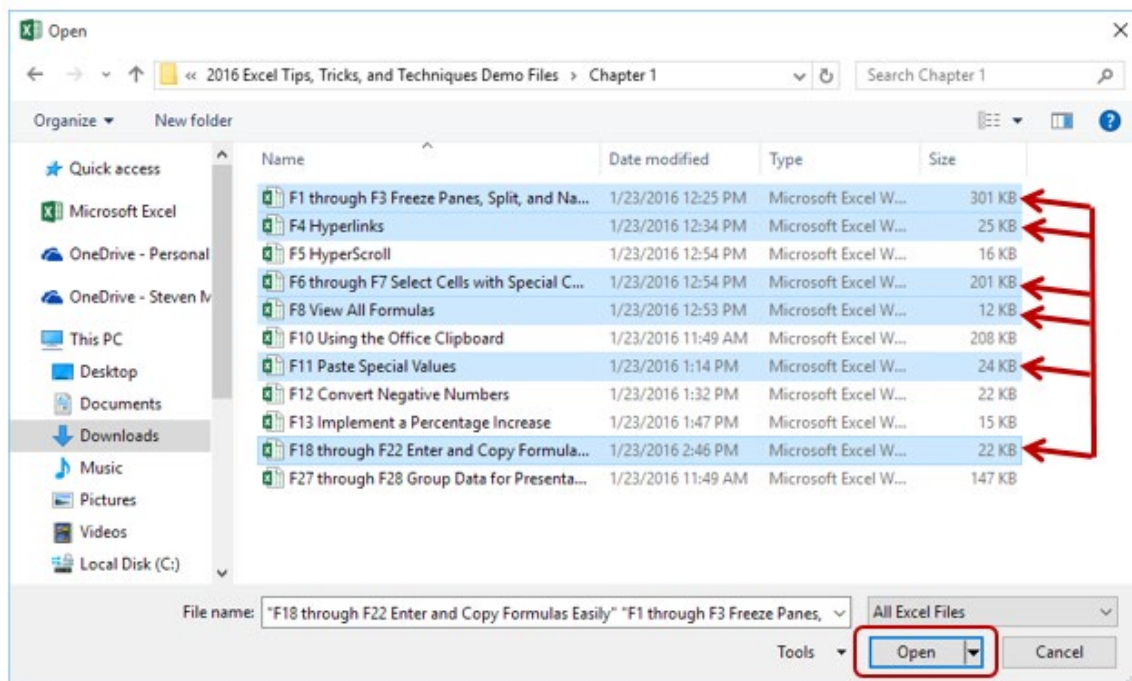


Figure 25 - Opening Multiple Files in a Single Operation

Another time-saving technique is to **Pin** frequently used files to the **Recent Documents** list, as shown in **Figure 26**. Pinned files will not rotate off the **Recent Documents** list until you unpin them. Click to pin or unpin.

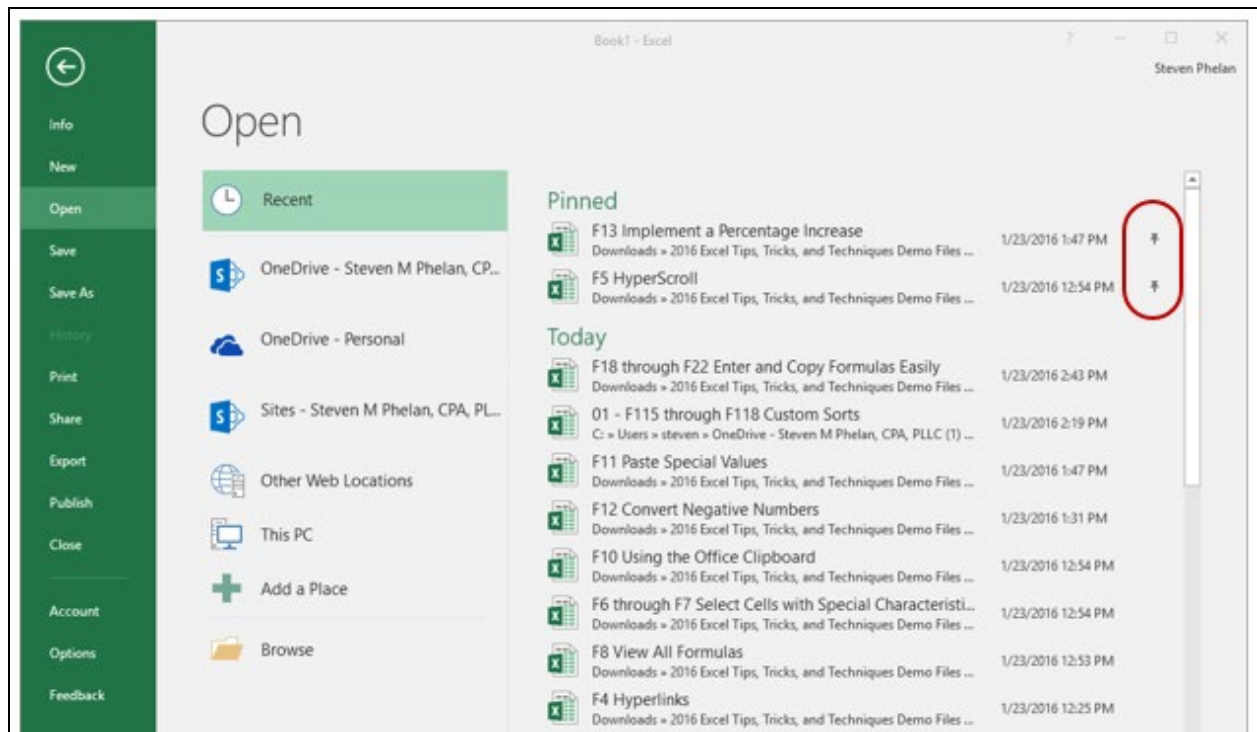


Figure 26 - Pinning Files to the Open Button for Quick Access

Group Data for Presentation with the Subtotal Feature

Excel's **Group** and **Outline** features make working with worksheets that include many subtotals or totals easier. The outlining features allow you to collapse or expand to eight detail levels to customize the data view in a worksheet. To use the outlining features, create the summary totals for each row using any desired method before beginning the grouping process.

In this example, the **Subtotal** feature automatically creates the subtotals and groups the data. The first step is to sort all the records by the field(s) on which you will use **Subtotal**. Then, select a cell in the range of data and click **Subtotal** on the Ribbon's **Data**. Next, in the **Subtotal** dialog box, select the field to summarize in the **At each change in** box, the summarizing function to use, and check the columns to sum. Finally, check any appropriate options and click **OK**, as shown in **Figure 27**.

The screenshot displays the Excel interface with the **Subtotal** dialog box open. The dialog box is configured with 'At each change in: Sales Region' and 'Use function: Sum'. The 'Add subtotal to:' section shows a list of columns: Aug, Sep, Oct, Nov, Dec, and Total. The 'Replace current subtotals' checkbox is checked. The 'OK' button is highlighted. Below the dialog box, the worksheet shows a table of sales data for Nature's Softness Inc. with columns for Sales Region, Product, and monthly sales from July to December, plus a Total column. The Subtotal Command bar is visible at the bottom of the dialog box.

Sales Region	Product	Jul	Aug	Sep	Oct	Nov	Dec	Total
Heartland	Creme, Aloe Vera Hand, 9 oz	16,440	14,875	14,484	12,526	11,352	10,960	80,638
Heartland	Creme, Extra Moisturizing Hand, 9 oz	17,616	15,939	15,520	13,422	12,164	11,744	86,406
Heartland	Creme, Hand and Body, 16 oz	30,552	27,643	26,916	23,278	21,096	20,368	149,854
Heartland	Lotion, Organic Body, 9 oz	18,792	17,003	16,556	14,318	12,976	12,528	92,174
Heartland	Lotion, Organic Body, 16 oz	35,256	31,899	31,060	26,862	24,344	23,504	172,926
Heartland	Lotion, Organic Body, 24 oz	51,720	46,795	45,564	39,406	35,712	34,480	253,678
Heartland	Lotion, Extra Moisturizing Body, 9 oz	16,440	14,875	14,484	12,526	11,352	10,960	80,638
Heartland	Lotion, Organic Hand and Body, 9 oz	19,968	18,067	17,592	15,214	13,788	13,312	97,942
Heartland	Lotion, Organic Hand and Body, 16 oz	37,608	34,027	33,132	28,654	25,968	25,072	184,462
Heartland	Mask, Organic Facial, 9 oz	32,904	29,771	28,988	25,070	22,720	21,936	161,390
Heartland	Mask, Wrinkle Reducing Facial, 9 oz	44,664	40,411	39,348	34,030	30,840	29,776	219,070

Figure 27 - Using Subtotal to Summarize and Outline Data

Referring to Figure 27, notice the **Outline Bar** along the left side of the worksheet matrix. At the top of the **Outline Bar** is a series of numbers indicating the number of detail levels available in the outline. For example, the number one [1] provides the highest level of summarization while the highest number, in this example, three [3], provides the most detail. Click the plus sign [+] to expand the detail for any summarized row, or click the minus sign [-] to collapse the detail.

A team member entered manual subtotals for sales by region and quarterly sales in the following example. To group and outline the data, begin selecting a cell in the data. Then select **Group, Auto Outline** from the Ribbon's **Data** tab, as shown in **Figure 28**. Excel analyzes the data and enters outlines where it finds summarizing formulas. Note that **Outline Bars** are along the top and left sides of the worksheet matrix. The Outline Bar along the top expands or collapses horizontal detail, such as months, into quarters and quarters into a total column.

Nature's Softness Inc
Monthly Sales by Product
For the Six Months Ended 12/31/2021

Sales Region	Product	Jul	Aug	Sep	Q3	Oct	Nov	Dec	Q4	Total
Heartland	Creme, Aloe Vera Hand, 9 oz	16,440	14,875	14,484	45,799	12,526	11,352	10,960	34,839	126,437
Heartland	Creme, Extra Moisturizing Hand, 9 oz	17,616	15,939	15,520	49,075	13,422	12,164	11,744	37,331	135,481
Heartland	Creme, Hand and Body, 16 oz	30,552	27,643	26,916	85,111	23,278	21,096	20,368	64,743	234,965
Heartland	Lotion, Organic Body, 9 oz	18,792	17,003	16,556	52,351	14,318	12,976	12,528	39,823	144,525
Heartland	Lotion, Organic Body, 16 oz	35,256	31,899	31,060	98,215	26,862	24,344	23,504	74,711	271,141
Heartland	Lotion, Organic Body, 24 oz	51,720	46,795	45,564	144,079	39,406	35,712	34,480	109,599	397,757
Heartland	Lotion, Extra Moisturizing Body, 9 oz	16,440	14,875	14,484	45,799	12,526	11,352	10,960	34,839	126,437
Heartland	Lotion, Organic Hand and Body, 9 oz	19,968	18,067	17,592	55,627	15,214	13,788	13,312	42,315	153,569
Heartland	Lotion, Organic Hand and Body, 16 oz	37,608	34,027	33,132	104,767	28,654	25,968	25,072	79,695	289,229
Heartland	Mask, Organic Facial, 9 oz	32,904	29,771	28,988	91,663	25,070	22,720	21,936	69,727	253,053
Heartland	Mask, Wrinkle Reducing Facial, 9 oz	44,664	40,411	39,348	124,423	34,030	30,840	29,776	94,647	343,493
Heartland	Mask, Wrinkle Reducing Facial, 16 oz	8,465	7,659	7,457	23,580	6,449	5,845	5,644	17,938	65,099
Heartland	Mask, Wrinkle Reducing Facial, 24 oz	12,699	11,489	11,187	35,374	9,675	8,768	8,466	26,909	97,657
Heartland Total		343,129	310,449	302,286	955,864	261,430	236,929	228,753	727,113	2,638,841
Mid-Atlantic	Creme, Aloe Vera Hand, 9 oz	15,560	14,078	13,708	43,346	11,855	10,744	10,373	32,972	119,663
Mid-Atlantic	Creme, Extra Moisturizing Hand, 9 oz	16,673	15,085	14,688	46,446	12,703	11,513	11,115	35,331	128,223
Mid-Atlantic	Creme, Hand and Body, 16 oz	28,916	26,162	25,474	80,552	22,031	19,966	19,277	61,274	222,377

Figure 28 - Using Auto Outline to Summarize and Report Data

One potential issue that you may have with the Subtotal command is the seeming inability to copy and paste its results to another location. For example, suppose you use Subtotal and attempt to copy and paste the data to another location. In that case, the process yields all records in the range, not just the summary visible in the Subtotaled data.

	A	B	F	J	K							
1	Nature's Softness Inc											
2	Monthly Sales by Product											
3	For the Six Months Ended 12/31/2021											
4												
5												
6	Sales Region	Product	Q3	Q4	Total							
20	Heartland Total		955,864	727,113	2,638,841							
34	Mid-Atlantic Total		904,657	688,160	2,497,474							
48	Midwest Total		947,330	720,621	2,615,280							
62	Mo	A	B	C	D	E	F	G	H	I	J	K
76	Nev	Nature's Softness Inc										
90	Pac	Monthly Sales by Product										
104	Sou	For the Six Months Ended 12/31/2021										
118	Sou											
119	Gra											
5												
6	Sales Region	Product	Jul	Aug	Sep	Q3	Oct	Nov	Dec	Q4	Total	
7	Heartland	Creme, Aloe Vera Hand, 9 oz	16,440	14,875	14,484	45,799	12,526	11,352	10,960	34,839	126,437	
8	Heartland	Creme, Extra Moisturizing Hand, 9 oz	17,616	15,939	15,520	49,075	13,422	12,164	11,744	37,331	135,481	
9	Heartland	Creme, Hand and Body, 16 oz	30,552	27,643	26,916	85,111	23,278	21,096	20,368	64,743	234,965	
10	Heartland	Lotion, Organic Body, 9 oz	18,792	17,003	16,556	52,351	14,318	12,976	12,528	39,823	144,525	
11	Heartland	Lotion, Organic Body, 16 oz	35,256	31,899	31,060	98,215	26,862	24,344	23,504	74,711	271,141	
12	Heartland	Lotion, Organic Body, 24 oz	51,720	46,795	45,564	144,079	39,406	35,712	34,480	109,599	397,757	
13	Heartland	Lotion, Extra Moisturizing Body, 9 oz	16,440	14,875	14,484	45,799	12,526	11,352	10,960	34,839	126,437	
14	Heartland	Lotion, Organic Hand and Body, 9 oz	19,968	18,067	17,592	55,627	15,214	13,788	13,312	42,315	153,569	
15	Heartland	Lotion, Organic Hand and Body, 16 oz	37,608	34,027	33,132	104,767	28,654	25,968	25,072	79,695	289,229	

Traditional Copy & Paste methods yield *all* records in the range, not just the summary data.

Figure 29 - Traditional Copy & Paste Results

To copy only the summarized information, select the desired range, choose **Find & Select, Go To Special, Visible Cells Only** from the Ribbon's **Home** tab before executing the Copy command. Alternatively, you can use the keyboard shortcut **ALT + ;**. Doing so causes Excel to copy only the visible data, allowing you to paste a range of subtotals without the hidden details.

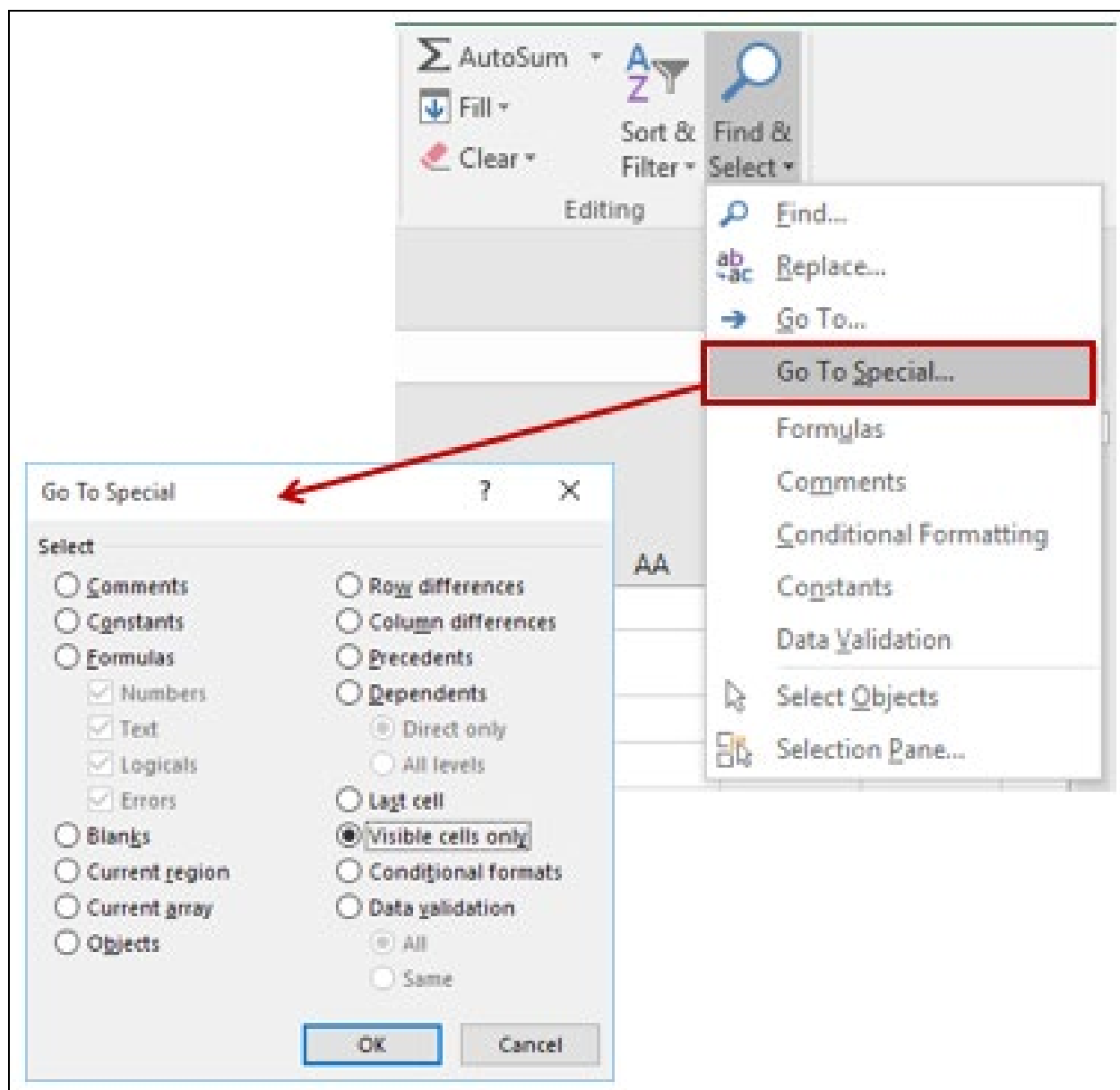


Figure 30 - Accessing Visible Cells Only from the Home Tab

Formatting Essentials

Chapter

2

As you know, Excel is a powerful tool for analyzing financial data and preparing financial reports. However, like most powerful tools, it contains features and functionality that are not obvious to many users, both novices and experts. This chapter aims to uncover hidden formatting features and techniques so that you may prepare aesthetically pleasing reports more effectively and efficiently.

Learning Objectives

Upon completing this chapter, you should be able to:

- Implement features such as Format Painter, Wrap Text, Indent, the Hidden Format, and the Accounting Format to improve the appearance of Excel-based reports;
- Apply underlines in a manner to achieve the intended results;
- Create and apply Custom Formats to Excel data;
- Utilize Styles to facilitate consistent formatting in and across Excel documents;
- Manage rounding issues in Excel with the Precision as Displayed feature; and
- Apply Conditional Formats to Excel data to call attention to significant trends and variances that require management's attention.

Formatting Multiple Objects

Most professionals work on single workbook objects such as cells, ranges, and rows when applying formats. Some users repeat this process until they have formatted all the others. Others copy formats from the first cell to other cells using the **Format Painter** available from the Ribbon's **Home** tab or the **Mini-Toolbar**, as shown in **Figure 32**. The Format Painter is used to copy and paste formats, *not data*, from one cell (or cells) to others.

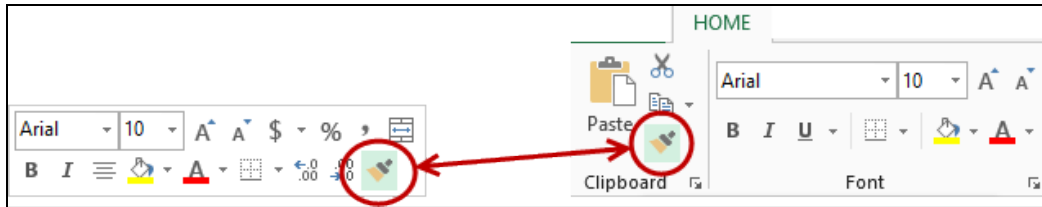


Figure 32 - Using the Format Painter to Copy Formats

You can simultaneously apply formatting to multiple objects, saving time and improving productivity. The key to using this technique is to select all the cells you wish to format *before* applying the formatting. To select multiple cells, ranges, rows, columns, or worksheet tabs, hold down the **CTRL** key while using the mouse to select the objects. For example, you could choose multiple columns before adjusting their widths, as shown in **Figure 33**.

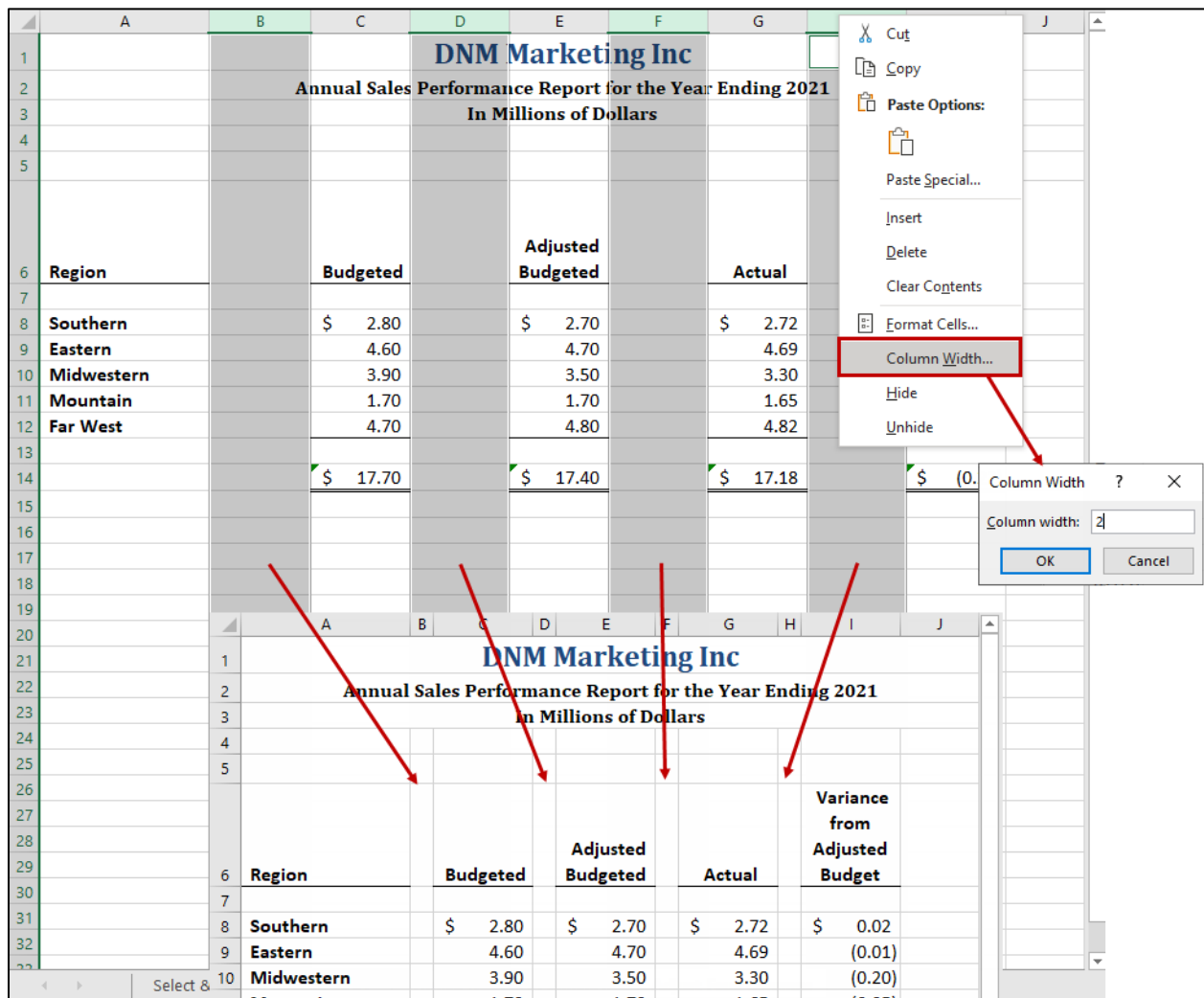


Figure 33 - Setting Multiple Column Widths in One Operation

Alternatively, double-clicking the Format Painter allows you to click on multiple cells and paste formats into those cells without selecting the cells in advance. To end this “multi-paste” process, press the **ESC** key or click the Format Painter icon.

Multiline Column Headings

Multiline column headings are commonly created by merging and stacking multiple individual cells. A better alternative is to wrap and center each column heading in a single cell. First, enter each column’s text heading. Then check **Wrap Text** on the **Alignment** tab of the **Format Cells** dialog box available from the context-sensitive menu or the dialog launcher in the **Font** group of the Ribbon’s **Home** tab, as shown in **Figure 34**. Complete the process by centering the column headings and widening the columns to separate the text as desired. Use **ALT + Enter** at the desired separation point to force a break in a column heading.

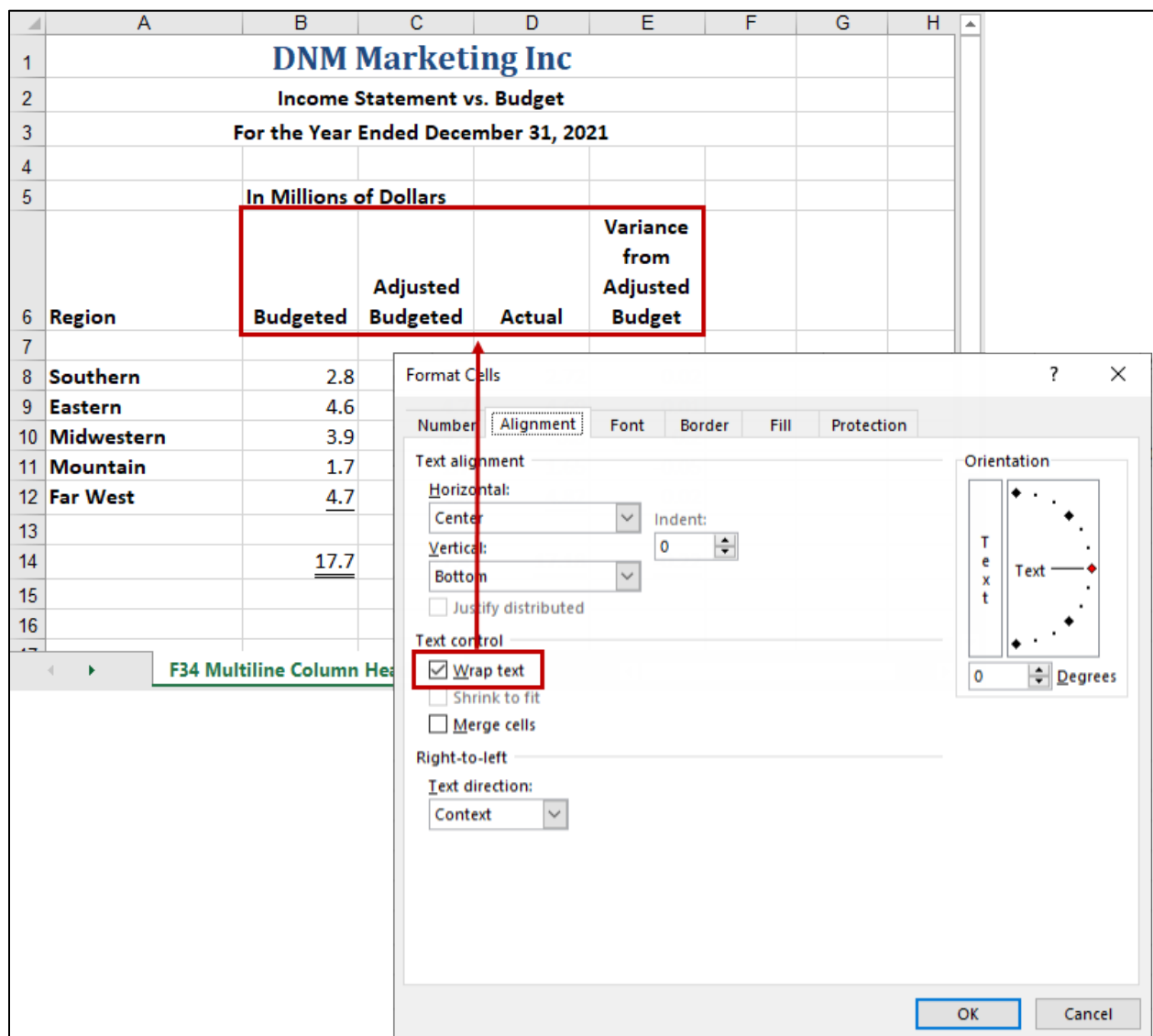


Figure 34 - Using Wrap Text with Multiline Column Headings

Using the Accounting Format

When asked whether they use the accounting format, many accounting professionals will respond that they do not use it. However, accounting is probably the profession's most frequently used number format. The accounting format applies when selecting the currency or comma styles from the Ribbon's **Home** tab. You can also choose the accounting format from the mini-toolbar. **Figure 35** illustrates both processes.

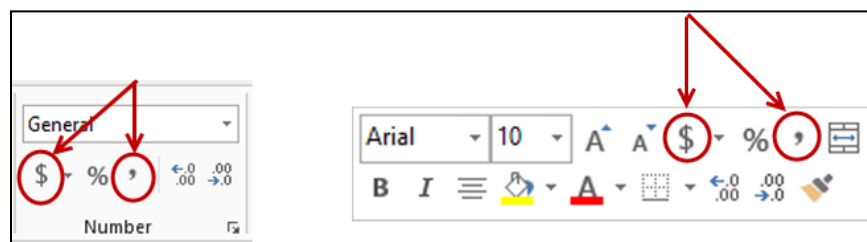


Figure 35 - Currency and Comma Style Buttons on the Ribbon and Mini-Toolbar

The currency style applies the accounting format with the dollar sign and two decimal places, while the comma style applies the accounting format without the dollar sign. In addition, the accounting format displays negative numbers within parentheses and ensures that decimal points align— perfect for financial reports!

Single and Double Underlines

The accounting format affects how single and double underlines apply to numbers and labels. When using the accounting format, single and double underlines for subtotals, totals, and column headings do not span the entire column like cell borders. Instead, the accounting format indents single and double underlines one-character space from the left and right cell margins. These spaces provide the desired break between underlines across adjacent columns without resorting to the frequent practice of inserting narrow *faux* columns to accomplish the same effect.

	A	B	C	D	E
1	DNM Marketing Inc				
2	Income Statement vs. Budget				
3	For the Year Ended December 31, 2021				
4					
5		In Millions of Dollars			
			Adjusted		Variance
6	Region	Budgeted	Budgeted	Actual	from Adjusted Budget
7					
8	Southern	\$ 2.80	\$ 2.70	\$ 2.72	\$ 0.02
9	Eastern	4.60	4.70	4.69	(0.01)
10	Midwestern	3.90	3.50	3.30	(0.20)
11	Mountain	1.70	1.70	1.65	(0.05)
12	Far West	4.70	4.80	4.82	0.02
13					
14	Total Revenues	\$ 17.70	\$ 17.40	\$ 17.18	\$ (0.22)

Figure 36 - Report Showing the Effect of the Accounting Format on Single and Double Underlines

Figure 36 displays single and double underlines applied to labels and numbers in cells formatted with the accounting format. Notice how the single and double underlines do not span the cells' full width, allowing for breaks in the underlines between adjacent columns.

As shown in **Figure 37**, underlines and double underlines are available from the Ribbon's **Home** tab. You may also apply underlines from the **Mini-Toolbar** by pressing **CTRL + U** or pressing **ALT, H, 3, U**. Further, you may create Double underlines from the keyboard by pressing **ALT, H, 3, D**.

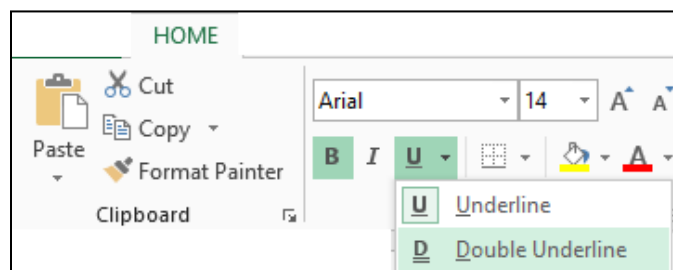


Figure 37 - Applying Underlines and Double Underlines from the Ribbon

Effect on Label Alignment

As the preceding section illustrates, the accounting format favorably affects underlining labels, such as column headings in financial reports. However, the accounting format can also cause labels to misalign. Almost everyone has encountered labels that do not align with labels in adjacent rows. After checking to ensure that no unwanted spaces are at the beginning of an affected label, many practitioners, confounded by this problem, insert spaces at the beginning of an affected label in the column to force the labels to align. The cause for this misalignment is simple – the cells affected have different number formats. The number format that causes the misalignment is the accounting format because labels, like single and double underlines, are indented one character from the left and right cell margins. To correct the misalignment, use the **Format Painter** to apply the same format to all labels in the affected column, as shown in **Figure 38**.

Region	Budgeted	Region	Budgeted
Southern	\$ 2.80	Southern	\$ 2.80
Eastern	4.60	Eastern	4.60
Midwestern	3.90	Midwestern	3.90
Mountain	1.70	Mountain	1.70
Far West	4.70	Far West	4.70
	\$ 17.70		\$ 17.70

Figure 38 - Misaligned Labels Caused by the Accounting Format

In this example, the accounting format applies to the label Eastern, and the other labels in the column use the default general format. The accounting format causes the label to be indented one character from the left cell margin, thus creating the misalignment. To correct the alignment problem, click on any appropriately aligned and formatted labels, click the Format Painter, and click on the misaligned text. The second column shows the result of the correction process with Eastern now aligned correctly.

The most common cause of the abovementioned condition is copying and pasting cells or ranges within or among worksheets. The default copy-and-paste process adds the contents of cells and the cells' formats, even when the copied cells are blank. It is relatively easy for you to paste cells unknowingly to an area where someone may later enter text in the standard spreadsheet creation and modification process. If a user applies the accounting format to the pasted cells, label misalignments will occur when the surrounding cells' formats differ.

Accounting Underline Styles

There are multiple single and double underline styles – single, single accounting, double, and double accounting. When the accounting format applies to a cell, the default underline styles are single and double accounting. Likewise, the default underline styles are single and double when any other number format applies to a cell. That only begs the question: *What is the difference between traditional and accounting underline styles?* It's simple: the accounting underline styles raise a number or label above the underline for readability. Excel accomplishes this feat by increasing the row height of the formatted cells.

Notice how it is easier to read the totals in the two left columns in **Figure 39**. That is due to the increased spacing between the numbers and underlines resulting from the accounting underline styles. Again, the accounting underline styles raise the numbers or labels off the underline for readability.

<u>Dept A</u>	<u>Dept B</u>		<u>Dept A</u>	<u>Dept B</u>
\$ 1,558.55	\$ 876.68		\$ 1,558.55	\$ 876.68
<u>966.12</u>	<u>598.72</u>	↔	<u>966.12</u>	<u>598.72</u>
592.43	277.96		592.43	277.96
<u>367.23</u>	<u>260.53</u>	↔	<u>367.23</u>	<u>260.53</u>
<u>\$ 225.20</u>	<u>\$ 17.43</u>	↔	<u>\$ 225.20</u>	<u>\$ 17.43</u>
Accounting Underlines			Non-Accounting Underlines	

Figure 39 - Standard Underlines vs. Accounting Underlines



The accounting underline styles cause the row height of cells to be higher than adjacent rows, which may cause vertical misalignments on some reports. Change the underline style from an accounting underline to a normal style to correct the problem. Different underline styles are also problematic in reports where some columns contain numbers formatted as percentages. Again, change the underline style from an accounting underline to a normal style to correct this problem. Click the dialog launcher in the **Font** group on the Ribbon's **Home** tab. Choose the desired underline style in the **Underline** drop-down box.



Were you previously using Excel's Accounting Format? How did you format numerical data and underlines in financially-oriented reports if not? Do you anticipate shifting to using the Accounting Format in the future?

Using Multiple Formats in a Cell

Although most practitioners do not use this functionality, Excel can display multiple formats in a single cell. While typing text into Excel, format the text using the formatting buttons or commands, such as underline, boldface, or italics. This capability is instrumental in creating footnotes in financial statements or other reports, as shown in **Figure 40**.

	A
40	Amount Paid for Accrued Vacation and Personal Time ⁴
41	Error in Accrued Vacation and Personal Time Calculation
42	
43	Gross Amount Still Owing Under the Written Severance Agreement
44	
45	
46	
47	¹ Accrued vacation time confirmed in conversation with Lynn Johnson and Becky Green.
48	² Accrued personal time confirmed in conversation with Lynn Johnson and Becky Green.
49	³ Calculation method confirmed in telephone conversation with Lynn Green on September 22, 2016. Lynn stated that salary equivalent to four 2-week pay periods was paid rather than 2 months salary as stipulated in the written severance agreement.
50	⁴ Calculated as \$12,115.00 (the gross amount of the payment) less \$10,769.23 (the amount of salary equivalent to four 2-week pay periods). The resulting amount must be the amount paid for accrued vacation and personal time.

Figure 40 - Creating Footnotes Using Multiple Formats in a Cell

To append footnote numbers to text, type the text of your entry. Before pressing **Enter**, click the dialog launcher in the **Font** group of the Ribbon's **Home** tab. Check **Superscript** on the **Font** tab and then click **OK**. Then, type in the appropriate footnote number and press **Enter**. To enter numbered footnotes, position your cursor in the footnote cell. Then, right-click and select **Format**

Cells from the context-sensitive menu. Check **Superscript** on the **Font** tab and click **OK**. Next, enter the appropriate footnote number, followed by a space. Then, right-click and choose **Format Cells**, uncheck **Superscript**, and click **OK**. Finally, type your footnote text and press **Enter**. Note that multiple formats in a single cell do not display correctly in cells where the number format is the accounting format. When this is a problem, reset the number format in the affected cells to the general format.

Custom Number Formats

Custom formats can format numbers and text in ways suitable for financial reporting. For example, you may need to restate financial statements and report the data in thousands, millions, or billions. While many accounting practitioners accomplish this task by dividing their actual data by an appropriate divisor, they can achieve the same result by merely using a custom format to display the data in thousands, millions, or billions, as shown in **Figure 41**.

	YTD	
Net Sales	\$ 243,585,573.23	
Cost of Goods Sold	<u>156,498,219.84</u>	
Gross Margin	87,087,353.39	
Operating Expenses	<u>62,792,138.76</u>	
Income from Operations	24,295,214.63	
Income Taxes	<u>5,587,899.36</u>	
Net Income	<u>\$ 18,707,315.27</u>	

	YTD
	Thousands
Net Sales	\$243,585.57
Cost of Goods Sold	<u>156,498.22</u>
Gross Margin	87,087.35
Operating Expenses	<u>62,792.14</u>
Income from Operations	24,295.21
Income Taxes	<u>5,587.90</u>
Net Income	<u>\$ 18,707.31</u>

	YTD
	Millions
Net Sales	\$ 243.59
Cost of Goods Sold	<u>156.50</u>
Gross Margin	87.09
Operating Expenses	<u>62.79</u>
Income from Operations	24.30
Income Taxes	<u>5.59</u>
Net Income	<u>\$ 18.71</u>

Figure 41 - Using Custom Formats to Report in Thousands or Millions

To create a custom format to report in thousands, millions, or billions, first format your cells with the desired accounting formats – with or without decimals and dollar signs. Next, access the **Format Cells** dialog box with the dialog launcher in the **Font** group on the Ribbon's **Home** tab or the context-sensitive menu. Select the **Number** tab in the **Format Cells** dialog box and **Custom** in the **Category** box. Finally, modify the format code in the **Type** box to append commas to the positive and negative formats appropriate for your needs. For example, to format the numbers in thousands, append one comma; for millions, append two commas; and for billions, append three commas.



A format code comprises four segments, with a semicolon separating each element. Each section formats a specific type of numeric or text data within a cell.

Positive Number	;	Negative Number	;	Zero	;	Label
----------------------------	----------	----------------------------	----------	-------------	----------	--------------

Figure 42 contains the appropriate format codes for using the accounting format displayed in thousands, millions, and billions. Again, note the comma placement identified by the arrows and underlines. Also, note that the toolbar buttons for increasing or decreasing the number of decimal points displayed work with these custom format codes.

With Dollar Signs	
Dollars	_ (\$* #,##0.00_);_(\$* (#,##0.00);_(\$* "-"??_);_(@_)
Thousands	_ (\$* #,##0.00,_);_(\$* (#,##0.00,);_(\$* "-"??_);_(@_)
Millions	_ (\$* #,##0.00,,);_(\$* (#,##0.00,,);_(\$* "-"??_);_(@_)
Billions	_ (\$* #,##0.00,,,);_(\$* (#,##0.00,,,);_(\$* "-"??_);_(@_)
Without Dollar Signs	
Dollars	_ (* #,##0.00_);_(* (#,##0.00);_(* "-"??_);_(@_)
Thousands	_ (* #,##0.00,_);_(* (#,##0.00,);_(* "-"??_);_(@_)
Millions	_ (* #,##0.00,,);_(* (#,##0.00,,);_(* "-"??_);_(@_)
Billions	_ (* #,##0.00,,,);_(* (#,##0.00,,,);_(* "-"??_);_(@_)

Figure 42 - Custom Codes for Displaying the Accounting Format in Thousands, Millions, and Billions

To display and print negative numbers in red, modify any number format to include the tag **[Red]** immediately preceding the negative number format code, as shown in **Figure 43**. For example, in addition to red, you may use the following colors in format codes: *black, white, green, blue, magenta, yellow, and cyan*.

`_$*#,##0.00_);[Red]($* (##0.00);_($*"-"??_);_(@_)`

Figure 43 - Format Code to Display and Print Negative Numbers in Red

You can also use custom formats to display and print percentages in a more aesthetically pleasing format than the default percentage format. For example, the code in **Figure 44** produces the custom percentage shown in **Figure 45**.

`_( * 0.00%_);_(* (0.00%);_(* 0.00%_);_(@_)`

Figure 44 - Format Code to Produce Percentages As Displayed in Figure 45

Figure 45 shows the percentages displayed using the default and custom percentage formats. Notice how, in the custom format, negative percentages displayed within parentheses and underlines mimic those of the accounting format. However, the custom percentage format does not use the accounting underline style. For example, suppose the percentages appear adjacent to dollar amounts formatted with the accounting format. In that case, you will need to reset the underline style of the dollar amounts to the default underline style for proper vertical alignment of underlined totals and subtotals.

	<u>%</u>	Custom <u>%</u>
Net Sales	100.00%	100.00%
Cost of Goods Sold	<u>64.25%</u>	<u>64.25%</u>
Gross Margin	35.75%	35.75%
Operating Expenses	<u>37.50%</u>	<u>37.50%</u>
Income from Operations	-1.75%	(1.75%)
Income Taxes	<u>0.00%</u>	<u>0.00%</u>
Net Income	<u>-1.75%</u>	<u>(1.75%)</u>

Figure 45 - Percentages Displayed Using the Default and Custom Percentage Format

Some accounting professionals prefer to display **0.00** for zeros when using the accounting format. This presentation is accomplished easily by modifying the accounting format to include the appropriate zero format code. The two custom format codes required, one with dollar signs and the other without, are displayed in **Figure 46**.

With Dollar Signs	_\$* #,##0.00_);_(\$* (#,##0.00);_(\$* 0.00_);_(@_)
Without Dollar Signs	_(* #,##0.00_);_(* (#,##0.00);_(* 0.00_);_(@_)

Figure 46 - Accounting Format Code Modified to Display 0.00

Adapted from the Excel **Help** system, **Table 1** lists some of the more common custom formatting codes and their uses.

Symbol	Effect
0 (zero)	This digit placeholder displays insignificant zeros if a number has fewer digits than zeros in the format. For example, if you type 8.9 and want it to appear as 8.90 , use the format #.00 .
#	This digit placeholder follows the same rules as the 0 (zero). However, Excel does not display extra zeros when the number you type has fewer digits on either side of the decimal than there are # symbols in the format. So, for example, if the custom format is ### , and you type 8.9 in the cell, the number 8.9 will display.
?	This digit placeholder follows the same rules as the 0 (zero). However, Excel adds a space for insignificant zeros on either side of the decimal point so that decimal points align in the column. For example, the custom format 0.0? aligns the decimal points for the numbers 8.9 and 88.99 in the same column.
. (period)	This digit placeholder displays the decimal point in a number.
, (comma)	This digit placeholder displays the thousands separator in a number. Excel separates thousands by commas if the format contains a comma enclosed by number signs (#) or zeros. A comma that follows a digit placeholder scales the number by 1,000. For example, if the format is #.0,, and you type 12,200,000 in the cell, 12.200.0 displays.

Table 1 - Common Custom Formatting Codes

Employing various combinations of the custom format codes outlined above, you can obtain the effects shown in **Table 2**.

To Display	As	Use This Code
1234.59	1234.6	####.#
8.9	8.900	#.000
.631	0.6	0.#
12 1234.568	12.0 1234.57	#.0#
44.398 102.65 2.8	44.398 102.65 2.8 (with aligned decimals)	???.???
5.25 5.3	5 1/4 5 3/10 (with aligned fractions)	# ???/???
12000	12,000	#,###
12000	12	#,
12200000	12.2	0.0,,

Table 2 - Sample Custom Format Codes Adapted from Excel's Help System

Custom Date Formats

You can customize date formats just as you can customize number formats. **Table 3** contains the codes for building custom date formats.

To Display	Use Code
Months as 1-12	M
Months as 01-12	Mm
Months as Jan-Dec	Mmm
Months as January-December	Mmmm
Months as the first letter of the month	mmmmm
Days as 1-31	d
Days as 01-31	dd
Days as Sun-Sat	ddd
Days as Sunday-Saturday	dddd
Years as 00-99	yy
Years as 1900-9999	yyyy

Table 3 - Custom Format Codes for Dates in Excel

In the worksheet shown in **Figure 47**, the column headings are dates. Each column heading is the last date of the month formatted to display the month's three-letter abbreviation.

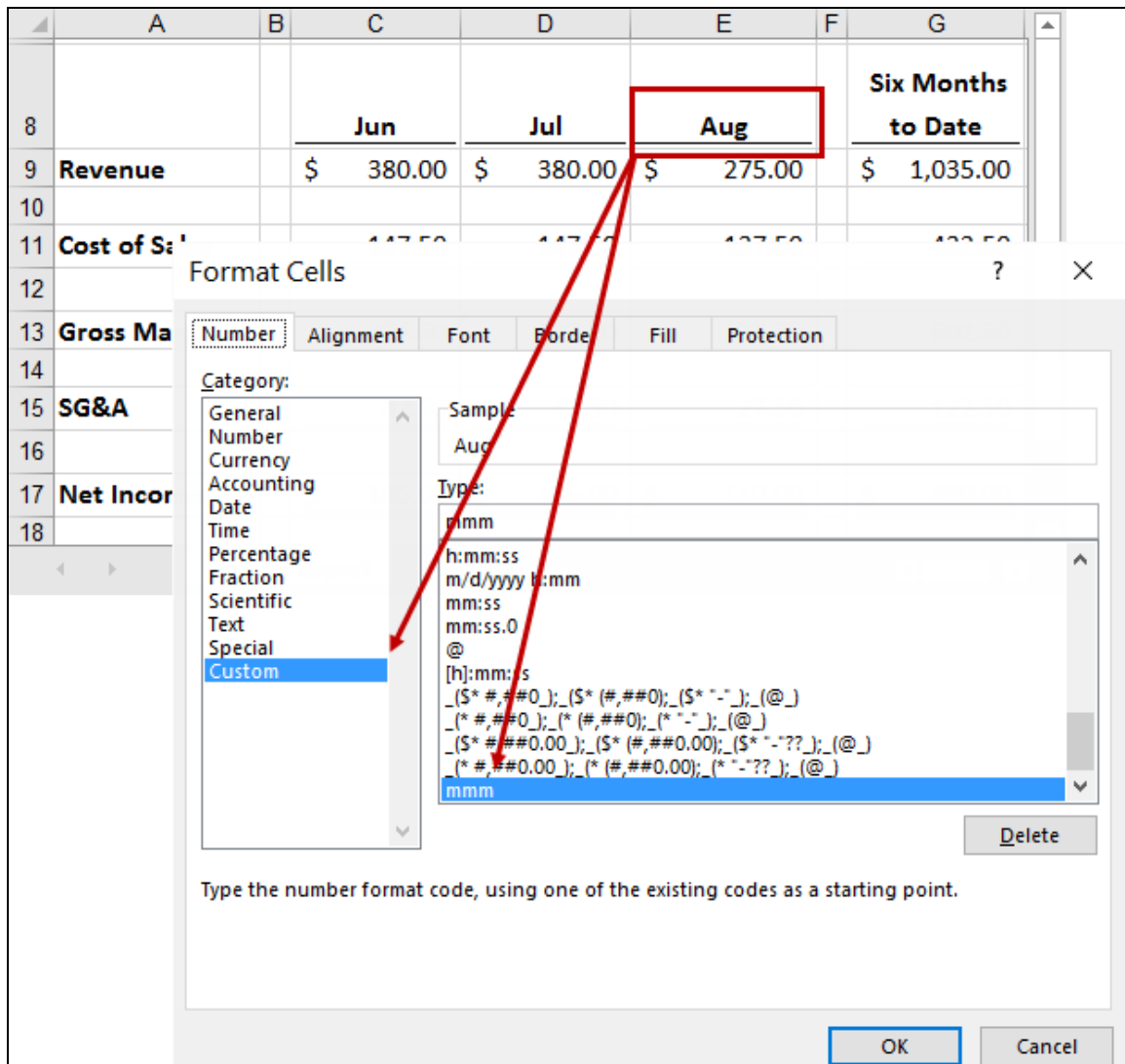


Figure 47 - Using Date Formats to Display Month Headings

Using dates as column headings allows the report date to link by formula to the latest reported month. This practice ensures that the report date is accurate and does not require any manual updates.

Using Styles to Preserve Custom Formats

As we have seen in the previous examples, custom formats help format financial data. However, saving custom formats for future use can be a little tricky. One straightforward way to save a custom format for future use is to save the configuration as part of a “custom style.” A custom style can contain alignment, border, font, number, and shading attributes. For example, a style for rows containing totals might include dollar signs in the number format, double underlines, and boldfaced fonts.

To create a named style, perform the following five steps.

1. Select **Cell Styles** from the Ribbon's **Home** tab. Then, near the bottom of the **Style Gallery**, click **New Cell Style**, as shown in **Figure 48**.

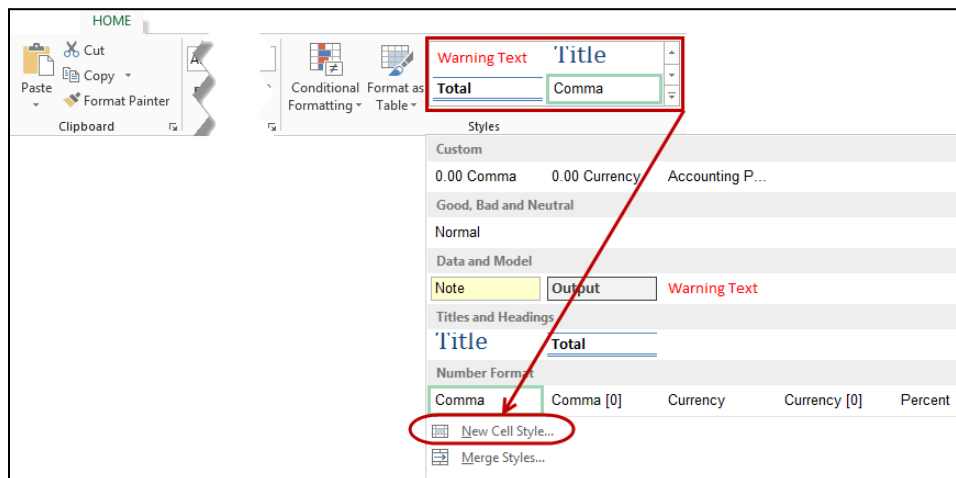


Figure 48 - Creating a New Style from the Ribbon

2. Check all the formatting attributes you wish to change in the Style dialog box. In this example, uncheck all formatting attributes except the **Number** format. Click the **Format** button.
3. Select the **Number** tab in the **Format Cells** dialog box and choose **Custom** in the **Category** list.
4. In the **Type** box, enter your custom format code. We will create a custom accounting format without dollar signs in this example. Refer to the appropriate code in Figure 46. Click **OK**.
5. Enter a descriptive name in the **Style Name** box – such as **0.00 Comma** – for your new style and click **OK**.

To apply your new named style, highlight the cells you want to format and click **Cell Styles** on the Ribbon's **Home** tab. Then, select your style from the **Custom** section of the **Style Gallery**.

Named styles are only available in the workbooks in which you create them. In other words, these do not save as global settings available in all workbooks. However, you can merge named styles from an open workbook into the active workbook. First, click **Cell Styles** followed by **Merge Styles** from the **Style Gallery** from the Ribbon's **Home** tab. In the **Merge Styles** dialog box, select an open workbook from which to merge named styles into the active workbook, as shown in **Figure 49**. Click **OK** to incorporate the named styles.

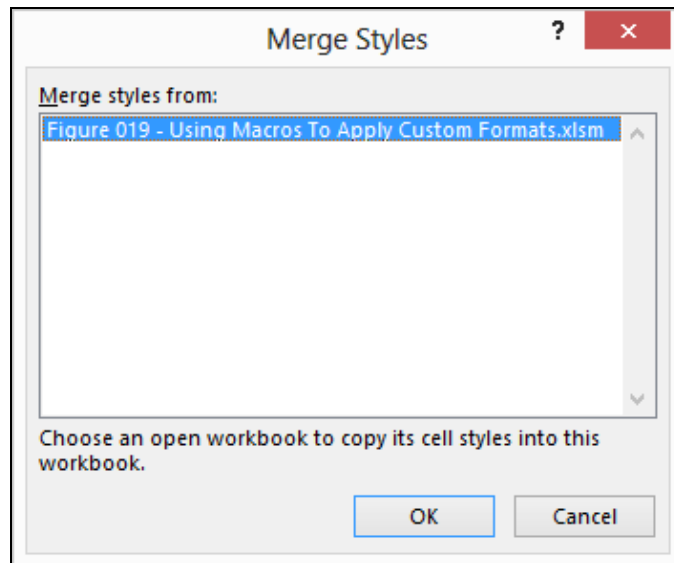


Figure 49 - Merging Styles from an Open Workbook

You can make named styles available in all newly created workbooks by saving them in Excel's default templates, **book.xltx** and **sheet.xltx**.

Many accountants and other business professionals will use a relatively small set of styles from a practical perspective. Accountants, for instance, might only use four styles.

1. The first number at the top of a column. This style will likely format in the Accounting format with the currency symbol enabled and zero values displayed as "\$0.00" instead of "-"
2. All other numbers in a column formatted in the Accounting format with the currency symbol suppressed and zero values displayed as "0.00" instead of "-" except for subtotals and totals
3. Subtotals in a column formatted in the Accounting format with the currency symbol suppressed, a single accounting underline, and zero values displayed as "0.00" instead of "-"
4. Totals formatted in the Accounting format with the currency symbol enabled, a double accounting underline, and zero values displayed as "\$0.00" instead of "-"

By creating styles to facilitate applying the formats described in "1," "3," and "4" above and by modifying the predefined "Normal" style to use the formats described in "2" above automatically, you can save a tremendous amount of time that you would otherwise spend on formatting. This action will simultaneously ensure that formats apply consistently throughout a

workbook. You should probably keep your custom styles in your default workbook templates to access them in all newly created workbooks.

Display of Zeros and Precision as Displayed

One of the confounding problems of using any financial number format (accounting, currency, and number) is how zeros appear. The third part of any number format code is the code used to display zeros. However, the format code only applies when the value in a cell is equal to zero, not when it appears as zero, such as when a small amount rounds off automatically to zero for display. This issue is especially problematic when using the accounting format because cells can display as zeros, positive zeros, or negative zeros, as shown in **Figure 50**.

		<u>Zero</u>	<u>Positive Zero</u>	<u>Negative Zero</u>
Accounting Format Display	\$	\$ -	\$ 0.00	\$ (0.00)
	w/o \$	\$ -	\$ 0.00	\$ (0.00)
Actual Number in Cell		\$ -	\$ 0.001	\$ (0.001)

Figure 50 - Zero Display Using the Accounting Format

Some practitioners have become so frustrated with this problem that they enter hard-coded zeros over formulas when this occurs so that zeros display consistently throughout their reports. However, in overwriting their formulas, they potentially corrupt their worksheet so that it does not recalculate correctly in the future.

There are two easily applied solutions to this problem. The most common is to round calculations to the number of displayed decimals. In other words, the values **0.001** or **-0.001** (or smaller) rounded to two decimals would result in a cell value of zero, which would correctly display when using the accounting format. When encountering a positive or negative “zero” cell, you can round it to the appropriate number of decimal places using the **ROUND** function.

The second solution to this problem is to enable global rounding in the affected workbook. With global rounding activated, all values round to their respective cell formats. In other words, the values “**0.001**” or “**-0.001**” displayed with two decimals would automatically round to a cell value of zero, which correctly appears when using the accounting format. To enable global rounding in a workbook, click the Ribbon’s **File** tab followed by **Options, Advanced**. Then check the box next to **Set precision as displayed** and click **OK** in the section labeled **When calculating this workbook**.

Regardless of which version of Excel is running, enabling global rounding in a workbook causes Excel to display the warning shown in **Figure 51**.

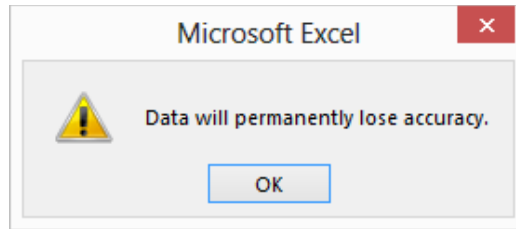


Figure 51 - Warning Message Displayed When Precision as Displayed is Enabled

Do not be alarmed by the warning. Instead, click **OK**, and all the cells that contain zeros will now display correctly.

Before continuing, an explanation of the warning message is in order. To do that, we must first review how Excel makes calculations. By default, Excel rounds off for display but uses the underlying data to make calculations. However, Precision as Displayed alters the way that Excel evaluates formulas. With Precision as Displayed enabled, Excel ignores the underlying data and uses the screen's data to make calculations. Hence, with Precision as Displayed enabled, all calculations foot and cross-foot properly. In other words, practitioners will not encounter the one-cent rounding error often appearing in worksheets. The example in **Figure 52** will help in explaining Precision as Displayed.

Units	Product			Average	
Rec'd	Code	PO	Total	Unit Cost	
4	G217-9	06-1838	247.11	61.78	61.777500000000
15	H77-9	06-1838	494.22	32.95	32.948000000000
12	H83-3	06-1799	741.33	61.78	61.777500000000
7	K562-3	06-1803	988.44	141.21	141.205714285714
Total Received				297.71	297.708714285714

Units	Product			Average	
Rec'd	Code	PO	Total	Unit Cost	
4	G217-9	06-1838	247.11	61.78	
15	H77-9	06-1838	494.22	32.95	
12	H83-3	06-1799	741.33	61.78	
7	K562-3	06-1803	988.44	141.21	
Total Received				297.72	

Solution:
Enable Precision as Displayed.

Figure 52 - Rounding Error Corrected by Enabling Precision as Displayed

Note the one-cent (least significant digit) rounding error in the table at the top of Figure 52. The displayed value is \$297.71, but it should read \$297.72. The error occurs because Excel uses the underlying data shown in the column on the right in the summation. In the bottom table,

Precision as Displayed was active. In this case, Excel uses the data displayed on the worksheet's face, and the rounding issue disappears.

Now, we can return to the warning message appearing when Precision as Displayed is enabled. The warning message refers to a problem occurring when we enter constants (numbers) in a worksheet and do not display all the decimals entered. In this circumstance, Excel truncates any decimals not displayed. For example, if we entered **2.2385** in a cell and showed only two decimal places, the truncate to **2.24** if Precision as Displayed is active. Furthermore, if we tried to undo our change, we would find it is irreversible. Under these circumstances, saving workbooks before enabling Precision as Displayed would be wise.

Note that this issue does not arise when cells contain *formulas*. In other words, Precision as Displayed can be enabled or turned off at will without any impact on the accuracy of the underlying data when the data results from formulas. Most of our rounding issues result from floating-point calculations. Further, most Excel users are not likely to enter constants with more decimal places than are displayed. Therefore, Precision as Displayed should not pose a problem in day-to-day practice. In fact, many accounting professionals have altered their default templates, **book.xltx** and **sheet.xltx**, to enable Precision as Displayed so that all workbooks foot and cross-foot correctly without using the ROUND function in formulas. If you need Precision as Displayed without permanently truncating on constants, preface the constant's entry with an equals sign (=), and Excel will treat the entry as a formula. Precision as Displayed will solve rounding and footing issues; however, Excel does not permanently truncate the data because the formula is volatile and recalculates.



If you import or rekey financial data into a worksheet and then display the data in thousands, millions, or billions using custom number formats, as illustrated earlier in this chapter. If you enable Precision as Displayed to eliminate rounding errors in the resulting reports, your keyed data will be truncated. Save your original workbook with a different filename before enabling Precision as Displayed. A better solution would be to use formulas to create another worksheet in your workbook where you will apply the custom formats. Because the cells on the new worksheet contain formulas instead of constants, you can turn Precision as Displayed on or off at will without affecting the data on your original worksheet.



What is the primary purpose of Excel's Precision as Displayed feature? What types of issues does implementing Precision as Displayed solve? For example, is Precision as Displayed more efficient than implementing multiple formulas, including ROUND functions, to address "rounding" issues?

The Hidden Format

It is often necessary to hide some worksheet information for presentation purposes. In Excel, you can easily hide entire rows and columns, but what about situations where you must hide only a single cell or range of cells? Many accountants change the text color to be the same as the background color, thereby rendering the cells invisible. Now that we understand more about custom formats and their syntax, it should be easy to recognize that we can make a cell or cells invisible to all with one of the most straightforward sets of custom format codes: three semicolons (;;). The three semicolons represent a format that includes neither positive, negative, zero, nor label formats. Hence, nothing displays or prints when you apply this custom format! Furthermore, cells with the hidden format do not reveal their location, even when highlighted.

Conditional Formatting

Conditional formatting automatically causes Excel to format cells differently based on conditions in the cells and the conditional formatting rules applied to them. For example, conditional formatting could cause cells with month-over-month variances in a comparative income statement that exceed 15% to format with a red background and white text. Simultaneously, another set of conditional formatting rules could cause less than -10% variances to format with a navy blue background and yellow text. In sum, conditional formatting allows you to analyze data more efficiently and effectively, including data found in financial statements and related schedules.

Although Microsoft improved conditional formatting significantly beginning with Excel 2007, it has been a part of Excel since Excel 97. Presently, there are five types of predefined conditional formats.

1. **Highlight Cells Rules** – Excel will format cells based on whether specific criteria are satisfied. There are six built-in rule types: Greater Than, Less Than, Equal To, Text That Contains, A Date Occurring, and Duplicate Values.
2. **Top/Bottom Rules** – Formatting applies to a selected range of cells more or less than a given threshold. There are six built-in rule types: Top N Items, Top N %, Bottom N Items, Bottom N %, Above Average, and Below Average.
3. **Data Bars** – This fills cells with gradient bars whose length is relative to all other values in the selected range. The color combinations available are dependent on the active theme.

4. **Color Scales** – Cells fill with gradient colors using a two- or three-color scheme. The shades are relative to all other values in the selected range. The color combinations available are dependent on the active theme.
5. **Icon Sets** – This fills the left-hand margin of cells with small graphical characters whose shape and color are relative to all other values in the selected range.

Also, you can create your custom conditional formats based on specific criteria or formula results that you specify. For example, you could create rules that apply formats based on the following conditions.

1. Apply a red background and white text if the month-over-month variance exceeds 15%.
2. In contrast, apply a blue background and yellow text if the month-over-month variance is less than -10%.

Select the entire range to apply the first conditional formatting rule to begin the process. For example, **Figure 52** shows that the range is A6 through D27 in this example.

	A	B	C	D
1	DNM Marketing, Inc.			
2	Monthly Income Statements			
3	For the Months Ended September and October, 2021			
4				
5		<u>September</u>	<u>October</u>	<u>% Variance</u>
6	Revenue	\$ 1,435,896	\$ 1,404,219	-2.21%
7	Cost of Goods Sold	864,914	872,694	0.90%
8	Gross Profit	570,982	531,525	-6.91%
9				
10	Operating Expenses			
11	Advertising	25,687	31,274	21.75%
12	Amortization	18,333	18,333	0.00%
13	Bank Charges	732	711	-2.87%
14	Commissions	127,616	97,214	-23.82%
15	Insurance	43,333	43,333	0.00%
16	Office Supplies	18,971	21,219	11.85%
17	Officers Salaries	25,000	25,000	0.00%
18	Payroll Taxes	13,369	18,219	36.28%
19	Rent	32,165	32,165	0.00%
20	Telecommunications	2,439	1,821	-25.34%
21	Utilities	11,132	10,971	-1.45%
22	Wages	96,541	137,812	42.75%
23	Depreciation	21,687	21,687	0.00%
24	Interest	27,896	25,412	-8.90%
25	Total Expenses	464,901	485,171	4.36%
26				
27	Net Income	\$ 106,081	\$ 46,354	-56.30%

Figure 53 - Selecting the Range to Which a Conditional Formatting Rule Will Apply

With the range selected, click **Conditional Formatting** from the Ribbon's **Home** tab and select **New Rule** to open the **New Formatting Rule** dialog box. There, click **Use formula to determine which cells to format**. In the **Edit the Rule Description** box, enter the formula **\$D6>15%** and click **Format...** to open the **Format Cells** dialog box. On the **Font** tab of the Format Cells dialog box, choose the white font, click the **Fill** tab, and then choose the red background. Click **OK** twice to create your conditional formats, as shown in **Figure 54**.

	A	B	C	D
1	DNM Marketing, Inc.			
2	Monthly Income Statements			
3	For the Months Ended September and October, 2021			
4				
5		<u>September</u>	<u>October</u>	<u>% Variance</u>
6	Revenue	\$ 1,435,896	\$ 1,404,219	-2.21%
7	Cost of Goods Sold	864,914	872,694	0.90%
8	Gross Profit	570,982	531,525	-6.91%
9				
10	Operating Expenses			
11	Advertising	25,687	31,274	21.75%
12	Amortization	18,333	18,333	0.00%
13	Bank Charges	732	711	-2.87%
14	Commissions	127,616	97,214	-23.82%
15	Insurance	43,333	43,333	0.00%
16	Office Supplies	18,971	21,219	11.85%
17	Officers Salaries	25,000	25,000	0.00%
18	Payroll Taxes	13,369	18,219	36.28%
19	Rent	32,165	32,165	0.00%
20	Telecommunications	2,439	1,821	-25.34%
21	Utilities	11,132	10,971	-1.45%
22	Wages	96,541	137,812	42.75%
23	Depreciation	21,687	21,687	0.00%
24	Interest	27,896	25,412	-8.90%
25	Total Expenses	464,901	485,171	4.36%
26				
27	Net Income	\$ 106,081	\$ 46,354	-56.30%

Figure 54 - Conditional Formats for All Variances Greater than 15%

To create the conditional format rules for the variances less than -10%, repeat the process outlined above, substituting the following formula:

=D6<-10%

Then, set the font color to yellow and the background color to navy blue. The result should resemble that shown in **Figure 55**. From a financial reporting perspective, applying conditional formats as described here can be invaluable to accountants and analysts in validating the accuracy of data appearing in financial statements and accompanying schedules.

	A	B	C	D
1	DNM Marketing, Inc.			
2	Monthly Income Statements			
3	For the Months Ended September and October, 2021			
4				
5		September	October	% Variance
6	Revenue	\$ 1,435,896	\$ 1,404,219	-2.21%
7	Cost of Goods Sold	864,914	872,694	0.90%
8	Gross Profit	570,982	531,525	-6.91%
9				
10	Operating Expenses			
11	Advertising	25,687	31,274	21.75%
12	Amortization	18,333	18,333	0.00%
13	Bank Charges	732	711	-2.87%
14	Commissions	127,616	97,214	-23.82%
15	Insurance	43,333	43,333	0.00%
16	Office Supplies	18,971	21,219	11.85%
17	Officers Salaries	25,000	25,000	0.00%
18	Payroll Taxes	13,369	18,219	36.28%
19	Rent	32,165	32,165	0.00%
20	Telecommunications	2,439	1,821	-25.34%
21	Utilities	11,132	10,971	-1.45%
22	Wages	96,541	137,812	42.75%
23	Depreciation	21,687	21,687	0.00%
24	Interest	27,896	25,412	-8.90%
25	Total Expenses	464,901	485,171	4.36%
26				
27	Net Income	\$ 106,081	\$ 46,354	-56.30%

Figure 55 - Multiple Conditional Formats Applied to the Same Range

Another application of conditional formatting is identifying duplicate values in a range of data. For example, suppose an accountant reviewed the check register shown in Figure 55 and desired to highlight any redundant check numbers. The auditor could quickly complete the task using conditional formatting by performing the following three steps.

1. Select the contents of the **Check Number** field in the worksheet.
2. Choose **Conditional Formatting, Highlight Cells Rules, and Duplicate Values** from the Ribbon's **Home** tab.

3. In the **Duplicate Values dialog box**, choose the formatting characteristics to apply to any duplicate values in the range and click **OK**.

The results of the auditor's test might resemble those pictured in **Figure 57**.

	A	B	C	D
1	Hesson Flooring Company			
2	Check Payments Data			
3	For the Years 2021 and 2022			
4				
5				
6	Date	Num	Name	Amount
7	01/11/2021	100	East Bayshore Auto Mall	532.97
8	01/21/2021	101	Sergeant Insurance	712.56
9	02/11/2021	103	East Bayshore Auto Mall	532.97
10	03/11/2021	104	East Bayshore Auto Mall	532.97
11	04/12/2021	105	East Bayshore Auto Mall	532.97
12	04/17/2021	106	Kershaw Computer Services	714.00
13	04/19/2021	107	Sergeant Insurance	0.00
14	04/19/2021	108	Sergeant Insurance	712.56
15	05/13/2021	101	East Bayshore Auto Mall	532.97
16	06/10/2021	110	East Bayshore Auto Mall	532.97
17	07/11/2021	111	East Bayshore Auto Mall	532.97
18	07/19/2021	112	Sergeant Insurance	712.56

Figure 56 - Sample Check Register with Duplicate Check Numbers

	A	B	C	D
1	Hesson Flooring Company			
2	Check Payments Data			
3	For the Years 2021 and 2022			
4				
5				
6	Date	Num	Name	Amount
7	01/11/2021	100	East Bayshore Auto Mall	532.97
8	01/21/2021	101	Sergeant Insurance	712.56
9	02/11/2021	103	East Bayshore Auto Mall	532.97
10	03/11/2021	104	East Bayshore Auto Mall	532.97
11	04/12/2021	105	East Bayshore Auto Mall	532.97
12	04/17/2021	106	Kershaw Computer Services	714.00
13	04/19/2021	107	Sergeant Insurance	0.00
14	04/19/2021	108	Sergeant Insurance	712.56
15	05/13/2021	101	East Bayshore Auto Mall	532.97
16	06/10/2021	110	East Bayshore Auto Mall	532.97
17	07/11/2021	111	East Bayshore Auto Mall	532.97
18	07/19/2021	112	Sergeant Insurance	712.56

Conditional Formatting shades the cells with duplicate values in pink.

Figure 57 - Conditional Formatting Applied to Checks with Duplicate Check Numbers

Indenting Account Detail

Indenting account details for readability in formal financial reports and their supporting schedules is typical. However, many accounting professionals still use hard-coded spaces or *faux* columns to indent elements rather than Excel's **Indent** commands – **Increase Indent** and **Decrease Indent** – available on the Ribbon's **Home** tab. For example, to increase the indent of account details by two spaces, highlight the column of cells to be indented and click **Increase Indent**, as shown in **Figure 58**. Similarly, **Decrease Indent** decreases the indentation by two spaces.

File		Home	Insert	Page Layout	Formulas	Data	Review	View	Power Pivot
Paste Cut Copy Format Painter		Calibri 11 A A B I U A		Merge & Center		Wrap Text			
Clipboard		Font		Alignment					
I26									
	A	B	C	D	E	F	G		
1	DNM Marketing Inc								
2	Income Statement								
3	For the quarter ending 12/31/2021								
4									
5									
6	Sales	\$ 325,000							
7									
8	Cost of Goods Sold	173,000							
9									
10	Gross Margin	152,000							
11									
12	Operating Expenses								
13	Payroll Expenses	\$ 91,400							
14	Rent	20,400							
15	Utilities	4,850							
16	Insurance	3,000							
17	Equipment Rental	2,700							
18	Miscellaneous	1,200							
19									
20	Total Operating Expenses	123,550							
21									
22	Net Income Before Taxes	\$ 28,450							
23									

Figure 58 - Using Increase or Decrease Indent Commands

Customizing Excel

Chapter

3

As experienced Excel users know, Excel has a variety of settings to allow you to customize your work environment so that you can get your work done faster and easier. This chapter focuses on customizing Excel – through the user interface, global settings, and default templates – so you can be more productive.

Learning Objectives

Upon completing this chapter, you should be able to:

- Customize Excel’s user interface, including the Ribbon and the Quick Access Toolbar;
- Utilize Macros to facilitate customizing Excel;
- Manage Excel’s Options to improve user efficiency;
- Construct and apply templates – including *book.xltx* and *sheet.xltx* – to improve efficiency when building workbooks; and
- Create, manage, and apply Themes to Excel and other Microsoft Office applications.

We begin with coverage of how to modify the user interface by customizing the Ribbon, adding buttons to the Quick Access Toolbar, and recording simple macros for performing repetitive tasks.

Customizing the Ribbon

For many users, the most striking change in the 2007 release of Excel was replacing traditional drop-down menus with the ubiquitous Ribbon. As a result, Excel users had to learn a different way of interacting with the application. Further, all Excel users had to recognize that the Ribbon was not easily customizable. Fortunately, starting with Excel 2010, you can easily customize the Ribbon, including customizing and deleting “standard” tabs and creating new, user-defined ones.

Perhaps the easiest way to begin the process of customizing the Ribbon is to right-click on the Ribbon and select **Customize the Ribbon** to open the **Customize Ribbon** section of **Excel Options** shown in **Figure 59**. As highlighted in the lower right-hand corner of that window, buttons allow you to create a new tab on the Ribbon or a new group on an existing tab on the Ribbon, rename

an existing tab on the Ribbon, and reset a customized Ribbon back to its default settings. Additionally, you may import and export customized Ribbon settings.

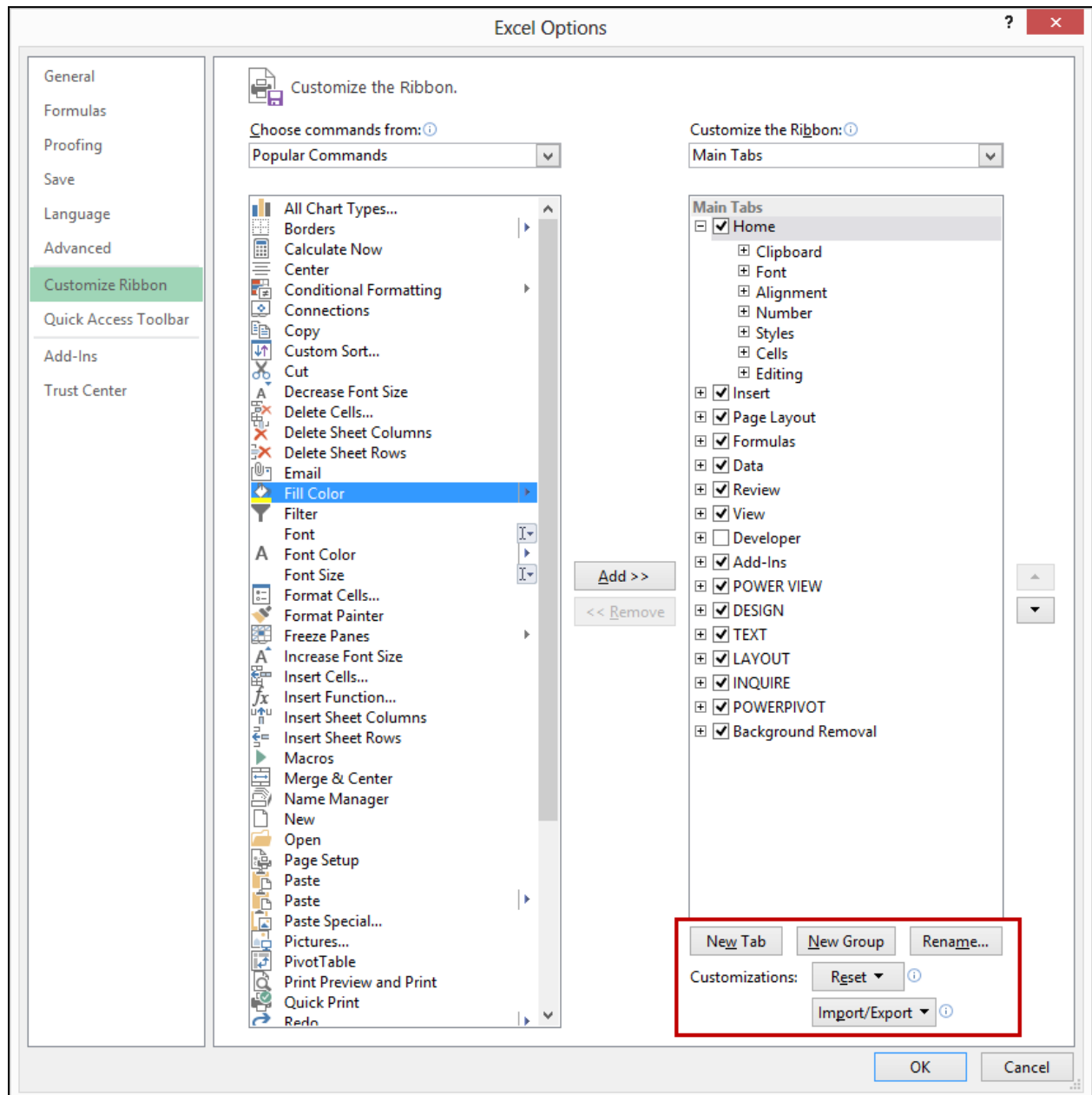


Figure 59 - Customize Ribbon Options in Excel 2013 and Newer

For instance, suppose you wanted to create a tab on the Ribbon that contained common print commands and functions. To do so, click the **New Tab** button highlighted in Figure 59. Doing so adds the **New Tab** to the Ribbon, as shown in **Figure 60**. Next, with the newly added tab selected, choose **Rename** to change the name to a more suitable one – in this case, **Print** – as shown in **Figure 61**. Finally, follow the same procedure to rename the **New Group** that Excel created when it created the new tab. In this example, **Print** is the replacement name for the group.

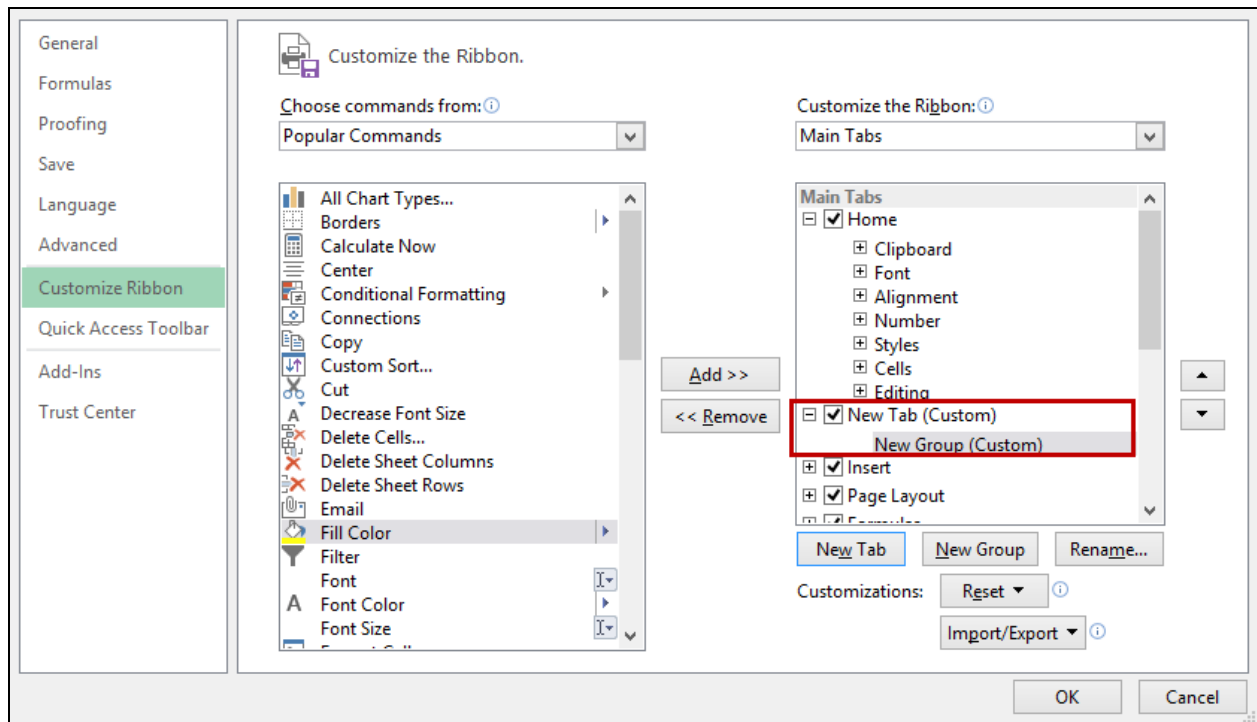


Figure 60 - Adding a New Tab to the Ribbon

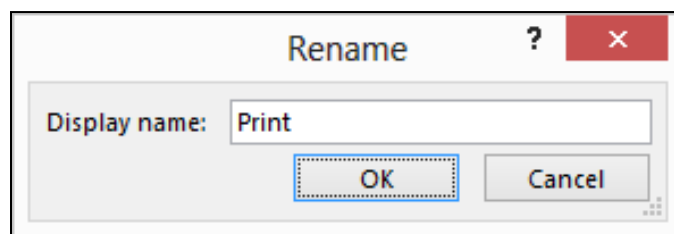


Figure 61 - Changing the Name of a Tab on the Ribbon

Once you rename the group, you can add functions by selecting them from the window's left side and choosing **Add**, as shown in **Figure 62**. Repeat this process for as many commands as you desire to add. Of course, you can rearrange the order of the added items. To do so, select the item you wish to reposition and then click the arrows on the right-hand side of the window.

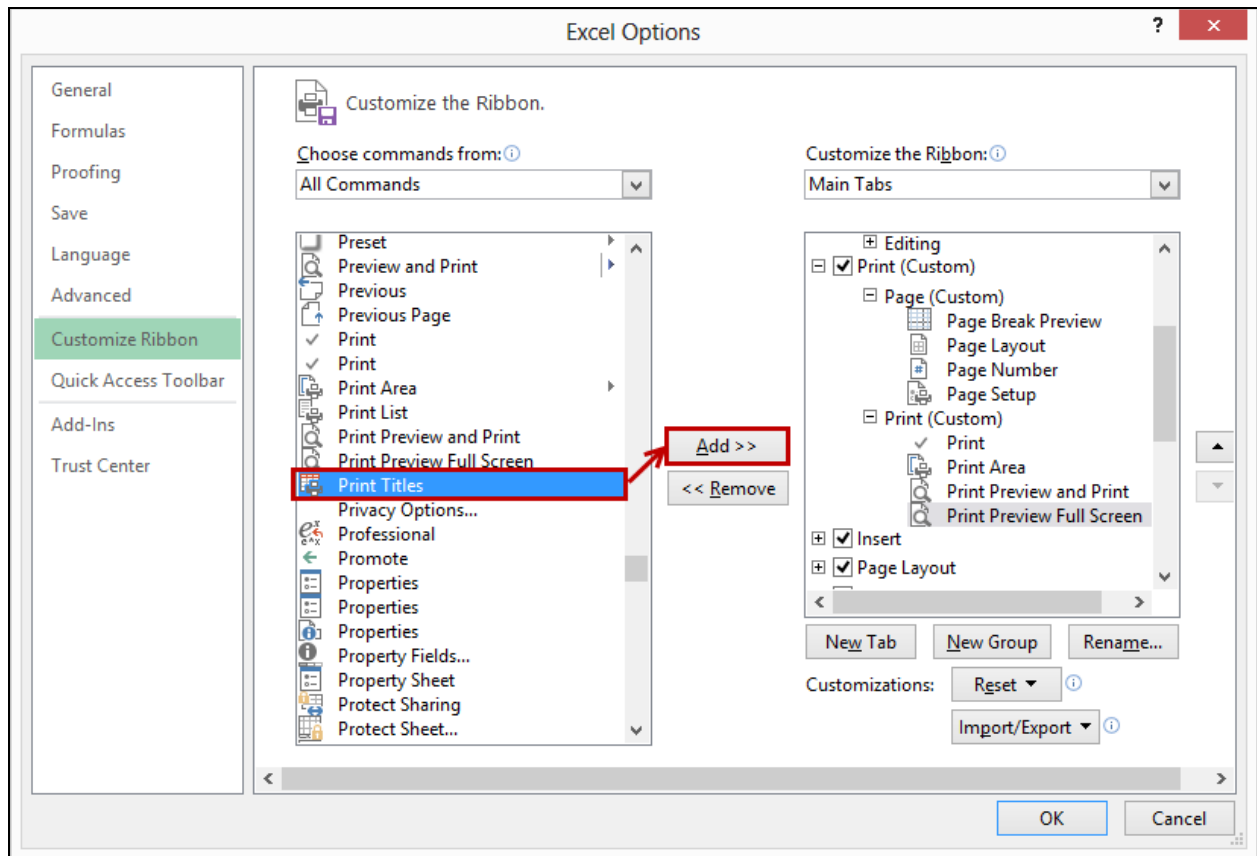


Figure 62 - Adding Commands to a Ribbon Group

Upon completing the processes detailed above, the Ribbon's customized tab might appear like the image in **Figure 63**.

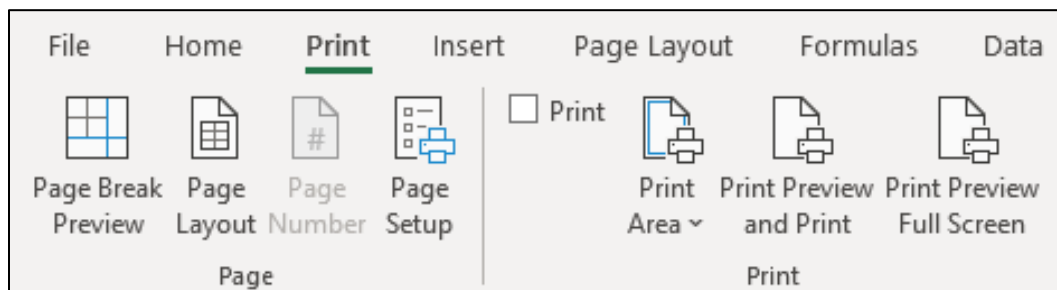


Figure 63 - Completed Customized Print Tab of the Ribbon

Customizing the Quick Access Toolbar

The **Quick Access Toolbar (QAT)** provides an easily customizable user interface component. You can modify the QAT to add buttons for commonly used commands or macros. The QAT resides above the Ribbon in the Windows title bar, but you can reposition it below the Ribbon, as shown in **Figure 64**.

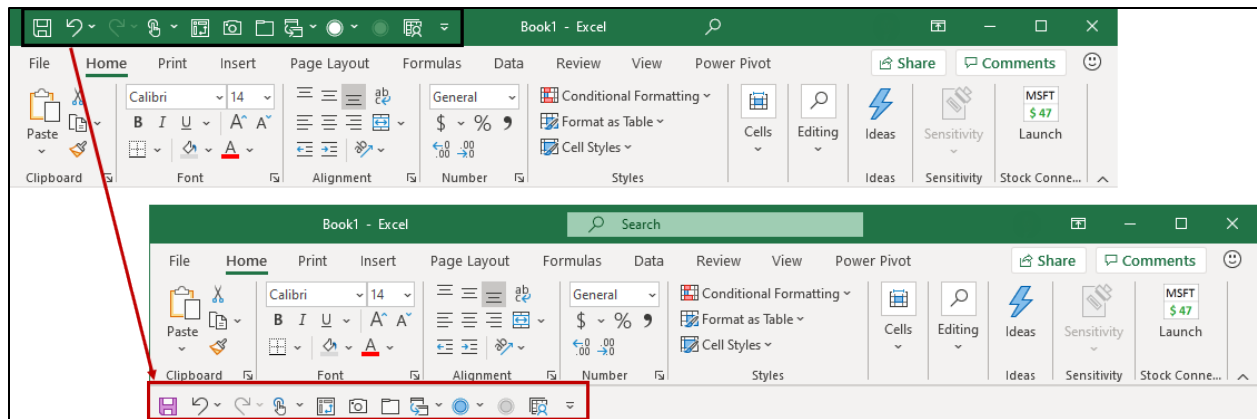


Figure 64 - Positioning Quick Access Toolbar Above or Below the Ribbon

Many users will likely find that repositioning the toolbar below the Ribbon will deliver better results because it reduces mouse travel to execute commands on the toolbar. In addition, you can relocate the toolbar and modify its default commands. Click the drop-down arrow at the right end of the toolbar to display the **Customize Quick Access Toolbar** menu, as shown in **Figure 65**.

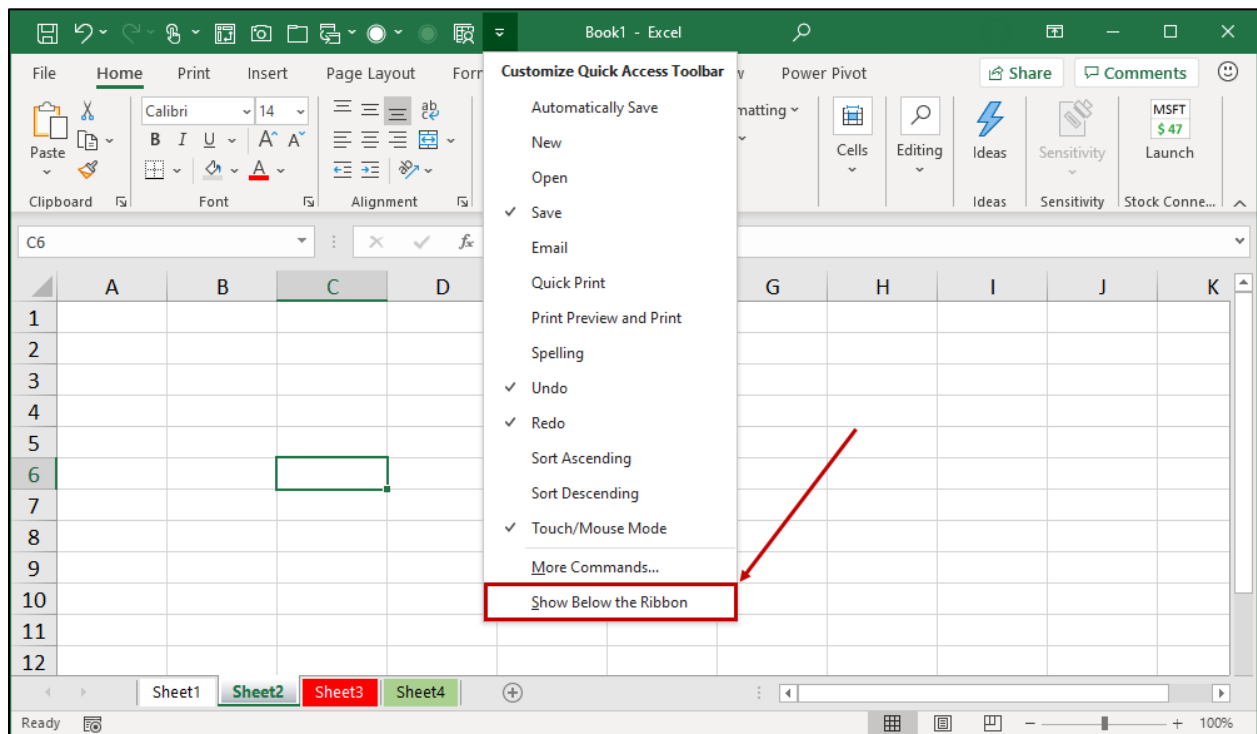


Figure 65 - Customizing Quick Access Toolbar Menu

The default commands appear on the QAT in the order you select them from the menu. To rearrange the order, first, unselect all default commands. Then, choose the tools in the order you want them to appear, left to right, on the toolbar.

The easiest method for many to add a command to the QAT is to right-click any item in the Ribbon and select **Add to Quick Access Toolbar** from the context-sensitive menu, as shown in **Figure 66**.

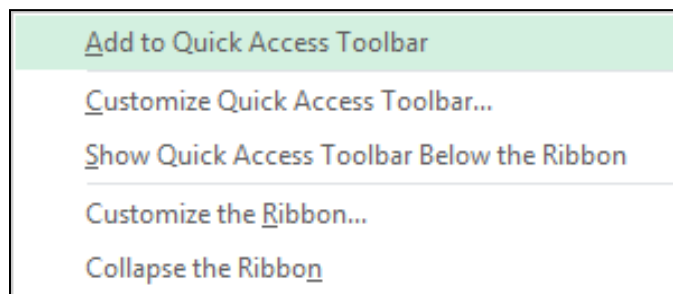


Figure 66 - Adding a Command to the QAT Directly from the Ribbon

To add commands that do not appear in the Ribbon, select **More Commands** from the **Customize Quick Access Toolbar** menu to launch the **Excel Options** dialog box, as shown in **Figure 67**.

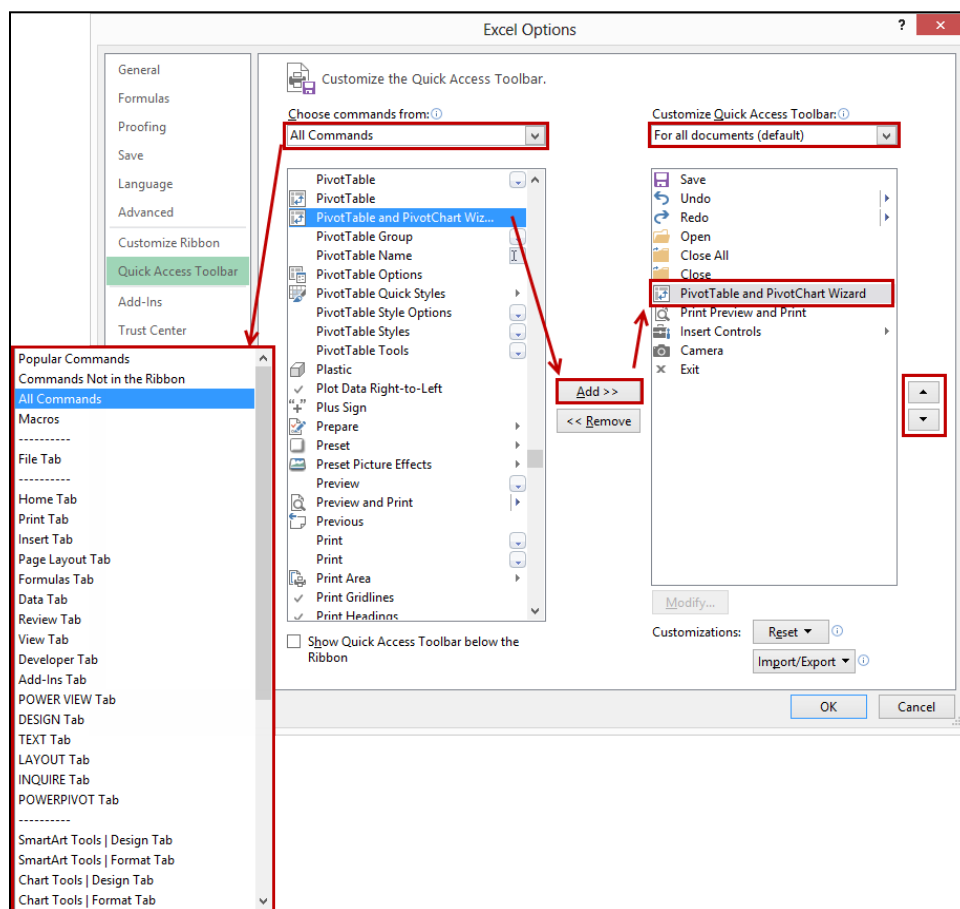


Figure 67 - Adding Commands to the QAT through Excel Options

You can add commands or macros to the Quick Access Toolbar for all documents or just the active document. This functionality allows you to attach macros or command buttons to a toolbar

associated with a single workbook so that the “regular” toolbar remains uncluttered with little-used functionality.

The application adds a second row if you add more commands to the QAT than Excel can display on a single row. However, Excel only shows the first row until you click the **More Controls** icon at the right of the toolbar. To remove an item from the QAT, right-click on the item and choose **Remove from Quick Access Toolbar**.

Customize with Macros

One of the tasks that many practitioners find frustrating is centering multiline report headings. The conventional process available from the Ribbon -- **Merge and Center** -- merges cells but potentially creates other issues. For example, using Merge and Center on multiple rows combines the rows so that only the first row’s content remains intact in the merged cell.

The current version of Excel improves this process because the **Merge Across** command is available from the Ribbon’s **Home** tab. When used with the **Center** command, it allows multiline headings to be centered easily in a report. However, this remains an unacceptable solution if you do not wish to merge cells. To center text across columns without combining cells, use the **Center Across Selection** command, available from the dialog launcher in the **Alignment** group of the Ribbon’s **Home** tab, as shown in **Figure 68**.

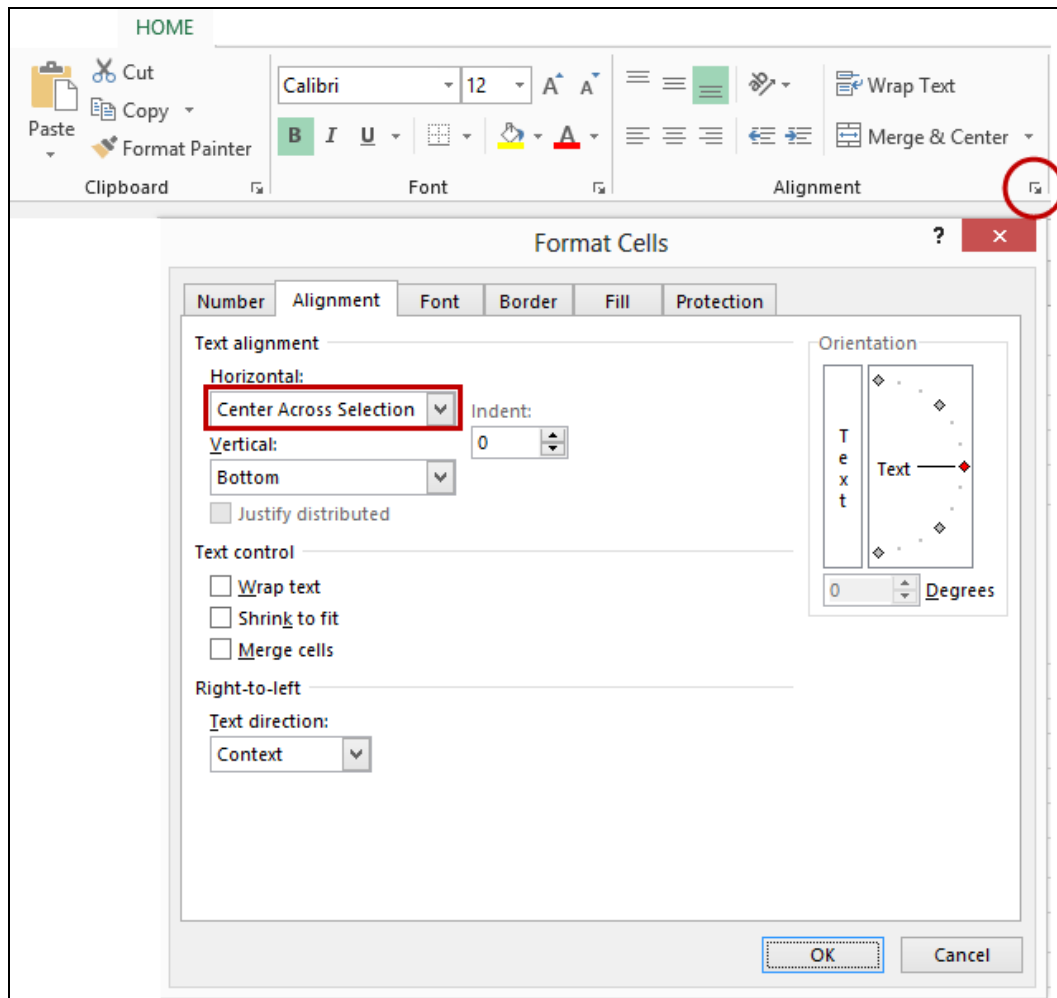


Figure 68 - Centering Text across Multiple Columns without Merging Cells

Centering across columns using either of the methods described requires multiple mouse clicks. However, a simple recorded macro can reduce the process to a single click always available from the QAT. Take the following steps to create a macro to center across multiple columns without merging cells.

1. Select the cells across which the labels are to be centered.
2. From the **View** tab of the Ribbon, select **Macros**, and then click **Record Macro**. Alternatively, select **Record Macro from the Developer tab of the Ribbon**.
3. Enter a descriptive name for your macro in the **Record Macro** dialog box. In this case, enter CenterAcrossSelection. The macro name must begin with a letter and cannot contain spaces or special characters. Then, choose to store the macro in the **Personal Macro Workbook** and enter a description, if desired. Next, click **OK** to turn on the macro recorder, as shown in **Figure 69**.

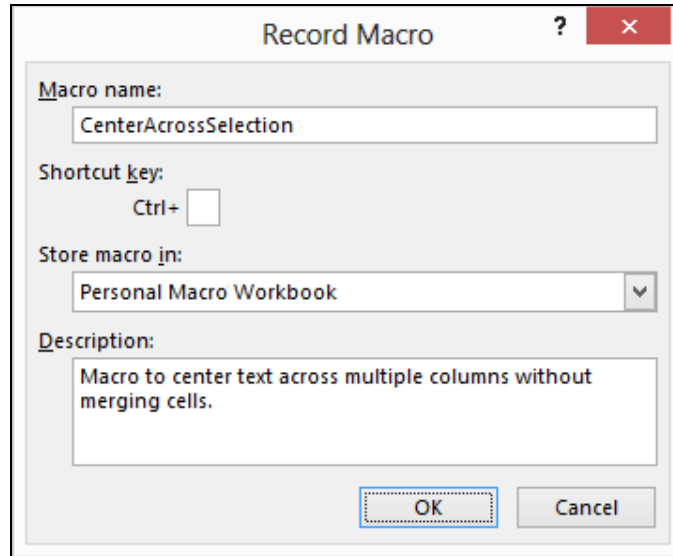


Figure 69 - Recording a Macro with the Macro Recorder

4. Step through the commands to center text across a selection of cells. Select **Macros, Stop Recording** from the Ribbon's **View** tab, or **Stop Recording** from the Ribbon's **Developer** tab when you complete the sequence.

Before running the macro, select the cells containing the text you wish to center. Then, from the **View** tab of the Ribbon, click **Macros** and **Run Macro** to open the **Macro** dialog box; alternatively, open the **Macro** dialog box from the **Developer** tab of the Ribbon by clicking **Macro**. Next, select the **CenterAcrossSelection** macro from the list and click **Run** to execute the macro. The next step is to attach the macro to a button on the Quick Access Toolbar to make it continuously available.

1. Right-click the **QAT** and select **Customize Quick Access Toolbar** to open the **Excel Options** dialog box.
2. Select **Macros** from the **Choose commands from** the drop-down menu. Scroll down and highlight the macro titled **PERSONAL.XLSB!CenterAcrossSelection**. Click the **Add** button to add it to the Customize QAT commands list on the right.
3. Now, click **Modify** to select an appropriate icon and edit the name to be displayed as a **Tool Tip** when the mouse cursor hovers over the button. Finally, click **OK** twice to add the button to the QAT. **Figure 70** depicts this process.

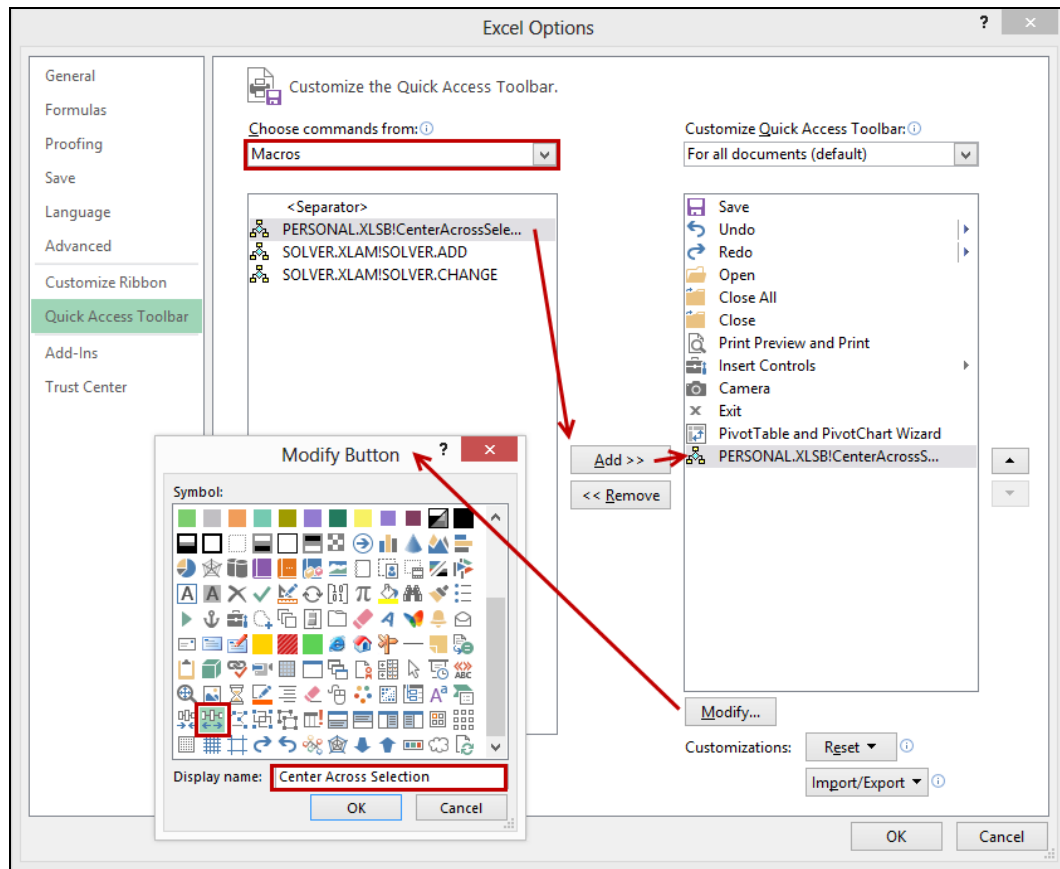


Figure 70 - Attaching a Macro to a Button on the QAT

Once the process is complete, the QAT will include a button for the *CenterAcrossSelection* macro recorded earlier, as shown in **Figure 71**. The macro will always be available when you save it in the Personal Macro Workbook.

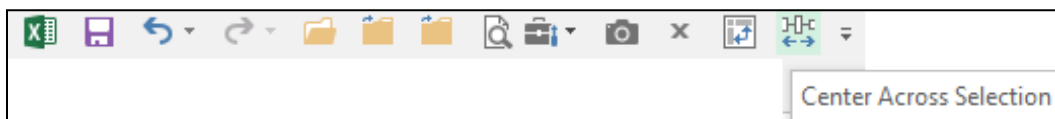


Figure 71 - Center Across Selection Macro Attached to a Button on the QAT



Comprehensive coverage of creating macros in Excel is beyond the scope of this course. The Macro Recorder demonstrated helps create macros that issue commands. However, it is not a keystroke recorder, so it is not generally helpful in recording macros that enter or modify formulas. Further, the macro recorder will not meet your needs if you need user interaction, such as user inputs, or if the macro must branch on user input or conditions within the workbook. Instead, you must write Visual Basic for Applications (VBA) code.

You may store a macro created by the Macro Recorder in one of three locations: 1) the Personal Macro Workbook, 2) the workbook in which the macro was recorded, or 3) a new workbook. If you want a macro to be available for execution in every workbook, then the Personal Macro Workbook is the appropriate storage location.

Like formulas, you can record macros with relative or absolute references. Macros recorded with relative references execute relative to the cursor's position in the workbook. This option renders the desired results in most circumstances. Select **Macros** and **Use Relative References** from the Ribbon's **View** tab to configure the Macro Recorder to use relative references. Alternatively, you can select **Use Relative References** from the Ribbon's **Developer** tab.

A brief discussion of the **Visual Basic Editor** will round out this limited coverage of macros. To open the Visual Basic Editor, right-click on a worksheet tab and select **View Code**, as pictured in **Figure 72**. Alternatively, use the keyboard shortcut **Alt + F11**.

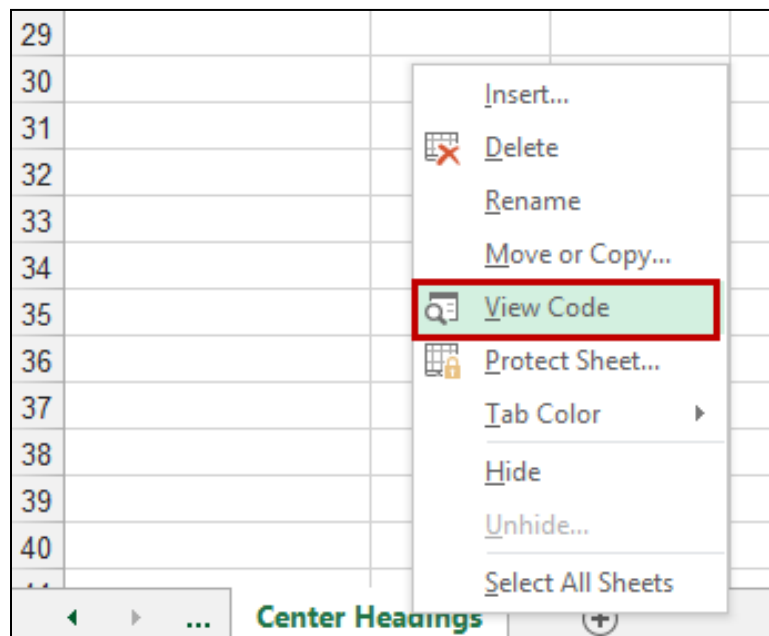


Figure 72 - Opening the Visual Basic Editor from a Worksheet Tab

Figure 73 shows the Visual Basic Editor. On the left are the **Project** and **Properties** windows. Select the workbook in the Project window where the VBA code of interest resides, in this case, PERSONAL.XLSB, and then double-click on a **Module** to see the recorded code.

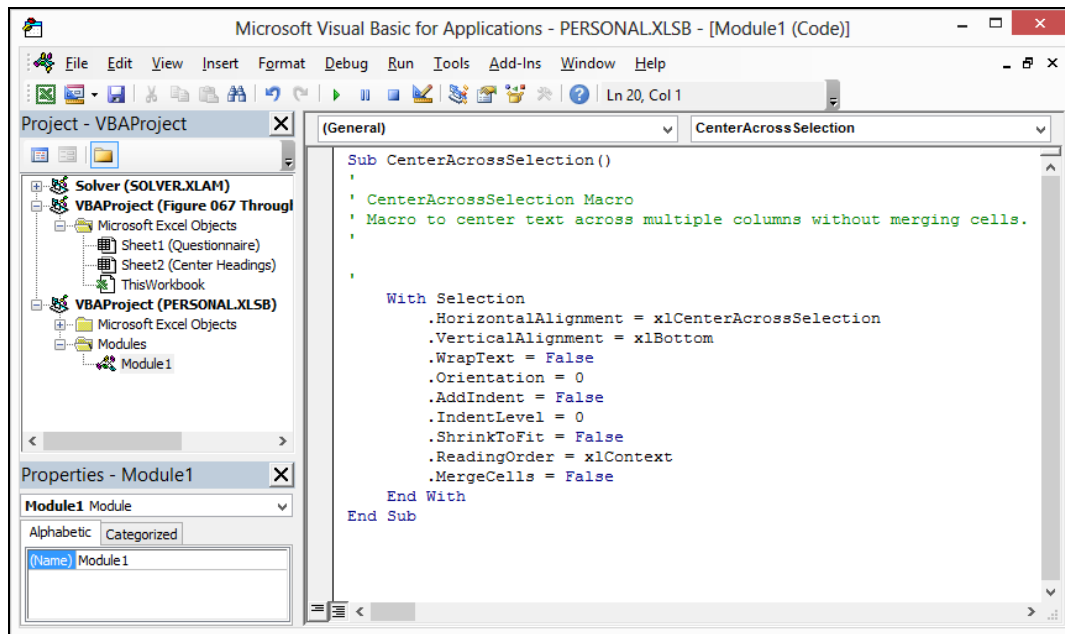


Figure 73 - Visual Basic Editor

Excel displays the VBA code in the pane on the right. VBA is structured and balanced – note that procedures exist in pairs (**Sub//End Sub**, **With//End With**). Further, Excel indents the code for improved readability. VBA is object-oriented. In this case, Excel establishes multiple properties such as **HorizontalAlignment**, **VerticalAlignment**, and **WrapText** with a single object selection.

Note that the Macro Recorder recorded the settings of all properties displayed on the **Alignment** tab of the **Format Cells** dialog box. In this case, however, the only line of code relevant to our requirements is the one that sets horizontal alignment. Therefore, to create a macro that will change only the horizontal alignment of the cells selected without altering any other properties, modify the code to that shown in **Figure 74**.

```
Sub CenterAcrossSelection()

    Selection.HorizontalAlignment = xlCenterAcrossSelection

End Sub
```

Figure 74 - Macro to Center Across Selection

Most Excel users, even experienced ones, are not VBA programmers and will never be. For many of us, that spells trouble because the Macro Recorder can automate only the simplest tasks. Online support forums and newsgroups often serve as self-help tools. In some cases, resolving problems submitted on these online support forums and newsgroups needs more than just a formula; they require a macro. To implement a proposed solution that employs a macro, copy and paste the macro code from the forum or newsgroup into a **Module** of the **Personal Macro Workbook**.

Excel Options

Excel has many option settings that allow you to customize your Excel work environment. There are five settings types or options available in Excel: global settings, session settings, workbook options, worksheet options, and window options.

Global settings, such as error checking rules, affect every workbook. **Session settings**, such as calculation options, affect all workbooks in the current Excel session until Excel is closed. Excel applies the session settings of the first workbook opened during a session to all workbooks used. **Workbook options**, like precision as displayed, affect a single workbook. Likewise, **worksheet options**, such as the Lotus compatibility settings, involve a single sheet within a workbook. Finally, **Window options**, such as the setting to show sheet tabs, affect a single window. The distinction between worksheet options and window options is irrelevant to many and not likely to affect most Excel users. However, given the possibility of having multiple windows open in a single sheet, it is possible, for example, to show formulas in cells in one window and calculated amounts in the same cells in another.

You will find Excel's various settings and options in **Excel Options**, available from the Ribbon's **File** tab. You can access the options in groups from the navigation pane, as shown in **Figure 75**. There are twelve options in current versions of Excel: *General, Formulas, Data, Proofing, Save, Language, Ease of Access, Advanced, Customize Ribbon, Quick Access Toolbar, Add-Ins*, and *Trust Center*. Each group splits into sections of similar settings. Excel does not explicitly identify **window options** and **session settings** in the **Excel Options** dialog box.

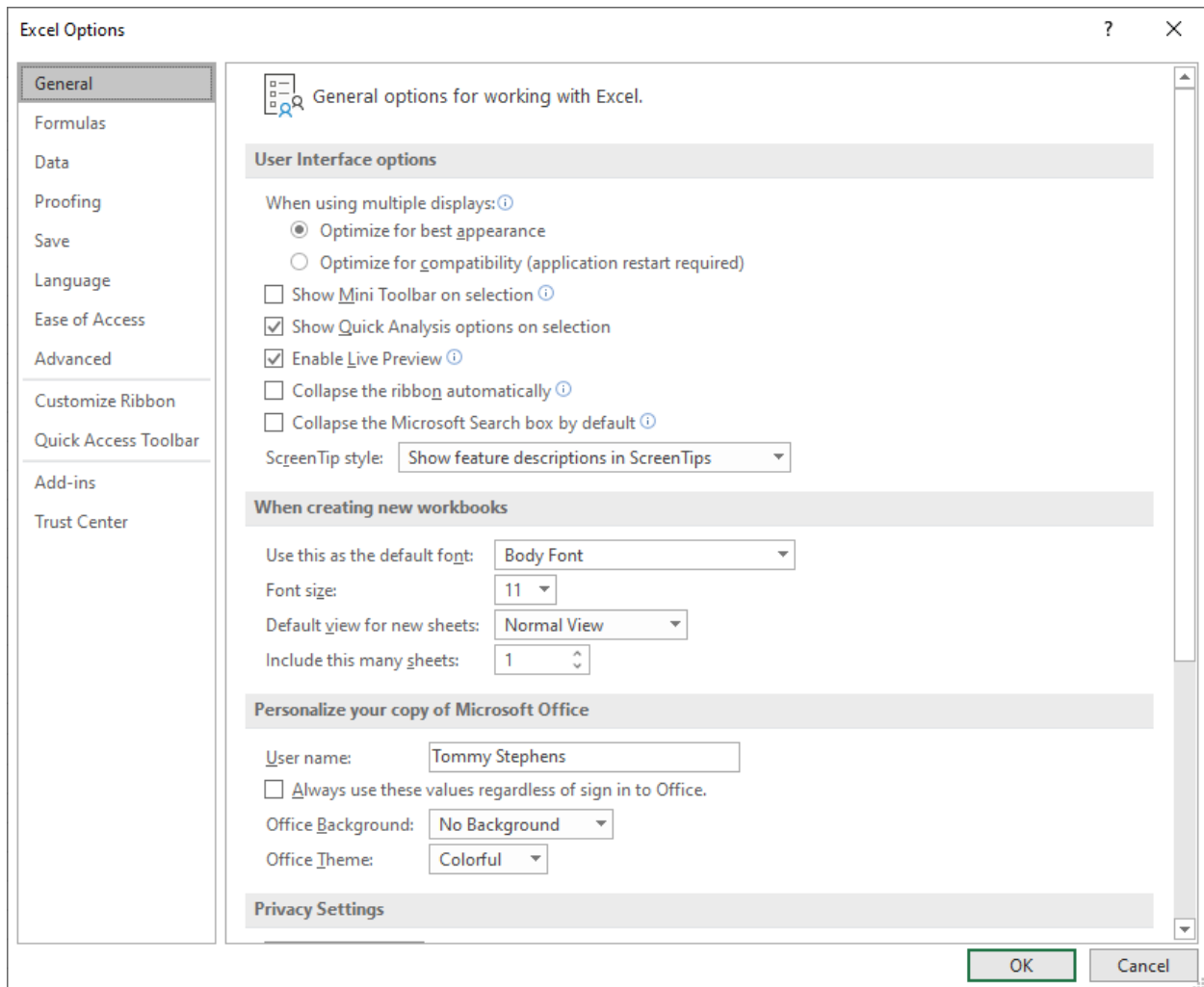


Figure 75 - Customizing Options and Settings in the Excel Options Dialog Box

The **General** group includes options to show the **Mini Toolbar**, enable Live Preview, and show the Ribbon's **Developer** tab. This group also contains options for new workbooks, such as the following:

- The default font and size,
- The number of sheets,
- The default window view, and
- Custom Lists, which we covered in Chapter One.

All options in this group are global settings that affect all workbooks.

The **Formulas** group includes sections for calculation options, working with formulas, and error checking. All the calculation options are *session* settings, and all other options are *global* settings. We will cover iterative calculation and error checking settings in Chapter Four, Formula Building Essentials.

In the **Data** group of options, you will find settings that allow you to specify the default layout of PivotTables. You will also be able to identify which legacy data import wizards you want to be able to access in Excel.

The **Proofing** group includes sections for *AutoCorrect* options and spelling and grammar checking. Recall that we discussed AutoCorrect options in Chapter One. All options in the Proofing group are global settings that affect all workbooks.

The **Save** group includes sections for saving workbooks, auto-recover exceptions, offline editing, and preserving a workbook's visual appearance in earlier Excel versions. Options for auto-recover exceptions and appearance preservations are workbook options. All other options are global settings. Several Save options warrant further discussion. First, you can set the default format for saving workbook files to something other than the latest Excel format. Second, you can establish the default file location. If you open and save files to a network server, properly configuring this setting can reduce the time spent navigating files and folders. You can stipulate the folder path using mapped drives or the universal naming convention (`\\servername\sharename\foldername`). Third, you can turn auto-recover on or off and set the minutes between auto-recover saves. You can also specify the location of auto-recover files. Auto-recover saves open workbooks at specified intervals to protect you from unexpected shutdowns or crashes.

The **Language** group allows you to specify Editing languages. Editing languages set specific features such as dictionaries, grammar checking, and sorting. Additionally, you can establish and prioritize Display languages and Help languages from the Language group of options.

Excel's **Ease of Access** group of settings allows you to make Excel more accessible to those with disabilities. This group of settings includes options to provide feedback with sound and animation and a default font size. Also available is the opportunity to keep the Accessibility Checker running. This tool helps find and fix content that might be difficult for those with disabilities to consume.

The **Advanced** group contains the most significant number of settings and options, grouped into eleven sections. Options for editing, cutting/copying/pasting, printing, displaying, formulas, general options, and Lotus transition navigation keys are global settings. In contrast, the settings affecting workbook calculation are workbook options. Workbook display settings are workbook options and window options, except for show object settings, which serve only as workbook options. The settings affecting worksheet display are both worksheet options and window options. Precision as Displayed, another setting in the Advanced group, was covered in Chapter Two.

The **Customize Ribbon** group provides access to the tools available to customize the Ribbon. For additional discussion of this topic, visit page 59.

The **Quick Access Toolbar** group provides access to the tools available to customize the Quick Access Toolbar.

The **Add-Ins** group controls the availability of Excel add-ins, such as the Analysis Tool Pak.

The **Trust Center** group allows you to configure macro security and other security settings.

Use Templates to Improve Productivity

In general terms, a template is nothing more than a pre-configured workbook. It contains reusable text and formulas arranged for some specific purpose. Nearly every accounting professional has numerous templates they reuse as required, but few professionals have converted their pre-configured workbooks from workbook (.xlsx) files to “true” Excel template (.xltx) files. However, there are two significant advantages of converting pre-configured workbooks into templates.

1. You will not waste time finding templates you seldom use because Excel stores template files in a common location. To open a template, select **New** from the **File** tab of the **Ribbon**. As shown in **Figure 76**, double-click on the template in the **New Workbook** dialog box to create a new workbook. If the desired template does not appear in the **Recently Used Templates** list, click on **My templates** to open the **New** dialog box to select a template.

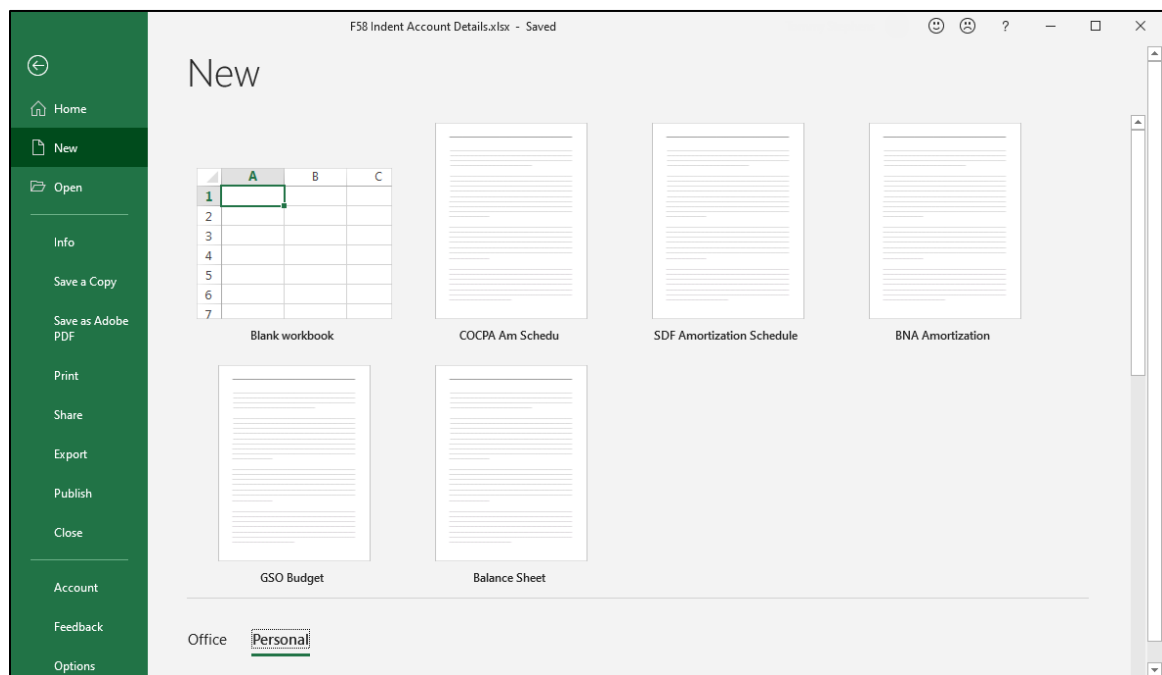


Figure 76 - Opening a Template in Excel

2. You will not waste time cleaning up a template after inadvertently saving data in a pre-configured workbook (.xlsx) file. If you enter data in a previously unsaved template (.xltx), Excel displays the **Save As** dialog box when you click the **Save** button. In other words, you

cannot easily save data over a template file, which relieves you of the time-consuming task of cleaning up a pre-configured workbook if you inadvertently overwrite one.

Save the workbooks as template files to convert pre-configured workbooks to templates. First, open a pre-configured workbook. Then, select **Save As** from the Ribbon's **File** tab to open the dialog box. Next, select **Excel Template** in the **Save as type** drop-down box at the bottom of the **Save As** dialog box, shown in **Figure 77**. Finally, type in a descriptive name for the template and click **Save**.

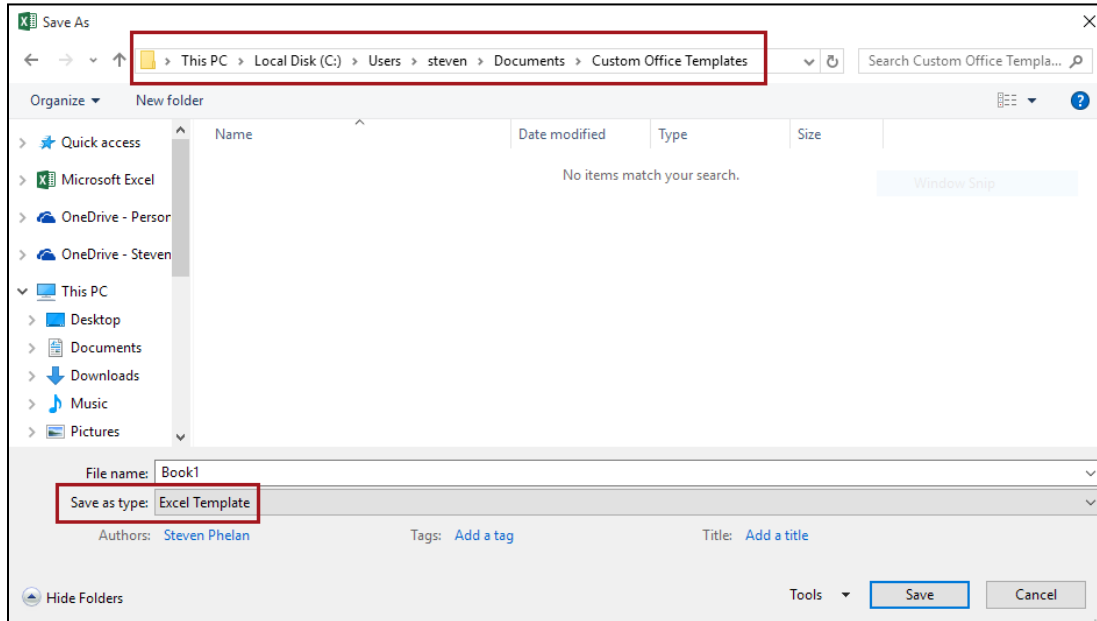


Figure 77 - Saving a Workbook as a Template



Note that the process described above saves a copy of the workbook as a template. The original workbook will still be available in its original folder. Note also that you can update templates by saving a newer version over an older template.

Creating and Modifying Excel's Default Templates

Now that we have covered template fundamentals, let us examine Excel's default templates, **book.xlsx**, and **sheet.xlsx**. These two files help control what happens in Excel when you create a new workbook or insert a new worksheet into an existing workbook. Excel automatically opens a copy of **book.xlsx** with all its settings each time you launch the application. Additionally, Excel uses **book.xlsx** as the foundation for new workbooks when you click the **New** icon on the **Quick Access Toolbar** or use the **CTRL + N** keyboard shortcut to create a new workbook. Note, however, that Excel does not use **book.xlsx** as the foundation of a new workbook you create using a **File, New** sequence. When you insert a worksheet into an existing workbook, Excel inserts a copy of **sheet.xlsx** with all its settings. Creating and modifying these two files allows you to customize

your work environment in ways that are not generally possible through the graphic user interface (GUI).

Let us take just one example. Most accounting professionals would change the default number format from General to Accounting if they knew how. Changing the default number format is impossible through the GUI; however, it is a simple process for those who understand the significance of the default templates.

Here is the general process for creating the default templates.

1. Open a blank workbook.
2. Modify the default settings of the blank workbook as desired.
3. Save the blank workbook as **book.xltx** in the **XLstart** folder.
4. Delete all but one sheet and save the workbook as **sheet.xltx** in the **XLstart** folder.

Synchronize **book.xltx** to **sheet.xltx** to reduce frustration when inserting worksheets into existing workbooks. In other words, whatever settings exist in one should be configured in the other. Otherwise, the settings of new sheets inserted into workbooks will differ from those of other worksheets in the same workbook. This characteristic can cause unnecessary frustration in working with Excel workbooks.

The only potentially tricky part of creating default workbook and worksheet templates is saving them in the XLstart folder. The XLstart folder issue is problematic because the folder's location depends on several factors, the most significant of which is the operating system. In Windows 7, Windows 8, and Windows 10, the location of the XLstart folder is usually:

C:\Users\user name\AppData\Roaming\Microsoft\Excel\XLstart.

Note that the location of your XLstart folder could vary from the information shown above. However, you can find the exact location of XLstart in the **Trust Center**, as shown in **Figure 78**.

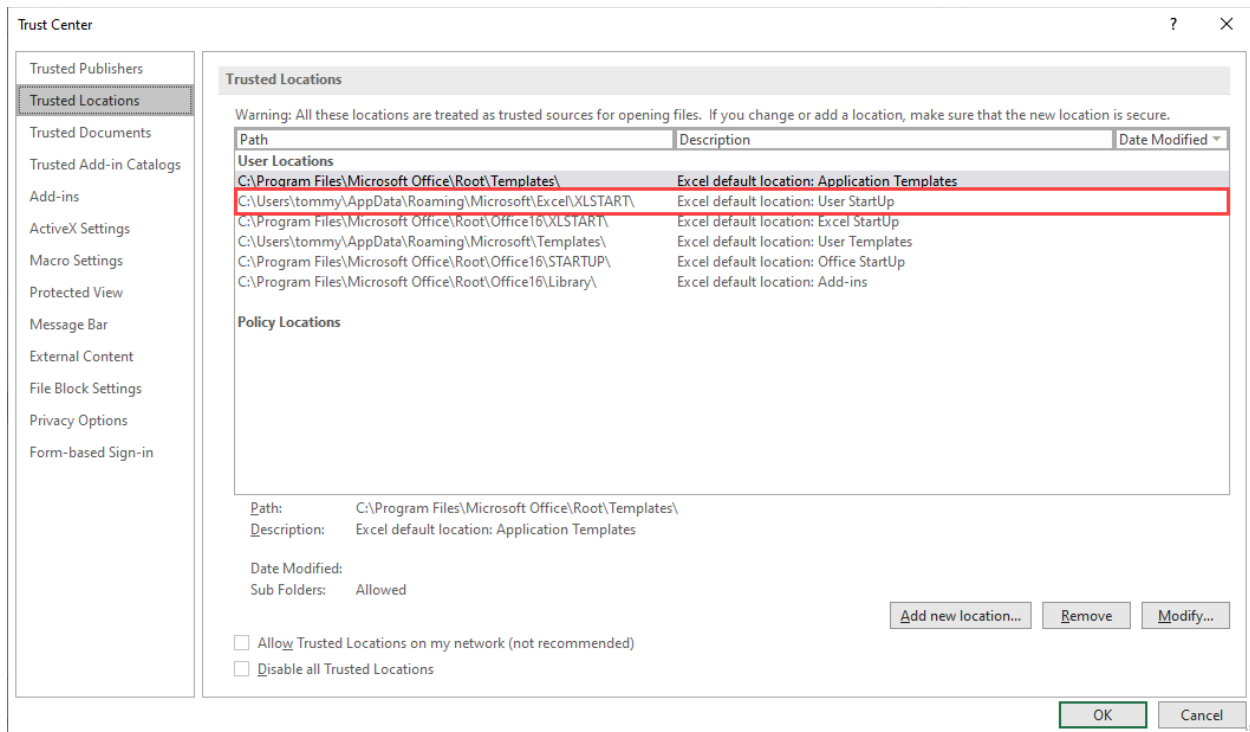


Figure 78 - Determining the XLstart Folder Location from the Trust Center

In addition to creating and saving your **book.xlsx** and **sheet.xlsx** templates, you should make a simple change to one of Excel's options. Click **File, Excel Options, and General**, and ensure that the box next to **Show the Start screen when this application starts** is unchecked. This action will ensure that each time you start Excel, it will create a new workbook for you that uses the **book.xlsx** template.

That is it! The next time you open Excel, click the **New** button, or use **CTRL + N** to create a new workbook, the new workbook will inherit the template's settings and use them to pre-configure the new workbook for you. Likewise, upon saving the **sheet.xlsx** template and storing it in your XLStart folder, any new worksheets you insert into an existing workbook will inherit settings from that template. You should incorporate any settings you routinely establish in every workbook in your default templates, including those listed below.

- Accounting format with two decimal places and no dollar signs,
- Precision as displayed (global rounding),
- Modified Normal style,
- Custom headers and footers, and
- Named styles.



The changes made to the default templates have a prospective impact only. The new settings only impact workbooks created after making the changes and do not affect existing workbooks unless you insert a new worksheet into a current workbook. In that case, only the new worksheet will be affected. You can modify any settings made using the default workbooks. For example, you may set **Precision as Displayed** in the default templates, but that does not stop you from turning off the setting in an individual workbook created from the default templates.



What are the primary benefits of creating and maintaining Excel's **book.xltx** and **sheet.xltx** templates? Is this a practice in which you have engaged in the past? If not, is it something you anticipate implementing on a going-forward basis?

Custom Themes

Themes are collections of visual design elements – colors, fonts, and effects – that you can apply across Office applications. Themes ease the burden of creating consistent-looking documents across multiple applications, such as Excel, Word, and PowerPoint. Since all the visual elements of a document reside in a theme, changing its theme will alter its look and feel. Every dependent component – cell styles, tables, charts, SmartArt graphics, shapes, equations, and embedded Office objects – updates when you change a document's theme.

Excel provides several built-in themes. You can access all available themes by selecting **Themes** on the Ribbon's **Page Layout** tab, shown in **Figure 79**. Note that theme *Colors*, *Fonts*, and *Effects* are also available in the Themes group.

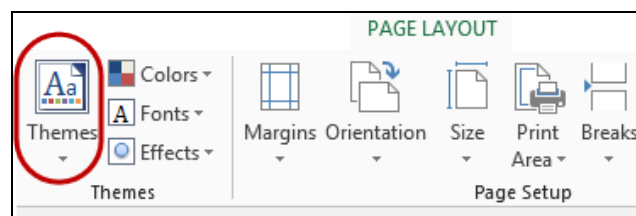


Figure 79 - Accessing Themes from the Ribbon

Excel is pre-configured with many built-in themes; more are available through Microsoft Office Online. By default, all documents use the **Office** theme. To change the default theme for new workbooks, apply the appropriate theme to Excel's default templates, as described earlier in this chapter.

The effect of changing the theme used in a workbook is immediately observable through **Live Preview**. The workbook's visual elements change when you hover the cursor over alternate theme buttons, as shown in **Figure 80**.

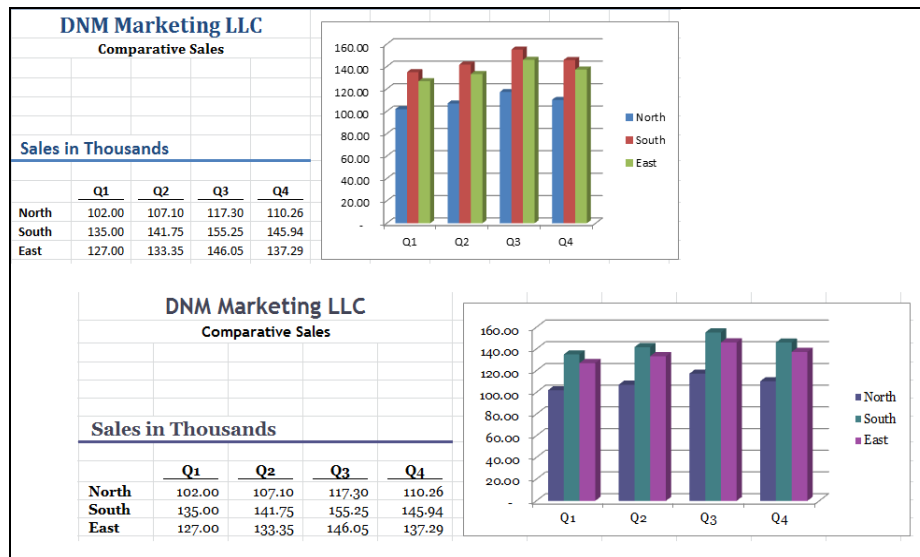


Figure 80 - Immediately Observable Theme Effects with Live Preview

You can create custom themes from Excel's built-in library. Simply choose a theme, change its settings – colors, fonts, and effects – to suit your needs, and save them as a new theme in the gallery. Select **Themes** and **Save Current Theme** from the Ribbon's **Page Layout** tab to save a custom theme. Type a descriptive name in the **Save Current Theme** dialog box and click **Save**. Conversely, open the gallery, right-click the theme you want to delete, and choose **Delete** to remove a custom theme.

Formula Building Essentials

Chapter

4

Formulas and formatting are at the core of any worksheet, and Excel provides exceptional functionality for both. This chapter covers the essential elements of creating and editing formulas. Cell references and their crucial role in constructing formulas, including relative, absolute, and mixed addresses, are covered in this chapter. Other topics covered will include conditional, Boolean, and text functions, vertical lookups, creating and using defined names, formula error checking, and the intentional use of circular references.

Learning Objectives

Upon completing this chapter, you should be able to:

- List and utilize the three primary means for building and editing formulas in Excel;
- Differentiate between relative, absolute, and mixed cell addresses in formulas;
- Utilize the Formula Bar and the Formula tab of the Ribbon in the formula-building processes;
- Create formulas to manipulate date and textual data in Excel;
- Create and apply Defined Names in Excel;
- Construct conditional formulas using Boolean operators, IF functions, and IFERROR functions;
- Find data using VLOOKUP and HLOOKUP functions in formulas;
- Summarize data with SUBTOTAL functions in formulas; and
- Manage formula errors, including formulas with circular references.

Building and Editing Formulas

Formulas can contain cell references, operators, values, strings, Excel functions, and parentheses and must begin with an equal sign. You can build or enter Excel formulas in one of three ways.

1. **Type or enter a formula directly into a cell.** Begin the formula with an equal sign, then type in the cell or range references as required. Finally, press **Enter** to complete the process.
2. **Create a formula by pointing to the cell references.** Again, begin the formula with an equal sign. However, instead of typing cell references, select them using the keyboard or mouse and enter operators, functions, and constants. Finally, press **Enter** to end the process and complete the formula. Pointing to cell references during the formula-building process significantly reduces the potential for error.
3. **Use an automated Excel process to build all or part of formulas.** For example, when summing a column of numbers, you can click the **AutoSum** command on the Ribbon's **Home** tab or press **ALT + =** from the keyboard to build a formula to sum highlighted rows and columns.

To fully understand how Excel calculates a formula, you must realize Excel's order of operator precedence. Operator precedence refers to the order in which Excel performs calculations. For example, Excel calculates exponentiation (^) before multiplication or division (*, /). Further, Excel computes multiplication and division before addition or subtraction (+, -). Additionally, Excel calculates addition and subtraction before text concatenation (&). Finally, Excel calculates concatenation before comparisons (=, >, <, <=, >=, <>). You may use parentheses to alter or override Excel's order of operator precedence. Calculations within parentheses take place before those outside of parentheses. If you nest calculations with parentheses, Excel makes the calculations from the parentheses' innermost set to the outermost. Even when you do not need to use parentheses, their use clarifies the calculation order and makes formulas easier to read and understand.

You can edit formulas in one of three ways.

1. **Double-click on a cell that contains a formula.** This procedure allows you to edit a formula directly in the cell that contains the formula or in the **Formula Bar**.
2. **Press F2.** Reposition the cursor to the cell containing the formula of interest and press **F2**. Then, edit the formula directly in the cell that contains the formula or in the **Formula Bar**.
3. **Select a cell that contains a formula and click the Formula Bar.** This action allows you to edit a formula in the **Formula Bar**.

Using Navigation Keys

The formula building and editing process changes the navigation keys' action (**Right, Left, Up, Down** arrows, **Page Up** and **Page Down**, **Home**, and **End**). Therefore, the navigation keys may not work as expected, depending on the process. Use the **F2** key to alter the navigation keys' utility while building or editing formulas.

When building a formula by typing in cell references, pressing a navigation key without entering an operator first during the formula-building process places the formula into the cell. Further, it moves the cursor consistent with the navigation key pressed. To edit the formula while in the building process, press **F2** and edit the formula.

When building a formula by pointing to cell references, pressing a navigation key during the formula-building process moves the cursor consistent with the navigation key pressed. To edit the formula while creating it, press **F2** and enter the correction. Pressing **F2** again allows you to resume the formula-building process by pointing to cell references at the cursor's point. Make sure to reposition the cursor before resuming.

The **Home** key will reposition the cursor to the beginning of a formula if not wrapped for display in the formula editing process. Similarly, the **End** key will reposition the cursor to the end of a formula. If a formula is wrapped, the **Home** key moves the cursor to the beginning of its line in the formula. To position the cursor to the front of a wrapped, press **CTRL + Home**. Similarly, if a formula is wrapped, the **End** key repositions the cursor to the end of the cursor's line. To position the cursor to the end of a wrapped formula, press **CTRL + End**.

Relative, Absolute, and Mixed Address Formulas

A complete understanding of cell referencing rules is critical to building and troubleshooting formulas because the reference type determines whether you can copy a formula successfully. Cell addresses can be *relative*, *absolute*, or *mixed* (partially relative and partially absolute). Cell addresses have two components – a *column* reference and a *row* reference in the simplest case. In default, cell addresses are relative. That attribute means the column and row references relate to a formula's current location. For example, a simple formula using the SUM function appears in cell E6 when summing monthly product sales, as shown in **Figure 81**. When the user copied the formula to rows 7 and 8, Excel automatically re-wrote the formula to reference those rows. Column F displays the original and rewritten formulas.

	A	B	C	D	E	F
1	Nature's Softness Inc					
2	Monthly Sales by Product					
3	For the Quarter Ended 12/31/2021					
4						
5		Oct	Nov	Dec	Total	
6	Creme, Aloe Vera Hand, 9 oz	\$ 11,184	\$ 10,136	\$ 9,786	\$ 31,106	=SUM(B6:D6)
7	Creme, Extra Moisturizing Hand, 9 oz	11,984	10,861	10,486	\$ 33,331	=SUM(B7:D7)
8	Creme, Hand and Body, 16 oz	20,784	18,836	18,186	\$ 57,806	=SUM(B8:D8)

Figure 81 - Relative Address Formulas Automatically Rewritten When Copied

An absolute address means that row and column references are not relative to a formula's current location but remain the same as the formula is copied. Excel uses dollar signs (\$) to

indicate whether a column or row reference is absolute. For example, the cell address **C13** is relative, while the address **\$C\$13** is absolute. Use absolute addresses whenever a formula component must always reference the same cell.

In computing quarterly use tax, as shown in **Figure 82**, a simple formula in cell **D8** multiplies the tax rate times the asset purchase price. The formula as entered is **=D\$5*C8**. The reference to **D\$5** indicates that the column and row references are absolute and will not change as the formula is copied. (Note that you may type the dollar signs into the formula or press F4 to enter them automatically. To do so, press **F4** immediately after typing in a cell reference or pointing to a cell when constructing the formula.) However, the reference to cell **C4**, which contains an asset's purchase price, is relative. Therefore, it will not change as users copy and paste the formula into other cells. As users copy and paste the formula, the cell reference pointing to the tax rate remains constant; however, Excel automatically rewrites the cell reference pointing to an asset's purchase price to reference rows 5, 6, and 7. The original and rewritten formulas appear in column E. Note how the reference to cell **D\$5** remains constant. Still, Excel re-wrote the references to the rows reflecting each asset's purchase price.

	A	B	C	D	E
1	Nature's Softness Inc				
2	Use Tax Owed on Asset Purchases				
3	For the Quarter Ended 12/31/2021				
4					
5			Use Tax Rate:	8.75%	
6					
7	Date	Equipment	Purchase Price	Use Tax	
8	10/13/2012	Workstation, HP xw9400	\$ 2,728.00	\$ 238.70	=D\$5*C8
9	10/13/2012	Workstation, HP xw9400	2,728.00	\$ 238.70	=D\$5*C9
10	10/15/2012	Desktop PC, HP dc7800	1,012.00	\$ 88.55	=D\$5*C10
11	12/01/2012	Server, HP ProLiant ML570 G4	6,319.00	\$ 552.91	=D\$5*C11
12					
13		Total Use Tax		\$ 1,118.86	

Figure 82 - Absolute Address Remaining Constant when Copying a Formula

A mixed address means that the references in a cell address are different. One part, either row or column, is relative, and the other is absolute. For example, **\$C13** is absolute to a column and relative to a row, while the cell address **C\$13** is relative to a column and absolute to a row. Use mixed addresses whenever you need to copy a formula down and across.

In planning for real estate acquisitions, as shown in **Figure 83**, a single formula in cell **C11** computes ancillary real estate costs as a percentage of total planned real estate purchases. The formula as entered is **=C\$8*\$B11**. The reference to cell **C\$8** indicates that the column is relative, and the row is absolute. As you copy the formula down and across, it will always point to row **8**. However, the column reference will adjust relative to the column where you paste the formula. Similarly, the reference to cell **\$B11** indicates that the column is absolute and the row is relative. As you copy the formula down and across, it will always point to column **B**. Further, the row reference will adjust relative to the row where you paste the formula. Using a mixed address formula is more efficient and reduces the potential for error because it requires building a single formula rather than six.

6		Rate	Jan	Feb
7				
8	Real Estate Purchases		\$ 2,000,000	\$ 2,000,000
9				
10	Real Estate Costs			
11	Sales Commissions	3.00%	=C\$8*\$B11	
12	Attorney's Fees	2.00%		
13	Inspection Fees	0.20%		
14	Surveying Fees	0.50%		
15	Zoning Changes	1.00%		
16	Misc Closing Costs	0.50%		

Figure 83 - Building a Single Formula to Copy Down and Across

The Formula Bar

The **Formula Bar** displays one line of the formula or text by default. However, note the scroll buttons and drop-down arrow at the right end of the Formula Bar. The scroll buttons allow you to scroll through the lines of a multiline formula or multiple lines of text, while the drop-down arrow displays up to three lines. In addition, you can click the drop-down arrow to expand the formula box so that the worksheet grid is not hidden by long, complex formulas, as shown in **Figure 84**.

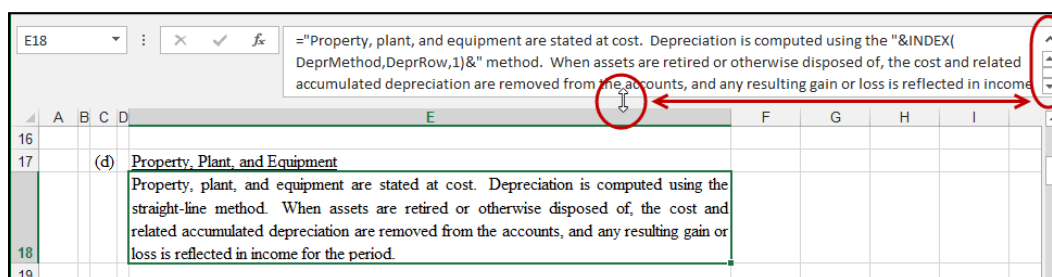


Figure 84 - Expanding the Formula Bar or Scroll to See More Lines

If the formula or text exceeds three lines, use the scroll buttons to scroll through the formula or drag the formula bar's bottom edge to expand its size. To split a formula into separate lines for easy reading or troubleshooting, position the cursor in the formula and press **ALT + Enter**, as shown in **Figure 85**.

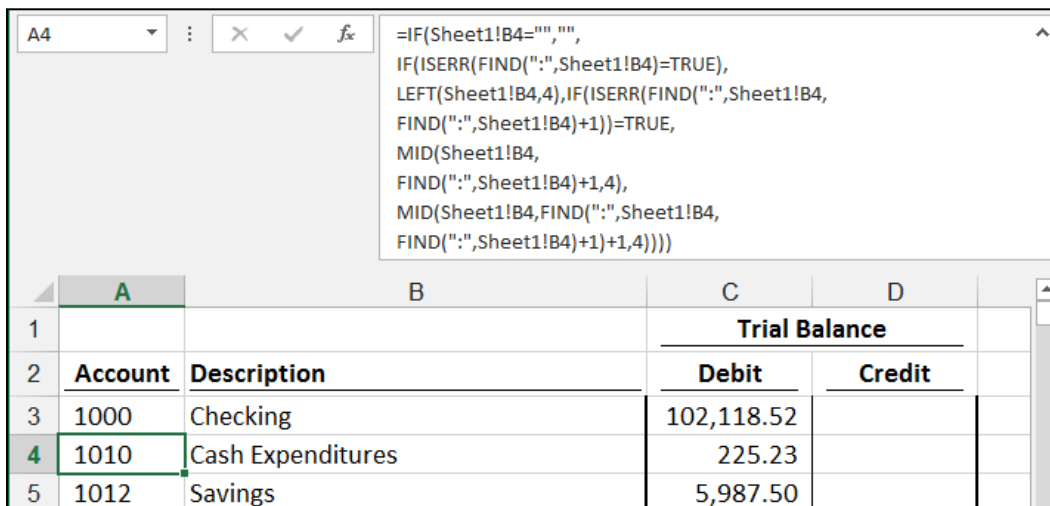


Figure 85 - Using ALT + Enter to Split a Formula

The complex formula shown in Figure 85 parses an exported Trial Balance from QuickBooks into multiple columns. It is more difficult to understand if the formula runs together in the Formula Bar. However, you can use **ALT + Enter** to split it, making reading and understanding it easier for all users.

The Formula Tab

The Ribbon's **Formula** tab, shown in **Figure 86**, contains four standard groups – **Function Library**, **Defined Names**, **Formula Auditing**, and **Calculation**. The **Function Library** includes organized lists of all functions available in Excel. The **Defined Names** group includes the **Name Manager** and other tools for defining and using defined names.

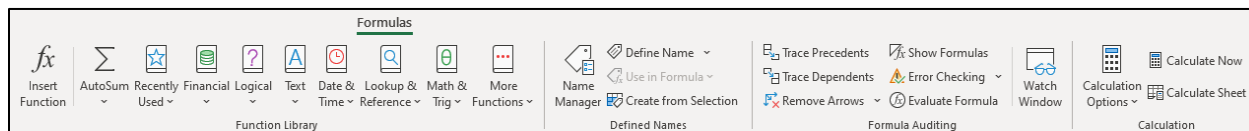


Figure 86 - The Formula Tab in Excel

The **Formula Auditing** group contains tools for auditing formulas or watching results, and the **Calculation** group allows you to calculate a workbook or adjust calculation settings.

Accruals and Deferrals with Date Arithmetic

A date is a number formatted to look like a date in Excel. To be precise, a date is a serial number representing the number of days since January 1, 1900, with “1” representing January 1, 1900, and “2” representing January 2, 1900, etc. Similarly, 41,274 represents December 31, 2012. Because dates in Excel are simply numbers formatted to look like dates, it is easy to deal with dates in formulas. For example, you can easily subtract the earlier date from the later date to compute the number of days between two dates. Accountants and other financial professionals can use this feature to calculate items like accrued or deferred revenues and expenses. For example, **Figure 87** displays a worksheet that uses date arithmetic to compute accrued interest on notes.

	A	B	C	D	E
1	ABC Holding Company				
2	Accrued Interest on Notes				
3	For the Date Ended:				
4	December 31, 2022				
5					
6	Days in Year:	365			
7	Date Issued	Due Date	Amount	Interest Rate	Accrued Interest
8	6/19/2021	6/19/2023	\$ 360,000.00	4.20%	\$ 23,197.81
9	7/21/2021	7/21/2023	210,000.00	3.90%	11,847.45
10	8/15/2021	8/15/2023	150,000.00	4.30%	8,888.63
11	10/1/2021	10/1/2023	450,000.00	4.40%	24,736.44
12	10/15/2021	10/15/2023	850,000.00	4.60%	47,348.49
13	10/21/2021	10/21/2023	320,000.00	4.80%	18,347.84
14			<u>\$ 2,340,000.00</u>		<u>\$ 134,366.66</u>
15					

Figure 87 - Using Date Arithmetic to Compute Accrued Interest

Parsing and Combining Labels with String Arithmetic

You can use Excel's text functions to combine or parse labels. For example, simple formulas that use the ampersand (&) as the operator can add labels to other labels or numbers. This attribute helps accountants and other business professionals build integrated workbooks that separate assumptions from analyses and reports. **Figure 88** shows how to use text functions and string

arithmetic to tie report headings to common assumptions. As the assumptions change, the report headings change also. In this case, the reporting period and date automatically updated when the assumptions section's values changed. The **TEXT** function embeds the report date in the report heading. In addition, the TEXT function converts values (numbers) into strings (labels) and allows you to stipulate the format in which the value appears.

F13		="For the "&B7&" ended "&TEXT(B6,"mmmm d,yyyy")"				
	A	B	C	D	E	F
1	Integrate Workbooks					
2	Using Formulas and Text Functions					
3						Report Headings
4						
5	Assumptions					DNM Marketing LLC
6	Report Date	September 30, 2023				Balance Sheet
7	Report Period	quarter				September 30, 2023
8						
9	Depreciation Method	Straight Line				
10						
11						DNM Marketing LLC
12						Balance Sheet
13						For the quarter ended September 30,2023
14						

Figure 88 - Using String Arithmetic to Update Report Headings Easily

Figure 89 shows how you can use string arithmetic to tie footnotes to the financial reports or analyses to which they apply. In this case, the **DOLLAR** and **TEXT** functions convert values in a report to a string embedded within the report's surrounding text.

	A	B
5		\$M
6	Sales	\$ 256,000
7		
8	Cost of Goods Sold	158,344
9		
10	Gross Margin	97,656
11		
12	Operating Expenses	42,000
13		
14	Net Income Before Taxes	\$ 55,656
15		
16		
17	Footnotes	
18		
19	="Sales for the year amounted to "&DOLLAR(\$B\$6,0)&". Cost of goods amounted to "& DOLLAR(\$B\$8,0)&", yielding a gross margin percentage of "&TEXT(\$B\$10/\$B\$6,"0.0%")& ". " Sales for the year amounted to \$256,000. Cost of goods amounted to \$158,344, yielding a gross margin percentage of 38.1%.	
20		

Figure 89 - Using the Dollar and Text Functions to Create Footnotes Linked to Financial Data

Just as you can use functions to combine labels and numbers, you can also use them to split – also known as *parse* – text into various components. The example formulas in **Figure 90** parse a QuickBooks trial balance's combined account number and account name into two columns - one for the account number and the other for the account name. The formula that parses the account number uses the **LEFT** function, while the one parsing the account name uses the **RIGHT** and **LEN** functions together.

	A	B	C
1	This is typically on an imported data sheet.		
2			
3			
4		<u>Debit</u>	<u>Credit</u>
5	1000 · Checking	110,394.20	
6	1200 · Accounts Receivable	26,128.41	
7	1300 · Inventory Asset	8,378.54	
8	1510 · Fixed Assets	13,750.00	
9	1520 · Accumulated Depreciation		1,725.00
10	2000 · Accounts Payable		9,758.94

E5
:
=LEFT(A5,4)

F5
:
=RIGHT(A5,LEN(A5)-7)

	E	F	G	H
1	This is typically on a reporting worksheet.			
2				
3				
4			<u>Debit</u>	<u>Credit</u>
5	1000	Checking	110,394.20	-
6	1200	Accounts Receivable	26,128.41	-
7	1300	Inventory Asset	8,378.54	-
8	1510	Fixed Assets	13,750.00	-
9	1520	Accumulated Depreciation	-	1,725.00
10	2000	Accounts Payable	-	9,758.94

Figure 90 - Parsing Account Numbers and Titles Using String Functions

You can parse data with other, more advanced text functions when the text components have fewer common characteristics than the data in the trial balance example above. For example, accountants frequently face the problem of grouped or combined data fields – multiple data elements in a single column. Many casual users of Excel will routinely combine data elements, such as city, state, and zip code, in a single column, which may hinder the effective use of the data. Excel's text functions can parse the combined data elements into individual columns or extract a specific component. For example, **Figure 91** displays formulas using **LEFT**, **RIGHT**, **MID**, **FIND**, and **LEN** functions to parse contact details into city, state, and zip code columns.

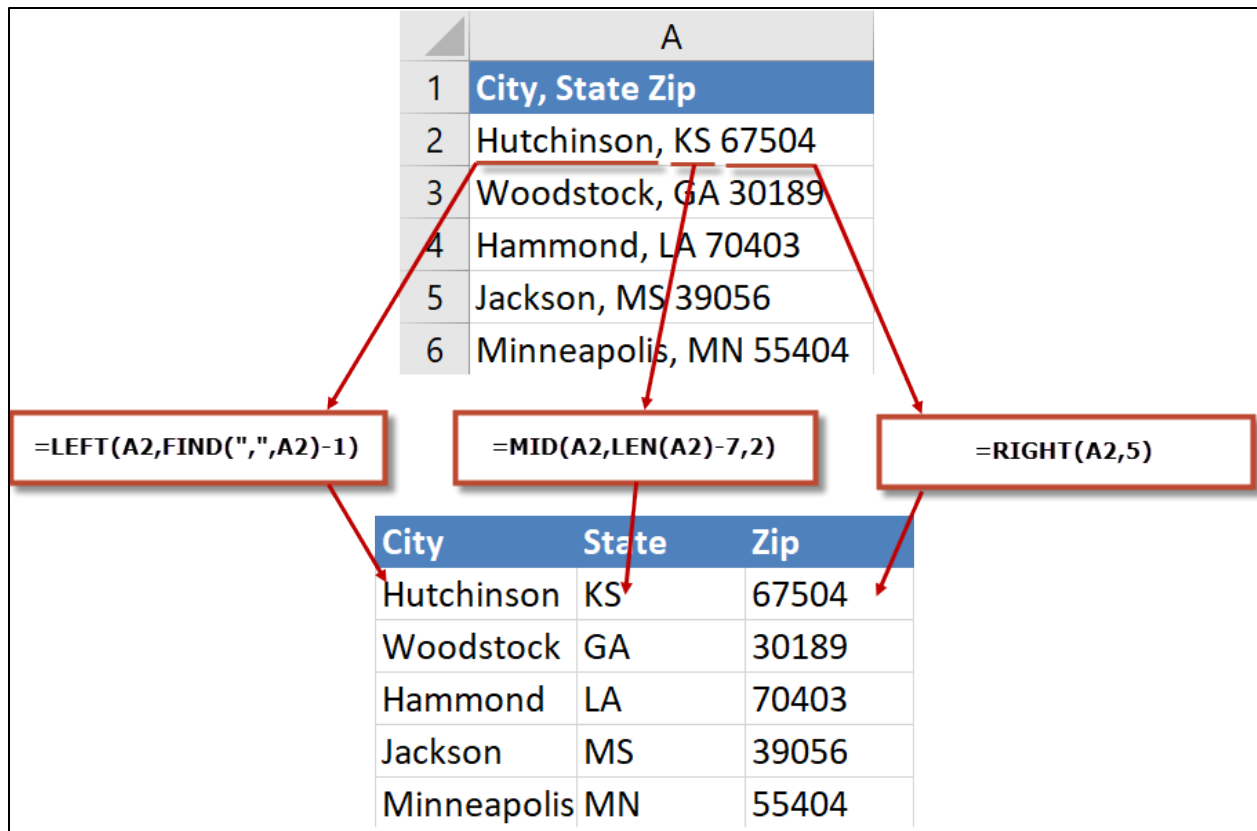


Figure 91 - Parsing Contact Details

Parsing Data with Text to Columns

Parsing text with Excel functions requires knowledge and skill to produce satisfactory results. The **Text to Columns** command automates converting combined text into individual columns of data. Select the data to parse and click **Text to Columns** on the Ribbon's **Data** tab to use this feature, as shown in **Figure 92**.

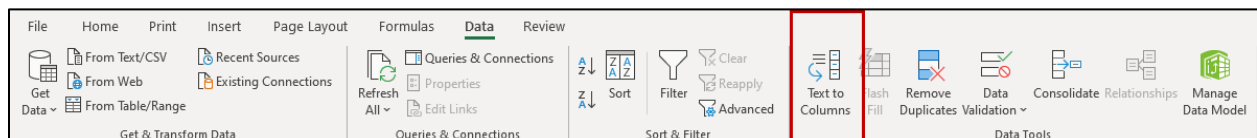


Figure 92 - Text to Columns Available on the Data Tab of the Ribbon

In this case, the process will require two steps – the first to parse the city from the state and zip code, and the second to parse the state from the zip code. The first step uses the **comma** as the parsing delimiter; the second uses the **space** as the delimiter. In parsing the state from the zip code, select **Text** as the **column data format** for the zip code, as shown in **Figure 93**. Otherwise, Excel will remove leading zeros from any zip codes that begin with “0,” such as those often found in the New England region.

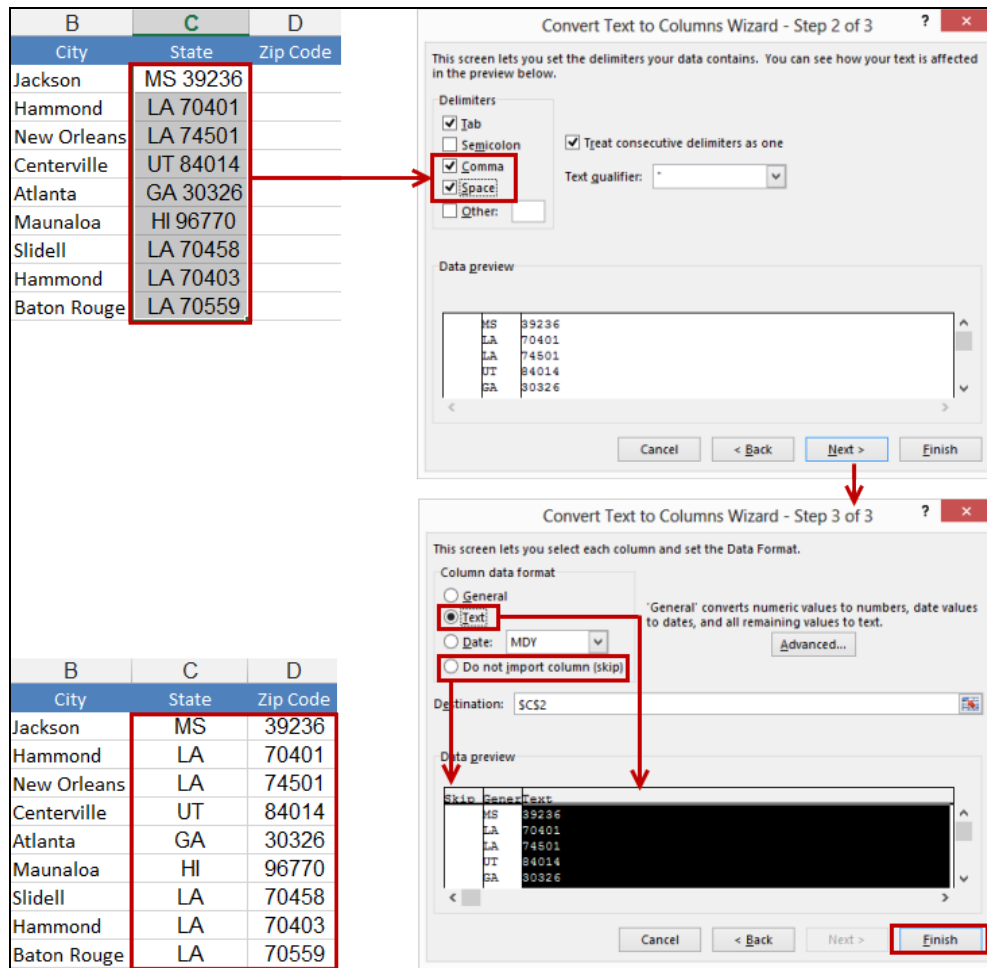


Figure 93 - Parsing State and Zip Code Using Text to Columns

Using Defined Names

You can use **defined names** instead of cell references when building formulas. For many, defined names are more easily remembered than corresponding cell references, constants, or formulas when building worksheet models.

Defined names can be created and used in almost any manner imaginable. They can represent:

- Numeric constants, such as tax rates;
- Text constants, such as a company name;
- Absolute, relative, or mixed cell or range references;
- Three-dimensional cell or range references; or
- Formulas.

You can create defined names in numerous ways in Excel. The easiest method is to highlight the cell or range of cells to be named. Then, type the desired name in the **Range Box** on the **Formula Bar**, just below the Ribbon, as shown in **Figure 94**.

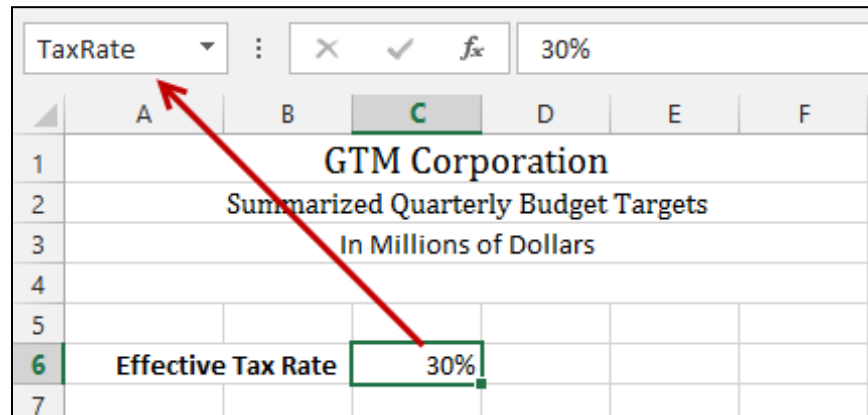


Figure 94 - Using the Name Box to Create a Defined Name



Excel has naming rules for defined names. A partial list of these rules appears below.

- Names must begin with a letter, backslash, or underscore.
- No spaces are allowed in a defined name.
- You cannot use names that resemble cell references.
- You cannot use single letters for names except for **R**, **r**, **C**, and **c**.
- Names can contain up to 255 characters and are not case-sensitive.

Another way to create a defined name is to highlight the cell or range of cells to be named and then click **Defined Name** on the Ribbon's **Formulas** tab to open the **New Name** dialog box, shown in **Figure 95**. Next, type in the desired **Name**, select the **Scope**, enter a **Comment**, and modify the **Refers to** information as required. Finally, click **OK** to create the defined name.

Note that the **Refers to** reference typically begins with an equal sign (=); however, that is not a requirement. If you type an entry that does not start with an equal sign, Excel treats it as a text constant. For example, you could create "ORDC" as a defined name representing your company's name, Opihi River Development Corporation. Then, you could type in =ORDC to use the name anywhere in the workbook.

New Name

Name:

Scope:

Comment:

Refers to:

OK Cancel

Figure 95 - Using the New Name Dialog to Create a Defined Name

You can also create defined names from adjacent labels. Just highlight the range, including the labels, and select **Create from Selection** from the **Formulas** tab of the Ribbon, as shown in **Figure 96**. Then, in the **Create Names from Selection** dialog box, check the boxes corresponding with the labels' position in the selected range and click **OK** to create the names automatically. Excel will replace spaces or special characters in the labels with underscores in the defined names. Likewise, an underscore precedes labels that begin with a number.

FORMULAS

fx Insert Function Σ AutoSum Recently Used Financial Logical Text Date & Time Lookup & Reference Math & Trig More Functions Name Manager Define Name Use in Formula Create from Selection Trace Precedents Trace Dependents Remove Arrows

Function Library

A8 fx

GTM Corporation					
Summarized Quarterly Budget Targets					
In Millions of Dollars					
Effective Tax Rate		30%			
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
Sales	\$ 32.00	\$ 36.00	\$ 37.00	\$ 41.00	\$ 146.00
CGS	21.80	24.50	25.20	27.90	99.40
GM	10.20	11.50	11.80	13.10	46.60
SG&A	4.50	5.00	5.20	5.70	20.40
NBIT	5.70	6.50	6.60	7.40	26.20
Taxes					
NIAT					

Create Names from Selection

Create names from values in the:

☒ Top row

☒ Left column

☐ Bottom row

☐ Right column

OK Cancel

Create from Selection (Ctrl+Shift+F3)
Automatically generate names from the selected cells.
Many people choose to use the text in the top row or the leftmost column of a selection.

Figure 96 - Creating Defined Names from Adjacent Labels



With the dramatic increase in the worksheet grid's size that began with Excel 2007, defined names such as **TAX2023** are no longer allowed because they are now identical to a valid cell reference. Alternatively, consider placing an underscore character at the beginning of the defined name, such as **_TAX2023**.

Using Names in Formulas

One of the significant advantages of using defined names is creating *self-documenting* formulas. In other words, the formula's defined names explain the calculation. For example, **=Sales-CGS** explains the calculation of Gross Margin more clearly than **=B4-B6**. There are at least three ways to use defined names in formulas.

1. Enter the defined names from the keyboard while creating formulas.
2. Enter the first few letters from the keyboard while creating formulas, and then use Formula AutoComplete to select the name.
3. Click **Use in Formula** on the Ribbon's **Formulas** tab to select a defined name while building a formula. Note that **Use in Formula** only lists the defined names relevant to the active worksheet.

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
Sales	\$ 32.00	\$ 36.00	\$ 37.00	\$ 41.00	\$ 146.00
CGS	21.80	24.50	25.20	27.90	99.40
GM	10.20	11.50	11.80	13.10	46.60
SG&A	4.50	5.00	5.20	5.70	20.40
NBIT	5.70	6.50	6.60	7.40	26.20
Taxes					
NIAT					

Figure 97 - Inserting Defined Names with Use in Formula

In the example worksheet, we must create formulas to compute **Taxes** and **NIAT**. First, position the cursor in cell B19 and then complete one of the following procedures to produce the first formula.

1. Type in **=NBIT*TaxRate** and press **Enter**.
2. Alternatively, begin the formula by typing **=NB** and then double-click on the defined name **NBIT** in the AutoComplete list. Type in ***** followed by **Tax**. Double-click on the defined name **TaxRate** and press **Enter**.
3. As another option, begin the formula by typing **=**. From the **Formulas** tab of the Ribbon, click **Use in Formula** and then click on **NBIT**. Type ***** and then click on **Use in Formula**, selecting **TaxRate**, as shown in **Figure 97**. Press **Enter**.
4. Create a similar formula in cell B21 for NIAT. Copy the formulas across to complete the worksheet.

If you subsequently define names for ranges already used in formulas, you can use a single command to replace the cell references with their defined names. From the Ribbon's **Formulas** tab, click the drop-down arrow to the right of **Define Name** and select **Apply Names**. Select the names to be applied and click **OK**. You can use the procedure on a specified range or the entire workbook. *CAUTION!* If you delete a defined name, formulas referencing the deleted name will return the **#NAME** error message.



How does using defined names potentially change your approach to creating formulas in Excel spreadsheets? For example, will you use defined names to save formulas and constants in your *book.xlsx* template file?

Conditional and Boolean Calculations

The **IF** function can make calculations based on whether specified conditions exist. Further, recent versions of Excel support up to sixty-four (64) nested IFs in each formula. The syntax of the IF function follows.

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

The value returned by the function depends on the logical test results. For example, in **Figure 98**, a formula based on the IF function calculates a budget variance percentage, but only if the budget amount is not equal to zero, thereby avoiding the **#DIV/0** error. If the budget amount equals zero, the formula returns a null string, displaying a blank cell. Use two quotation marks entered side-by-side to return a null string, as shown in the sample formula.

=IF(\$C7<>0,(\$D7-\$C7)/\$C7,"")

Figure 98 - Formula to Return Null String If Budget Equals Zero

The Boolean functions – **AND**, **OR**, and **NOT** – can be combined with others to produce compound conditional formulas. For example, to create a formula that requires multiple satisfied conditions to return a specified result, use AND with the IF function, as shown in **Figure 99**.

	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5									
6									
7	6230	Auto Fuel	\$ 21,800.00	\$ 19,696.58	-9.65%	\$ (2,103.42)	TRUE	TRUE	TRUE
8	6240	Auto Maintenance	21,800.00	19,696.58	-9.65%	(2,103.42)	TRUE	TRUE	TRUE
9	6400	Bank Service Charges	100.00	89.00	-11.00%	(11.00)		TRUE	TRUE
10	6550	Payroll Expenses	340,000.00	344,865.36	1.43%	4,865.36		TRUE	
11	6600	Delivery Fee	1,500.00	3,292.95	119.53%	1,792.95	TRUE	TRUE	
12	6900	Insurance	32,500.00	39,457.85	21.41%	6,957.85	TRUE	TRUE	
13	7100	Equipment rental	7,300.00	7,373.28	1.00%	73.28			
14	7200	Miscellaneous	8,000.00	17,227.74	115.35%	9,227.74	TRUE	TRUE	
15	7300	Office Supplies	18,000.00	17,227.74	-4.29%	(772.26)			TRUE
16	7500	Rent	77,000.00	77,373.28	0.48%	373.28			
17	7553	Equipment Repairs	10,500.00	9,556.66	-8.98%	(943.34)		TRUE	TRUE
18	7700	Tools and Misc. Equipment	3,500.00	3,708.05	5.94%	208.05		TRUE	
19	7751	Gas and Electric	8,300.00	9,256.00	11.52%	956.00		TRUE	
20	7753	Telephone	3,000.00	2,941.22	-1.96%	(58.78)			TRUE
21	7752	Water	1,865.00	1,686.38	-9.58%	(178.62)		TRUE	TRUE
22	9000	Interest Expense	6,000.00	7,433.98	23.90%	1,433.98	TRUE	TRUE	
23									
24		Total Operating Expenses	\$ 561,165.00	\$ 580,882.65		\$ 19,717.65			
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									

Figure 99 - Using Boolean Functions to Build Compound Conditional Formulas

Conditional IF Functions

Excel includes built-in functions for conditional sums, counts, and averages – **SUMIF**, **SUMIFS**, **COUNTIF**, **COUNTIFS**, **AVERAGEIF**, and **AVERAGEIFS**. The singular versions of these functions (SUMIF, COUNTIF, and AVERAGEIF) only support a single conditional test and are similar in application, operation, and syntax. The plural versions of these functions (SUMIFS, COUNTIFS, and AVERAGEIFS) perform calculations with up to 127 conditions. Their syntax differs slightly. For example, compare the syntax of SUMIF with SUMIFS.

SUMIF(range, criteria, sum range)

SUMIFS(sum range, criteria range1, criteria1, criteria range2,criteria2...)

Note that the sum range is the last criterion in the SUMIF function but the first criterion in the SUMIFS function. SUMIFS can support criterion references for up to 127 criteria. Like SUMIF, you can enter criteria as numbers, cell references, or text surrounded by quotation marks. Criteria can also contain wildcard characters. However, criteria ranges must be the same shape and size as the sum range.

GTM Manufacturing Company compiles a list of weekly sales by region and product. The CFO needs to produce a monthly report that sums the sales by product, region, and product within the region. Previously, she generated the information using multiple sorts and formulas and copied and pasted the totals into her report sheet. In Excel, she can create the report with just three simple formulas – one SUMIF to total sales by region, one SUMIF to total sales by product, and one SUMIFS to sum sales by product within a region. The SUMIF formulas use absolute addresses to define the sum and criteria ranges so you can copy the formula without error. The SUMIFS formula uses absolute addresses to establish the sum and criteria ranges. However, it uses mixed addresses for the criteria; therefore, you can copy the formula down and across. **Figure 100** displays the worksheet and formulas used to produce the required totals.

	A	B	C	D	E	F	G	H	I	J	K
1	GTM Manufacturing Inc										
2	Sales Data in Thousands										
3	For the period 07/01 through 07/28										
4											
5											
6	Date	Region	Product Line	Amount		Region					
7	7/7/2021	Northeast	Lotions	623.12		Northeast	=SUMIF(\$B\$7:\$B\$42,F8,\$D\$7:\$D\$42)				
8	7/7/2021	Northeast	Cremes	486.03		South					
9	7/7/2021	Northeast	Masks	218.09		Midwest					
10	7/7/2021	South	Lotions	654.28							
11	7/7/2021	South	Cremes	510.34							
12	7/7/2021	South	Masks	229.00							
13	7/7/2021	Midwest	Lotions	672.97		Product Line					
14	7/7/2021	Midwest	Cremes	524.92		Lotions	=SUMIF(\$C\$7:\$C\$42,F14,\$D\$7:\$D\$42)				
15	7/7/2021	Midwest	Masks	235.54		Cremes					
16	7/14/2021	Northeast	Lotions	647.00		Masks					
17	7/14/2021	Northeast	Cremes	504.66							
18	7/14/2021	Northeast	Masks	226.45							
19	7/14/2021	South	Lotions	679.35		Product Line Within Region					
20	7/14/2021	South	Cremes	529.89			Lotions	Cremes	Masks		
21	7/14/2021	South	Masks	237.77		Northeast	=SUMIFS(\$D\$7:\$D\$42,\$B\$7:\$B\$42,\$F21,\$C\$7:\$C\$42,G\$20)				
22	7/14/2021	Midwest	Lotions	698.76		South					
23	7/14/2021	Midwest	Cremes	545.03		Midwest					
24	7/14/2021	Midwest	Masks	257.57							

Figure 100 - Using SUMIF and SUMIFS to Produce a Sales Report

Figure 101 shows the formula used to produce sales totals by product and region. Note the use of mixed addresses in the formula for the criteria. In this formula, the criterion for **Region** is \$F21, which is absolute to column and relative to row. As you copy the formula across columns, it will always look to column F for the **Region** criteria relative to the formula's row. The criterion for the **Product Line** is G\$20, which is relative to a column and absolute to a row. As you copy the formula, it will always look to row 20 for the **Product Line** criteria relative to the formula's column. Stipulating mixed addresses for the criteria is the magic that allows us to copy the formula down and across.

=SUMIFS(\$D\$7:\$D\$42,\$B\$7:\$B\$42,\$F21,\$C\$7:\$C\$42,G\$20)

Figure 101 - Using Mixed Addresses in Formulas

Trap Errors with IFERROR

The **IFERROR** function can simplify creating complex formulas by trapping all errors with a single command. In older versions of Excel, you had to employ unintuitive formulas to trap simple errors or use multiple error-trapping functions, each of which trapped only specific errors. The syntax for IFERROR is as follows.

IFERROR(original value or formula, value if error)

The variance column formula uses the IFERROR function to trap **#DIV/0** errors in this example. Before IFERROR, you had to use an IF function to test whether the divisor was zero. Based on the test, the formula completes the division calculation or displays some desired number, character, or text. The worksheet shown in **Figure 102** illustrates using IF and IFERROR to trap errors.

	A	B	C	D	E	F	G	H
1	Larry's Landscaping Services				Error =E7/C7			
2	Actual to Budget Performance				Using IF =IF(C7=0,"",E7/C7)			
3	For the Month Ended December 31, 2021							
4						Error	Using IF	Using IFERROR
5			<u>Budget</u>	<u>Actual</u>	<u>Variance</u>	<u>% Variance</u>	<u>% Variance</u>	<u>% Variance</u>
6	6230	Auto Fuel	\$ 1,275	\$ 1,267	\$ (8)	-0.63%	-0.63%	-0.63%
7	6240	Auto Maintenance	425	442	17	4.00%	4.00%	4.00%
8	6400	Bank Service Charges	213	213	-	0.00%	0.00%	0.00%
9	6550	Payroll Expenses	79,900	82,450	2,550	3.19%	3.19%	3.19%
10	6600	Delivery Fee	8,500	8,330	(170)	-2.00%	-2.00%	-2.00%
11	6900	Insurance	2,125	2,125	-	0.00%	0.00%	0.00%
12	7100	Equipment rental	-	4,887	4,887	#DIV/0!		
13	7200	Miscellaneous	850	2,235	1,385	162.94%	162.94%	162.94%
14	7300	Office Supplies	425	349	(77)	-18.00%	-18.00%	-18.00%
15	7500	Rent	17,000	17,000	-	0.00%	0.00%	0.00%
16	7553	Equipment Repairs	-	1,496	1,496	#DIV/0!		
17	7700	Tools and Misc. Equipment	1,275	1,131	(145)	-11.33%	-11.33%	-11.33%
18	7751	Gas and Electric	2,125	1,938	(187)	-8.80%	-8.80%	-8.80%
19	7753	Telephone	425	433	8	1.88%	1.88%	1.88%
20	7752	Water	638	629	(9)	-1.41%	-1.41%	-1.41%
21	9000	Interest Expense	2,975	2,933	(42)	-1.41%	-1.41%	-1.41%
22								
23	Total Forecasted Operating Expenses		<u>\$ 118,151</u>	<u>\$ 127,857</u>	<u>\$ 9,706</u>			

Figure 102 - Using IFERROR to Simplify Error Trapping

Looking Up Data with VLOOKUP

One of Excel's advanced features is its ability to look up items from tables using lookup functions. The most used lookup function is **VLOOKUP**, or vertical lookup, which looks up items arranged

vertically in a table. Business professionals will find many practical applications of VLOOKUP, including retrieving data from tax or inventory tables. The syntax for the VLOOKUP function is:

VLOOKUP(lookup value, table array, column index, True/False)

where:

lookup value is the value to look up in the table,

table array is the table in which the value is to be looked up, and

column index is the column in the table from which the data is returned.

True/False is an optional argument. If the option is *False*, you need not sort the first column in the table array in ascending order, and the function will only find an exact match of the lookup value. If an exact match does not exist, the function returns **#N/A**. For example, suppose the option is set to True, or you omit it from the function. In that case, you must sort the first column in the table array in ascending order. In this scenario, the function may find an *approximate* match – the largest value less than or equal to the lookup value.

In our first example, we will use a relatively simple VLOOKUP formula to determine the account name that matches with an account number from an abbreviated chart of accounts. For example, **Figure 103** presents an abbreviated chart of accounts for a small business. The accountant for the company wants to enter the account number in various financial statement spreadsheets and have Excel automatically return the appropriate account name from the chart of accounts shown in Figure 103.

Chart of Accounts	
6230	Auto Fuel
6240	Auto Maintenance
6400	Bank Service Charges
6550	Payroll Expenses
6600	Delivery Fee
6900	Insurance
7100	Equipment rental
7200	Miscellaneous
7300	Office Supplies
7500	Rent
7553	Equipment Repairs
7700	Tools and Misc. Equipment
7751	Gas and Electric
7753	Telephone
7752	Water
9000	Interest Expense

Figure 103 - Sample Chart of Accounts

The VLOOKUP formula highlighted in **Figure 104** matches data from column A of the financial statement to the first column of the range represented by the defined name **VLOOKUPTable**. In addition, the formula returns the corresponding value from the second column in that range.

B6		=VLOOKUP(A6,VLOOKUPTable,2)					
	A	B	C	D	E	F	G
1	Larry's Landscaping Services						
2	Actual to Budget Performance						
3	For the Month Ended December 31, 2021						
4							
5			<u>Budget</u>	<u>Actual</u>	<u>Variance</u>		
6	6230	Auto Fuel	\$ 1,275	\$ 1,267	\$ (8)		
7	6240	Auto Maintenance	425	442	17		
8	6400	Bank Service Charges	213	213	-		
9	6550	Payroll Expenses	79,900	82,450	2,550		
10	6600	Delivery Fee	8,500	8,330	(170)		
11	6900	Insurance	2,125	2,125	-		

Figure 104 - VLOOKUP Formula to Match Account Number to Account Name

Once you enter the VLOOKUP formula in cell B6, copy and paste it to the range B6 through B21 to complete the example. Then, all you need to do in the future is enter the appropriate account

number in column A of the spreadsheet. The VLOOKUP formula will automatically enter the account name in column B. However, what about instances where you may enter an invalid account number in column A? The potential for this type of mistake leads us to our second example.

In our second example of relatively simple VLOOKUP formulas, we want to force VLOOKUP to return an *exact* match based on the lookup value. The previous VLOOKUP example returned only an *approximate* match because we omitted the formula's optional fourth argument. As a result, the potential for error exists. For example, as shown in **Figure 105**, if you entered account number **7150** in cell A6, the VLOOKUP formula used above would return **Equipment rental** as the account name; unfortunately, as shown in Figure 103, account number 7150 does not exist! Because the VLOOKUP formula used in that example omits the optional fourth argument, the value returned by the formula is the one that most closely matches the lookup value without exceeding the lookup value.

B6					
=VLOOKUP(A6,VLOOKUPTable,2)					
	A	B	C	D	E
1	Larry's Landscaping Services				
2	Actual to Budget Performance				
3	For the Month Ended December 31, 2021				
4					
5			Budget	Actual	Variance
6	7150	Equipment rental	\$ 1,275	\$ 1,267	\$ (8)
7	6240	Auto Maintenance	425	442	17
8	6400	Bank Service Charges	213	213	-
9	6550	Payroll Expenses	79,900	82,450	2,550
10	6600	Delivery Fee	8,500	8,330	(170)
11	6900	Insurance	2,125	2,125	-

Figure 105 - Erroneous VLOOKUP Result as a Consequence of Erroneous Input in Cell A6

To force VLOOKUP to return an exact match, modify the formula in cells B6 through B21 to include the **False** argument, as shown in **Figure 106**. With the modified formula in place, if the account number entered in column A does not match any of the account numbers in the first column of the lookup range, the VLOOKUP formula returns a **#N/A** error message, indicating the account number is invalid.

=VLOOKUP(A6,VLOOKUPTable,2, FALSE)

Figure 106 - Modified VLOOKUP Formula to Force an Exact Match



Of note, depending upon your version of Excel, you either already have or will have in the future an Excel function available to you known as **XLOOKUP**. XLOOKUP provides a powerful, compelling, and easy-to-use alternative to VLOOKUP, HLOOKUP, INDEX, MATCH, and other similar functions. Once you have XLOOKUP available, you should experiment with it to learn how to use and benefit from it. For more information on XLOOKUP, see the article at <https://k2e.fyi/xlookup>.

Using IFERROR with VLOOKUP

The previous example notes that when you use the **False** option in a VLOOKUP formula, the formula returns **#N/A** when it does not find an exact match. However, what if you prefer the function to return **Account Number Not Found** in column B instead of the error message? To achieve this goal, modify the VLOOKUP formula to incorporate the IFERROR function, as shown in **Figure 107**.

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3											
4											
5											
6	7150	Account Number Not Found	\$ 1,275	\$ 1,267	\$ (8)						
7	6240	Auto Maintenance	425	442	17						
8	6400	Bank Service Charges	213	213	-						

Figure 107 - Using IFERROR with VLOOKUP to Trap Errors

Summarizing Data with SUBTOTAL

Many accounting workbooks have multiple levels of subtotals that summarize into a grand total. The **SUBTOTAL** function makes this process easier and less prone to error, especially when using large datasets with many subtotals. The SUBTOTAL function ignores nested subtotals (subtotals within subtotals) to avoid double-counting data. Grand totals are always calculated on the detailed data, not on any included intermediate (nested) subtotals. The SUBTOTAL function can summarize columns of data using any of the eleven methods identified in **Table 4**.

Function	Function Number	
	Includes Hidden Values	Ignores Hidden Values
AVERAGE	1	101
COUNT	2	102
COUNTA	3	103
MAX	4	104
MIN	5	105
PRODUCT	6	106
STDEV	7	107
STDEVP	8	108
SUM	9	109
VAR	10	110
VARP	11	111

Table 4 - SUBTOTAL Functions in Excel

Note that there are two columns of functions in the table. The left column's arguments indicate that the SUBTOTAL function includes values on hidden rows in the calculation. The function numbers in the right column cause SUBTOTAL to ignore values on hidden rows.



Data Filters alter the rules of the SUBTOTAL function. For example, summarizations calculated on filtered data always exclude values on hidden rows regardless of the function used. In other words, functions 1 and 101 do not include values on hidden rows when calculating. Furthermore, the **AutoSum** button's operation, which you can access from the Ribbon's **Home** tab, changes when a filter is active. In that case, AutoSum inserts SUBTOTAL functions instead of simple summarization functions, such as SUM, AVERAGE, COUNT, etc.

The example in **Figure 108** uses the SUBTOTAL function to produce subtotals on rows 11 and 19 and a grand total on row 21. The formulas in the left column of amounts use "9" in the SUBTOTAL function. Therefore, they include hidden values in the subtotals. On the other hand, the formulas in the right column use "109" in the SUBTOTAL function. Accordingly, they do not incorporate hidden values in the subtotals. Using function 109, creating a report that excludes miscellaneous expenses is a simple task. Hide the two miscellaneous expense rows, and the subtotal and grand total calculations immediately reflect their absence.

	A	B	C	D	E
1	Departmental Expenses				
2					
3			Function Used		
4			<u>9</u>	<u>109</u>	
5	Tax Department				
6	8000	Meals and Entertainment	\$ 865.35	\$ 865.35	
7	8020	Airfares	7,864.36	7,864.36	
8	8030	Hotels	2,899.36	2,899.36	
9	8040	Local Transportation	648.65	648.65	
10	8050	Miscellaneous	<u>483.21</u>	<u>483.21</u>	
11	Total for the Tax Department		<u>\$12,760.93</u>	<u>\$12,760.93</u>	
12					
12			=SUBTOTAL(9,C5:C10)	=SUBTOTAL(109,D5:D10)	
13	Audit Department				
14	8100	Meals and Entertainment	\$ 579.78	\$ 579.78	
15	8120	Airfares	5,269.12	5,269.12	
16	8130	Hotels	1,942.57	1,942.57	
17	8140	Local Transportation	434.60	434.60	
18	8150	Miscellaneous	<u>323.75</u>	<u>323.75</u>	
19	Total for the Audit Department		<u>\$ 8,549.82</u>	<u>\$ 8,549.82</u>	
20					
20			=SUBTOTAL(9,C13:C18)	=SUBTOTAL(109,D13:D18)	
21		Total for All Departments	<u>\$21,310.75</u>	<u>\$21,310.75</u>	
22					
22			=SUBTOTAL(9,C5:C19)	=SUBTOTAL(109,D5:D19)	

Figure 108 - Using SUBTOTAL to Automate the Totaling Process

Customizing and Using Error Checking

Spreadsheet errors are a frequent problem faced by all business professionals, but very few accountants understand and appreciate the extent of the problem. Numerous field studies have been conducted on this topic and report that **the error rate approximates 90%**! Fortunately, Excel offers multiple powerful tools for helping you discover and troubleshoot errors, audit formulas and workbooks, evaluate results, and observe calculations as you manipulate assumptions. Unfortunately, most business professionals remain unaware of how to use these tools.

Excel checks formulas for proper syntax as you enter them. If it finds minor errors, **Formula AutoCorrect** will propose a corrected formula. To accept the correction, click **Yes**, as shown in

Figure 109. To fix the error manually, click **No**. Refer to **Microsoft Knowledge Base article #212199** for a comprehensive list of errors corrected by Formula AutoCorrect.

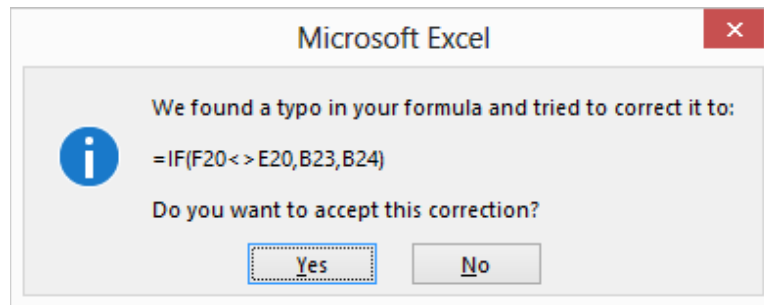


Figure 109 - Formula AutoCorrect Suggesting Corrections to Simple Errors

Advanced error checking is like a spell check routine in word processors. By default, Excel uses rules to check for errors in formulas. These rules check for errors in the background as you enter formulas and data into cells. The rules do not guarantee that your worksheet is error-free, but they do help you find common mistakes. Cells containing formulas or data that violate any error-checking rules display a green arrow point in the upper left corner of the cell, as shown in **Figure 110**.

F6						'2018
	A	B	C	D	E	F
1	Nature's Softness Inc					
2	Comparative Annual Sales by Product					
3	In Millions of Dollars					
4						
5						
6		2022	2021	2020	2019	2018
7						
8	Creme, Aloe Vera Hand, 9 oz	8,988	9,737	8,614	8,988	\$ 10,485
9	Creme, Extra Moisturizing Hand, 9 oz	8,988	9,737	8,614	8,988	11,235
10	Creme, Hand and Body, 16 oz	15,588	16,887	14,939	15,588	19,485
19	Mask, Wrinkle Reducing Facial, 16 oz	5,399	4,679	4,139	4,319	5,399
20	Mask, Wrinkle Reducing Facial, 24 oz	8,099	7,019	6,209	6,479	8,099
21						
22		\$ 177,766	\$ 189,655	\$ 167,777	\$ 175,066	\$ 218,833

Figure 110 - Green Arrow Points in the Upper Left Corner Indicating Errors

For most accountants and other business professionals, the green arrow points are nothing more than an unexplained irritation – they do not print, but they drive many of us mad! The arrow points are like the red “squiggly” underlines appearing in Microsoft Word to alert us of potentially

misspelled words. Hence, the green arrow points appear in cells to warn us of potential errors in our formulas or data before we realize an error exists.

You may correct the errors immediately or choose to deal with them later. In addition, you can modify the rules controlling the display of arrow points. Most accountants and financial professionals should consider adjusting the rules so Excel does not display errors in the following situations.

1. **Numbers are displayed as text or are preceded by an apostrophe.** Comparative reports often include headings for years to compare. Generally, accountants enter these headings, such as *2023*, *2022*, and *2021*, as labels so that they can be centered and underlined correctly. Entering the headings as labels will trigger the display of green arrow points.
2. **Formulas refer to empty cells.** Accountants are trained to sum columns from one row above to one row below the data so that the formula will always include inserted rows without modification. Including empty cells in a formula will trigger the display of green arrow points.

You can modify the error-checking rules from the **File** tab by selecting **Options**, then **Formulas** in the navigation pane on the left, as shown in **Figure 111**.

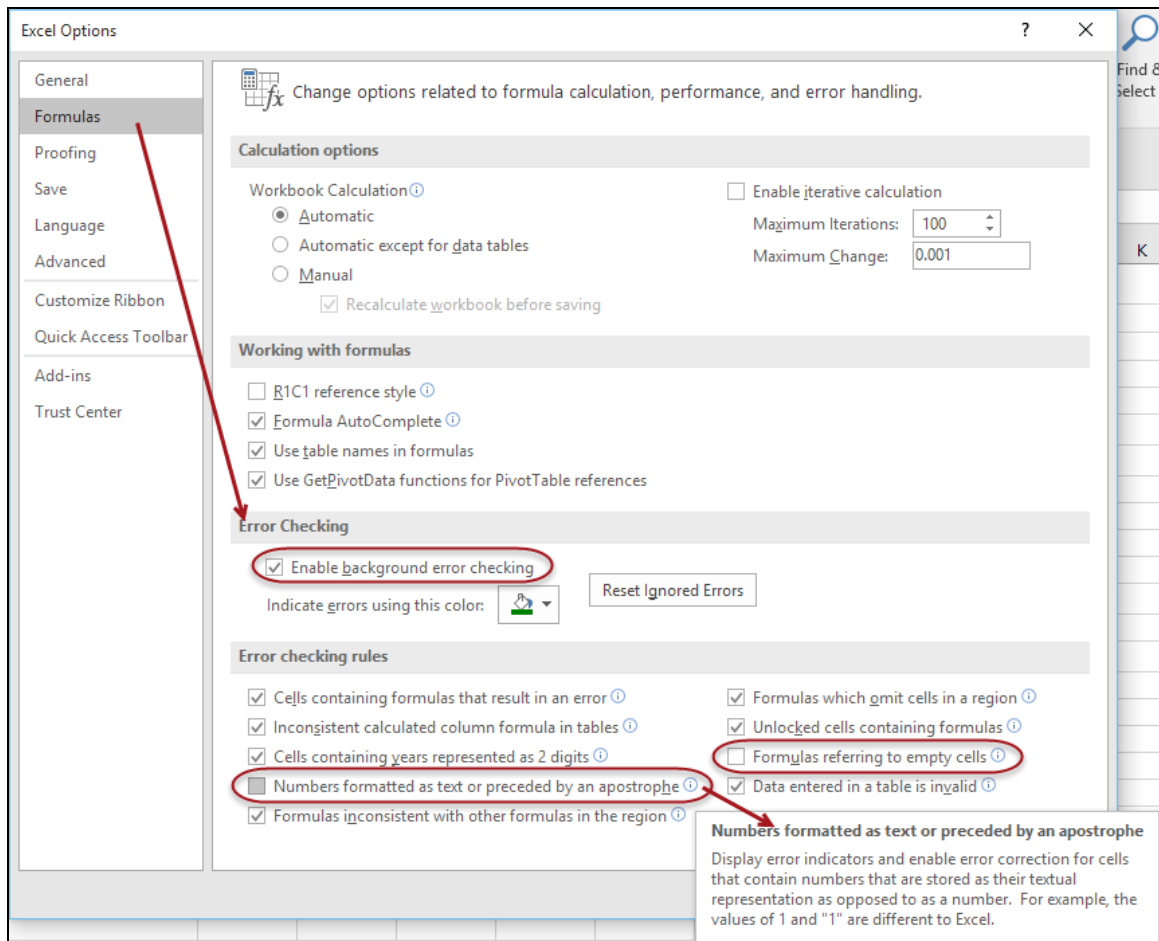


Figure 111 - Customizing Error Checking in Excel

Referring to Figure 111, note that you can enable or disable background error checking, reset ignored errors, and turn individual error-checking rules on or off. These settings affect all workbooks.

Position the cursor in the cell with the error to correct errors immediately upon entering a formula or data. Then click on the **contextual button** in the worksheet just to the left of the cell. A drop-down menu will appear, as shown in **Figure 112**. In this case, we corrected by copying the formula from the adjacent cell on the left. Note the other options available, including **Ignore Error**, which leaves the formula or data unaltered but removes the green arrow point.

	A	B	C	D	E	F
1	Nature's Softness Inc					
2	Comparative Annual Sales by Product					
3	In Millions of Dollars					
4						
5						
6		<u>2022</u>	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>
7						
8	Creme, Aloe Vera Hand, 9 oz	\$ 8,388	\$ 9,087	\$ 8,039	\$ 8,388	\$ 10,485
9	Creme, Extra Moisturizing Hand, 9 oz	8,988	9,737	8,614	8,988	11,235
10	Creme, Hand and Body, 16 oz	15,588	16,887	14,939	15,588	19,485
19	Mask, Wrinkle Reducing Facial, 16 oz	5,399	4,679	4,139	4,319	5,399
20	Mask, Wrinkle Reducing Facial, 24 oz	8,099	7,019	6,209	6,479	8,099
21						
22		\$ 177,111	\$ 189,655	\$ 167,777	\$ 175,066	\$ 218,833
23						
24						
25						
26						
27						
28						
29						
30						

Figure 112 - Checking Errors on the Worksheet Grid

Alternatively, you may check errors using an automated process like spell checking. From the **Formulas** tab of the Ribbon, click **Error Checking**. Excel will skip through the workbook, stopping at each cell that contains an error, at which time it will display the **Error Checking** dialog box, as shown in **Figure 113**. The error-checking options are identical to those indicated by the contextual button discussed earlier. You can correct or ignore the error and then click **Next** to proceed to the following error until the error check is complete. This process does not guarantee a workbook is error-free, but it helps find the most common mistakes. If you would like to use this as a first check on the integrity of workbooks received from someone else, reset ignored errors. Otherwise, the error check will not identify errors ignored previously by other users.

To enable Iterative Calculation, return to Excel's **Options**; in the **Formulas** pane, check **Enable Iterative Calculation**. Next, adjust the number of **Maximum Iterations**, representing the number of times each formula will calculate, and click **OK**, as shown in **Figure 115**.

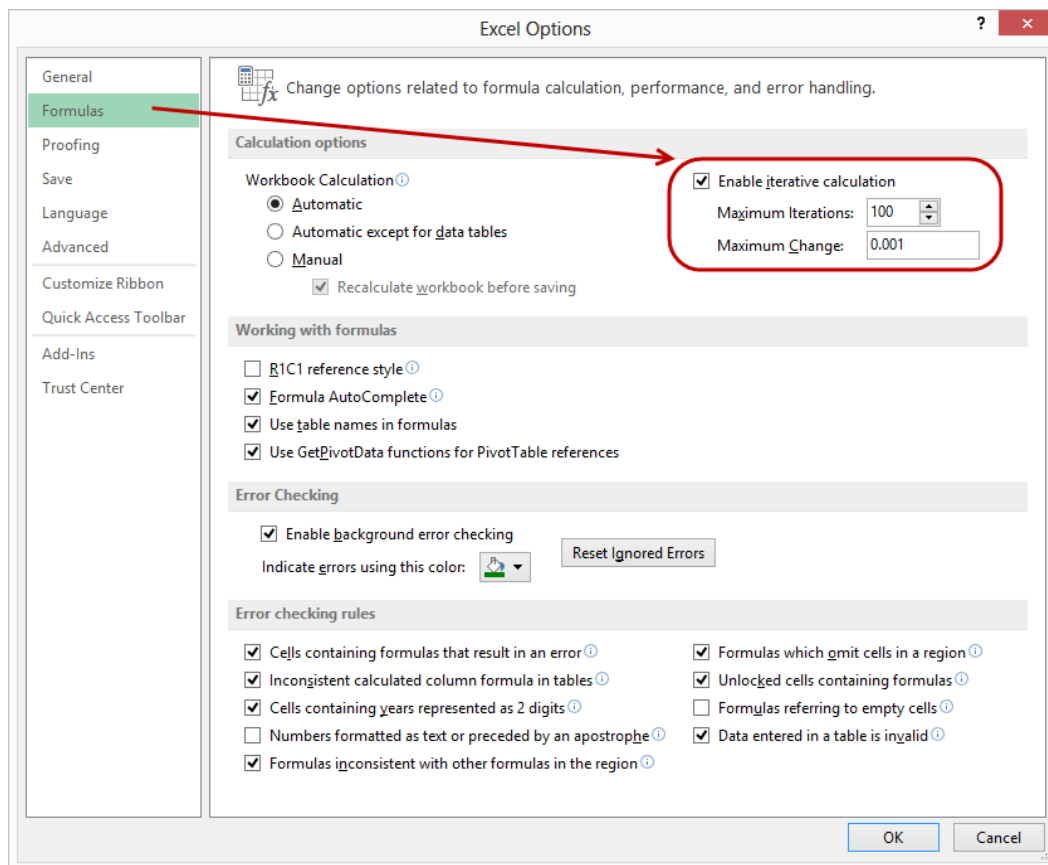


Figure 115 - Enabling Iterative Calculation in Excel

Circular references calculate once you enable iterative calculation, as shown in **Figure 116**.

?

Why are circular references typically emblematic of poor spreadsheet design? If you cannot eliminate circular references from your workbooks, how does enabling the Iterative Calculation feature help you address the issue?

	A	B	C	D	E	F	G	H	I
1	Nature's Softness Inc								
2	Quarterly Executive Profit Sharing Plan								
3	For the Year Ending 12/31/2021								
4									
5	Profit Sharing Percentage	10.0%							
6									
7		Q1	Q2	Q3	Q4	Total			
8	Budgeted Sales	\$ 1,281,000	\$ 1,407,000	\$ 1,319,000	\$ 1,348,000	\$ 5,355,000			
9									
10	Budgeting Net Income Before Profit Sharing	173,000	190,000	178,000	182,000	723,000			
11									
12	Budgeted Total Profit Sharing at 10.0% of Net Income After Profit Sharing	-							
13				Q1	Q2	Q3	Q4	Total	
14	Budgeted Net Income After Profit Sharing	\$ 173,000	\$ 190,000	\$ 1,281,000	\$ 1,407,000	\$ 1,319,000	\$ 1,348,000	\$ 5,355,000	
15				173,000	190,000	178,000	182,000	723,000	
16									
17									
18				15,727	17,273	16,182	16,545	65,727	
19									
20				\$ 157,273	\$ 172,727	\$ 161,818	\$ 165,455	\$ 657,273	
21									
22									

Figure 116 - Circular References Calculating Accurately after Enabling Iterative Calculation



Iterative Calculations is not an Excel setting affecting all workbooks but a session setting. It saves with a workbook and affects all sheets in a workbook. However, Excel uses the session settings in the first workbook opened during a session for all workbooks subsequently opened in the same session. If the first workbook opened has Iterative Calculation enabled, it is enabled for all workbooks until Excel or all workbooks are closed. Conversely, if the first workbook opened has Iterative Calculation disabled, then it is disabled for all workbooks, notwithstanding that a workbook opened subsequently has Iterative Calculation enabled.

To ensure circular references calculate correctly, close all open workbooks before opening a workbook with circular references with Iterative Calculations enabled. Alternatively, add the following macro to all workbooks that contain circular references. The macro automatically activates Iterative Calculations each time one of the workbooks opens.

```
Private Sub Workbook_Open( )
    Application.Iteration = TRUE
End Sub
```


Three-Dimensional Workbooks

Chapter

5

A single worksheet produces a two-dimensional work environment with rows as one dimension and columns as the second. A single worksheet is fine for simple models, but more complex analyses often require multiple worksheets, creating a three-dimensional work environment – rows, columns, and sheets. In contemporary accounting practice, multiple-sheet workbooks provide supporting schedules and analyses for financial reports and budgets. Additionally, they assist in multi-period, multidepartment, and multi-company analyses. Three-dimensional workbooks save time, make work more efficient, and reduce the risk of error when used correctly.

Learning Objectives

Upon completing this chapter, you should be able to:

- List three situations in which linking workbooks may be advantageous;
- Identify five ways for linking data across worksheets and workbooks;
- Manage workbook links and overcome problems associated with links;
- Combine multiple single-sheet workbooks into one and work with multiple worksheets within the same workbook; and
- List and apply different techniques for creating sum-through formulas and rolling reports.

We begin our examination of three-dimensional workbooks with a discussion of linked files.

Linked Workbooks

In the past, when spreadsheet applications allowed only one worksheet per workbook, most users relied on file linking to create three-dimensional models. Many offices still employ holdover models that use linked workbooks to accomplish tasks suited better to a single multi-sheet workbook. Using linked workbooks makes building formulas and maintaining data consistency across multiple workbooks more challenging. However, the most significant problem with using linked workbooks is the potential for broken or corrupted links. Notwithstanding the

disadvantages of using linked workbooks for building three-dimensional models, linked workbooks are appropriate in at least three situations.

1. **A table used by many workbooks changes periodically.** Suppose you have several workbooks that rely on data from a common table, such as a tax table or insurance rates that change regularly. In this case, linking the dependent workbooks to another workbook containing the table may be better. Whenever you change the common table's data, all the workbooks that link to the table update automatically. If you included the common table as a worksheet in each dependent workbook, each would have to be updated, increasing staff workload and error potential.
2. **Two or more individuals must develop significant portions of a project or analysis, and sharing a common workbook is impractical.** For example, each department will likely have a separate budget workbook in Excel-based budgeting processes. File linking is commonly used in this situation to consolidate departmental budgets into a single master budget workbook.
3. **Two large or complex workbooks with different purposes share a small amount of common data.** For example, team members may use a single workbook to manage and analyze shipment quantities and dates in a small business. However, the same company may use another workbook to track and analyze shipping costs. Although some of the unit data from the first workbook may be useful in the second to compute the average cost per unit shipped, combining the two workbooks into one very large and complicated workbook may not be practical. A standard solution in cases like this is to link the workbooks.

Creating Links Between Workbooks

There are multiple ways to create links between workbooks. For example, users may copy cells or ranges from one workbook and paste them with links to another workbook. However, the most common way to create links between workbooks is to build a formula in one workbook that references a cell or range in another. Here are the simple rules for building formulas referencing data in another worksheet or workbook.

1. If the cell or cells are on another worksheet within the same workbook, precede the cell or range reference with the worksheet's name followed by an exclamation point.

= Sheet2 ! A1+1

2. If the cell or cells to reference are in another workbook, precede the sheet and cell or range reference with the workbook's name enclosed in brackets.

= [Project.xlsx] Sheet1! A1+1

- If the workbook or sheet name referenced in the formula includes a space or spaces, enclose the workbook and worksheet reference with apostrophes.

= ' [Capital Budget] Cash Flow ' ! A1+1

- If the workbook to which the formula refers is not open, you must specify the full path and the filename in the formula.

= ' C:\Users\Mustafa\Documents\ [Plan] Cash Flow ' ! A1+1

While you may enter linking formulas by typing them directly into a cell, the easiest method to create a link is to point to and click on the cell or cells during the formula-building process. First, ensure that the workbook to which you want to create the link is open. Then, point to a cell or cells in that workbook as you would point to a cell in an active workbook. Arranging the workbooks side-by-side makes the task easier, as shown in **Figure 117**.

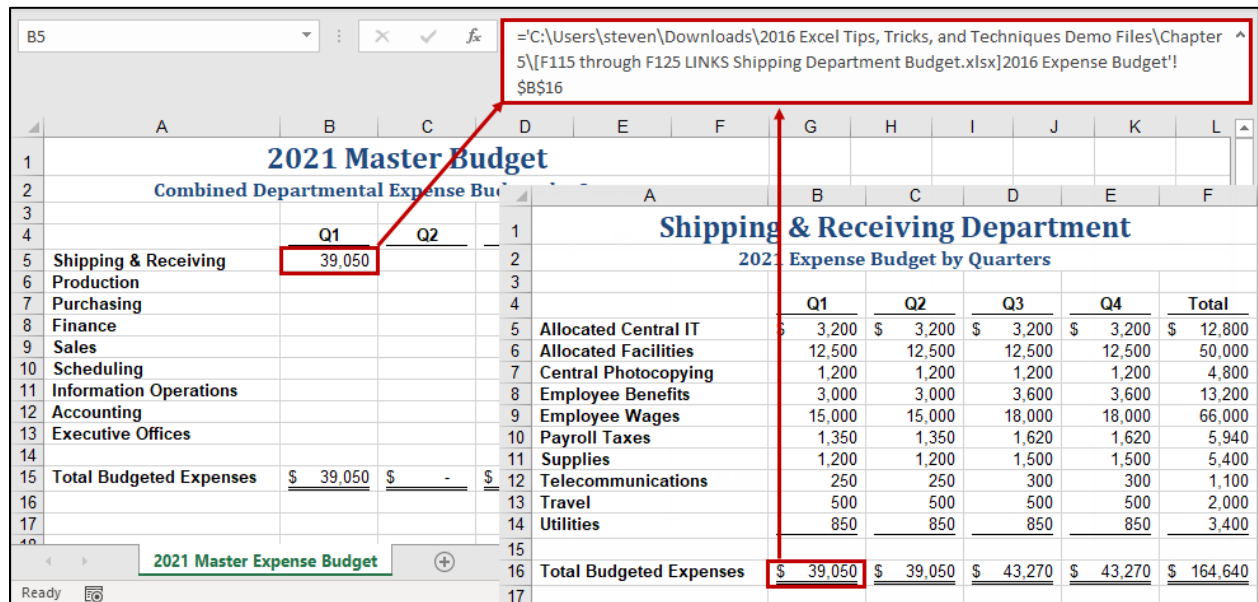


Figure 117 - Building a Formula Linked to Another Workbook

In this example illustrated in Figure 117, we will create a formula that links the shipping and receiving department's quarterly expense budget to the summarized expense schedule of the master budget.

- Open both workbooks.
- Make the **Master Budget by Quarter** workbook the active workbook. Next, arrange the workbooks so that their windows are side-by-side. Then, from the **View** tab of the Ribbon, select **Arrange All, Vertical**, and click **OK**, as shown in **Figure 118**.

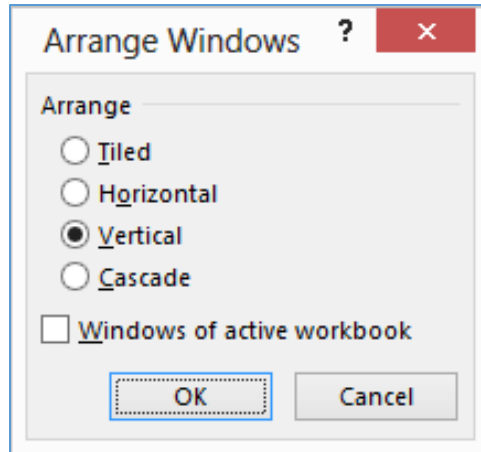


Figure 118 - Arranging Workbook Windows Side-by-Side

3. Position the cursor in cell **B5** of the Master Budget workbook. Type in the equal sign (=) and then, using the mouse, point to cell **B16** of the **Shipping Department Budget** workbook.
4. Press **F4** three times to cycle through various combinations of absolute and relative cell references to turn the absolute reference (\$B\$16) into a relative reference (B16), and press **Enter** to complete the formula.
5. Now, copy the formula across to complete the operation.



Excel always generates an absolute reference when you create a formula by pointing to a cell or range in another workbook. Therefore, you must edit it if you need to use relative references.

Alternatively, we could have created the linked formulas using a copy-and-paste operation. Again, open the source and dependent workbooks and arrange them side-by-side. Now, highlight the cells in the source workbook you want to link. In this case, highlight cells **B16** through **F16** of the **Shipping Department Budget**. Press **CTRL + C** to copy the cells to the clipboard. Next, position the cursor in the leftmost cell of the paste range in the dependent workbook. In this case, position the cursor in cell **B5** of the **Master Budget by Quarter** workbook. From the **Home** tab of the Ribbon, select **Paste, Paste Link** to complete the process, as shown in **Figure 119**.

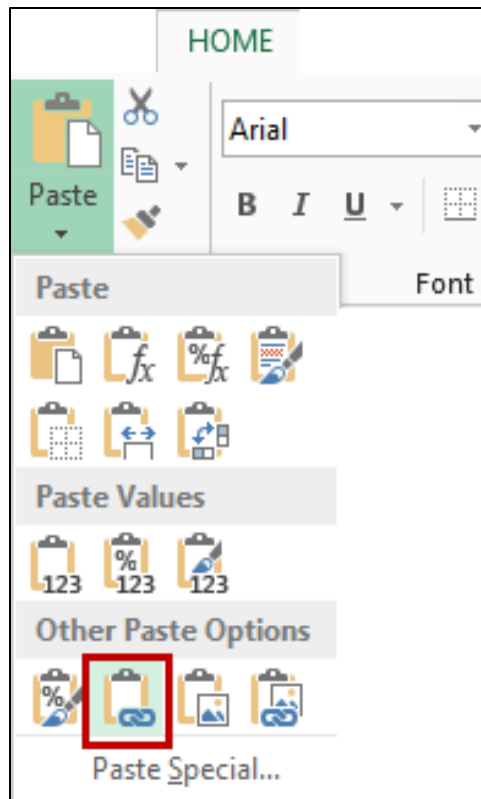


Figure 119 - Using Paste Link to Create Formulas Linked to Another Workbook



Note that creating formulas using the cut-and-paste process creates relative reference formulas when copying more than one cell that does not need modifying before being copied. Also, note that the formatting of the paste range stays intact after the process is complete.

Overcoming Problems with Links

While file linking has definite advantages in some situations, it has some drawbacks. For example, you can break links if you rename or move the source file while the dependent file is closed. Additionally, you can corrupt the accuracy of data or calculations in the dependent workbook if you add rows or columns to the source workbook when the dependent workbook is not concurrently open. Here are some rules for working with linked workbooks to help overcome these potential problems.

1. Make sure to open all workbooks in a linked set whenever you plan to edit any of the linked workbooks. If all workbooks are open, then Excel rewrites formulas automatically to reference the same cells when rows or columns are inserted or deleted or when files are saved in other locations or with different names.

2. Save all workbooks in a linked set to a separate folder to increase the likelihood that team members will open all the files whenever they need access.
3. Use defined names, discussed previously, to identify cells or ranges in source workbooks to link by formulas in dependent workbooks. Defined names overcome problems associated with inaccurate cell or range references in dependent workbooks. These issues often arise when someone inserts or deletes rows or columns in source workbooks. This feature is essential in cases where there is a high probability that a source workbook will be edited or modified without having dependent workbooks open.

For example, a formula in a dependent workbook refers to cell B16 in a source workbook. Someone modifies the source workbook by inserting a row above row 16, which causes cell B16 to become B17. This action causes an error in the dependent workbook because the formula still references cell B16. If the dependent workbook had been open when a user inserted the row, Excel would have rewritten the reference to cell B16 in the source workbook to reference cell B17, and no errors would have occurred.

Alternatively, cell B16 in the source workbook could have a defined name, for example, **BudgetQ12021**. The dependent workbook's formula will reference the defined name rather than cell B16. When someone inserts a row above row 16 in the source workbook, cell B16 becomes cell B17, just as before. However, in this case, the defined name becomes associated with cell B17, the same cell that defined the name before inserting the row. Hence, this does not cause an error in the dependent workbook.

To create a formula that refers to a defined name in a source workbook, point to and highlight the cell or range of cells that make up the defined name during the formula-building process. Excel will automatically substitute the defined name for the cell reference in the formula. If the defined name consists of a range of unknown size or shape, begin the formula in the dependent workbook and click on the source workbook's title bar. From the **Formula** tab of the Ribbon, click **Use in Formula** and then select the appropriate defined name, as shown in **Figure 120**, to insert the reference at the cursor's point. Complete the formula and press **Enter**.

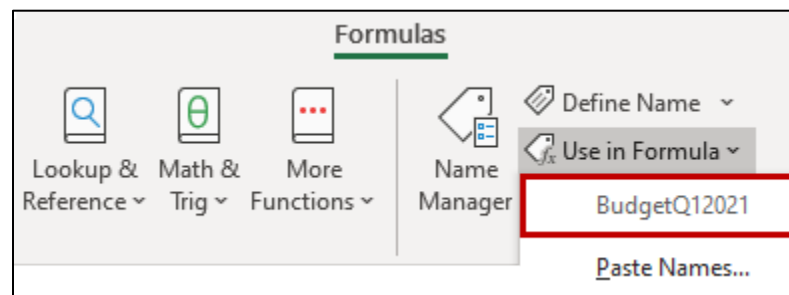


Figure 120 - Specifying Multi-cell Defined Names in a Source Workbook



The **Use in Formula** command will *not* be available in the source workbook if no defined names exist in the dependent workbook. However, you can create a “dummy” name in the dependent workbook to work around this problem.

Updating Links

Links update automatically when the dependent workbook and the source workbook are open. By default, when a dependent workbook opens without first opening a source workbook, you are prompted to update the links. To update all links, respond affirmatively to the prompt. Select **Edit Links** from the Ribbon's **Data** tab to update some but not all the links. Then, highlight the link or links to update and click **Update Values**, as shown in **Figure 121**.

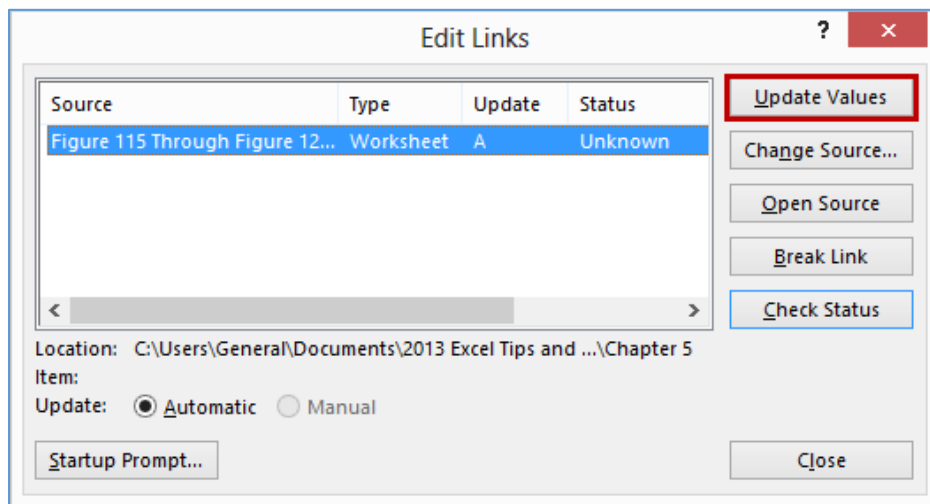


Figure 121 - Updating Selected Links

Managing Links

Note the link management options available within the **Edit Links** dialog box displayed in Figure 121. From that dialog box, you can change or open the source workbook of any link, check the link's status, or break a link. If you break a link, the linked cell's formula changes to a constant equal to the cell's value when the link breaks.



You cannot reverse the process of breaking a link using the **Undo** command. The only way to reestablish a linked formula is to rebuild the formula, which may be difficult if the formula is complex. So, make sure to save your work before breaking a link.

Also, note the **Startup Prompt** button in the lower-left corner of the **Edit Links** dialog box. That opens the **Startup Prompt** dialog shown in **Figure 122**, which controls whether Excel prompts

you to update links when you open a dependent file. If the source workbooks are open when you open a dependent workbook, these settings have no effect. In that case, all links will update automatically.

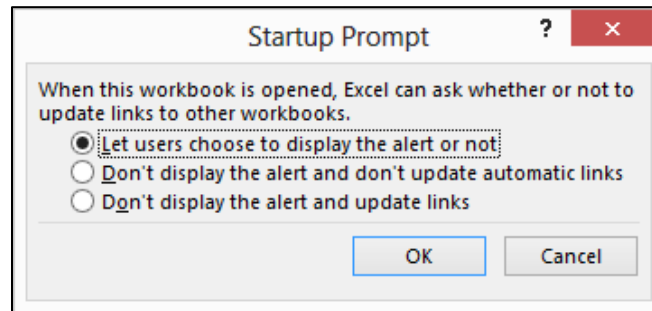


Figure 122 - Setting Link Update Prompt Options

The default is the first option, **Let users choose to display the alert or not**. A setting in Excel's **Advanced Options** controls the prompt. In the **General** section of Advanced Options, check or uncheck **Ask to update automatic links** to manage whether Excel asks you to update automatic links. With this option checked, the results are consistent with the previous section's discussion on updating links.

The second option, **Don't display the alert and don't update automatic links**, is especially problematic. This setting affects all users. It suppresses any prompts and does not update the linked formulas. With this setting enabled, you could unknowingly use, save, distribute, or communicate out-of-date data or information. Use this setting cautiously or not at all!

The third option, **Don't display the alert and update links**, has no practical effect because the Trust Center settings override Startup Prompt settings. As discussed in Chapter Three, you can access the Trust Center from Excel's **Options**. Click **Trust Center Settings, External Content** for more options in the Trust Center.

Dealing with Broken Links

One of the biggest problems of working with linked workbooks is the seemingly inevitable broken links. For example, broken links occur when a client or coworker sends a workbook by email that includes links to source workbooks you cannot access. Broken links also appear whenever someone moves or renames any source workbook while the dependent workbook is unopened. When someone opens the dependent workbook later and chooses to update links, Excel presents the prompt in **Figure 123**.

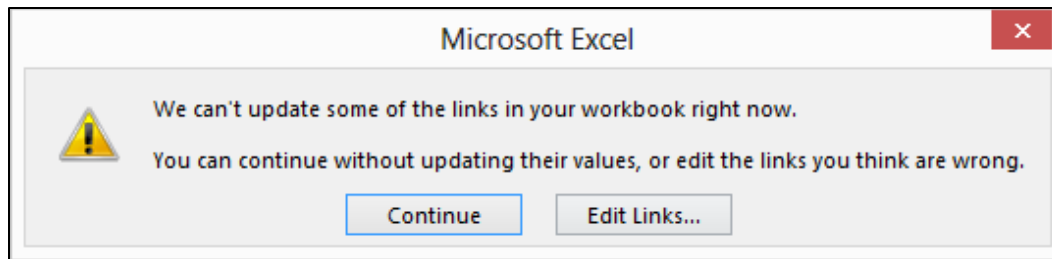


Figure 123 - Prompt User Receives When Broken Links Appear

Clicking **Continue** will allow you to use the workbook without updating the links. Any cells with a formula that depends on a linked workbook will continue to display their current values so that the workbook remains intact. Until someone repairs the links, Excel displays the same prompt each time the dependent file opens.

Click **Edit Links** to open the dialog box shown in **Figure 124**. You can manage the offending links from the **Edit Links** dialog box, including breaking or editing them. If the source workbook is unavailable, the best action may be to break the offending links. Of course, that strategy presents another problem because the cells containing the links are *not* identified. Excel has no built-in mechanism for identifying cells that contain links or broken links. The most common method of identifying cells that contain links is to search for a left bracket ([) because brackets surround all file names in linked formulas. To find all linked formulas using this method, press **CTRL + F** and enter the left bracket in the **Find what** box. Then, click **Find Next** repeatedly to step through the workbook, stopping at each cell that contains a linked formula.

You can identify cells that contain broken links using a similar process. First, open the **Edit Links** dialog box. Then select **Edit Links** on the **Data** tab of the Ribbon. Next, click **Check Status** to update the display, as shown in **Figure 124**.

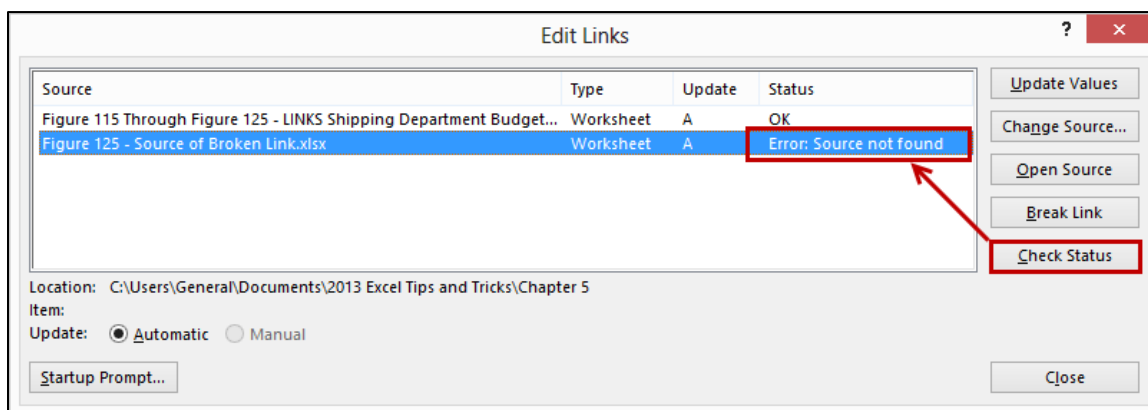


Figure 124 - Identifying the Sources of Broken Links

Note all source workbook file names for which the status is **Error: Source not found**. Then, search for each source file name, selecting **Find All** in the **Find and Replace** dialog box to get a list of all cells referencing the source workbook, as shown in **Figure 125**.

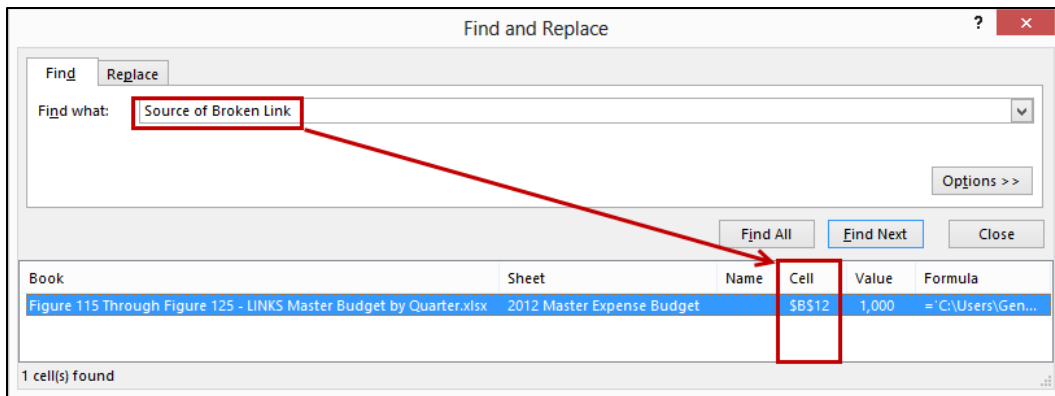


Figure 125 - Identifying Individual Cells That Contain Broken Links

The aforementioned method allows you to assess the significance of not being able to access a source workbook. The process also allows you to break a single or small number of known links to improve the work experience without compromising the structural integrity of a workbook.

Alternatively, you can use the **FindLink** add-in by Excel MVP (Microsoft Most Valuable Professional) Bill Manville. This utility can help find, list, and break links to other workbooks or external files, as shown in **Figure 126**.

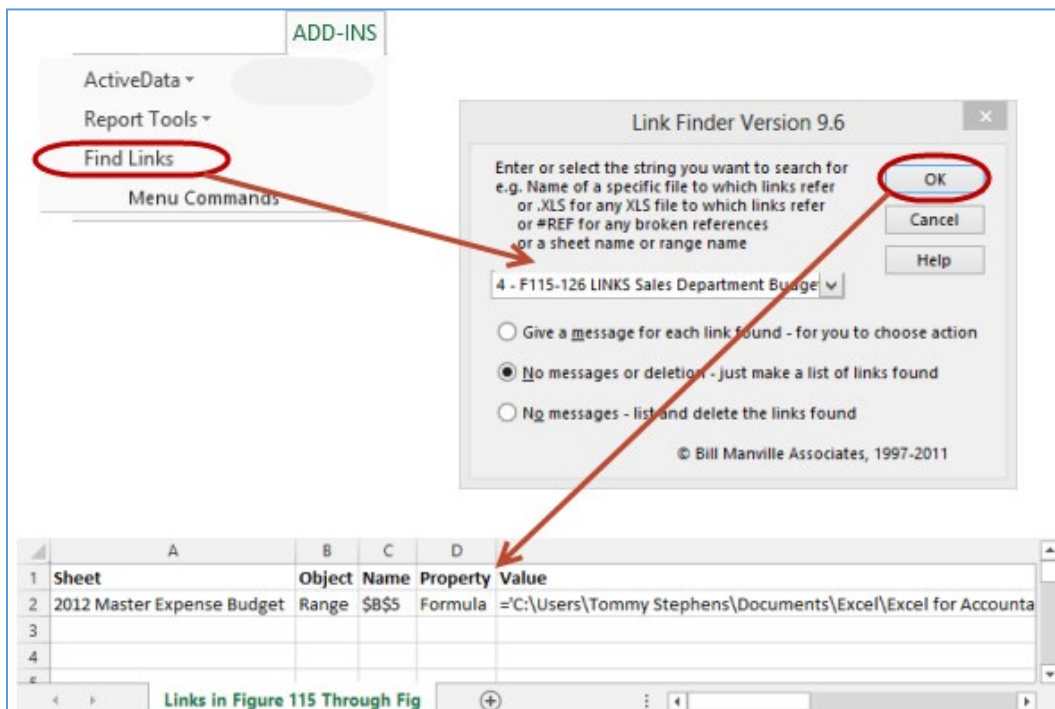


Figure 126 - Using Find Link to List All Links in a Dependent Workbook

To use FindLink, visit <https://k2e.fyi/FindLink> and download **FindLink.ZIP**. The latest version at this writing was version 13.1. Upon downloading and installing FindLink, the **Add-Ins** tab of the Ribbon will show a **Find Links** command button you can use to launch the add-in.

Multiple-sheet Workbooks

While many professionals use linked workbooks, multiple-sheet workbooks are a better alternative in most situations, as identified earlier in this chapter. Multiple-sheet workbooks allow you to build integrated models with separate worksheets for assumptions, data, analysis, and reports. For example, a master budget workbook may include sheets for budgetary assumptions, the sales forecast, departmental expense details, an expense budget summary, and the budgeted income statement. Most users will find multiple-sheet workbooks easier to build, use, and maintain than linked workbooks.

Combining Single-sheet Workbooks

Many accounting professionals have multiple single-sheet workbooks that are holdovers from the days when spreadsheet applications only supported one worksheet per file. The first task is to combine related sets of single-worksheet files into a single, integrated workbook. Combining single-sheet files into an integrated workbook is an easy, straightforward task. There are several methods of combining worksheets into one workbook.

1. Copy all cells in each single-sheet workbook to the clipboard, one at a time, and paste the cells to a blank sheet in the combined workbook. This method is easy and intuitive but often yields inferior results. With this method, you will lose all print settings and formatting that flow from the original workbook's default formats. You will also lose column widths unless you paste them subsequently using the **Paste Special** command.
2. Copy an entire worksheet using **Move or Copy**, as shown in **Figure 127**. The **Move or Copy** command preserves all the original worksheet's formatting, column widths, and print settings. First, open the workbooks from which you want to combine worksheets. Then, right-click on a worksheet tab to copy and select **Move or Copy** from the context-sensitive menu. In the **Move or Copy** dialog box, choose the name of an open workbook or a new book for the worksheet's destination. Next, in **Before sheet**, select the position of the worksheet amongst all the worksheets in the destination workbook. Finally, check **Create a Copy** if you want the worksheet to remain in the existing workbook and a copy to go to the destination workbook. Leaving this unchecked removes the worksheet from the original workbook. Click **OK**.

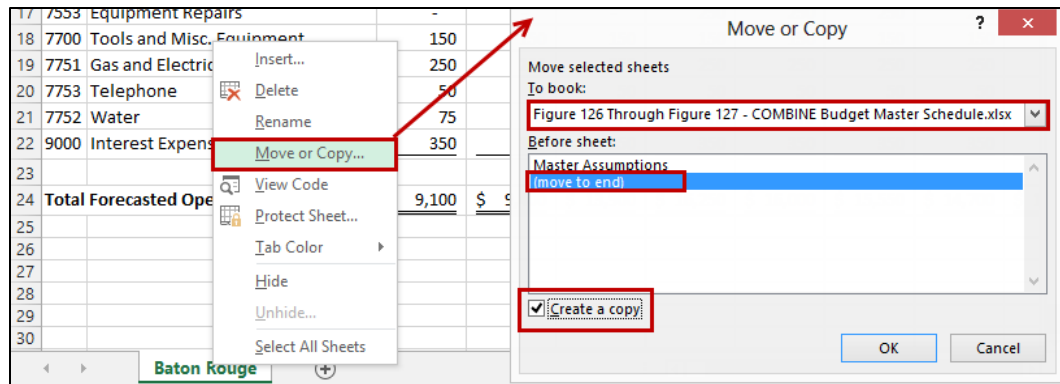


Figure 127 - Combining Worksheets Using the Move or Copy Command



Moving a worksheet from a multiple-sheet workbook to another removes the worksheet from the source workbook. If the source is a single worksheet workbook, moving a worksheet to another workbook will close the source workbook while leaving the worksheet intact. Copying a worksheet always leaves the source workbook intact.

- Alternatively, drag and drop a worksheet from one workbook to another. First, arrange the workbooks side-by-side using **Arrange All** from the **View** tab of the Ribbon. Then, click the worksheet tab to be moved and drag the tab to the destination workbook. Finally, drop the tab in the desired position within the destination workbook, as shown in **Figure 128**.

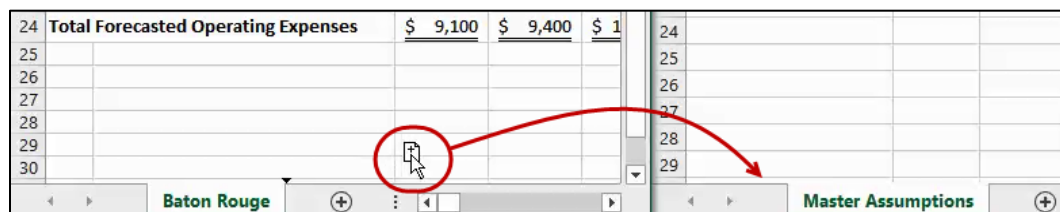


Figure 128 - Using Drag-and-drop to Move or Copy a Worksheet

By default, you move worksheets when using drag-and-drop. Press and hold the **CTRL** key while dropping the worksheet in the desired location to copy a worksheet.

You can use these same processes to move or copy worksheets within the same workbook.



Defined names in moved or copied worksheets maintain their scope in the destination workbook if their names do not conflict with any existing defined names in the destination workbook. For those defined names conflicting with existing names, the defined name's scope in the moved or copied worksheet changes automatically to the worksheet on which the defined name exists.

Working with Multiple Sheets

Multiple-sheet workbooks are easier to use and maintain than linked workbooks. For instance, individual sheets can be renamed and colored for more efficient use. To rename a worksheet, double-click on its sheet tab and type in the new name. Complete the process by pressing **Enter**. Worksheet names can be up to thirty-two characters long. Similarly, you can recolor individual sheet tabs for clarity. For example, to change the color on a worksheet tab, right-click on the tab, select **Tab Color**, and then choose a color, as shown in **Figure 129**.

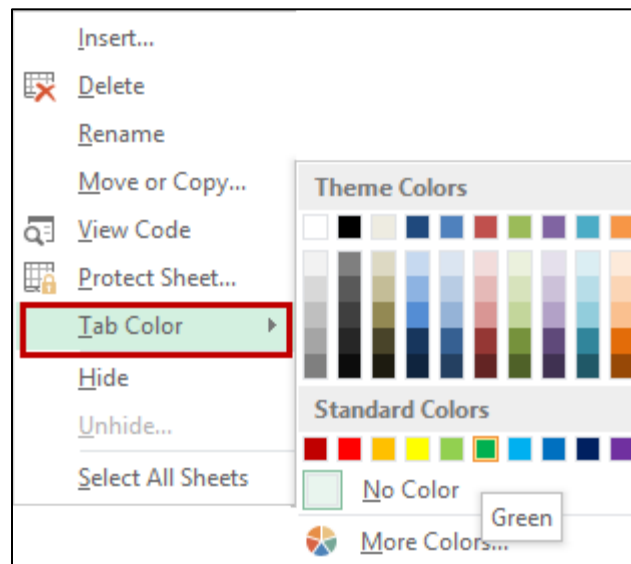


Figure 129 - Changing Worksheet Tab Color

A powerful feature of using three-dimensional workbooks is modifying or changing the structure of multiple sheets in a single operation. You can select multiple sheets by holding down the **CTRL** key while clicking the worksheet tabs to group. Alternatively, hold down the **Shift** key while clicking the endpoint worksheet tab in a range of sheets. With grouped worksheets, any action taken on one worksheet replicates to all the others in the group. You can add or delete columns or rows, format cells, enter account names or column headings, and create or modify formulas across multiple worksheets simultaneously.

For example, let us assume that we must add a new expense account to twelve identical monthly budget worksheets. To accomplish this task, group all twelve worksheets. Then, insert a new row

in the appropriate location in the list of accounts and type in the account name. Excel modifies all worksheets to have a new row with a new account in that one operation. Finally, ungroup the worksheets to complete the process. You can right-click on the sheet tab of a grouped worksheet and select **Ungroup sheets** to ungroup worksheets.

Sum-through Formulas

Most accounting professionals routinely face the task of combining or consolidating financial data from several worksheets. The task may require consolidating the results of multiple periods, departments, divisions, or related businesses. In almost every case, practitioners insert a new worksheet to hold the combined or consolidated information and then sum through the existing worksheets to produce consolidated totals.

Generally, a single formula is created and copied down and across the summarizing worksheet. Then, users can delete extraneous totals and apply formatting to complete the report. This method is easily understood, most users can use it, and it is well-suited to those situations where the worksheets have identical layouts – column by column, row by row, and cell by cell. However, if the worksheets do not have symmetrical arrangements, a common workaround is adding rows and columns to one or more worksheets until the cells align.

While some users may create sum-through formulas using a simple arithmetic formulation (**=Sheet1!B15+Sheet2!B15+Sheet3!B15**), using the SUM function if the cells are aligned is more efficient. Such a formula would be like this: **=SUM(Sheet1:Sheet3!B15)**. Let us examine the process of creating and utilizing sum-through formulas that employ the SUM function. Refer to the workbook displayed in **Figure 130**.

	A	B	C	D	E	F	G
1	Larry's Landscaping Services						
2	Forecasted Operating Expenses						
3	Slidell Location						
4	For the Year 2021						
5							
6			<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>
7	6230	Auto Fuel	\$ 100	\$ 100	\$ 150	\$ 250	\$ 250
8	6240	Auto Maintenance	-	-	50	-	-
9	6400	Bank Service Charges	25	25	25	25	25
10	6550	Payroll Expenses	5,000	5,000	8,600	9,800	9,800
		Slidell	Covington	Hammond	Houma	Baton Rouge	Consolidated

Figure 130 - Forecasted Expenses Workbook

The workbook has six worksheets – *Slidell*, *Covington*, *Hammond*, *Houma*, *Baton Rouge*, and *Consolidated* – each containing forecasted expenses for the upcoming year. For example, the

Consolidated sheet will include total forecasted expenses after building a sum-through formula and copying it down and across the appropriate worksheet range.

To create the sum-through formula, follow the steps below.

1. Click on the **Consolidated** worksheet tab and put the cursor in the upper left-hand corner of the data range. In this case, place the cursor in cell **C7**.
2. Begin the formula by entering **=SUM(**.
3. Next, click on the sheet tab of the first worksheet in the range, **Slidell**, and then click on cell **C7**.
4. Press the **SHIFT** key while clicking on the last worksheet's sheet tab, **Baton Rouge**, and press **Enter**.

Excel will have entered the following formula: **=SUM('Slidell:Baton Rouge'!C7)**. Now, copy the formula down and across the appropriate range. Then, reformat cells, delete rows, and add totals as necessary to complete the worksheet.

Note the endpoints of the range of worksheets. In this case, the Slidell and Baton Rouge worksheets act as endpoints. The endpoints of the sum-through formula act in a similar fashion to any other SUM formula's endpoints. If you add another worksheet for another store location between the endpoints, the new location's forecasted amounts appear automatically in the consolidated totals. However, the consolidated totals will not include the values if you add the new worksheet outside the endpoints. You can drag a worksheet outside the endpoints to remove its contributions from the consolidated totals. Likewise, you can drag a worksheet within the endpoints to include its values in the calculations. This adaptability is a powerful feature but can also cause problems for those unaware of this functionality.

For example, when printing multiple worksheets simultaneously, the sheets always print from left to right, regardless of the order in which you select the sheets. Suppose you wanted to print the *Slidell*, *Baton Rouge*, *Hammond*, and *Consolidated* worksheets in that order from our example workbook. Some users may attempt to accomplish that task by dragging the *Baton Rouge* sheet tab to the left of the *Hammond* sheet tab. However, in doing so, the totals on the *Consolidated* worksheet would no longer include the amounts from the *Hammond* worksheet because the *Hammond* worksheet no longer resides between the endpoints identified in the formula. Even experienced Excel users inadvertently fall into this subtle trap when dragging sheets to reorder them for printing. Arranging worksheets can be problematic in more extensive workbooks with many sheets because some users may not recognize the impact of rearranging sheets on totals.

A simple solution to this problem is to create dummy worksheets with no purpose other than to function as endpoints for the sum-through formulas. In other words, create two new sheets, one named **Begin** and the other **End**, serving as the endpoints for the sum-through formulas, as shown in **Figure 131**.

		Jan	Feb	Mar	Apr	May	Jun
6230	Auto Fuel	\$ 500	\$ 500	\$ 750	\$ 1,250	\$ 1,250	\$ 1,250
6240	Auto Maintenance	-	-	250	-	-	250
6400	Bank Service Charges	125	125	125	125	125	125

Figure 131 - Using Dummy Worksheets as End Points for Sum-through Formulas

i Using dummy sheets as endpoints can be very useful when users want to report rolling twelve-monthly or rolling quarterly results. The report column where the rolling totals appear would use sum-through formulas employing dummy endpoint sheets. As users copy the financial results from a new month into the workbook, the new sheet moves between the endpoints. Further, the oldest sheet appears outside the endpoints, quickly rolling up the previous twelve months' results without creating a new formula.

Sum-through formulas can also use wildcard characters to make easy work of challenging data consolidation tasks. Refer to the workbook shown in **Figure 132** for this discussion.

	Denver	Memphis	Houston	New York
Transaction Count				
Deposit Count				
Withdrawal Count				
Begin Cash				
Deposits				
Withdrawals				
Cash On Hand				
Cash Removed				
End Cash				

Figure 132 - Sum-through Random Ordered Sheets Using Wildcards

In this example, a small bank has ATMs in four major cities. The bank polls the machines electronically, and each one returns a CSV file of the transactions for the week. The files are opened in Excel and copied to a common workbook. The naming convention for each sheet is a three-letter abbreviation of the city where the ATM resides, plus a three-digit number indicating the specific machine. A clerical worker in the accounting department copies the worksheets into the workbook in random order. Next, a manager, Debbie, must create a summary report summarizing each city's transaction data. To complete this task, she must create four formulas, one for each city, entered in row 6, and copied through row 14. Here is the formula to summarize the data for the machines located in Denver.

=SUM('DEN*!B6)

Notice the asterisk (*) in the formula that acts as a wildcard to stipulate any string after **DEN**. In this case, the formula will sum all twenty-two sheets associated with ATMs in Denver, regardless of their sheet tab order. After entering the formula as illustrated, Excel automatically rewrites the formula to read, as shown below.

**=SUM(Den002!B6,Den003:Den017!B6,Den008!B6,
Den009:Den016!B6,Den018:Den020!B6,Den021:Den022!B6,
Den006:Den010!B6,Den001!B6,Den012:Den015!B6,Den014!B6)**

Examine the formula carefully. It seems that some of the machines are missing from the formula. However, when two or more sheets are adjacent, Excel places a colon (:) between them in the formula. Therefore, if more than two sheets are adjacent, only the endpoint worksheets are visible in the formula. The missing sheets are not visible within the formula because they are between visible endpoints. CAUTION! Do not drag sheets to rearrange them after entering the formulas without re-entering all the formulas. Otherwise, your summary totals may be in error.

Since the cell reference to B6 is relative, copy the formula down the column through cell B14, and the summary totals for the ATMs located in Denver will be complete. Next, create a formula for each city code – **MEM**, **HOU**, and **NYC** – and copy them to complete the report.



The familiar wildcard characters – asterisk (*) and question mark (?) – work as expected. The asterisk represents all characters. The question mark represents a single character. In our example, suppose that our bank owned all machines numbered 010 through 019 in partnership with another bank, and we needed a separate summary report for those devices. The following formula would calculate the correct totals: **=SUM('*1?'B6)**. Similarly, if we needed to sum the ATMs numbered 010 through 019 in New York, we could use this formula: **=SUM('NYC01?'!B6)**.

Rolling Reports

Earlier in this chapter, we suggested using sum-through formulas that employed dummy endpoint worksheets to produce updated rolling period reports quickly and easily without recreating the formulas. You can use a similar strategy – dummy endpoint columns – to aggregate data in rolling reports where all the supporting data resides on a single worksheet. The following are some examples of when you could use such a rolling report.

- Year-to-date, twelve-months-to-date, six-months-to-date, or quarter-to-date financial reports not produced by the general ledger;
- Year-to-date, twelve-months-to-date, six-months-to-date, or quarter-to-date statistical reports;
- Twelve-month rolling reports where the current month drops and another month adds on to the end of the reporting period; and
- Any report that requires including the newest data while excluding the oldest data.

In our example, a company reports the current month's and the past six months' results. **Figure 133** illustrates the report worksheet containing two dummy endpoint columns, columns **B** and **I**, shaded in green. The six months-to-date formula will summarize the range between the endpoint columns. This formula will allow us to add new columns with current results and delete outdated columns without affecting any formulas. Once we modify the data columns as required, we will hide the ones for the preceding five months, and the report will be complete.

	A	B	C	D	E	F	G	H	I	J	K
1	GTM Manufacturing Inc										
2	Retail Sales Division										
3	Summarized Income Statement										
4	Stated in Millions of US Dollars										
5	For the Month Ended August 31, 2021										
6											
7											
8			Mar	Apr	May	Jun	Jul	Aug		Six Months to Date	
9	Revenue		\$ 250.00	\$ 287.50	\$ 330.00	\$ 380.00	\$ 1,247.50	\$ 275.00		\$ 2,770.00	=SUM(B9:I9)
10											
11	Cost of Sales		125.00	132.50	140.00	147.50	545.00	137.50		\$ 1,227.50	=SUM(B9:I9)
12											
13	Gross Margin		125.00	155.00	190.00	232.50	702.50	137.50		\$ 1,542.50	=SUM(B9:I9)
14											
15	SG&A		25.00	32.50	40.00	47.50	145.00	27.50		\$ 317.50	=SUM(B9:I9)
16											
17	Net Income		\$ 100.00	\$ 122.50	\$ 150.00	\$ 185.00	\$ 557.50	\$ 110.00		\$ 1,225.00	=SUM(B9:I9)

Figure 134 - Completed Rolling Six-month Report

When the summarized data is available for September, retrieve the rolling report worksheet and unhide columns B, C, D, E, F, and G. Then, delete column C containing March's results. Next, select column H, formerly column I, before deleting column C and inserting a new column. Finally, copy and paste the data for September and re-hide columns B, C, D, E, F, and G. The rolling report is now up to date – quick, easy, and computationally accurate!



Custom Views, discussed in Chapter Six, could be used to automate hiding and un-hiding the columns containing the previous five months of data. Also, note that the monthly column headings are dates with a value equal to the last day of the month formatted as "mmm". The date in the report header links to the date of the current month. As the month changes, so too does the heading. This linkage prevents you from printing a report with the correct data but an incorrect heading.



Compare and contrast the approaches presented in this chapter for summarizing data from multiple worksheets in the same workbook. What are the primary differences between each of the three methods?

Printing Essentials

Chapter

6

One of the most time-consuming tasks faced by those who create reports and analyses in Microsoft Excel is assembling and printing reports. This chapter is devoted to helping you be more effective and efficient in the report assembly and printing processes. Some topics covered include integrating reports using embedded or linked objects, creating dynamic print areas using Custom Views, and using the Camera to create report forms.

Learning Objectives

Upon completing this chapter, you should be able to:

- Manage fundamental print settings such as setting margins, creating print areas, and establishing page breaks from the Page Layout tab of the Ribbon and from the Page Setup dialog box;
- Utilize Excel's Camera feature to streamline many printing processes; and
- Create and apply Custom Views associated with specific reports.

We begin with a review of printing basics.

Review of Printing Basics

First, all print settings are available from the Ribbon's **Page Layout** tab, shown in **Figure 135**. Most Excel users can establish printing preferences in the **Page Setup** dialog box, print individual worksheets or parts of worksheets, and set page orientation, margins, headers, and footers. Beyond these few fundamental skills, many printing processes and settings are unknown or confusing to many Excel users. Let us examine a few of these processes and Excel settings to ease the burden of printing financial analyses and reports.

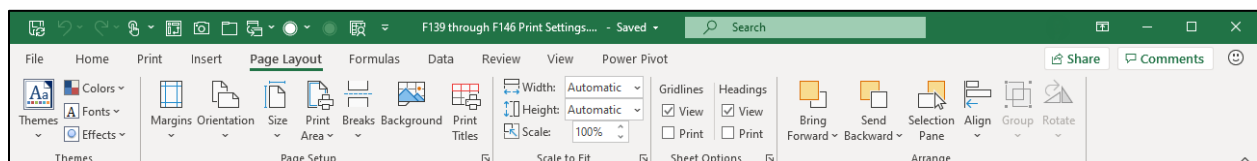


Figure 135 - Page Layout Tab of the Ribbon

Setting Margins and Page Orientation

To set the margins, page orientation, paper size, print area, page breaks, or repeating rows or columns, select the appropriate option from the **Page Setup** group on the **Ribbon's Page Layout** tab, as shown in **Figure 136**.

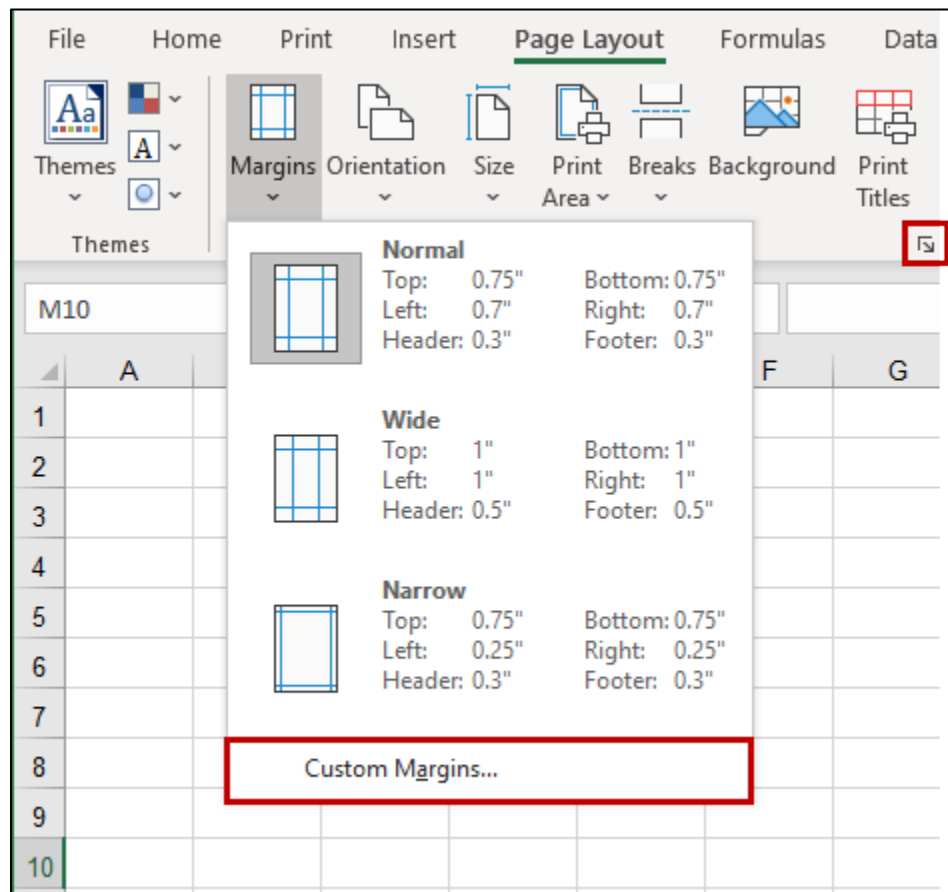


Figure 136 - Basic Print Settings Available on the Page Layout Tab of the Ribbon

You can apply numerous predefined margin settings with a single mouse click. Also, you can enter custom margins by clicking on **Custom Margins**, as shown in Figure 136. Excel redefines the predefined margin setting for the **Last Custom Setting** to be consistent with the most recently used custom margin. Note that you can access the familiar **Page Setup** dialog box – and related *Page*, *Margins*, *Header/Footer*, and *Sheet* tabs – from the dialog launcher in the lower right-hand corner of the **Page Setup** group.

Adjusting Page Size and Page Number

Nearly everyone has used the "shrink to fit" options to re-size printed output to the paper size. By default, selecting the option shrinks the output horizontally and vertically. However, we often have long reports that are slightly wider than a defined page. In those instances, we need to shrink the report horizontally while allowing it to run out as many pages as necessary to print the

entire document. In other words, the page width needs to shrink without affecting the *length* of the whole report. The problem is that the settings are adjusted through spinner controls, as shown in **Figure 137**. Seemingly, users must adjust the vertical control using trial and error until the document sizes appropriately. However, here is a trick to circumvent that entire process. Just delete the spinner page setting for the number of pages tall. Once done, the document's width adjusts to fit the page and margin settings while allowing the entire document to print. The process shrinks a document for printing horizontally without shrinking it vertically.

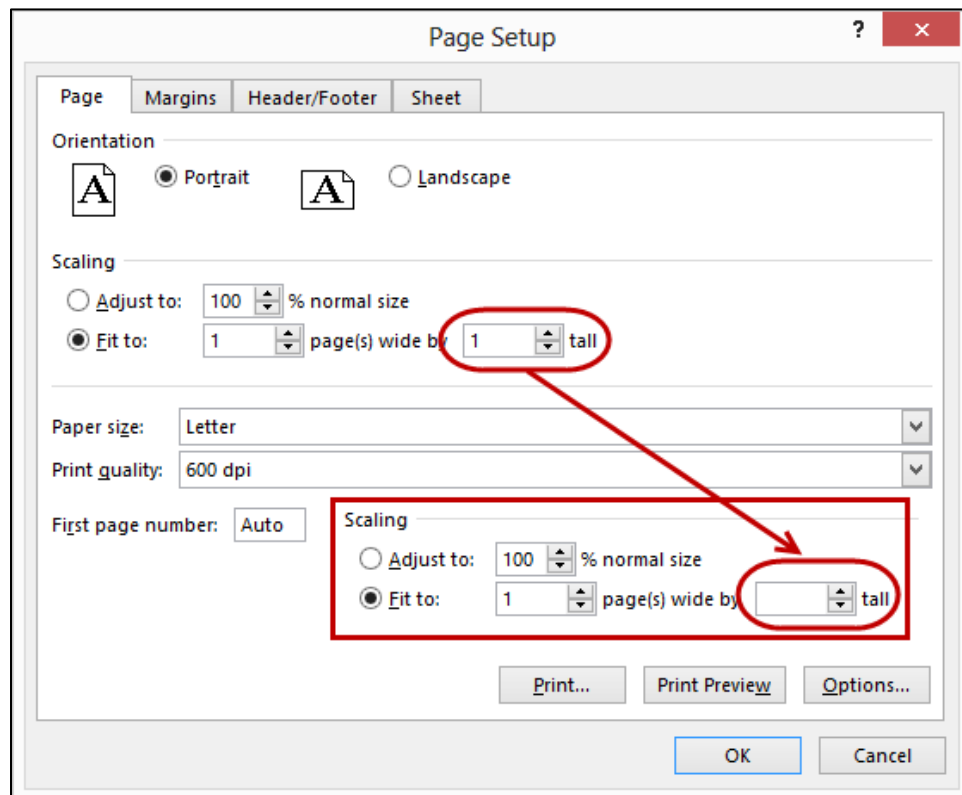


Figure 137 - Shrinking a Printout Horizontally and Setting the Page Number

To delete the vertical (tall) page size, put your cursor in the size box and press **Delete**. Also, note the **First page number** field in the **Page Setup** dialog box shown in Figure 137. This option allows you to set the page number of the first printed page. Setting the page number is useful when a report consists of printouts from several Excel workbooks, worksheets, or a combination of Excel and Word documents.

Making Printing Easier with Sheet Settings

Several settings that can make printing complex documents easier reside on the **Sheet** tab of the **Page Setup** dialog box, accessible by clicking **Print Titles** on the Ribbon's **Page Layout** tab. For example, if you need to print headings on each page, one way to handle that would be to put the headings in a **Custom Header**. However, many business professionals routinely include their headings at the top of their worksheets, which may cause printing problems if the user does not

know how to repeat the headings on each page. A similar issue may arise when printing a multi-year cash flow analysis for a capital project. A user may want to print the column on the left that identifies each row's contents. To accomplish these tasks, set the **Rows to repeat at top** or **Columns to repeat at left** in the **Print Titles** area of the **Sheet** tab in the **Page Setup** dialog box.

In our example, displayed in **Figure 138**, you might want to print the headings at the top of each page of the notes to accompany compiled financial statements. Note that rows one through five, including the three-line header plus the two blank spacer rows, are specified as the **Rows to repeat at top**. More importantly, the **Print area**, rows six through eighty-three, does not overlap the rows to repeat. Overlapping the print area with repeated rows or columns, which causes double printing of the repeated rows or columns, is a common mistake many users make.

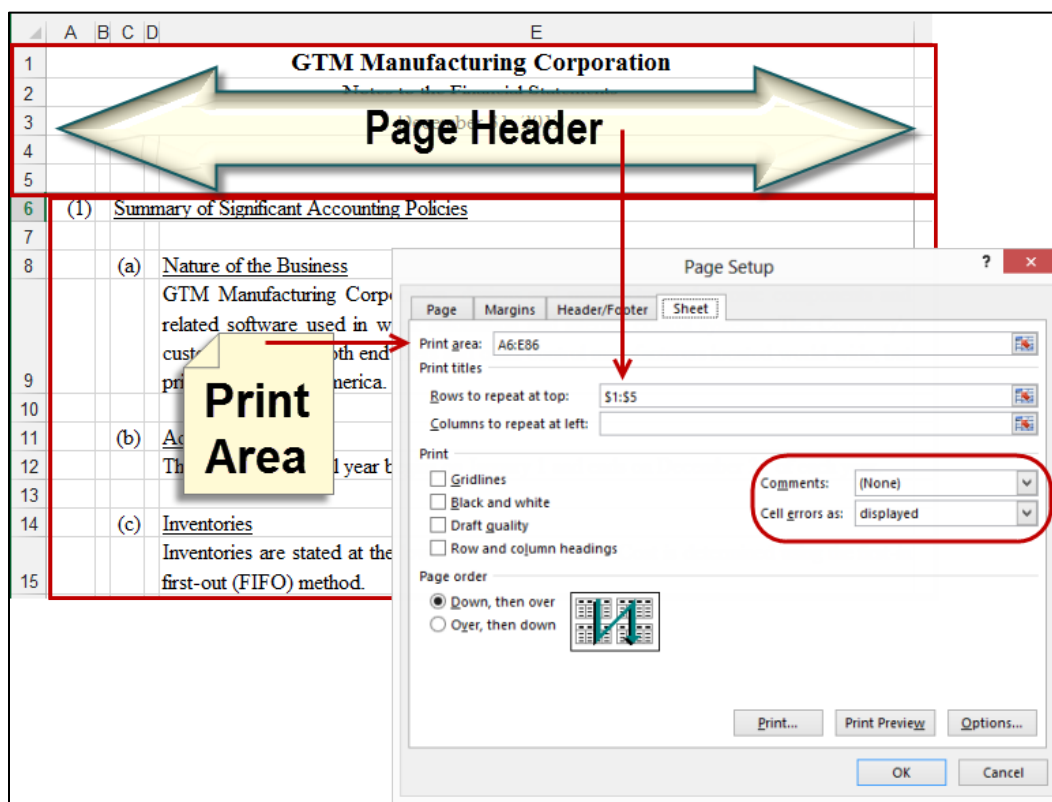


Figure 138 - Advanced Print Settings on the Sheet Tab

The **Sheet** tab also contains the settings to control the printing of comments, notes, and cell errors. By default, Excel does not print these elements, but you can force them to print 1) as displayed on the sheet or 2) at the end of the sheet. For example, you may enter notes in the master budget workbook during the budgeting process. In preparing for an upcoming budget status meeting, you want to print all relevant notes. To accomplish this task, display and arrange the notes in the report as desired. Then, choose to print the workbook with notes printed **as displayed**. Only the notes visible on the worksheet will print, and they will print as you arranged them on the worksheet. You may add, delete, hide, or display comments and notes from the **context-sensitive menu** or the Ribbon's **Review** tab. Additionally, recognize that you can only

position them to print at the end of the sheet if you want to print comments instead of or in addition to notes.

Cell errors can also be a problem in printed reports. For example, some calculations may cause the **#DIV/0** error. These errors are especially prevalent in worksheets that present variances and variance percentages. Any variance percentage calculated where the budgeted amount was zero for the period will yield the error. The most common solution to this problem is to type over the formula so that the error does not appear on the printed report. Of course, that solution may corrupt the worksheet, so it does not calculate correctly in the future.

A better solution is to use a more complex formula to calculate the variance percentage. Such a formula would use the **IFERROR** function to test whether the formula generates an error. The formula returns a null string, which displays a blank cell if it does. On the other hand, if the formula yields a numeric result, that result appears in the report. Refer to **Page 100** for more information on Excel's IFERROR function.

Another option is to leave the errors intact but print the worksheet with settings that hide them on the printed report. By default, cell errors print as they appear in a worksheet. However, you may choose to print errors as 1) blank cells, 2) dashes (--), or 3) #N/A. To hide cell errors on a printed report, select **<blank>** in the **Cell error as** drop-down box on the **Sheet** tab of the **Page Setup** dialog box.

Applying Page Settings to Multiple Worksheets

One of the most frequently asked questions of K2 instructors is how to apply page settings to multiple worksheets simultaneously. To simultaneously apply page settings to multiple worksheets, group or activate the appropriate sheets. Excel highlights the tabs of grouped worksheets when selected, as shown in **Figure 139**. Once you choose the worksheets, add your desired page settings, and they will apply to the entire group.

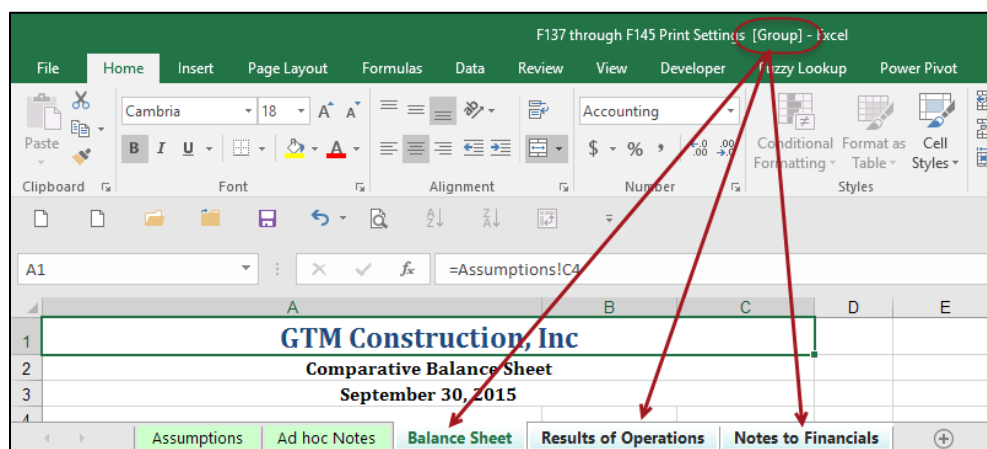


Figure 139 - Grouped Sheets Having Highlighted Tabs

Any page setting configured will apply to all grouped sheets upon grouping worksheets. In other words, to set headers and footers on multiple worksheets simultaneously, group the sheets before entering the headers and footers.

You can apply the page settings of an existing worksheet to other worksheets in the same workbook. First, select the desired worksheets, selecting the worksheet that contains the page settings to transfer first. Then, choose **Page Layout** from the Ribbon, click the dialog launcher in the **Page Setup** group, and click **OK**. It is as simple as that! Further, you can transfer page settings on a worksheet in another workbook. To do so, drag a copy of the worksheet into the current workbook. Then, perform the page setting transfer steps described above and delete the imported worksheet. Note that Excel transfers all print settings when you use this method.

Setting Print Areas

Most accounting practitioners understand that they can print part of a worksheet by setting a **Print Area** to include just that part of the worksheet they wish to print. However, you need not establish a **Print Area** to accomplish this task. Instead, highlight the range to print and then click the **File** tab, **Print**, and under **Settings**, choose **Print Selection**, as shown in **Figure 140**.

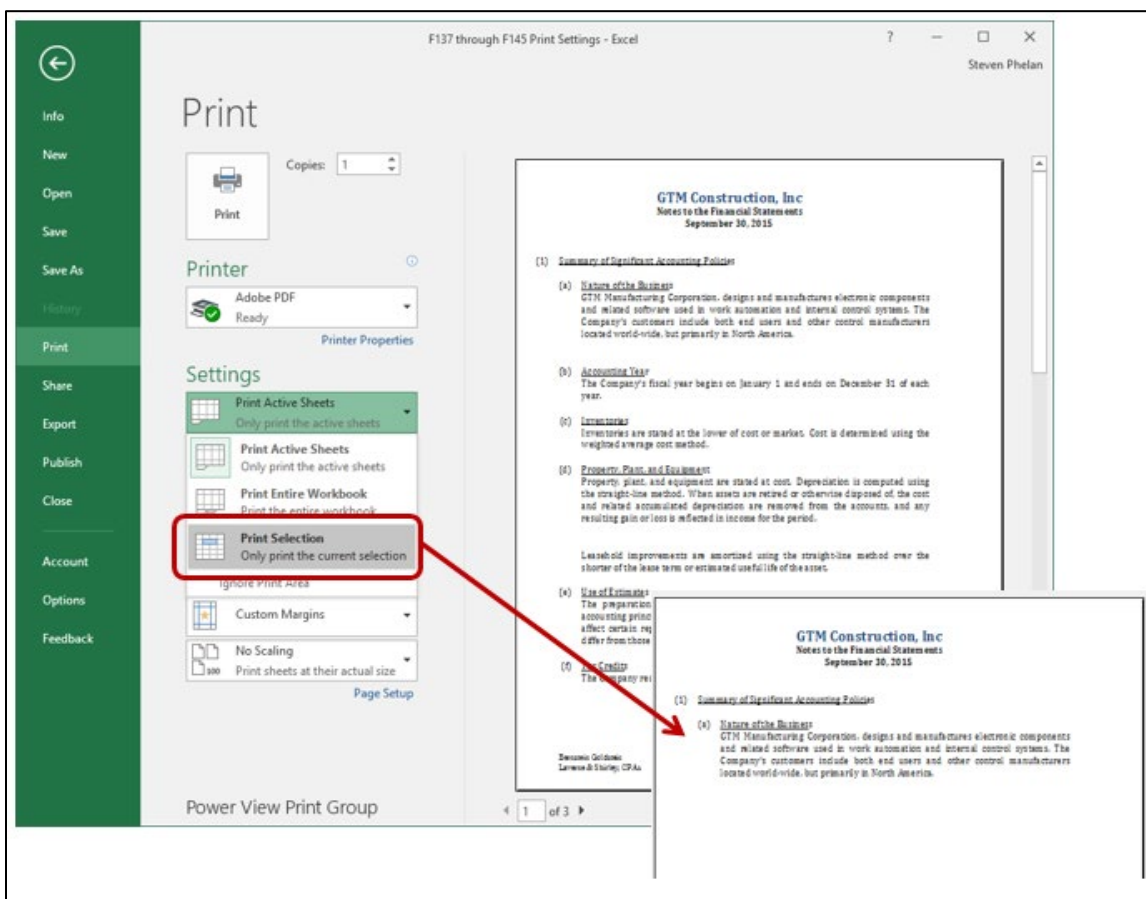


Figure 140 - Printing a Selection from Excel

This method is ideal for printing what could otherwise be termed temporary print areas. But, of course, if you always print the same range, setting a **Print Area** is a more efficient way of printing.

Likewise, you can print multiple non-contiguous print areas using the same technique. Use **CTRL + Click and Drag** to highlight multiple non-contiguous print areas. Again, select **Print**, choose **Selection**, and then click **OK**. This technique prints the specified ranges in the order established. You can use this technique to print an area near the bottom of a large worksheet by selecting the bottom section before printing an area at the top! Note, however, that each selection prints on a separate page. If you need to print the ranges on a single page, you will need to create a report form. Report forms are covered later in this chapter.

Suppose you want the same three print areas printed in a specific order each time you print a particular worksheet. The proper way to accomplish this task is to set three non-contiguous print areas in the worksheet. To do so, select and establish the first area to print. Next, choose **Print Area** from the **Page Layout** tab of the Ribbon, followed by **Set Print Area**. Then, highlight and set additional print areas, one at a time, in your desired print order. Complete the process by selecting **Print Area** and **Add to Print Area** from the Ribbon's **Page Layout** tab for the additional areas.

Printing Multiple Worksheets

Just as you can print multiple print areas with a single print command, you can also print multiple sheets or an entire workbook. To print multiple worksheets, group the worksheets you need to print using the process outlined previously. Then click the **Quick Print** button on the QAT or select **Print** from the **File** tab. Note that the worksheets always print in sheet tab order from left to right, regardless of the order in which you choose the tabs. This behavior is different from the order in which multiple print *areas* print. As we discovered earlier, multiple print areas print in the order selected. If the worksheet tabs are not in the proper print order, drag them to the appropriate location, then choose and print the sheets desired.

You can print an entire workbook in one of two ways. First, group all sheets and click the **Quick Print** command on the QAT or select **Print** from the **File** tab. With the worksheets ungrouped, the second option is to select **Print** from the **File** tab. Then, under **Settings**, choose **Print Entire Workbook**. Next, in the **Print** dialog box, select **Entire workbook** in the **Print what** section. Finally, click **OK** to print the entire workbook.

Printing multiple grouped worksheets with a single command has a hidden advantage. Specifically, Excel paginates the entire printout consecutively. For example, suppose that we print three four-page worksheets with separate print commands. In that case, Excel paginates each four-page report, "1" through "4". However, suppose we grouped all three worksheets and printed them with a single command. Excel paginates the reports "1" through "12" in that case. This functionality provides you with additional flexibility when printing reports from multiple worksheets.



Caution! Any action taken on one worksheet replicates to all others in the group when you act on grouped worksheets. This behavior can be dangerous if you inadvertently save a workbook with grouped sheets. If you save the workbook with grouped sheets, when you reopen it, the sheets remain grouped. Thus, while working on one sheet, you or a coworker could alter or destroy the others. The only telltale signs that worksheets in a workbook are grouped are 1) the visual cue "[Group]" appears in the title bar of the window in which the workbook is opened, and 2) multiple worksheet tabs will be highlighted. Unfortunately, neither telltale sign is very prominent, and they are easy to overlook. Therefore, you must remain disciplined when working with grouped worksheets. When you want to act on a group of worksheets, you must group the sheets, take the desired action, and immediately ungroup them. Otherwise, danger lurks!

Setting Page Breaks

The default page breaks in a report or analysis often do not divide the document properly for printing. For example, an accountant may want to produce a two-page balance sheet with assets printed on the first page and liabilities and equities printed on the second. If you do not arrange the worksheet to conform to the desired print layout, portions of the balance sheet's liabilities and equities section may print with the asset section on the first page. To avoid this result, add page breaks to the worksheet in the locations desired or utilize **Page Break Preview** to drag and drop the page breaks to the proper place. A fine dashed line indicates default page breaks, while a coarse dashed line indicates user-set page breaks (including print areas). For example, the horizontal page break shown in **Figure 141** is a default page break, denoted by the fine dashed line, while a user has set the vertical page break.

27				
28	(2)	Inventories		
29				
30		Inventories consist of the following:		
31			2015	2014
32		Raw Materials	\$ 337,075	\$ 360,615
33		Work in Progress	104,921	63,959
34		Finished Goods	466,753	440,599
35				
36			\$ 908,749	\$ 865,173
37				
38				
39	(3)	Note Receivable from Officer		
40				

27				
28	(2)	Inventories		
29				
30		Inventories consist of the following:		
31			2015	2014
32		Raw Materials	\$ 337,075	\$ 360,615
33		Work in Progress	104,921	63,959
34		Finished Goods	466,753	440,599
35				
36			\$ 908,749	\$ 865,173
37				
38				
39	(3)	Note Receivable from Officer		
40				

Figure 141 - Page Breaks as Shown in Normal and Page Break Preview

The default page breaks do not appear in new worksheets you have never printed. Click the **Print Preview** command on the QAT to display the default page breaks without printing the worksheet. The default page breaks appear when the Print Preview window is closed. To set a manual page break, position the cursor in a cell immediately below the row or to the right of the column where you want to insert the page break, as shown in **Figure 142**. Then, from the **Page Layout** tab of the Ribbon, select **Breaks, Insert Page Break**.

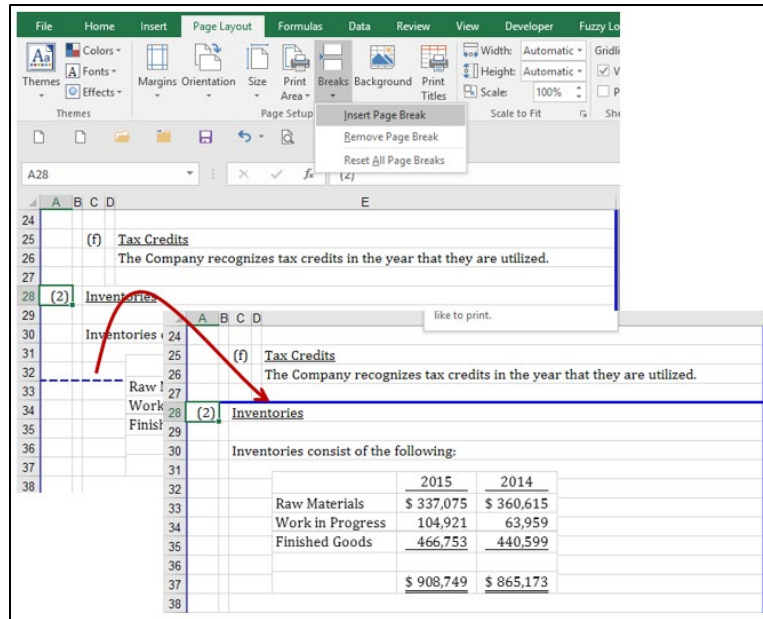


Figure 142 - Manually Setting a Page Break

You may also set page breaks to the proper location using drag-and-drop within the **Page Break Preview**, accessible from the Ribbon's **View** tab, as shown in **Figure 143**. Likewise, you can use the **Page Break Preview** icon on the Status Bar, just to the left of the Zoom Slider.

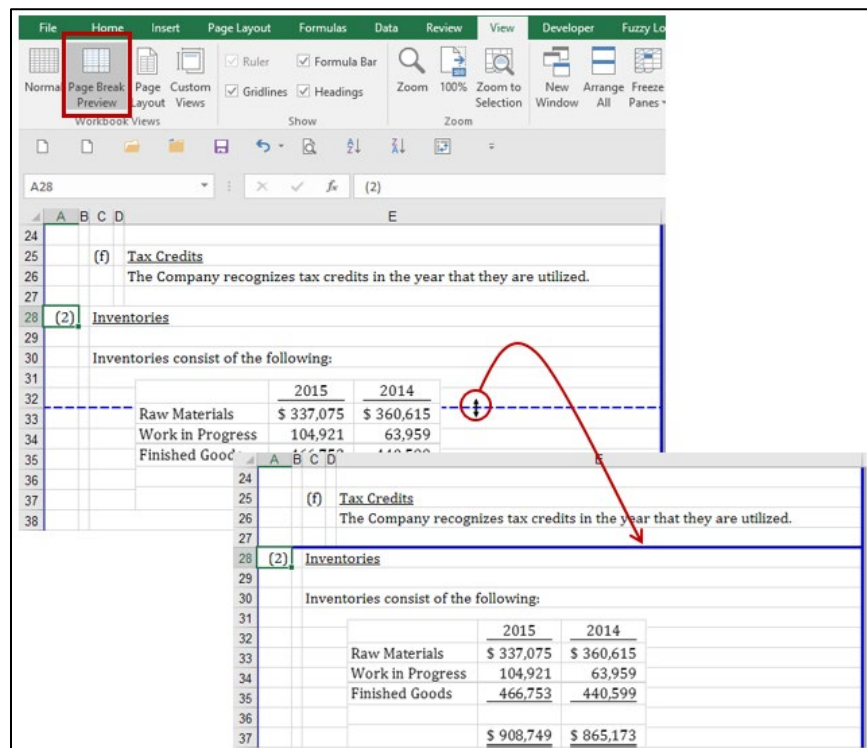


Figure 143 - Using Page Break Preview to Drag-and-drop Page Breaks

Page Layout View and Headers/Footers

You can conventionally add headers and footers within the **Page Setup** dialog box discussed earlier in this chapter. However, a better way to add headers and footers to a worksheet is to use the **Page Layout** view. The Page Layout view in Excel is similar to the Print Layout view in Word. It shows how the worksheet or defined print area will print page-by-page. You can enable Page Layout view by selecting **Page Layout** from the **View** tab of the Ribbon or by clicking the **Page Layout** icon on the Status Bar just to the left of the Zoom Slider, as shown in **Figure 144**.

In Excel's Page Layout view, you can see headers and footers at the top and bottom of each page. The header and footer areas are clickable, each with three sections – one each for the left, center, and right headers/footers – like the layout in the **Page Setup** dialog box. Headers and footers can be entered directly into the worksheet by clicking and typing into the appropriate sections. When you click into a header or footer section, the **Header & Footer Tools** contextual tab appears in the Ribbon, from which you can enter page numbers and other functions, as shown in Figure 144. Note the advanced capabilities, such as **Different First Page**, **Different Odd and Even Pages**, and **Scale with Document**.

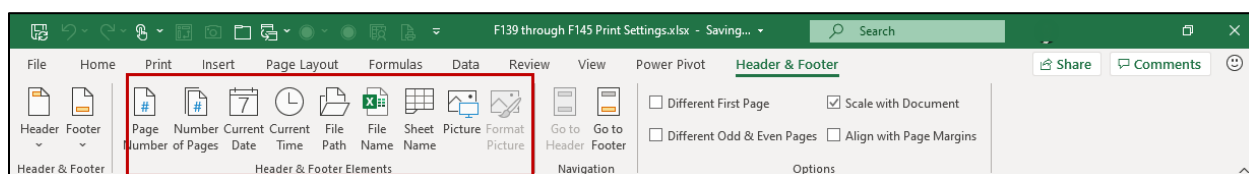


Figure 144 – Accessing Headers and Footer Elements in Page Layout View

Adding Print Tools to the Ribbon and Quick Access Toolbar

Let us make two modifications to the Ribbon to make printing easier and faster with print areas. First, add the **Print Area** icon to the Ribbon, the QAT, or both. Next, add the **Print** icon to the Ribbon, the QAT, or both.

Additionally, you quickly add the **Quick Print** command to the QAT. Quick Print sends the print job immediately to the default printer. Click on the drop-down arrow at the right end of the QAT and select **Quick Print**. If you want to print a selection without setting a print area or wish to change the printer, the Quick Print command does not accommodate these actions. Instead, you must select **Print** to get the full Print dialog in those situations; then, you can make the necessary changes. However, adding the **Print** command to the QAT may be advantageous if you change print settings often at print time.

Using the Camera to Create Report Forms

Earlier in this chapter, we learned how to set multiple print areas in the same worksheet. As we described, creating print areas causes them to print on separate pages in the order selected. However, users often would like several print areas to print on the same page in a specific layout.

In other words, their report consists of multiple small snippets of a workbook arranged on a single page. We refer to the resulting printable sheet as a report form. Those faced with building reports in this fashion understand the difficulty of achieving this result. Cutting and pasting routines do not work because the column widths of the individual snippets vary, so the report does not line up correctly. Further, you must update results whenever the source data changes. Building formulas to bring live data to a report's print area is better. Still, the process is time-consuming and cumbersome, and the data is not guaranteed to line up any better.

That brings us to Excel's **Camera** tool. This feature allows you to cut and paste dynamic pictures of data ranges that you can arrange in any layout for display or printing. To use the **Camera**, first, add the tool to the QAT. Then, click the drop-down arrow at the right end of the QAT and select **More Commands**. In the **Excel Options** dialog box, choose **Commands Not in the Ribbon**. Next, scroll down in the list of commands and select the **Camera** tool. Finally, click **Add** and **OK** to close the dialog box, as illustrated in **Figure 145**.

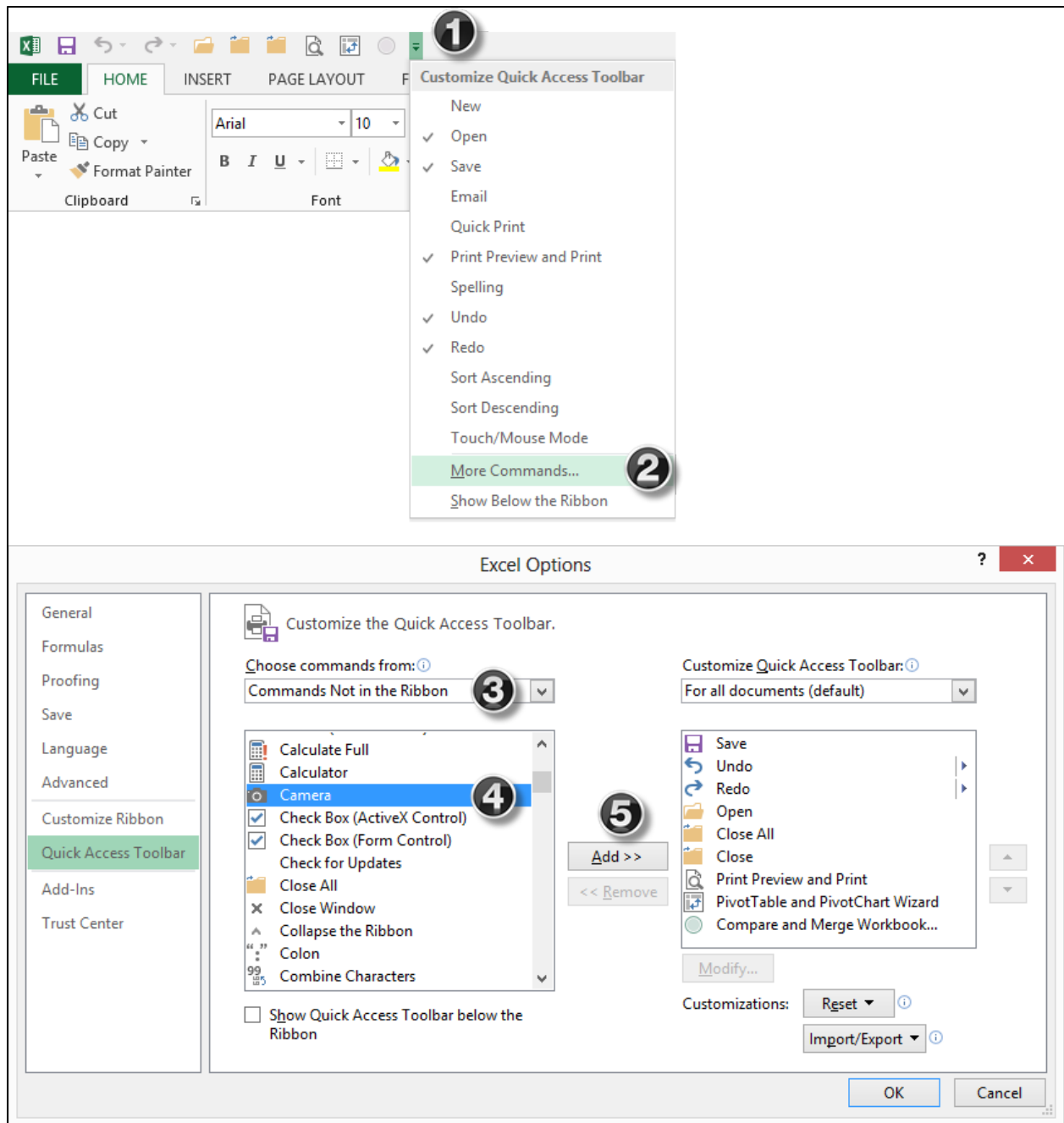


Figure 145 - Adding the Camera to the QAT

Using the **Camera** feature is similar to cut-and-paste processes. Highlight the range to copy and click the **Camera** toolbar button. Now, navigate to the worksheet that will serve as your report form. Then, click your mouse on the sheet. Excel will paste a picture of your data snippet on the worksheet. Click and drag the image to its proper location. Repeat the process with other data snippets to build your report form, as shown in **Figure 146**.

OPUHA DAM LIMITED			
Operating Revenue			
Wholesale Price of Power (c/kWh)	4,200		
Demand for Power (GWh)	33,000		
Power Station	1,386,000		
Annual Increase in Power Price Above Inflation	0.7%		
Water Price per 1000 m ³			
Years 1995-2002	\$ 15.00		
Years 2003-2009	11.50		
Years 2010-	14.50		
Water Sales to Tamaru	\$150,000		
Cash Investment Rate	-4.0%		
After Tax Cost of Capital			
Cost of Equity Capital	k_e	$B(R_e) + R_e$	16.0%
Marginal Cost of Debt Capital	k_d	$R_{wd}(1-t)$	6.37%
Weighted Actual Cost of Debt Capital	k_a		5.41%
Weighted Average After-Tax Cost of Capital			
Using Marginal Cost of Debt	k	$w_d(k_d) + w_e(k_e)$	8.29%
Using Weighted Actual Cost of Debt	k_a	$w_d(k_a) + w_e(k_e)$	7.53%
Weighted Average Wholesale Cost of Power			
	Price	Gwh	Weighted Cost
Winter Day	\$ 5.40	14.0	\$ 2,100.0
Winter Night	2.50	1.0	0.0694
Summer Day	4.50	18.0	2,250.0
Summer Night	1.50	3.0	0.1250
		36.0	\$ 4,544.4
Less: Transmission Loss @ 5%			1.8
			34.2
Price After Allowance for 5% Margin			\$ 4,320.0
Expected Annual Revenue from Power Sales			\$ 1,480,176

Figure 146 - Assembling a Report Form Using the Camera

The report in Figure 146 uses data from three worksheets in the same workbook. Notice how the columns of each snippet remain intact as originally formatted. This formatting is impossible to produce using conventional cut-and-paste techniques. Moreover, these snippets have hidden power! Each one links to the underlying data from which it was copied so that as the original data is updated, the report form is updated, providing us with flow-through reporting. Suppose you do not want the snippet to update when its underlying data changes. Copy the area and use the **Paste, As Picture, Copy as Picture** command from the Ribbon's **Home** tab. Then, paste it in the desired location with the **Paste, As Picture, Paste as Picture** command.

When pasted, a black border surrounds each snippet on the report form. To remove the border, right-click on the snippet and select **Format Picture**. Next, select **No Lines** in the **Line Color** drop-down box and click **OK** on the **Colors and Lines** tab, as shown in Figure 147. You can resize a picture by dragging its sides or corners, but dragging its *corners* reduces the likelihood of visual distortion. Alternatively, you can use the **Size** controls available from the Ribbon's **Picture Format** tab to resize the picture to meet your specifications. To activate the Picture Format tab of the Ribbon, click on the pasted image.

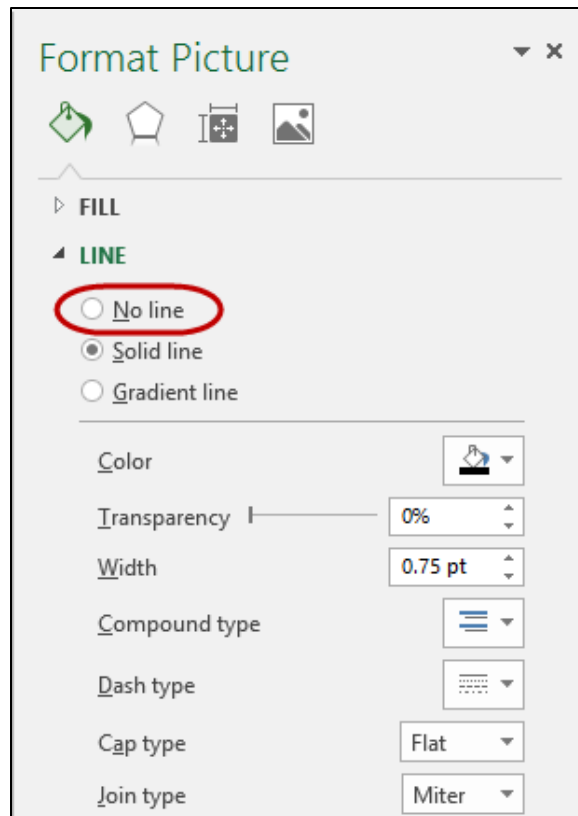


Figure 147 - Selecting No Line to Remove the Border from Camera Snippets

The **Camera** tool works across multiple workbooks; further, you can paste linked snippets into Word documents. To insert a **Camera** worksheet snippet into a Word document, highlight and capture the snippet in the same manner as described above. Then, shift focus to your Word document and position the cursor where the snippet is to appear. Next, select the Ribbon's **Home** tab, choose **Paste**, followed by **Paste Special**. Next, click **Paste Link** (or **Paste** for an unlinked snippet) and highlight **Picture** (Windows Metafile) in the **Format As** box in the **Paste Special** dialog box. Finally, click **OK** to complete the operation. You can replicate this result without using the **Camera** by copying a range and then pasting the copied selection into Word using **Paste Special, Picture (Windows Metafile)** with or without a link.



How does using the Camera feature to create report forms differ from linking data from various worksheets into a report? What advantages does Camera provide, as compared to linking data?

Custom Views

One of Excel's little-known but compelling features is creating **Custom Views** of a worksheet for use on demand. Custom Views are excellent for navigating or arranging a worksheet for a specific purpose. You can also use Custom Views to capture print settings so that a single worksheet can

have multiple print settings, such as page orientation, margins, headers, and footers. Most accounting professionals have set up a worksheet to print an area, only to reset the same worksheet to print another section, perhaps several times over. Further, they may do this many times each month in multiple workbooks to create the reports they need. Custom Views can automate creating multiple print areas and modifying print settings without writing macros. This feature has the potential to improve staff productivity dramatically. Before covering Custom Views for printing, let us examine Custom Views to navigate and rearrange a worksheet.

To create a Custom View, do the following.

1. Rearrange the worksheet just as you want it to print, including repositioning the cursor to the likely point of use.
2. Select **Custom Views** from the **View** tab of the Ribbon. Then, in the Custom Views dialog box, click **Add**. Then, in the **Name** box of the **Add View** dialog, type in a name for your view and click **OK**.

To use this view, select **Custom Views** from the **View** tab of the Ribbon. Then, highlight the Custom View in the dialog box and click **Show**, as shown in **Figure 148**. Your worksheet instantly rearranges to display the Custom View selected.

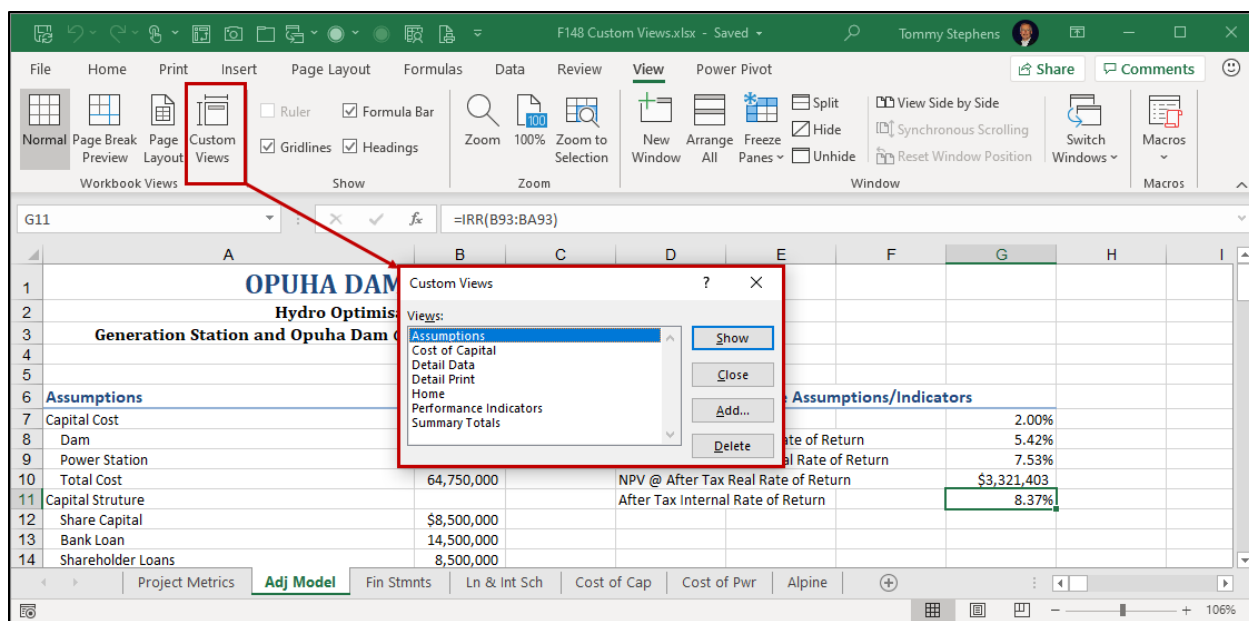


Figure 148 - Selecting a Custom View

Adding the Custom Views command to your QAT allows you to change views quickly from the desktop without using the dialog box.

Custom Views can include settings for hidden rows and columns, frozen panes, window splits, data filters, and printing. You cannot edit a view directly. However, display the Custom View you

need to change to work around this limitation. Make the necessary edits to the Custom View, and choose to add a new Custom View as described previously. Make sure you save the Custom View with the same name. Confirm the change by clicking **Yes** to the overwrite warning.

Using Custom Views to Automate Print Settings

As mentioned, Custom Views can contain print settings such as Print Areas. They can also include all other print settings defined in the **Page Setup** dialog box. For example, a Custom View can contain settings for margins, shrink-to-fit, and page orientation. You can save any print setting defined in the **Page Setup** dialog box as part of a Custom View. You must set all relevant print settings before creating the Custom View.



Each workbook has its own set of Custom Views, so you must create them in each workbook or include them in user-defined templates. The use of templates was examined in Chapter Three.

Because you define Custom Views within workbooks, you cannot create a view that links directly to another workbook. A potential workaround is to bring the desired data into the workbook using formulas or Camera objects linked to the source workbook. Then, create the Custom View, referencing the data linked into the workbook where the Custom View will reside.